

# Global Technology Supply Chain Handbook

## Connecting the Dots from Around the World

- **Updated Global Technology Supply Chain Handbook** — Our updated Global Technology Supply Chain Handbook includes several enhancements including country average wage cost and two new appendixes for site locations, sorted by company and area, which should prove useful for unexpected disasters (earthquakes, floods, power outages) or potential supply chain disruptions (political instability). The Handbook serves as a reference guide enabling investors to gauge the impact of incremental data points as related to specific companies within key technology sectors. Global Supply Chain diagrams provide a high level overview of a company's supply chain by mapping that company's "upstream" suppliers and "downstream" customers. With these diagrams, investors can connect the dots to see how data from one or more companies can affect others.
- **This publication includes:**
  - Proprietary sector overview charts, key product teardowns/bill of materials analysis and placemats from Citi technology analysts globally
  - Supply Chain charts with key suppliers, customers, competitors, geographic exposure, operating segments for 183 companies.
- **Industries covered include:**
- **Equipment/Components:**
  - Semiconductor Equipment
  - Semiconductor Foundry
  - Semiconductors (Analog Semiconductor, Memory: DRAM & NAND)
  - Glass Substrate
  - Flat Panel Display
  - Cover Glass
  - Connectors
- **Hub:**
  - Electronic Manufacturing Services
  - Distribution
- **End Products:**
  - Handsets
  - Servers, PC & Tablets
  - Enterprise Storage
  - TV's
  - Set Top Boxes
  - Gaming Consoles
  - Networking & Telecommunications Equipment
  - 3D Printing and Traditional Printing
  - Automotive/Aerospace
  - Solar

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Sunpower Corporation	442		
Synnex Corp.	444		
Taiyo Yuden	446		
Tamron Co Ltd.	448		
TDK	450		
TE Connectivity	452		
Tech Data Corp.	454		

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## Sources

The product, operating segment, and geographic breakdown data in this publication is primarily from the latest U.S. SEC filings (10-Ks, 20-Fs and Annual Reports).

Supply chain data regarding customers, suppliers, and competitors are from Citi Research analysts, company publications, as well as SEC filings. The SEC requires companies to disclose material customer or supplier relationships so, in general, more supply chain information is available for U.S. companies than non-U.S. companies. That said, individual analysts have contributed proprietary information to materially enhance this product.

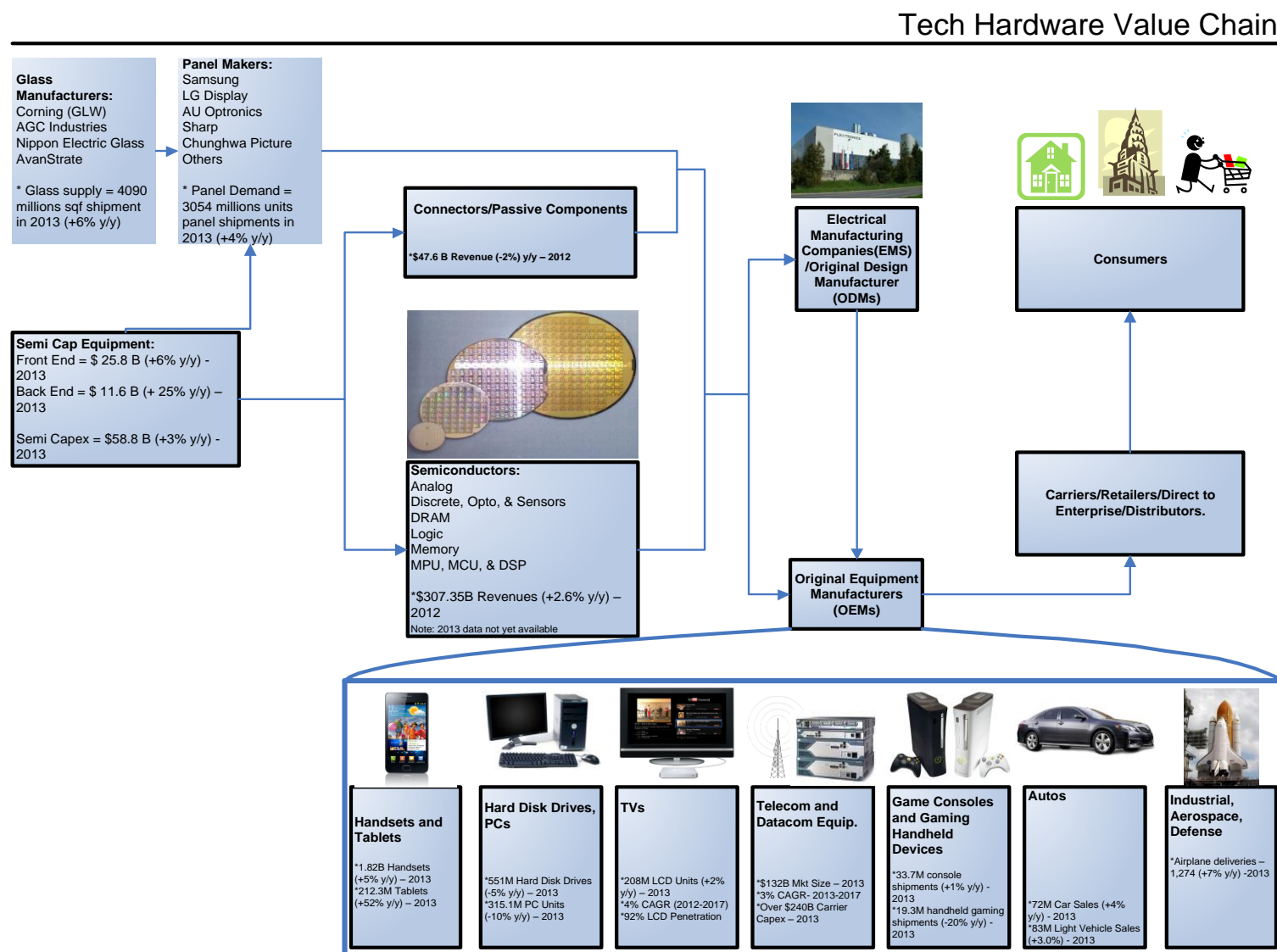
Almost all of the data are from sources that are less than a year old. Note: prices, rating, and target prices are as of April 04, 2014. All financial estimates have been retrieved from Citi's DataCentral service or factset for non-covered companies.

Please contact your Citi representative for additional details as most industry charts are summaries of much more detailed information.

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Figure 1. Overview of Tech Hardware and Supply Value Chain



Source: Citi Research, Gartner, IDC, World Bank, IMF, Thomson First Call, SIA

**Figure 2. Internet of Things**



During 2008, the number of things connected to the Internet exceeded the number of people in the world. These things are not just tablets and smartphones. Cisco's Internet Business Solutions Group (IBSG) predicts some 25 billion devices will be connected by 2015 (from 12.5 billion in 2010), and 50 billion by 2020.

Devices, or things, in the IoT are managed by intelligent systems, which are defined as securely managed electronic systems that run a high-level operator system (HLOS) and autonomously connect to the Internet, execute native or cloud-based applications, and analyze data collected. Additional details can be found in Citi's GPS report Upwardly Mobile III:

<https://ir.citi.com/GCfHMaIpArsRb012U9tNzYIU4mfdeSVszOSPfHQqQvcUOIqRVRQheQ%3D%3D>

Examples of Internet of Things: Connected cars, Remote healthcare monitoring, Personal fitness, Public transit, Transportation, Smart utilities, Discrete manufacturing, Home security/monitoring, etc.

Source: Citi Research

Figure 3. Tech Dashboard

	2009		2010		2011		2012		2013		2014E	
	Absolute	Y/Y	Absolute	Y/Y	Absolute	Y/Y	Absolute	Y/Y	Absolute	Y/Y	Absolute	Y/Y
Global GDP Growth (Real)		-1.9%		4.2%		3.0%		2.6%		2.5%		3.1%
Global CPI		1.4%		2.7%		3.6%		2.9%		2.6%		2.9%
US GDP Growth (Real)		-2.6%		3.0%		1.7%		2.8%		1.9%		2.8%
US CPI		0.1%		1.6%		2.5%		1.8%		1.1%		1.4%
Euro vs US\$ (Q4 est)	1.43	2.4%	1.32	-7.8%	1.39	5.3%	1.28	-7.9%	1.33	3.9%	1.39	4.5%
S&P 500 Operating EPS	\$62.05	0.4%	\$85.29	37.5%	\$97.84	14.7%	\$103.76	6.1%	\$110.10	6.1%	\$117.50	6.7%
Tech Sector Weighting (Strategy)			19.2%		20.0%		19.5%		21.6%			
S&P 500 Semis (Over-wt)			2.5%		2.9%		2.9%		2.2%			
S&P 500 Software (Over-wt)			9.8%		8.6%		10.2%		12.6%			
S&P 500 Hardware (Over-wt)			6.9%		8.6%		7.5%		6.8%			
PC												
PC WW Units (Desktop + Portable)	314.8M		357.9M	14%	363.9M	2%	349.3M	-4%	315.1M	-10%	314.3M	0%
Desktop	146.0M		157.0M	7%	154.8M	-1%	148.3M	-4%	136.7M	-8%	136.7M	0%
Portable	168.8M		200.9M	19%	209.1M	4%	201.0M	-4%	178.4M	-11%	177.5M	0%
Tablets			19.3M		72.0M	273%	139.5M	94%	212.3M	52%	258.5M	22%
Hard Disk Drive units	557.1M		651.3M	17%	622.4M	-4%	578.5M	-7%	551.6M	-5%	558.0M	1%
Comm Equipment												
Handset Units	1.39B		1.73B	24%	1.97B	14%	1.74B	-12%	1.82B	5%	1.93B	6%
Smartphone Units	189M		320M	70%	487M	52%	723M	48%	1,004M	39%	1,320M	31%
Enterprise												
Enterprise Network Equipment Revenue			\$36.3B		\$37.7B	4%	\$39.9B	6%	\$42.3B	6%	\$43.9B	4%
Servers (x86)	6.6M		7.7M	18%	8.0M	4%	8.5M	7%	8.8M	4%	9.3M	5%
Total External Disk-Based Storage Systems	\$19.1B		\$22.5B	18%	\$25.1B	12%	\$26.3B	5%	\$26.8B	2%	\$27.8B	4%
Direct Attached Storage (DAS)	\$3.6B		\$3.1B	-13%	\$2.8B	-11%	\$2.6B	-6%	\$2.4B	-9%	\$2.2B	-5%
Storage Area Networking (SAN)	\$11.2B		\$13.2B	18%	\$15.5B	17%	\$16.6B	6%	\$17.1B	4%	\$17.9B	4%
Network Attached Storage (NAS)	\$3.7B		\$5.4B	49%	\$5.9B	9%	\$6.1B	2%	\$6.2B	3%	\$6.7B	7%
Enterprise Software WW (top down)			\$245.3B		\$272.6B	11%	\$285.4B	5%	\$299.2B	5%	\$319.8B	7%
Citi-covered Software (bottoms-up)			\$161.3B		\$171.8B	6%	\$171.8B	0%	\$183.0B	7%	\$203.4B	11%
Applications			\$46.1B		\$49.4B	7%	\$49.4B	0%	\$53.3B	8%	\$60.7B	14%
Infrastructure			\$106.8B		\$113.3B	6%	\$113.3B	0%	\$120.6B	6%	\$133.0B	10%
Security			\$8.5B		\$9.1B	7%	\$9.1B	0%	\$9.2B	2%	\$9.6B	4%
Consumer												
LCD TV	145.4M		191.6M	32%	205.3M	7%	203.2M	-1%	208.0M	2%	230.3M	11%
Automotive												
Global Production	59.5M		74.4M	25%	77.0M	4%	81.6M	6%	83.3M	2%	87.9M	6%
Global Sales	63.9M		72.4M	13%	76.9M	6%	81.0M	5%	82.5M	2%	86.6M	5%
Components/Suppliers												
Semi Revenues	\$226.3B		\$298.3B	32%	\$299.5B	0%	\$291.6B	-3%	\$305.4B	5%	\$332.6B	9%
Glass Demand (millions sq meters)			306 mln m2	30%	302 mln m2	-1%	325 mln m2	8%	348 mln m2	7%	372 mln m2	7%
*includes carriers covers by Citi Research												

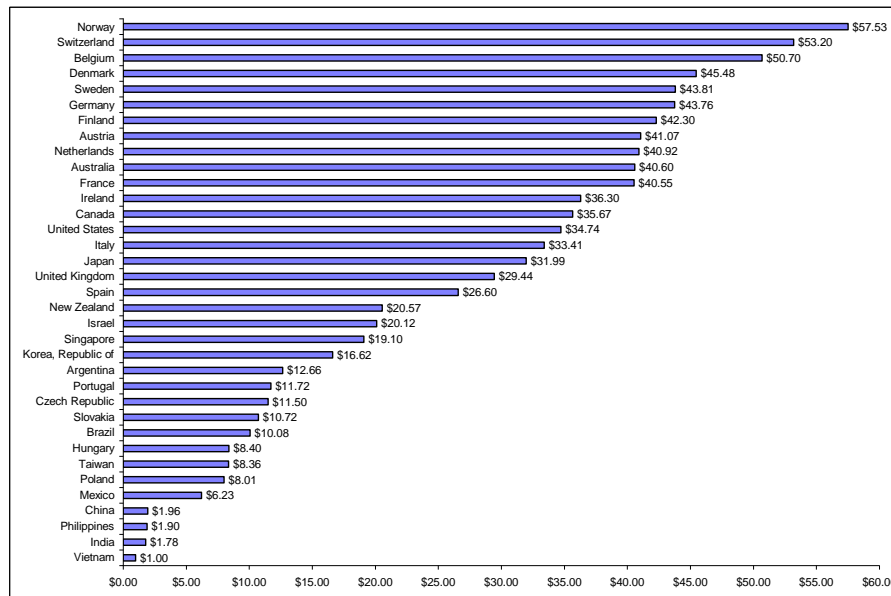
Source: Citi Research

Figure 4. IT Dashboard in US\$ terms

	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	CAGR '09-'13	CAGR '10-'13	CAGR '10-'14	CAGR '10-'15
Personal Computers	\$246	\$231	\$207	\$200	\$204	\$209	\$213	1.0%	-6.1%	-10.5%	-3.4%	2.2%	-1.5%	-5.3%	-4.8%	-3.5%
Servers	\$57	\$56	\$54	\$55	\$56	\$58	\$59	14.1%	-0.8%	-4.8%	1.8%	2.6%	3.7%	2.5%	2.4%	2.4%
Printers / Copiers	\$52	\$51	\$48	\$48	\$47	\$46	\$45	-1.5%	-1.7%	-5.3%	-1.2%	-1.5%	-0.4%	-2.8%	-2.4%	-2.2%
Storage Systems	\$31	\$33	\$33	\$33	\$34	\$35	\$36	8.9%	4.7%	-0.1%	2.1%	2.4%	7.7%	4.4%	3.8%	3.6%
Networked Storage Systems (SAN +	\$20	\$21	\$22	\$23	\$24	\$25	\$27	14.9%	5.4%	2.3%	5.3%	5.4%	11.8%	7.4%	6.9%	6.6%
Software	\$273	\$285	\$300	\$320	\$343	\$367	\$393	11.5%	4.7%	5.2%	6.8%	6.9%	7.4%	7.1%	7.0%	7.0%
Storage Management Software	\$14	\$15	\$16	\$17	\$18	\$20	\$21	13.6%	6.9%	7.1%	7.4%	7.6%	8.3%	9.2%	8.7%	8.5%
IT Services	\$888	\$906	\$922	\$963	\$1,011	\$1,062	\$1,116	10.7%	2.0%	1.8%	4.5%	4.9%	4.4%	4.7%	4.7%	4.7%
Networking / Telecom Equipment	\$187	\$187	\$195	\$204	\$214	\$222	\$230	4.6%	0.3%	4.0%	4.8%	4.6%	3.8%	3.0%	3.4%	3.7%
Data Networking	\$54	\$56	\$58	\$59	\$61	\$62	\$62	3.8%	3.0%	3.4%	2.5%	2.4%	6.5%	3.4%	3.2%	3.0%
Mobile Handsets	\$286	\$353	\$368	\$387	\$416	\$438	\$458	17.7%	23.8%	4.2%	5.1%	7.6%	15.6%	14.9%	12.4%	11.4%
All IT (excludes Telecom Services)	\$2,018	\$2,103	\$2,126	\$2,210	\$2,324	\$2,437	\$2,550	9.6%	4.2%	1.1%	3.9%	5.2%	5.5%	4.9%	4.7%	4.8%
IT Hardware (ex Telecom Services)	\$858	\$911	\$904	\$926	\$971	\$1,009	\$1,041	7.9%	6.3%	-0.8%	2.4%	4.8%	6.1%	4.4%	3.9%	4.1%
IT Hardware ex-Handsets	\$572	\$558	\$536	\$539	\$555	\$570	\$583	3.5%	-2.5%	-4.0%	0.7%	2.8%	1.4%	-1.0%	-0.6%	0.1%
All IT: Constant-Currency (excludes Telecom Services)	\$1,860	\$2,008	\$2,075	\$2,179	\$2,297	\$2,412	\$2,524	7.9%	3.3%	5.0%	5.4%					

Source: Citi Research

Figure 5. 2012 Manufacturing Labor Rates in US\$



Source: Citi Research, US Department of Labor, company managements, Labor data release usually lags 3-4 years



Figure 6. IT Service Forecasts

	2012	2013	2014	2015	2016	2017	2011-2012 Growth (%)	2012-2013 Growth (%)	2012-2017 CAGR (%)
<b>Project based</b>									
Business consulting	80142	85642	91485	98209	105604	113789	8.10	6.90	7.30
IT consulting	30395	31212	32459	33885	35436	37034	-1.22	2.70	4.00
Systems integration	111741	114999	120095	125707	131418	137353	-0.05	2.90	4.20
Network consulting and integration	36008	38119	40751	43513	46556	49550	3.13	5.90	6.60
Custom application development	38154	39778	41543	43391	45266	47185	1.88	4.30	4.30
Subtotal	296441	309749	326333	344706	364281	384910	2.55	4.50	5.40
<b>Outsourcing</b>									
Business process outsourcing services	159091	167853	177270	187369	197982	209082	3.73	5.50	5.60
Application management	50741	52813	55136	57403	59362	61185	4.61	4.10	3.80
Hosted application management	9897	10571	11383	12294	13249	14292	3.77	6.80	7.60
IS outsourcing	121149	122398	124337	126283	127347	127508	-1.12	1.00	1.00
Network and desktop outsourcing services (NDOS)	47024	48123	49846	51791	53828	56001	0.01	2.30	3.60
Hosting infrastructure services	35278	38050	41321	44988	48845	52809	7.67	7.90	8.40
Subtotal	423180	439807	459293	480128	500612	520877	2.26	3.90	4.20
<b>Support/training</b>									
Hardware deploy and support	62875	64495	66281	68276	70353	72532	1.70	2.60	2.90
Software deploy and support	68883	70799	73159	75794	78436	81144	0.76	2.80	3.30
IT education and training	23412	24017	24855	25793	26778	27862	0.49	2.60	3.50
Subtotal	155170	159312	164296	169863	175567	181538	1.10	2.70	3.20
IT services subtotal	635557	655373	681166	709118	736875	764454	1.06	3.10	3.80
Business services subtotal	239233	253495	268755	285578	303586	322871	5.16	6.00	6.20
Total	874791	908868	949921	994697	1040460	1087325	2.15	3.90	4.40

Source: Citi Research, IDC

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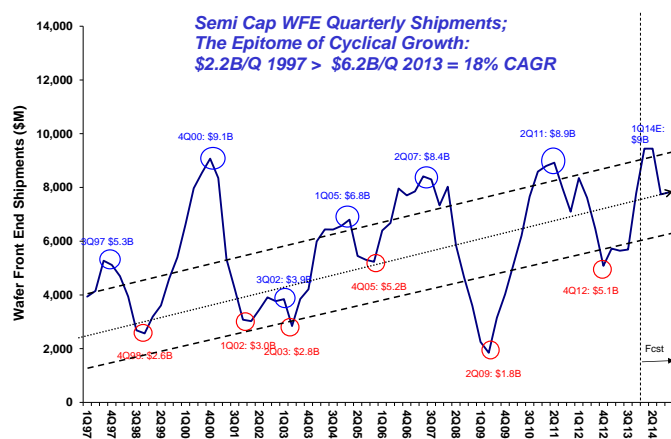
## Sector Charts

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## Semiconductor Capital Equipment

Semiconductor capital equipment suppliers provide equipment to chip or device makers such as Intel, TSMC and Samsung. Semiconductor equipment suppliers include both front-end or wafer fab equipment and back-end or test and packaging suppliers. Wafer fab equipment is used to manufacture semiconductor device on a silicon substrate or wafer. Major wafer fab equipment suppliers include Applied Materials, ASML, Tokyo Electron, Lam Research and KLA-Tencor. Packaging and test equipment is used to final test a chip electrically before it is packaged in the OEM box. Major test and packaging equipment suppliers include Teradyne, Advantest, and Kulicke and Soffa.

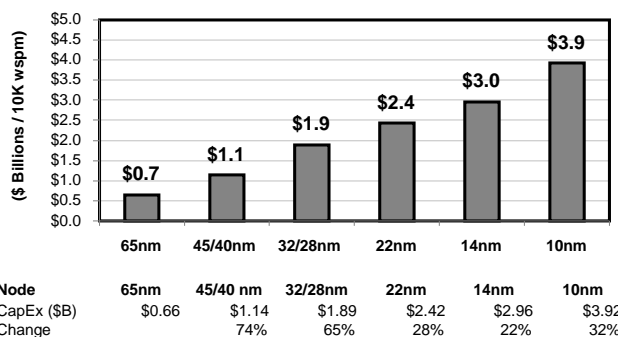
Figure 7. Semi Cap: Cyclical Growth Mistaken for Mature Cyclical



Source: Citi Research

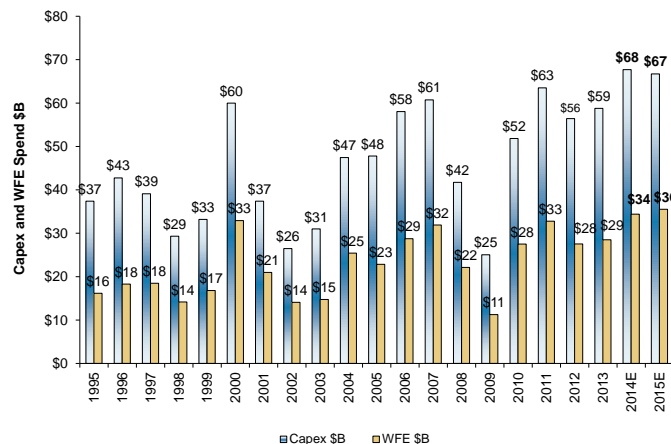
Figure 8. Rising Capital Intensity

### CapEx for Logic/Foundry Production Line



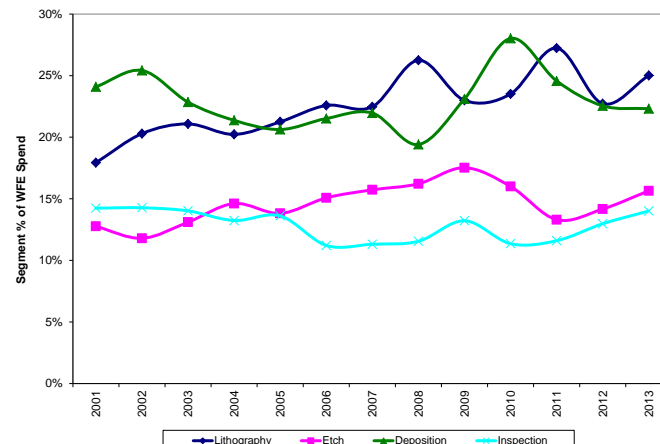
Source: Citi Research

Figure 9. Capex & WFE Spend Forecast



Source: WWSEMS, Citi Research

Figure 10. Litho and Inspection Spend Outperforming



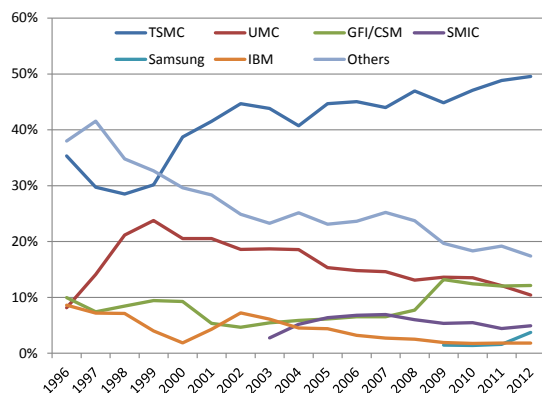
Source: WWSEMS, Citi Research



## Semiconductor Foundry & Backend

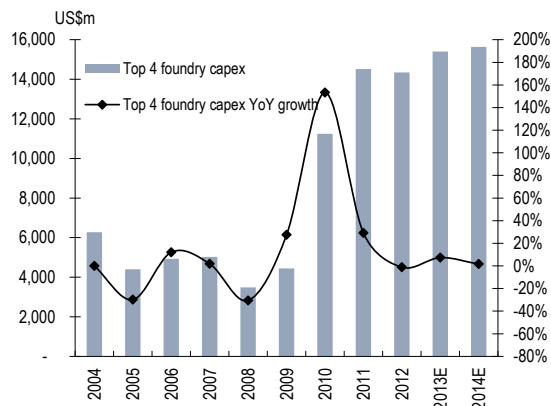
Semiconductor foundry and backend companies are contract manufacturers; foundries provide front-end wafer processing services for their customers (including IDMs, system makers and fabless companies), and backend suppliers provides IC assembly and testing services. The major players providing foundry services include TSMC (50% market share), Globalfoundries, UMC, SMIC, and Samsung. The major backend service providers include ASE, Amkor, SPIL, STATS ChipPAC and Powertech.

Figure 11. Trend of foundry market share



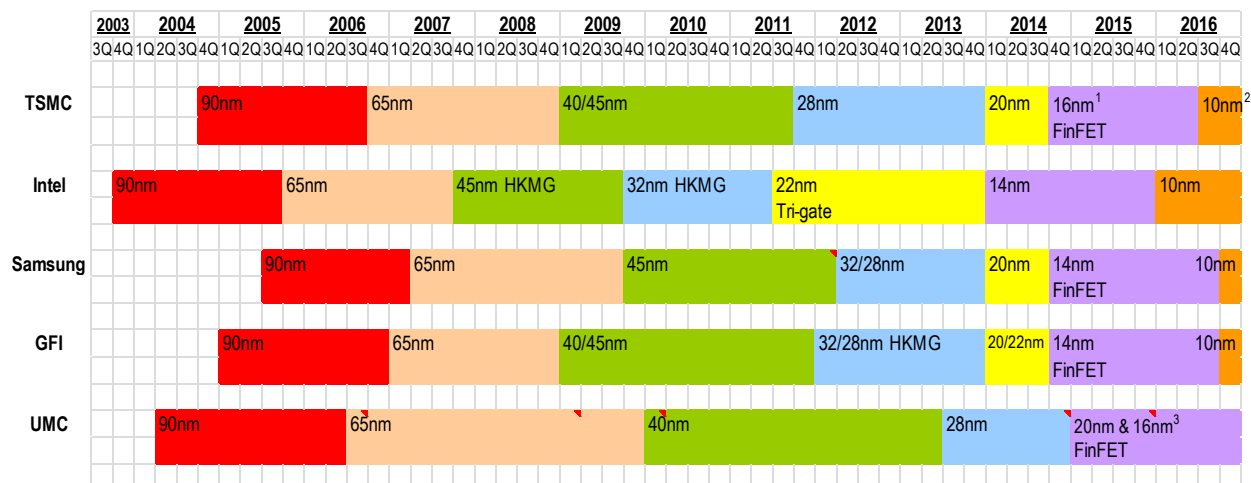
Source: Company, Citi Research

Figure 12. Top 4 Foundry Capex Trend



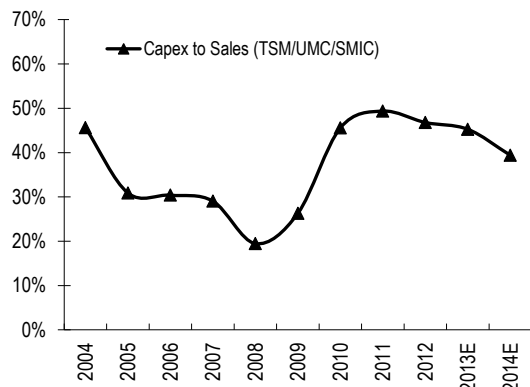
Source: Company, Gartner, Citi Research

Figure 13. Mass production roadmap of key technologies in TSMC, Intel, Samsung, Globalfoundries and UMC



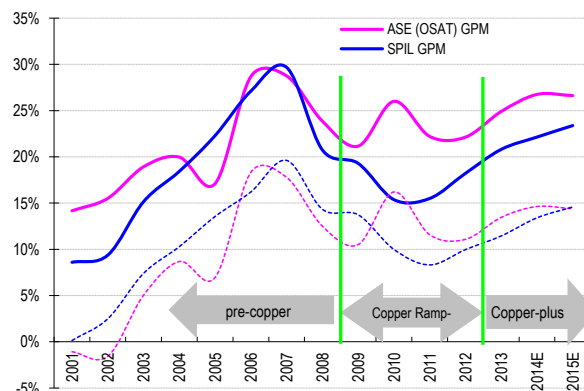
Source: Companies, Citi Research

Figure 14. TSMC+UMC+SMIC foundry capex to sales ratio



Source: Company, Bloomberg, Citi Research

Figure 15. OSATs entering the "copper plus" era



Source: Company, Citi Research

Figure 16. Foundry capacity expansion

(8"-equivalent)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013E	2014E
TSMC	4,791	5,955	7,064	8,294	9,376	9,952	11,327	13,222	15,089	16,447	18,120
UMC	3,158	3,855	4,017	4,308	4,507	4,586	4,792	5,323	5,514	6,106	6,505
CHRT/Globalfoundries	1,289	1,501	1,784	1,960	2,443	3,341	3,834	4,354	5,670	6,896	7,200
SMIC Total	1,097	1,697	2,050	2,135	1,909	1,922	2,010	2,286	2,423	2,727	3,021
Samsung							3,896	4,305	4,871	4,697	5,575
Top 4 + Samsung	10,336	13,008	14,914	16,697	18,235	19,802	25,859	29,490	33,567	36,873	40,420
YoY		26%	15%	12%	9%	9%	31%	14%	14%	10%	10%
Total Foundry Capacity (Gartner)	19,459	23,512	26,210	29,527	32,775	34,939	37,906	42,970	45,827	49,433	53,007
YoY		21%	11%	13%	11%	7%	8%	13%	7%	8%	7%

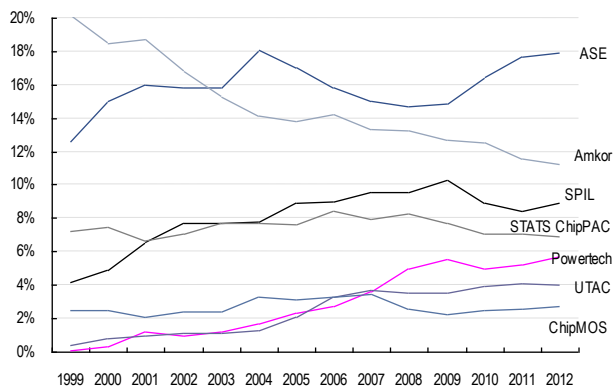
Source: Citi Research

Figure 17. Total Incremental Wafer Demand from Key New Products

(Unit: '000 of 8" equivalent)	iPhone	Samsung smartphone	Other smartphone	Feature phone	iPad / Tablet	NB	Total
Total incremental wafers (2012E)	1,767	4,842	2,815	(3,244)	4,218	(607)	9,792
Total incremental foundry addressable (2012E)	935	1,700	1,704	(1,926)	2,696	(239)	4,870
As % of 2011 top 4 foundry capacity	4%	7%	7%	-8%	11%	-1%	19%
Total incremental wafers (2013E)	733	4,284	6,843	(3,063)	5,188	(1,969)	12,015
Total incremental foundry addressable (2013E)	388	1,504	4,142	(1,819)	3,316	(775)	6,756
As % of 2012 top 4 foundry capacity	1%	5%	14%	-6%	12%	-3%	24%
Total incremental wafers (2014E)	86	3,315	6,883	(2,459)	4,285	(696)	11,414
Total incremental foundry addressable (2013E)	46	1,164	4,166	(1,461)	2,739	(274)	6,380
As % of 2013 top 4 foundry capacity	0%	4%	13%	-5%	9%	-1%	20%

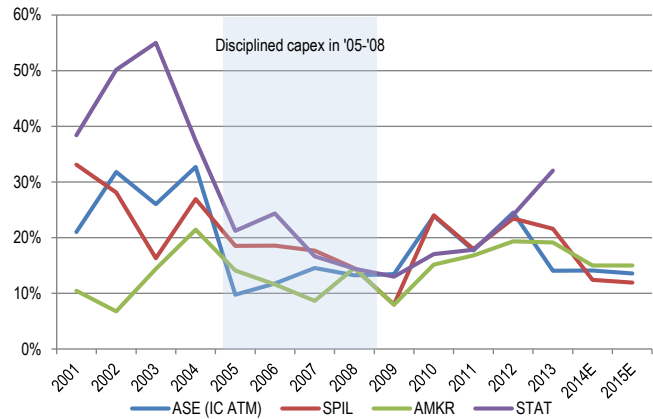
Source: Citi Research

Figure 18. OSAT market share trend



Source: Gartner

Figure 19. Capex to sales trend of top four OSATs

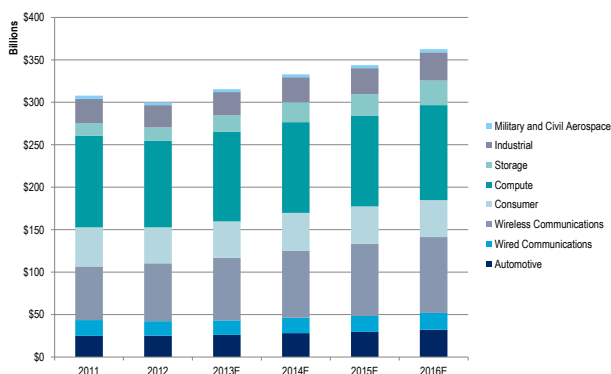


Source: Gartner, Citi Research

## Semiconductor

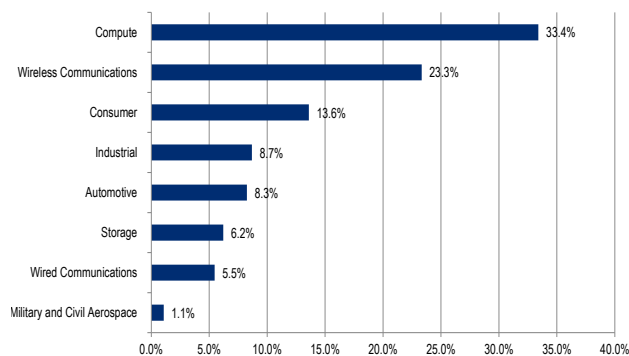
Semiconductor companies design devices (chips) used in a variety of applications worldwide. Chip companies can be characterized by the degree to which they outsource the manufacturing of the chips they design. Outsourcing to foundries is a growing trend due to the exponentially rising cost of building chip fabrication plants (fabs). Smaller chip companies can avoid the capital intensive costs and burdens they impose by going “fables.” On one end of the spectrum, integrated device manufacturers (IDMs) design chips and build their own fabs to manufacture the devices—Intel is an example of a pure IDM company. On the other end of the spectrum, fabless chip companies contract all of their production to external foundry partners like TSMC, UMC, or GlobalFoundries—Qualcomm and Broadcom are examples of pure fabless companies. Several chip companies fall in between the two extremes, operating their own fabs in addition to outsourcing to foundry partners—Texas Instruments outsources a small portion of its production, mainly for leading-edge chips; and Cypress Semiconductor outsources half, a so-called “fab-lite” strategy.

**Figure 20. Semiconductor Revenues by Application, Historical and Forecast**



Source: Citi Research, Gartner

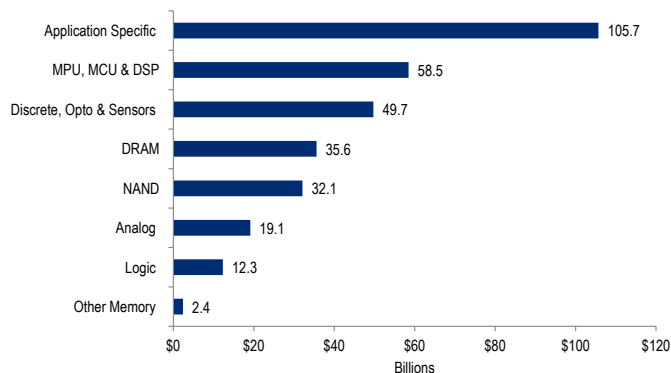
**Figure 21. Semiconductor Revenues by Application, 2013 (% of total)**



Source: Citi Research, Gartner

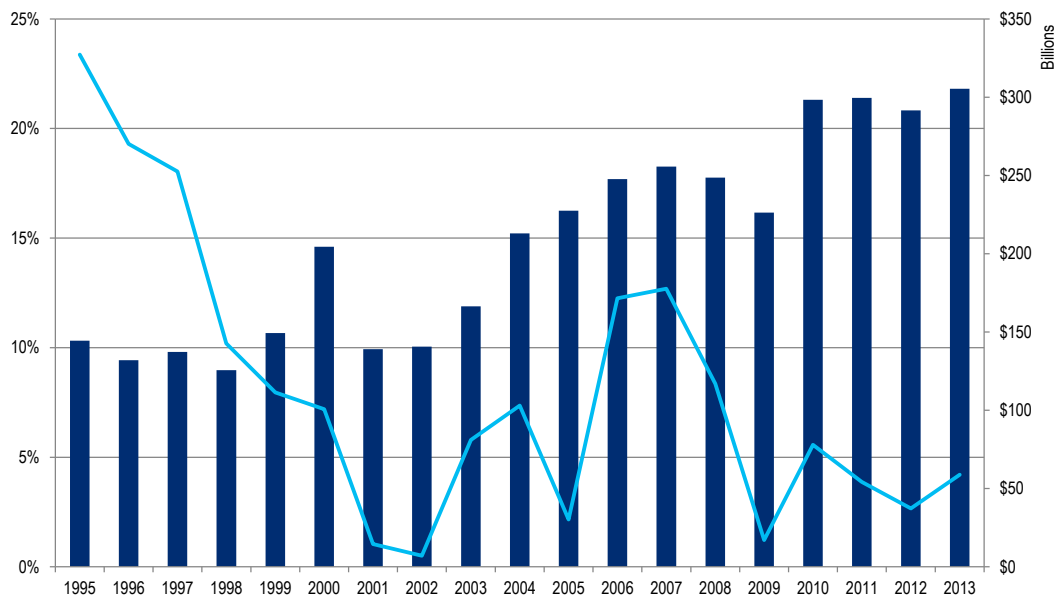


**Figure 22. Semiconductor Revenues by Chip Type, 2013 (billions of US\$)**



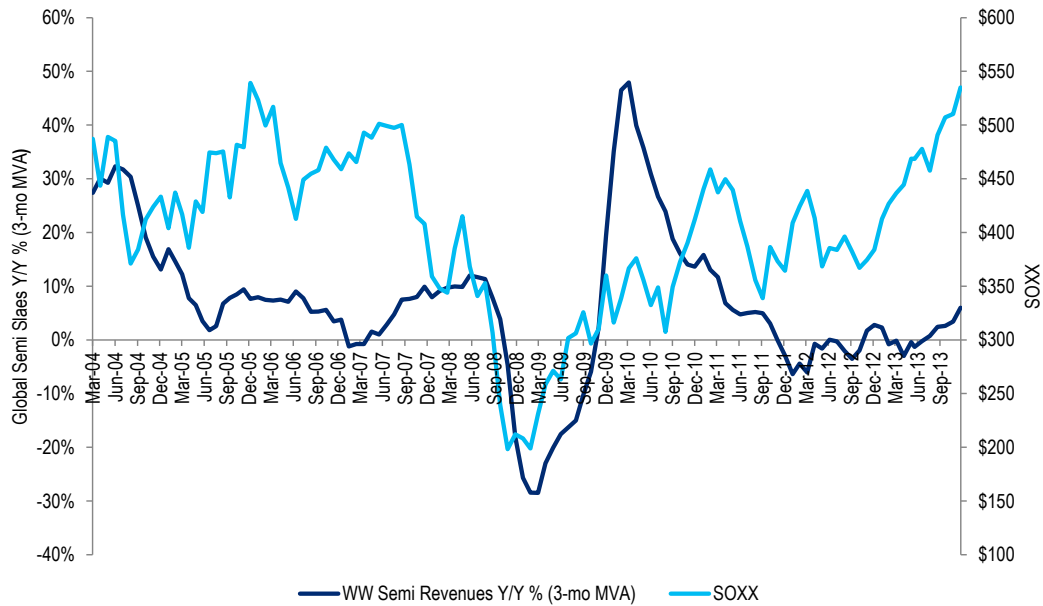
Source: Citi Research

**Figure 23. Annual Semiconductor Sales, Historical**



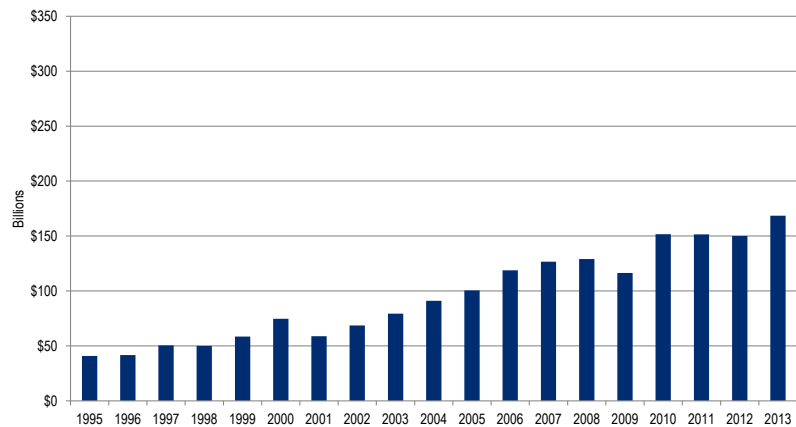
Source: WSTS, Citi Research

Figure 24. Global Semiconductor Revenues, Y/Y %, vs. SOXX



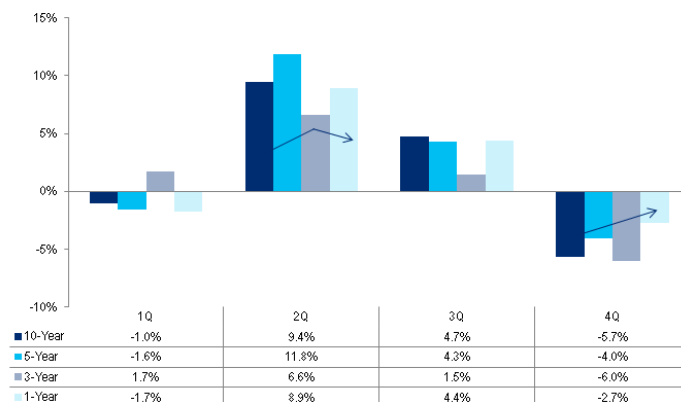
Source: Citi Research, WSTS, FactSet

Figure 25. Annual Global Sales Ex-Memory & Discretes



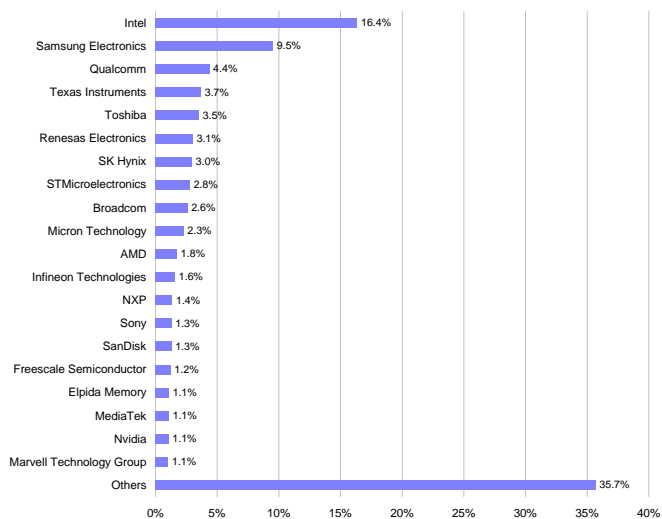
Source: Citi Research

Figure 26. Semiconductor Units Seasonality



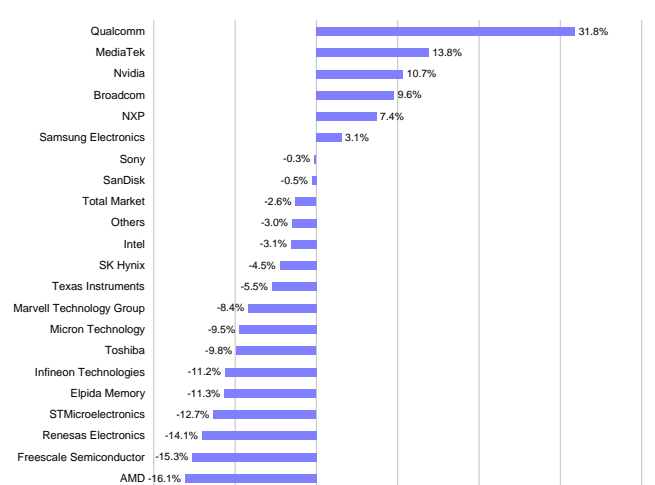
Source: Citi Research, WSTS

Figure 27. 2012 Semiconductor Market Share %, Top 20



Source: Citi Research, Gartner

Figure 28. 2012 y/y Sales Growth %, Top 20



Source: Citi Research, Gartner

## Analog Semiconductor

Our 12-stock coverage group spans three analog mixed-signal markets:

- a) analog (all twelve companies),
- b) discrete (FCS, IRF, ONNN, SMTC), and
- c) microcontrollers (MCHP and SLAB).

Analog chips regulate power and manipulate electrical signals. Discrete components are simpler 'non-integrated' single function devices, and microcontrollers blend logic, memory, and mixed signal into an embedded processing and control unit. To use an analogy, if microprocessors and memory act as the 'brains' of an electronic device, then analog mixed-signal chips makeup the cardiovascular, nervous, and endocrine systems by circulating energy, transmitting signals, and regulating basic functionality, respectively.

**Fabless/Fab-lite Analog Companies:** ADI, ISIL, SLAB and SMTC have adopted a fabless or fab-lite manufacturing process. Foundries such as TSMC, UMC and MX, manufacture the chips that are designed at these fab-lite companies.

Figure 29. Analog End Market Exposure 2013

2013 Sales (\$M)	Computing	Communications	Consumer	Industrial	Auto	Total
ADI	0	543	370	1229	498	2,640
FCS	125	350	226	545	159	1,405
IRF	66	201	232	402	140	1,040
ISIL	118	136	118	146	58	575
LLTC	171	342	105	454	244	1,317
MCHP	243	243	747	402	233	1,868
MX	301	0	519	17	0	836
MXIM	321	369	1058	478	193	2,419
ONNN	438	487	543	557	758	2,783
SLAB	87	203	158	68	64	580
SMTc	116	162	168	119	30	595
<b>Total</b>	<b>1987</b>	<b>4175</b>	<b>5188</b>	<b>4848</b>	<b>2509</b>	<b>18,707</b>

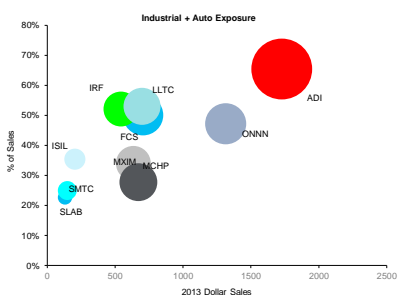
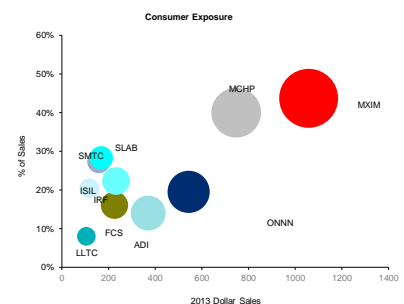
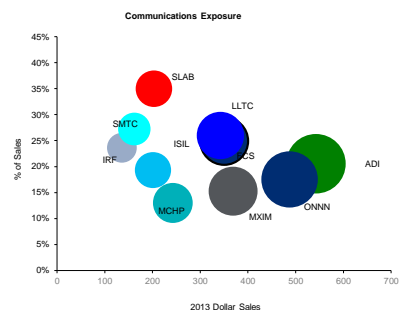
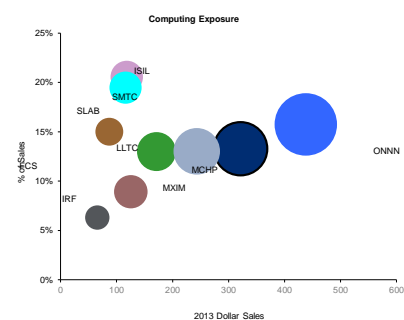
2013 % of Sales	Computing	Communications	Consumer	Industrial	Auto	Total
ADI	0%	21%	14%	47%	19%	100%
FCS	9%	25%	16%	39%	11%	100%
IRF	6%	19%	22%	39%	13%	100%
ISIL	21%	24%	20%	25%	10%	100%
LLTC	13%	26%	8%	34%	19%	100%
MCHP	13%	13%	40%	22%	13%	100%
MX	36%	0%	62%	2%	0%	100%
MXIM	13%	15%	44%	20%	8%	100%
ONNN	16%	18%	20%	20%	27%	100%
SLAB	15%	35%	27%	12%	11%	100%
SMTc	19%	27%	28%	20%	5%	100%
<b>Average</b>	<b>13%</b>	<b>22%</b>	<b>28%</b>	<b>25%</b>	<b>12%</b>	<b>100%</b>

End Market Exposure versus Group Average

2013 % of Total	Computing	Communications	Consumer	Industrial	Auto
ADI	0.00	0.93	0.50	1.89	1.61
FCS	0.66	1.13	0.57	1.58	0.96
IRF	0.47	0.87	0.79	1.57	1.15
ISIL	1.53	1.07	0.73	1.03	0.85
LLTC	0.97	1.18	0.28	1.40	1.58
MCHP	0.97	0.59	1.42	0.87	1.06
MX	2.68	0.00	2.21	0.08	0.00
MXIM	0.99	0.69	1.56	0.80	0.68
ONNN	1.17	0.79	0.69	0.81	2.32
SLAB	1.12	1.58	0.97	0.48	0.94
SMTc	1.45	1.23	1.01	0.81	0.43
<b>Total</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>

MARKET SHARE OF COMPOSITE

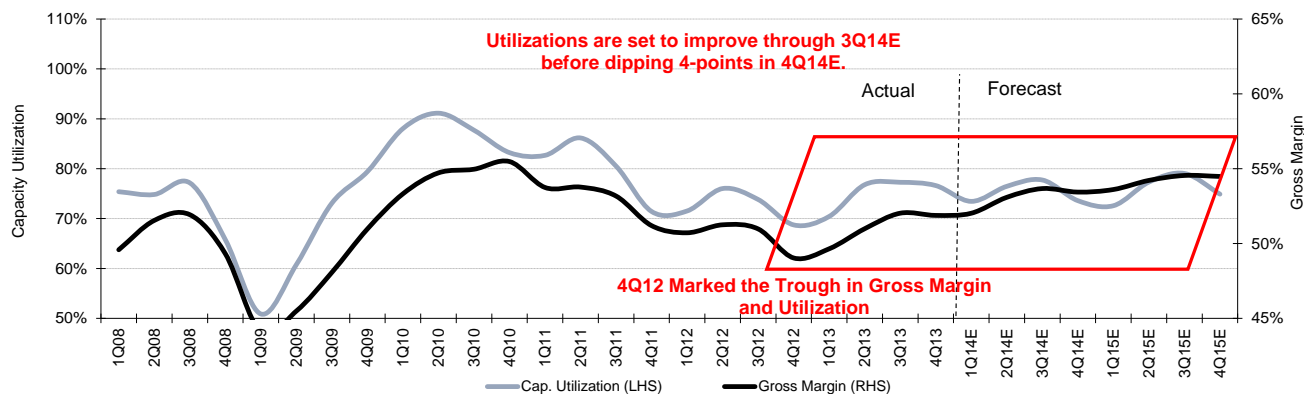
2013 % of Total	Computing	Communications	Consumer	Industrial	Auto	Total
ADI	0%	13%	7%	25%	20%	14%
FCS	6%	8%	4%	11%	6%	8%
IRF	3%	5%	4%	8%	6%	6%
ISIL	6%	3%	2%	3%	2%	3%
LLTC	9%	8%	2%	9%	10%	7%
MCHP	12%	6%	14%	8%	9%	10%
MX	15%	0%	10%	0%	0%	4%
MXIM	16%	9%	20%	10%	8%	13%
ONNN	22%	12%	10%	11%	30%	15%
SLAB	4%	5%	3%	1%	3%	3%
ISIL	6%	4%	3%	2%	1%	3%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>



Source: Citigroup Investment Research, Gartner, Street Estimates, Company Presentation

Source: Citi Research, Gartner, Street Estimates, Company Reports

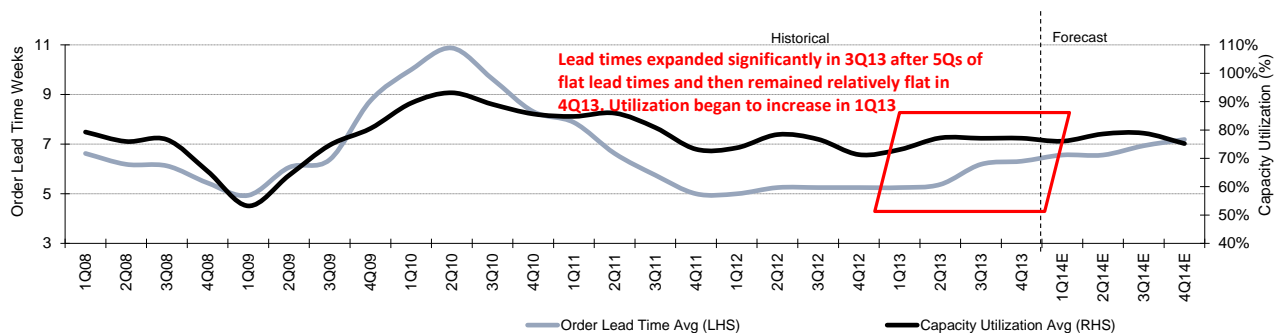
Figure 30. Analog Lead Times vs. Utilization Rates (1Q08-4Q14E)



	1Q10	2Q10	3Q10	4Q10	1Q11	2Q11	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14E	2Q14E	3Q14E	4Q14E
Utilization (LHS)	88%	91%	88%	83%	83%	86%	81%	71%	72%	76%	74%	69%	70%	77%	77%	77%	73%	76%	78%	74%
Gross Margin (RHS)	53%	55%	55%	55%	54%	54%	53%	51%	51%	51%	51%	49%	50%	51%	52%	52%	52%	53%	54%	53%

Source: Citi Research, Company Reports

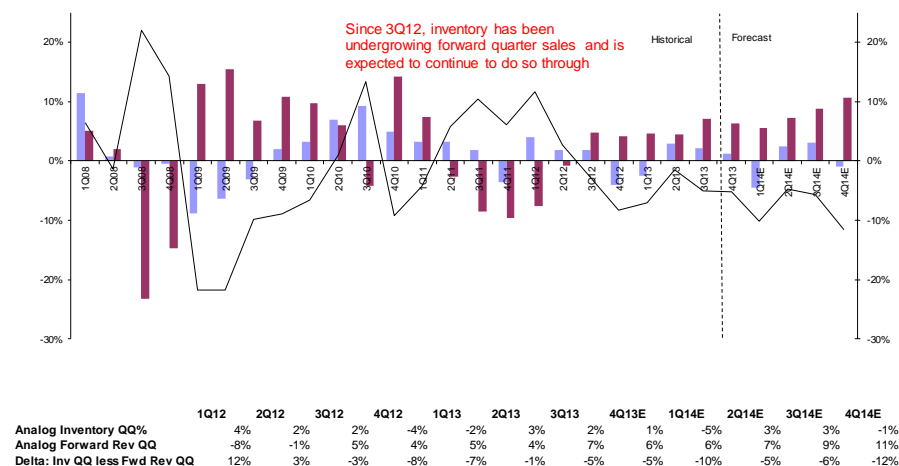
Figure 31. Analog Capacity Utilization vs. Gross Margins (1Q08-4Q14E)



	1Q10	2Q10	3Q10	4Q10	1Q11	2Q11	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14E	2Q14E	3Q14E	4Q14E
Order Lead Time Avg - New	10.0	10.9	9.6	8.3	7.9	6.6	5.8	5.0	5.0	5.3	5.3	5.3	5.3	5.4	6.2	6.3	6.6	6.6	6.9	7.2
Cap. Utilization Avg	89%	93%	89%	86%	85%	86%	81%	73%	74%	78%	77%	71%	73%	77%	77%	77%	76%	79%	79%	75%

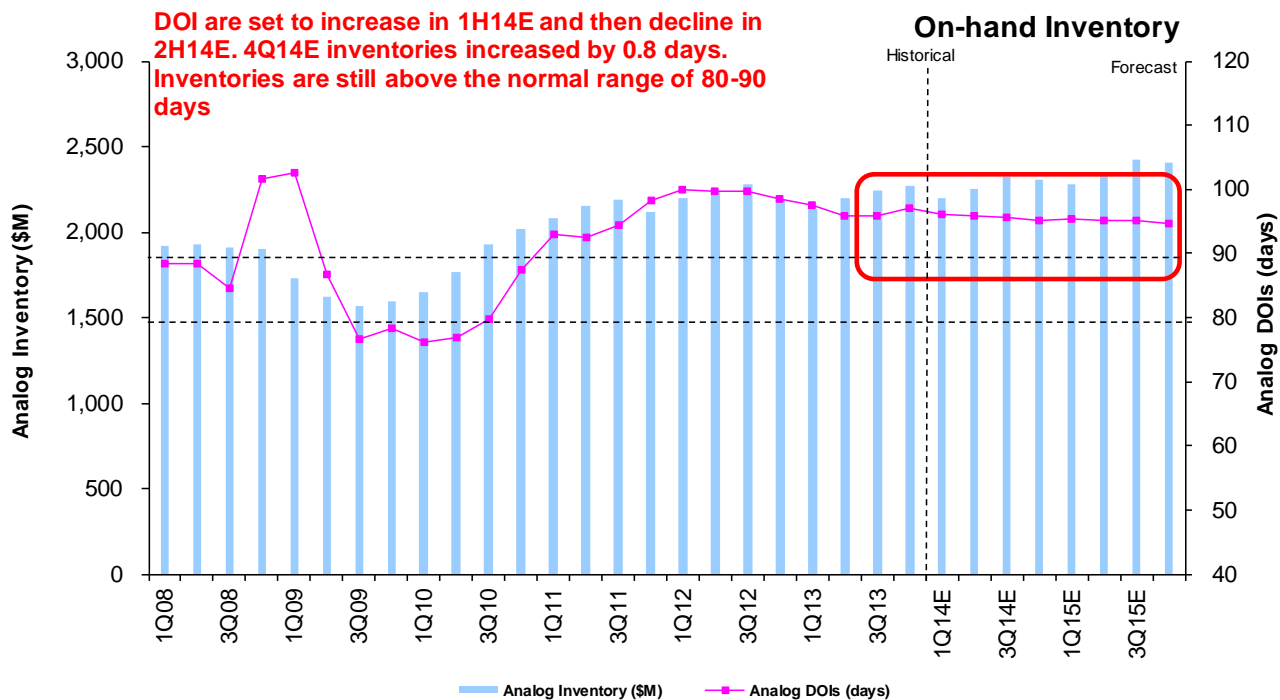
Source: Citi Research, Company Reports

Figure 32. Analog On-hand Inventory vs. Forward Sales Guidance (1Q08-4Q14E)



Source: Citi Research

Figure 33. Analog On-hand Inventory and DOIs (1Q08-4Q14E)

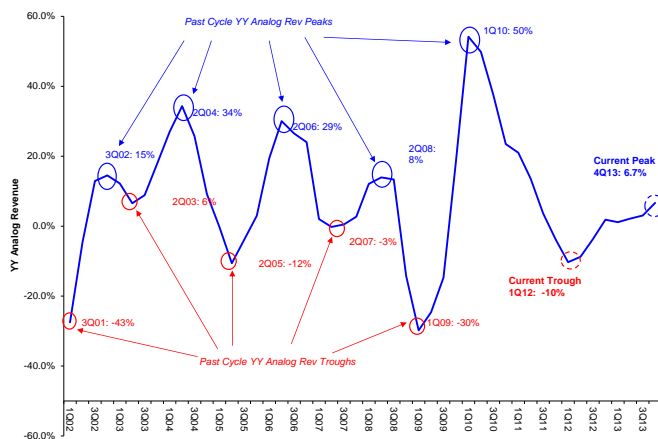


	1Q11	2Q11	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14E	2Q14E	3Q14E	4Q14E
Analog Inventory (\$M)	2,085	2,151	2,190	2,113	2,197	2,238	2,281	2,188	2,134	2,197	2,243	2,268	2,201	2,256	2,326	2,305
Analog DOIs (days)	93.1	92.5	94.3	98.2	99.9	99.8	99.7	98.5	97.6	95.8	95.8	97.1	96.2	95.8	95.5	95.2

Source: Citi Research, Company Reports



Figure 34. Analog Sales Y/Y Growth (4Q00-4Q14E)



Source: Citi Research

Figure 35. Analog Stock Index Performance around Y/Y Rev Peaks

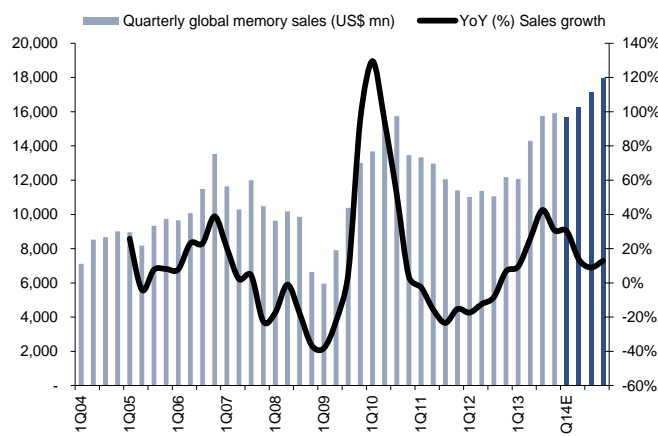


Source: Citi Research

## Memory: DRAM & NAND

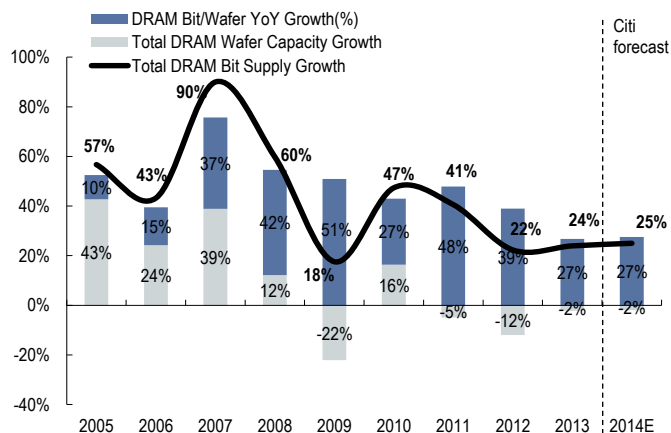
Semiconductor memory companies supply memory chips, which store data temporarily (DRAM to support CPU) or permanently (NAND like HDD), are used in virtually all electronic goods such as smartphones and feature phones, PCs, TVs, servers and communication infrastructure. Major DRAM suppliers include Samsung Electronics, SK Hynix and Micron. Major NAND suppliers include Samsung Electronics, SK Hynix, Toshiba and Micron.

Figure 36. Global DRAM Revenue Trend



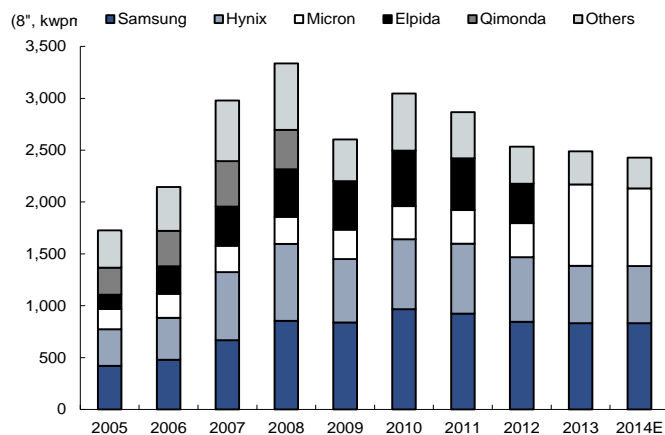
Source: WSTS, Citi Research

Figure 37. Supply Growth Forecast



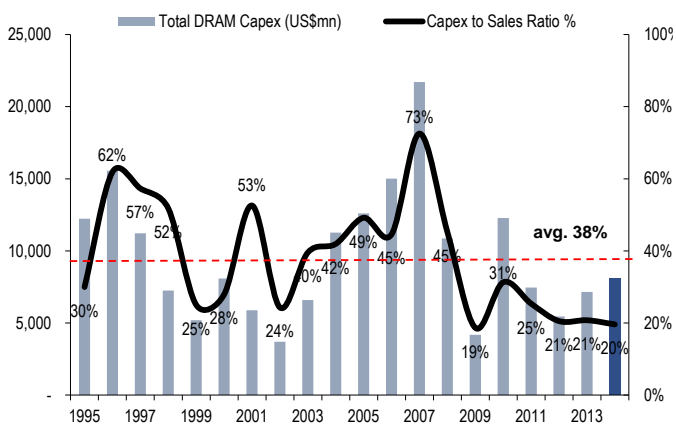
Source: Company data, Citi Research

Figure 38. DRAM Capacity Trend



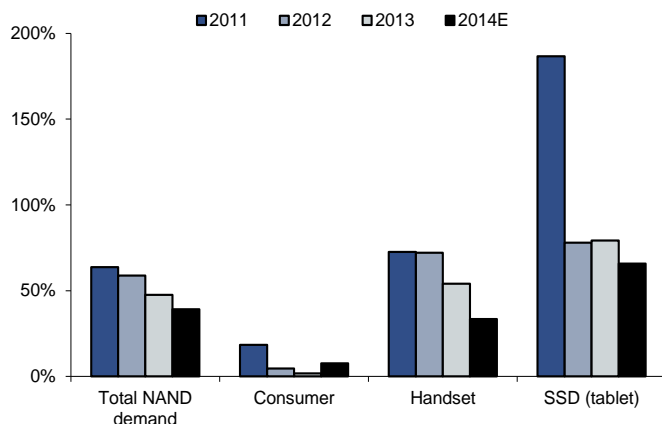
Source: Citi Research, Company Data

Figure 39. DRAM Capex and y/y growth



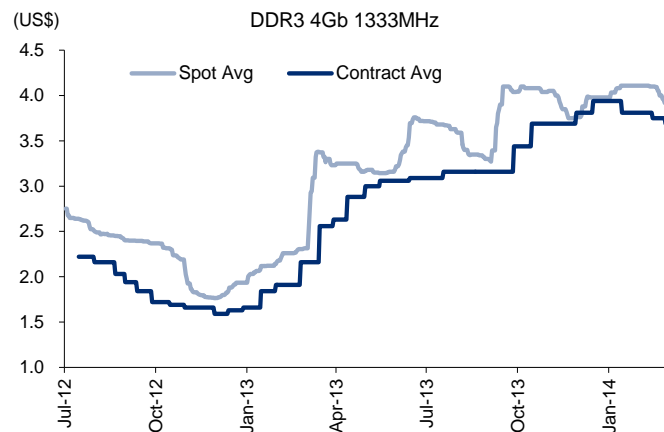
Source: Citi Research, Company Data

Figure 40. Demand Growth By Application



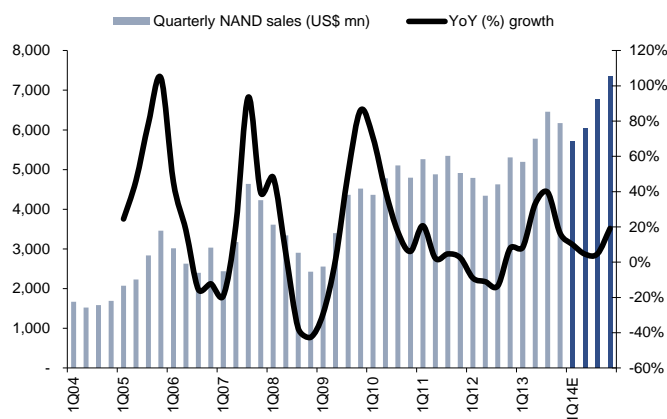
Source: Citi Research

Figure 41. DRAM Pricing



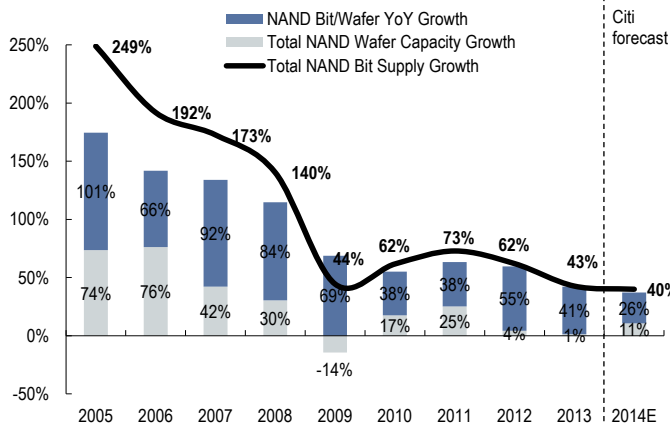
Source: Research, DRAmEXchange

Figure 42. Quarterly Global NAND Revenue Trend



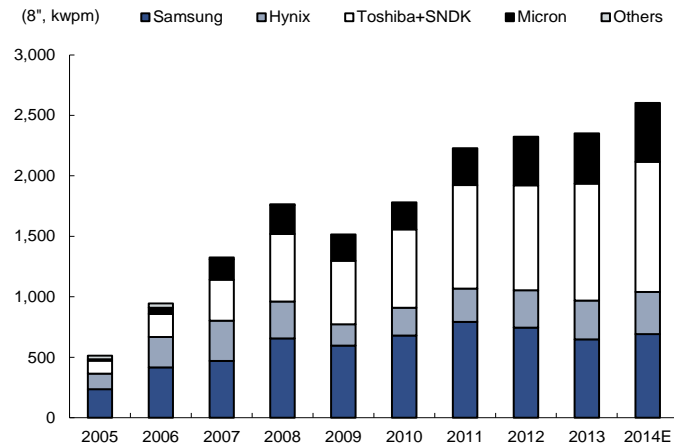
Source: Citi Research

Figure 43. NAND Supply Growth Forecast



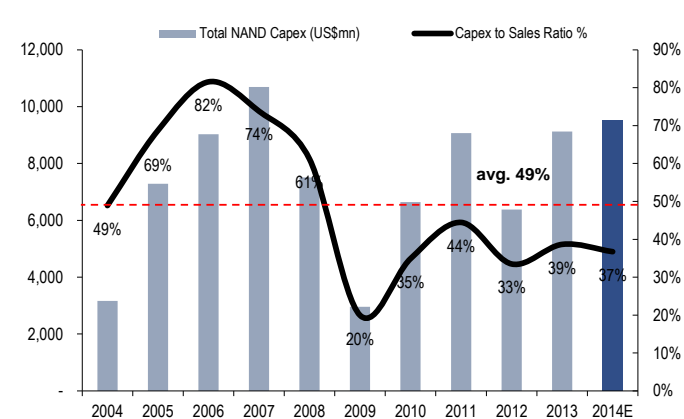
Source: Citi Research

Figure 44. NAND Capacity Trend



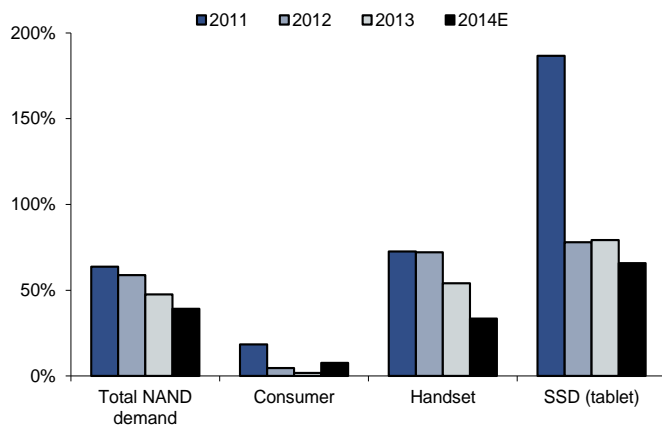
Source: Citi Research

Figure 45. Capex and Capex/Sales Trend



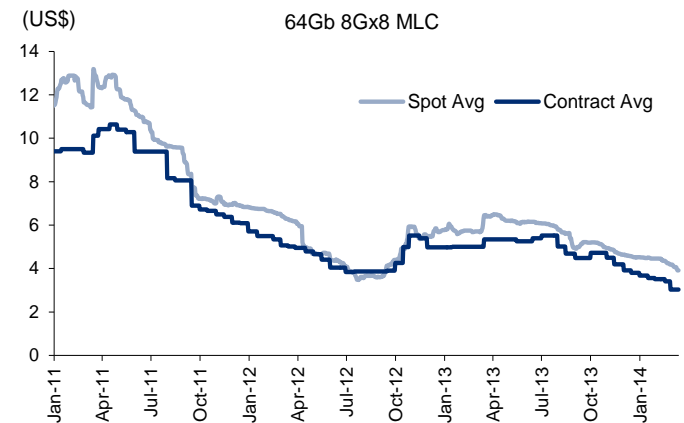
Source: Citi Research

Figure 46. Demand Growth by Application



Source: Citi Research

Figure 47. 64Gb MLC Price Trend



Source: Citi Research

## Glass Substrate

Glass substrates are thin sheets of borosilicate glass or other ion-free compounds with very smooth surfaces. The glass should not provide charge-carrying particles that can migrate into the thin-film transistor (TFT) structures that are fabricated on the glass. The glass should have a smooth surface and uniform thickness so that TFT or color filter dots can be fabricated on it. Other salient features of the substrate include strain temperature and density. The non-alkali glass substrate market was pioneered by Corning, the market and technology leader. Other major participants include Asahi Glass, AvanStrate, and Nippon Electric Glass.

Figure 48. Glass Substrate Shipments by Products

	Mar-11	Jun-11	Sep-11	Dec-11	Mar-12	Jun-12	Sep-12	Dec-12	Mar-13	Jun-13	Sep-13	Dec-13
	Q1-11A	Q2-11A	Q3-11A	Q4-11A	Q1-12A	Q2-12A	Q3-12A	Q4-12A	Q1-13A	Q2-13A	Q3-13A	Q4-13A
<b>Worldwide (K units)</b>												
Tablet	9,193	18,915	23,731	21,622	20,880	28,840	37,960	52,429	50,138	49,155	58,073	75,573
Netbook	9,813	11,123	8,447	6,519	7,711	10,057	7,360	6,429				
Notebook	41,890	46,831	47,570	46,795	46,190	50,160	52,241	47,627	42,012	48,654	46,250	45,742
Monitor	49,515	50,408	46,895	47,271	45,441	43,784	44,103	44,988	38,928	42,459	41,038	40,614
TV	46,988	49,862	49,814	52,557	51,437	55,215	60,331	63,445	55,769	58,545	57,149	58,868
Total	157,399	177,139	176,457	174,764	171,989	188,056	201,995	214,918	186,847	198,813	202,510	220,797

### SEQUENTIAL GROWTH

<b>Worldwide (K units)</b>												
Tablet		105.8%	25.5%	-8.9%	-3.4%	38.1%	31.6%	38.1%	-4.4%	-2.0%	18.1%	30.1%
Netbook		13.3%	-24.1%	-22.8%	18.3%	30.4%	-26.8%	-12.6%				
Notebook	-30.8%	11.8%	1.6%	-1.6%	-1.3%	8.6%	4.1%	-8.8%	-11.8%	15.8%	-4.9%	-1.1%
Monitor	-4.6%	1.8%	-7.0%	0.8%	-3.9%	-3.6%	0.7%	2.0%	-13.5%	9.1%	-3.3%	-1.0%
TV	-12.7%	6.1%	-0.1%	5.5%	-2.1%	7.3%	9.3%	5.2%	-12.1%	5.0%	-2.4%	3.0%
Total	-5.3%	12.5%	-0.4%	-1.0%	-1.6%	9.3%	7.4%	6.4%	-13.1%	6.4%	1.9%	9.0%
<b>Taiwan (K units)</b>												
Tablet		362.3%	78.2%	-21.5%	-49.8%	92.4%	26.7%	-0.9%	139.7%	16.0%	-12.6%	13.2%
Netbook		-7.7%	-18.5%	-23.7%	10.8%	34.4%	-15.3%	-24.5%				
Notebook		22.8%	-8.7%	-0.5%	-7.5%	19.6%	18.1%	-13.7%	-8.6%	27.3%	-8.9%	2.0%
Monitor		-2.2%	-10.6%	-2.6%	-5.2%	0.9%	-1.1%	9.0%	-11.0%	7.2%	-7.0%	-1.9%
TV		8.1%	-5.4%	-6.8%	-3.0%	5.2%	11.7%	-1.6%	-13.5%	1.4%	-6.4%	6.8%
Total		11.0%	-4.3%	-6.7%	-8.1%	13.6%	9.0%	-3.9%	-1.2%	12.8%	-8.7%	4.7%
<b>Korea/ Japan/ China (K units)</b>												
Tablet		80.4%	12.1%	-3.8%	11.8%	30.1%	32.7%	46.3%	-24.7%	-10.1%	36.0%	36.5%
Netbook		47.3%	-29.7%	-21.7%	26.8%	26.4%	-39.1%	4.8%				
Notebook		5.7%	8.3%	-2.2%	2.2%	3.1%	-4.0%	-5.3%	-13.9%	7.8%	-1.7%	-3.4%
Monitor		5.1%	-4.1%	3.2%	-2.9%	-6.7%	2.1%	-2.9%	-15.4%	10.6%	-0.5%	-0.4%
TV		4.8%	3.7%	13.6%	-1.7%	8.5%	8.0%	8.8%	-11.4%	6.7%	-0.6%	1.4%
Total		13.6%	2.2%	2.6%	2.1%	7.2%	6.6%	12.1%	-18.7%	2.7%	8.5%	11.3%

Source: Citi Research, Witsview

		Mar-12	Jun-12	Sep-12	Dec-12	Mar-13	Jun-13	Sep-13	Dec-13	Mar-14	Jun-14	Sep-14	Dec-14								
		Q1-12A	Q2-12A	Q3-12A	Q4-12A	Q1-13A	Q2-13A	Q3-13A	Q4-13E	Q1-14E	Q2-14E	Q3-14E	Q4-14E	2008A	2009A	2010A	2011A	2012A	2013E	2014E	2015E
Unit Demand (M)																					
LCD TVs		43.2	44.3	51.1	64.7	44.8	45.9	50.9	64.8	46.3	47.7	52.8	66.8	106	145	192	205	203	206	214	223
Notebooks		49.9	48.8	51.8	50.4	42.9	42.5	44.2	43.6	39.0	39.2	42.8	43.1	142	169	201	209	201	173	164	161
Tablets		21.1	28.3	34.8	60.0	48.4	44.3	55.3	91.3	68.5	75.3	79.1	106.8	0	0	19	76	144	239	330	380
Desktops		38.6	36.6	36.5	36.5	33.9	33.1	34.2	34.5	32.5	32.2	33.6	34.1	157	146	157	155	148	136	132	130
Handhelds		402.9	409.5	444.2	483.2	428.8	450.9	465.9	517.1	450.1	465.3	486.2	540.3	1,315	1,340	1,596	1,716	1,740	1,863	1,942	2,009
Total		555.7	567.4	618.4	694.9	598.7	616.7	650.6	751.1	636.4	659.7	694.5	791.1	1,721	1,800	2,165	2,361	2,436	2,617	2,655	2,698
YoY Growth																					
LCD TVs		-3%	-1%	-1%	1%	4%	4%	0%	0%	3%	4%	4%	3%	34%	37%	32%	7%	-1%	2%	3%	4%
Notebooks		4%	0%	-7%	-10%	-14%	-13%	-15%	-14%	-9%	-8%	-3%	-1%	33%	19%	19%	4%	-4%	-14%	-5%	-2%
Tablets		162%	81%	70%	87%	130%	56%	59%	52%	42%	70%	43%	17%				294%	89%	66%	38%	15%
Desktops		4%	-4%	-9%	-7%	-12%	-9%	-6%	-6%	-4%	-3%	-2%	-1%	-4%	-7%	7%	-1%	-4%	-8%	-2%	-2%
Handhelds		-1%	2%	2%	2%	6%	10%	5%	7%	5%	3%	4%	4%	15%	2%	19%	8%	1%	7%	4%	3%
Total		2%	3%	3%	4%	8%	9%	5%	8%	6%	7%	7%	5%	15%	5%	20%	9%	3%	7%	1%	2%
Screen/ Finished Product (M)																					
LCD TVs		1	1	1	1	1	1	1	1	1	1	1	1								
Notebooks		1	1	1	1	1	1	1	1	1	1	1	1								
Tablets		1	1	1	1	1	1	1	1	1	1	1	1								
Desktops		1.19	1.23	1.22	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2								
Handhelds		1	1	1	1	1	1	1	1	1	1	1	1								
Screen Unit Demand (M)																					
LCD TVs		43.2	44.3	51.1	64.7	44.8	45.9	50.9	64.8	46.3	47.7	52.8	66.8	106	145	192	205	203	206	214	223
Notebooks		49.9	48.8	51.8	50.4	42.9	42.5	44.2	43.6	39.0	39.2	42.8	43.1	142	169	201	209	201	173	164	161
Tablets		21.1	28.3	34.8	60.0	48.4	44.3	55.3	91.3	68.5	75.3	79.1	106.8	0	0	19	76	144	239	330	380
Monitors		46.0	45.1	44.5	44.5	41.3	40.4	41.7	42.0	39.6	39.3	41.0	41.5	174	177	199	197	180	165	161	158

[citivelocity.com](http://citivelocity.com)

Figure 50. TV Demand Model (Thousands of Units)

	Mar-12	Jun-12	Sep-12	Dec-12	Mar-13	Jun-13	Sep-13	Dec-13	Mar-14	Jun-14	Sep-14	Dec-14	2010A	2011A	2012A	2013E	2014E	2015E
	Q1-12A	Q2-12A	Q3-12A	Q4-12A	Q1-13A	Q2-13A	Q3-13A	Q4-13E	Q1-14E	Q2-14E	Q3-14E	Q4-14E						
<b>LCD TV Unit Shipments</b>																		
China	9,755	9,586	14,075	15,605	12,530	12,412	13,931	16,046	12,978	12,929	14,630	16,787	37,930	44,730	49,021	54,919	57,323	59,457
Eastern Europe	4,207	4,074	4,773	7,369	4,370	3,847	4,532	7,081	4,665	4,066	4,762	7,443	14,401	16,943	20,422	19,829	20,936	21,814
Japan	2,061	1,326	1,173	1,731	1,278	1,212	1,280	1,744	1,350	1,213	1,280	1,744	23,388	19,368	6,290	5,514	5,586	5,642
Latin America	4,390	5,171	5,638	6,537	4,324	5,615	5,691	6,722	4,559	5,990	6,100	7,228	16,123	19,472	21,736	22,353	23,877	25,420
MEA	3,149	3,185	3,196	3,200	3,314	3,475	3,652	3,700	3,452	3,709	3,950	3,949	8,287	11,589	12,730	14,140	15,060	16,213
North America	7,409	8,380	9,712	13,977	7,384	7,650	9,354	13,594	7,239	7,732	9,215	13,322	38,291	38,229	39,479	37,982	37,508	38,278
Western Europe	6,968	7,075	6,431	9,433	5,909	5,715	5,854	8,697	5,814	5,640	5,798	8,610	38,714	34,430	29,906	26,175	25,862	26,272
APAC	5,268	5,457	6,125	6,857	5,729	6,004	6,650	7,191	6,256	6,395	7,062	7,702	14,423	20,518	23,706	25,575	27,414	29,605
<b>Demand by Technology</b>																		
LCD	43,206	44,253	51,122	64,708	44,837	45,931	50,944	64,775	46,312	47,675	52,796	66,785	191,556	205,279	203,289	206,487	213,567	222,700
CRT	5,084	4,347	3,647	2,987	2,184	1,994	1,837	1,723	1,355	1,390	1,381	1,293	38,256	26,009	16,065	7,737	5,419	3,929
Other	3,007	3,165	3,341	3,887	2,529	2,562	2,573	2,771	1,729	1,517	1,389	1,389	18,616	17,344	13,400	10,435	6,025	3,076
Total TV	51,297	51,765	58,109	71,582	49,550	50,487	55,353	69,268	49,396	50,582	55,566	69,467	248,429	248,632	232,753	224,658	225,011	229,705
<b>YoY Unit Growth</b>																		
China LCD	1%	10%	18%	8%	28%	29%	-1%	3%	4%	4%	5%	5%	29%	18%	10%	12%	4%	4%
Eastern Europe LCD	18%	32%	16%	19%	4%	-6%	-5%	-4%	7%	6%	5%	5%	49%	18%	21%	-3%	6%	4%
Japan LCD	-60%	-77%	-76%	-50%	-38%	-9%	9%	1%	6%	0%	0%	0%	87%	-17%	-68%	-12%	1%	1%
Latin America LCD	32%	12%	6%	5%	-2%	9%	1%	3%	5%	7%	7%	8%	96%	21%	12%	3%	7%	6%
MEA LCD	31%	16%	0%	-1%	5%	9%	14%	16%	4%	7%	8%	7%	71%	40%	10%	11%	7%	8%
North America LCD	1%	5%	6%	1%	0%	-9%	-4%	-3%	-2%	1%	-1%	-2%	3%	0%	3%	-4%	-1%	2%
Western Europe LCD	-21%	-3%	-14%	-14%	-15%	-19%	-9%	-8%	-2%	-1%	-1%	-1%	16%	-11%	-13%	-12%	-1%	2%
APAC LCD	23%	19%	9%	14%	9%	10%	9%	5%	9%	7%	6%	7%	41%	42%	16%	8%	7%	8%
Total LCD	-3%	-1%	-1%	1%	4%	4%	0%	0%	3%	4%	4%	3%	32%	7%	-1%	2%	3%	4%
Total CRT	-31%	-36%	-43%	-46%	-57%	-54%	-50%	-42%	-38%	-30%	-25%	-25%	15%	10%	3%	2%	2%	2%
Total Other	-19%	-26%	-20%	-26%	-16%	-19%	-23%	-29%	-32%	-41%	-46%	-50%	7%	6%	5%	3%	3%	1%
Total TV	-8%	-7%	-7%	-5%	-3%	-2%	-5%	-3%	0%	0%	0%	0%	18%	0%	-6%	-3%	0%	2%
<b>Display Mix</b>																		
LCD	84%	85%	88%	90%	90%	91%	92%	94%	94%	94%	95%	96%	77%	83%	87%	92%	95%	97%
CRT	10%	8%	6%	4%	4%	4%	3%	2%	3%	3%	2%	2%	15%	10%	7%	3%	2%	2%
Other	6%	6%	6%	5%	5%	5%	5%	4%	4%	3%	3%	2%	7%	7%	6%	5%	3%	1%
<b>Demand by Region</b>																		
China	10,370	10,208	14,847	16,457	13,175	12,931	14,415	16,457	13,175	13,060	14,703	16,787	44,052	49,144	51,883	56,978	57,725	59,457
Eastern Europe	4,538	4,362	5,122	7,809	4,621	4,008	4,670	7,262	4,760	4,128	4,810	7,480	16,734	18,662	21,831	20,561	21,178	21,814
Japan	2,086	1,382	1,200	1,744	1,286	1,213	1,280	1,744	1,350	1,213	1,280	1,744	24,849	20,119	6,411	5,522	5,586	5,642
Latin America	5,270	6,139	6,447	7,242	4,812	6,253	6,300	7,387	4,956	6,441	6,489	7,609	25,311	25,107	25,098	24,752	25,494	26,259
MEA	4,420	4,160	3,936	3,841	3,890	4,132	4,352	4,302	3,968	4,215	4,439	4,388	15,271	17,544	16,357	16,675	17,009	17,519
North America	8,267	9,273	10,569	15,064	7,896	8,218	9,845	14,160	7,501	7,971	9,451	13,594	43,950	43,316	43,173	40,119	38,518	38,518
Western Europe	7,424	7,496	6,774	9,963	6,147	5,933	6,068	8,966	5,963	5,755	5,886	8,697	42,516	37,018	31,656	27,115	26,302	26,302
APAC	8,923	8,745	9,213	9,462	7,723	7,799	8,424	9,989	7,723	7,799	8,508	9,169	35,745	37,723	36,343	32,935	33,199	34,195
Total TV	51,297	51,765	58,109	71,582	49,550	50,487	55,353	69,268	49,396	50,582	55,566	69,467	248,429	248,632	232,753	224,658	225,011	229,705
<b>YoY Growth</b>																		
China	-4%	6%	13%	5%	27%	27%	-3%	0%	0%	1%	2%	2%	4%	12%	6%	10%	1%	3%
Eastern Europe	14%	26%	14%	16%	2%	-8%	-9%	-7%	3%	3%	3%	3%	38%	12%	17%	-6%	3%	3%
Japan	-62%	-77%	-76%	-52%	-38%	-12%	7%	0%	5%	0%	0%	0%	81%	-19%	-68%	-14%	1%	1%
Latin America	13%	0%	-4%	-4%	-9%	2%	-2%	2%	3%	3%	3%	3%	32%	-1%	0%	-1%	3%	3%
MEA	10%	-4%	-15%	-16%	-12%	-1%	11%	12%	2%	2%	2%	2%	27%	15%	-7%	2%	2%	3%
North America	-2%	-1%	3%	-1%	-4%	-11%	-7%	-6%	-5%	-3%	-4%	-4%	4%	-1%	0%	-7%	-4%	0%
Western Europe	-21%	-5%	-16%	-15%	-17%	-21%	-10%	-10%	-3%	-3%	-3%	-3%	16%	-13%	-14%	-14%	-3%	0%
APAC	1%	-3%	-7%	-5%	-13%	-11%	-9%	-5%	0%	0%	1%	2%	9%	8%	-4%	-9%	1%	3%
Total TV	-8%	-7%	-7%	-5%	-3%	-2%	-5%	-3%	0%	0%	0%	0%	18%	0%	-6%	-3%	0%	2%
<b>QoQ Growth</b>																		
China	-34%	-2%	45%	11%	-20%	-2%	11%	14%	-20%	-1%	13%	14%						
Eastern Europe	-33%	-4%	17%	52%	-41%	-13%	17%	56%	-34%	-13%	17%	56%						
Japan	-42%	-34%	-13%	45%	-26%	-6%	6%	36%	-23%	-10%	6%	36%						
Latin America	-30%	16%	5%	12%	-34%	30%	1%	17%	-33%	30%	1%	17%						
MEA	-3%	-6%	-5%	-2%	1%	6%	5%	-1%	-8%	6%	5%	-1%						
North America	-46%	12%	14%	43%	-48%	4%	20%	44%	-47%	6%	19%	44%						
Western Europe	-37%	1%	-10%	47%	-38%	-3%	2%	48%	-33%	-3%	2%	48%						
APAC	-10%	-2%	5%	3%	-18%	1%	8%	7%	-14%	1%	9%	8%						
Total TV	-32%	1%	12%	23%	-31%	2%	10%	25%	-29%	2%	10%	25%						
<b>Region Mix</b>																		
China	20.2%	19.7%	25.6%	23.0%	26.6%	25.6%	26.0%	23.8%	26.7%	25.8%	26.5%	24.2%	17.7%	19.8%	22.3%	25.4%	25.7%	25.9%
Eastern Europe	8.8%	8.4%	8.8%	10.9%	9.3%	7.9%	8.4%	10.5%	9.6%	8.2%	8.7%	10.8%	6.7%	7.5%	9.4%	9.2%	9.4%	9.5%
Japan	4.1%	2.7%	2.1%	2.4%	2.6%	2.4%	2.3%	2.5%	2.7%	2.4%	2.3%	2.5%	10.0%	8.1%	2.8%	2.5%	2.5%	2.5%
Latin America	10.3%	11.9%	11.1%	10.1%	9.7%	12.4%	11.4%	10.7%	10.0%	12.7%	11.7%	11.0%	10.2%	10.1%	10.8%	11.0%	11.3%	11.4%
MEA	8.6%	8.0%	6.8%	5.4%	7.9%	8.2%	7.9%	6.2%	8.0%	8.3%	8.0%	6.3%	6.1%	7.1%	7.0%	7.4%	7.6%	7.6%
North America	16.1%	17.9%	18.2%	21.0%	15.9%	16.3%	17.8%	20.4%	15.2%	15.8%	17.0%	19.6%	17.7%	17.4%	18.5%	17.9%	17.1%	16.8%
Western Europe	14.5%	14.5%	11.7%	13.9%	12.4%	11.8%	11.0%	12.9%	12.1%	11.4%	10.6%	12.5%	17.1%	14.9%	13.6%	12.1%	11.7%	11.5%
APAC	17.4%	16.9%	15.9%	13.2%	15.6%	15.4%	15.2%	13.0%	15.6%	15.4%	15.3%	13.2%	14.4%	15.2%	15.6%	14.7%	14.8%	14.9%
<b>LCD Penetration</b>																		
China	94%	94%	95%	95%	95%	96%	97%	98%	99%	99%	100%	100%	86%	91%	94%	96%	99%	100%
Eastern Europe	93%	93%	93%	94%	95%	96%	97%	98%	98%	99%	99%	100%	86%	91%	94%	96%	99%	100%
Japan	99%	96%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	94%	96%	98%	100%	100%	100%
Latin America	83%	84%	87%	90%	90%	90%	90%	91%	92%	93%	94%	95%	64%	78%	87%	90%	94%	97%
MEA	71%	77%	81%	83%	85%	84%	84%	86%	87%	88%	89%	90%	54%	66%	78%	85%	89%	93%
North America	90%	90%	92%	93%	94%	93%	95%	96%	97%	97%	98%	98%	87%	88%	91%	95%	97%	99%
Western Europe	94%	94%	95%	95%	96%	96%	96%	97%	98%	98%	99%	99%	91%	93%	96%	97%	98%	100%
APAC	59%	62%	66%	72%	74%	77%	79%	80%	81%	82%	83%	84%	40%	54%	65%	78%	83%	87%
<b>Average LCD Screen Size</b>																		
China	37.1	36.5	37.5	38.2	37.8	38.6	39.7	40.5	40.0	40.2	40.4	40.6	35.2	36.1	37.4	39.3	40.3	41.0</



Figure 51. Supply Chain Analysis (M sqf)

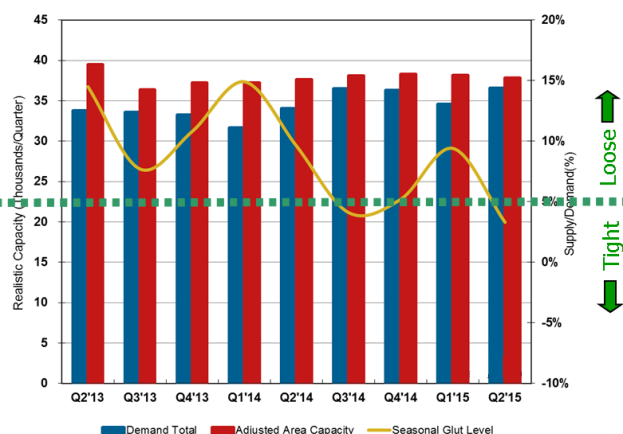
	Mar-12	Jun-12	Sep-12	Dec-12	Mar-13	Jun-13	Sep-13	Dec-13	Mar-14	Jun-14	Sep-14	Dec-14	
	Q1-12A	Q2-12A	Q3-12A	Q4-12A	Q1-13A	Q2-13A	Q3-13A	Q4-13E	Q1-14E	Q2-14E	Q3-14E	Q4-14E	
<b>Glass Shipments</b>	878	917	1004	1046	981	1026	1042	1042	1011	1051	1104	1137	
<b>Panel Shipments</b>	640	699	773	823	711	769	762	812	763	793	833	866	
<b>Set Shipments</b>	529	546	623	758	572	589	649	806	624	643	708	858	
Ratio Glass/ Set Shipments	1.66	1.68	1.61	1.38	1.71	1.74	1.61	1.29	1.62	1.63	1.56	1.33	
Seq. Change													
Glass Shipments	0%	4%	10%	4%	-6%	5%	2%	0%	-3%	4%	5%	3%	
Panel Shipments	-1%	9%	11%	6%	-14%	8%	-1%	6%	-6%	4%	5%	4%	
Set Shipments	-24%	3%	14%	22%	-25%	3%	10%	24%	-23%	3%	10%	21%	
Panel Inventory	251	268	258	230	264	275	304	285	290	295	301	299	
Set Maker Inventory	487	570	604	545	577	680	717	642	705	775	817	739	
Estimated Weeks of Inventory	18	17	15	18	19	19	16	19	20	20	17	20	
Glass Lost in Process - Panel Makers	211	202	241	251	235	246	250	250	243	252	265	273	
Glass Lost in Process - Set Makers	64	70	116	123	107	77	76	81	76	79	83	87	
Process Yield - Panel Makers	76%	78%	76%	76%	76%	76%	76%	76%	76%	76%	76%	76%	
Process Yield - Set Makers	90%	90%	85%	85%	85%	90%	90%	90%	90%	90%	90%	90%	
<b>Glass Shipments (M sqm)</b>													
NEG	17.3	18.8	20.2	20.0	17.8	18.2	18.2	18.2					
Asahi	19.4	21.5	23.7	24.3	23.5	25.6	25.4	25.4					
SCP	21.4	22.4	23.4	23.7	22.2	22.7	22.4	22.4	21.3	22.7	24.3	25.3	
Corning	18.9	17.7	21.0	24.0	23.5	25.0	26.6	26.6	25.5	26.8	28.2	28.7	
Others	4.5	4.8	5.0	5.2	4.2	3.8	4.3	4.3					
Total	81.6	85.2	93.3	97.2	91.1	95.3	96.8	96.8	93.9	97.7	102.5	105.6	
Corning Share	49%	47%	48%	49%	50%	50%	51%	51%	50%	51%	51%	51%	
<b>Panel Shipments Analysis</b>													
<b>Panel Maker Shipments (Units)</b>													
LCD TV	51.4	55.2	60.3	63.4	55.8	58.5	57.1	58.9					
Monitor	45.4	43.8	44.1	45.0	38.9	42.5	41.0	40.6					
Notebook	53.9	60.2	59.6	54.1	42.0	48.7	46.3	45.7					
Tablet	20.9	28.8	38.0	52.4	50.1	49.2	58.1	75.6					
Total	171.7	188.1	202.0	214.9	186.8	198.8	202.5	220.8					
<b>Panel Surface Area (Square Feet)</b>													
LCD TV	7.3	7.5	7.8	7.9	7.9	8.1	8.2	8.5					
Monitor	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2					
Notebook	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2					
Tablet	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5					
<b>Panel Maker Shipments (Surface Area)</b>													
LCD TV	376	414	469	504	441	475	470	501					
Monitor	55	52	53	55	47	52	50	50					
Notebook	65	72	71	66	51	59	57	57					
Tablet	12	16	21	28	26	25	29	36					
Total	508	555	614	653	565	611	605	645					
QoQ Change	-1%	9%	11%	6%	-14%	8%	-1%	6%					
<b>LG Display</b>													
LG Output Area (K sqm)	8089	8553	9173	10062	8182	8890	8784	9583	8300				
Area Shipments QoQ	-4%	6%	7%	10%	-19%	9%	-1%	9%	-13%				
LG Sales (KRW bn) - IFRS	6184	6910	7593	8743	6803	6572	6579	7079					
LG COGS (KRW bn) - IFRS	5856	6140	6792	7637	6099	5607	5591	6228					
LG Inventory (KRW bn) - IFRS	2198	2569	2747	2390	2529	2396	2417	1933					
Inventory K sqm (IFRS)	3036	3579	3710	3149	3393	3799	3797	2974					
<b>Samsung</b>													
LCD Sales	6180	5630	5400	4960									
Other Display Sales	2360	2620	3060	2790									
Display Segment Sales (KRW bn)	8540	8250	8460	7750	7110	8180	8090	6460					
Shipments Index	179	188	192	178	162	175	186	182					
Panel Shipments QoQ	-12%	5%	2%	-7%	-9%	8%	6%	-2%					
Panel Shipments YoY	20%	9%	8%	-12%	-9%	-7%	-3%						
<b>Chi Mei Innolux</b>													
Unit Shipments (M)	32.36	35.31	40.71	38.43	32.40	37.75	34.35	31.94					
Area Shipments (K sqm)	5802	6286	7206	7249	6452	7019	6363						
Net Sales (NTSM)	109.2	112.5	129.6	129.6	116.8	111.5	97.2						
COGS (NTSM)	116.1	114.5	125.3	120.1	107.7	97.7	87.3						
Inventory (NTSM)	60.9	61.1	50.3	42.0	45.2	44.7	50.5						
Inventory (Unit)	16.99	18.85	16.34	13.45	13.58	17.25	19.89						
Inventory (K sqm)	3046	3355	2893	2536	2705	3207	3685						
Area/ Unit	0.179	0.178	0.177	0.189	0.199	0.186	0.185						
<b>AUO</b>													
Unit Shipments (M)	27.3	31.7	33.2	31.0	27.0	30.5	29.3	27.4					
Area Shipments (K sqm)	3961	4720	5285	5490	4989	5688	5585	5253					
Net Sales (NTSM)	81.1	95.2	102.8	99.4	94.2	112.3	107.1	93.3					
COGS (NTSM)	87.6	98.4	104.6	97.8	89.7	100.8	96.8	88.1					
Inventory (NTSM)	54.2	50.8	47.3	42.6	47.1	41.8	41.5	38.8					
Inventory (Unit)	16.9	16.4	15.0	13.5	14.2	12.6	12.6	12.1					
Inventory (K sqm)	2451	2440	2389	2391	2620	2359	2395	2315					
Area/ Unit	0.145	0.149	0.159	0.177	0.185	0.186	0.191	0.192					
<b>Area Shipments (K sqm) - Top 4</b>													
LG Display	8089	8553	9173	10062	8182	8890	8784						
Samsung	7921	8317	8483	7889	7179	8260	8169						
Chi Mei Innolux	4695	5258	6480	6808	5996	6986	6356						
AUO	3961	4720	5285	5490	4989	5644	5422						
Total	24666	26848	29421	30249	26346	29779	28731						
QoQ Change	-9%	9%	10%	3%	-13%	13%	-4%						
<b>Area Share - Top 4</b>													
LG Display	33%	32%	31%	33%	31%	30%	31%						
Samsung	32%	31%	29%	26%	27%	28%	28%						
Chi Mei Innolux	19%	20%	22%	23%	23%	23%	22%						
AUO	16%	18%	18%	18%	19%	19%	19%						
Total	100%	100%	100%	100%	100%	100%	100%						
<b>Panel Inventory - Top 3</b>													
Inventory (M sqf)	184	202	194	174	188	202	213						
QoQ Change	9%	10%	-4%	-10%	8%	7%	5%						
% of Total	73%	75%	75%	76%	71%	73%	70%						
Weeks of Inventory	17.6	17.5	14.8	17.6	18.6	19.1	16.5	19.3					
Weeks of Inventory (As reported)	15.0	18.7	15.5	n/a	17.0	18.0	16.0	15.5					

Source: Citi Research

## Flat Panel Display

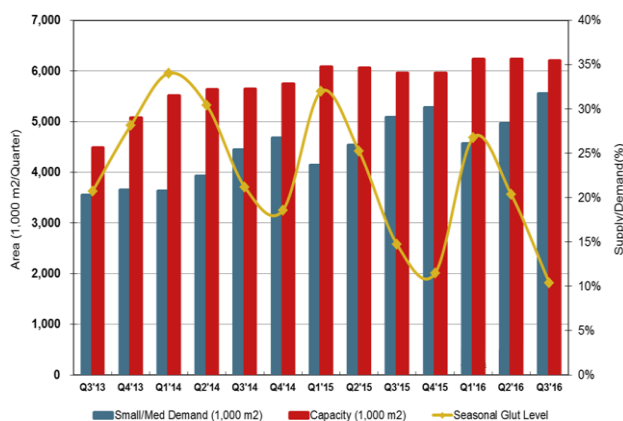
Flat panel displays encompass a growing number of electronic visual display technologies. They are far lighter and thinner than traditional television sets and video displays that use cathode ray tubes (CRTs). Most of the modern flat-panel displays use LCD technologies. Most LCD screens are backlit to make them easier to read in bright environments. They are thin and light. They provide better linearity and higher resolution. In many applications, specifically modern portable devices such as laptops, mobile phones, digital cameras, camcorders, point-and-shoot cameras, and pocket video cameras, any display disadvantages are made up for by portability advantages. Key panel makers include Samsung, LG Display, AU Optonics, Innolux, Japan Display and BOE

Figure 52. Restricted Large-Area Module Supply/Demand



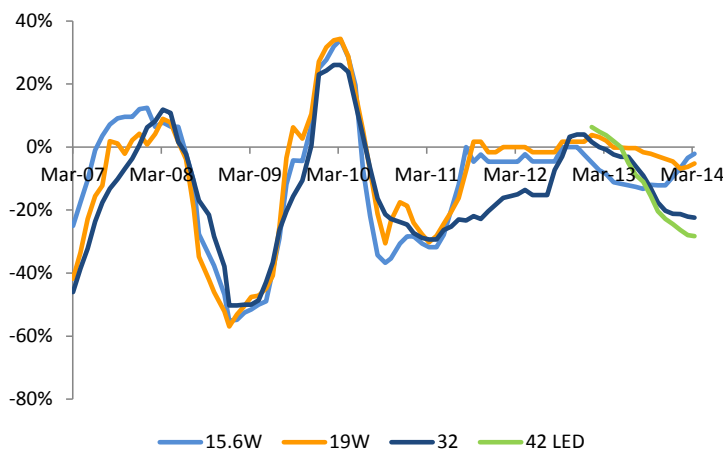
Source: DisplaySearch

Figure 53. Small-Area Module Supply/Demand



Source: DisplaySearch

Figure 54. Mainstream Panel Price Trend



Source: DisplaySearch, Citi Research

Figure 55. Panel Market Share by Major Application

January 2014 Large-Area TFT LCD Ranking and Shares by Shipments

	Jan 14	Share	Dec 13	Share	Jan 13	Share
#1	LG Display	23.6%	LG Display	28.5%	LG Display	24.4%
#2	Samsung	23.2%	Samsung	19.7%	Samsung	22.1%
#3	Innolux	17.7%	Innolux	19.0%	Innolux	18.3%
#4	AUO	17.7%	AUO	16.6%	AUO	15.8%
#5	BOE	7.2%	BOE	5.6%	BOE	7.1%

January 2014 Large-Area TFT LCD Ranking and Shares by Shipment and Application

	9"+ Tablet	Share	NB PC*	Share	Monitors	Share	TV	Share	Other	Share
#1	Samsung	58.5%	LG Display	30.8%	Innolux	25.8%	Samsung	25.0%	AUO	51.5%
#2	LG Display	14.2%	AUO	23.7%	LG Display	24.9%	LG Display	23.2%	Sharp	9.8%
#3	BOE	13.5%	Innolux	23.6%	AUO	18.1%	Innolux	15.1%	LG Display	6.2%
#4	AUO	6.0%	Samsung	13.7%	Samsung	13.4%	AUO	13.1%	Innolux	5.6%
#5	Innolux	3.7%	BOE	4.7%	BOE	10.1%	CSOT	9.5%	Tianma	4.7%

\*Including >9.1" and larger mini-notes

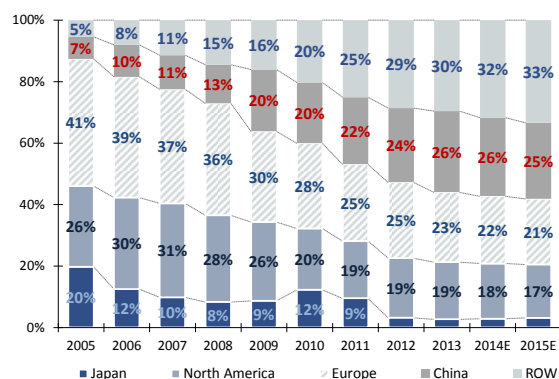
January 2014 Large-Area TFT LCD Ranking and Shares by Area and Application

	9"+ Tablet	Share	NB PC*	Share	Monitors	Share	TV	Share	Other	Share
#1	Samsung	58.8%	LG Display	32.1%	LG Display	26.8%	Samsung	25.9%	AUO	55.9%
#2	LG Display	13.9%	Innolux	23.8%	Innolux	24.9%	LG Display	24.6%	Samsung	14.3%
#3	BOE	13.3%	AUO	23.6%	AUO	17.9%	Innolux	14.8%	LG Display	10.6%
#4	AUO	6.3%	Samsung	13.8%	Samsung	14.7%	AUO	14.7%	Sharp	5.5%
#5	Innolux	3.7%	BOE	4.2%	BOE	8.6%	Sharp	7.6%	Innolux	3.0%

\*Including 9.1" and larger mini-notes

Source: DisplaySearch

Figure 56. Global LCD TV Regional Breakdown



Source: NPD DisplaySearch

Figure 57. China's New TFT LCD Fab Investment & Ramp

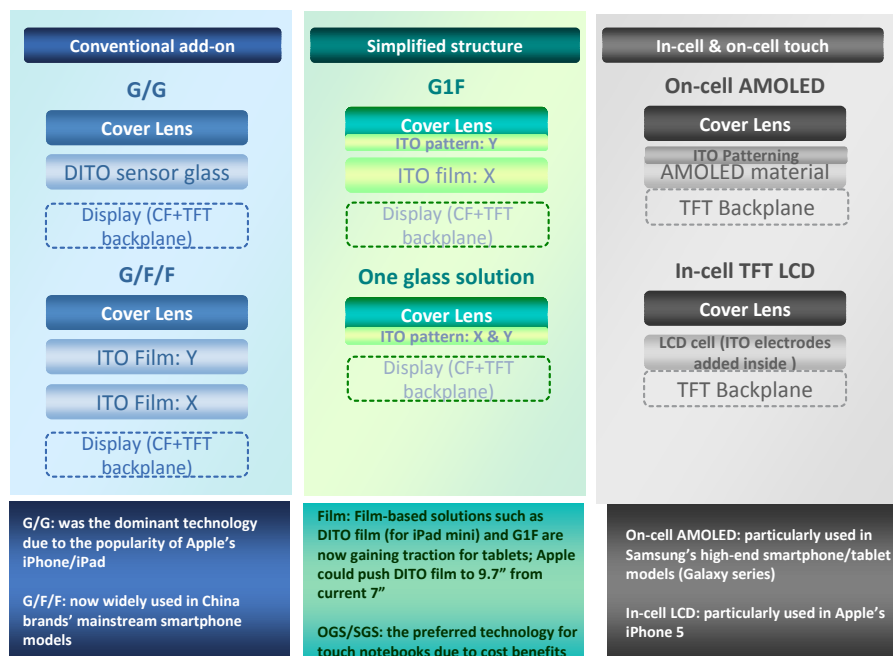
Maker	2013	2014	2015	2016
BOE	(B3) Hefei Gen6 (1500x1850mm) 90K/M → 110K/M (10K : Oxide TFT)			
	(B4) Beijing G8 (2200x2500mm) 100K/M → 125K/M → 135K/M			
	a-Si TFT & Oxide → (B5) Hefei Gen 8 30K/M → 60K/M (4K : White OLED)			
	LTPS & OLED → (B6) Gen5.5 20K/M (4K: RGB OLED)			
	a-Si TFT & Oxide/AMOLED → LTPS → (B7) LTPS Gen6 25K/M			
ChinaStar (CSOT)	Shenzhen Gen8 (2200x2500mm) 120K/M → 140K/M			
	Shenzhen Gen8 60K/M			
	LTPS & OLED → Wuhan Gen6 30K/M			
CEC-Panda	Nanjing G6(1500x1800mm) 83K/M			
	a-Si TFT & Oxide → Nanjing Gen8 30K → 60K → 120K/M			
Tianma	Xiamen G5.5 15K/M LTPS+15K/M OLED			
	LTPS + AMOLED, Shanghai, Phase -1 → G5.5 15K/M			
	LTPS + AMOLED, Shanghai, Phase-2 → G5.5 15K/M			
Samsung	(Under Consideration) LTPS, Xiamen → ? G6 30K/M			
	Suzhou G8 55K/M → 110K/M			
LG Display	Guangzhou G8 60K/M → 120K/M			
AUO	(Under Consideration) LTPS, Kunshan → ? Kunshan G6 LTPS 30K/M			
Foxconn	(Under Planning) LTPS, Chengdu → ? Tianyi (天億) G6 LTPS (24K/M)			
CPT-TG	(Under Planning) Qxide+AMOLED → ? Fuzhou (福州) G4 LTPS (30K/M)			
Truly	(Old line from Samsung) LTPS+AMOLED → Huizhou (惠州) G4 LTPS(30K/M)			

Source: NPD DisplaySearch

## Cover Glass

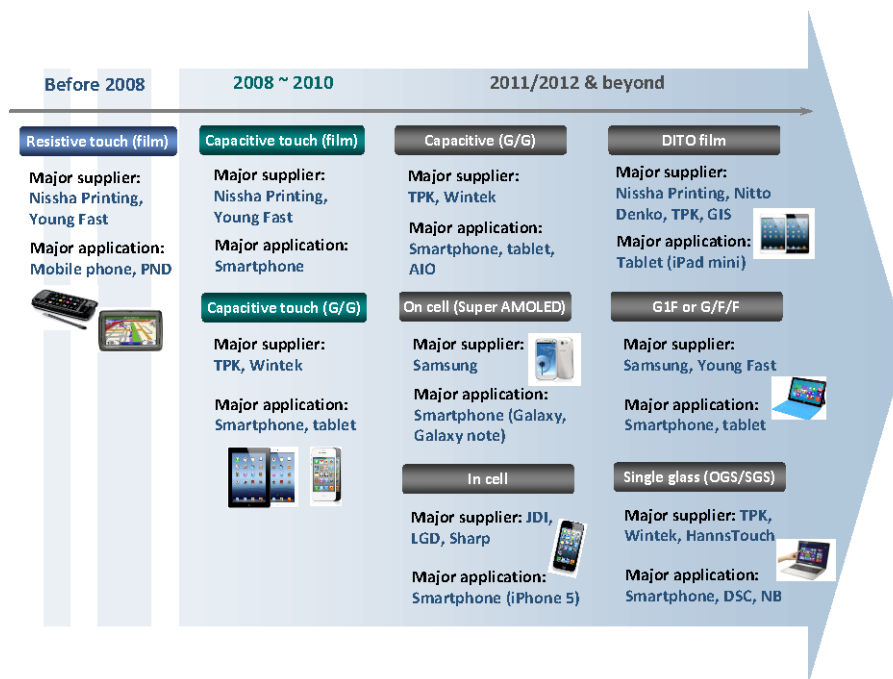
Touch panels are commonly used in a variety of mobile applications such as smartphones, tablets, e-books, and notebooks. Touch panel production process includes front-end sensor patterning and back-end lamination. To better control costs and meet client requirements, many tier-one touch module makers such as TPK and Wintek are becoming increasingly vertically integrated, with cover glass treatment, ITO sensor patterning, and full lamination processed in-house. Major touch panel suppliers include TPK, Wintek, Young Fast Opto, HannsTouch and Nissha Printing.

**Figure 58. Diverse touch panel technology structure**



Source: DisplaySearch, Citi Research

Figure 59. Touch panel technology roadmap



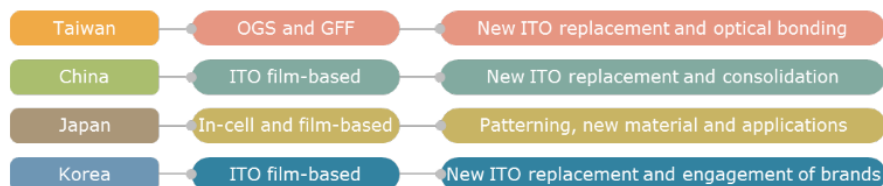
Source: Citi Research

Figure 60. Comparison of New Emerging Sensor Technology

Structures	OGS: Sheet Type	OGS: Piece Type	GFF	GF2	GF1	GF Metal Mesh	GF Nanowires
Sensor Material	ITO	ITO	ITO	ITO	ITO	Metal mesh	Silver nanowire
Sheet Resistance	≤ 100 ohm	≤ 100 ohm	≥ 100 ohm	≥ 100 ohm	≥ 100 ohm	< 30-100 ohm	< 30-100 ohm
Optical Performance	Better	Better	Good	Good	Good	By resistance	By resistance
Sensor Substrate	Cover glass	Cover glass	ITO film x2	ITO film x1	ITO film x1	PET x1 or 2	PET x1 or 2
Sensor Coating	Sputtering	Sputtering	Sputtering	Sputtering	Sputtering	By process	Wet coating
Sensor Patterning	Photolithography	Photolithography	Photolithography	Photolithography	Photolithography	By process	Photolithography
Process Concern	Throughput	Cover glass strength	Brittle material	Brittle material	Sensitivity	Moiré, reflection	Uniformity, ESD
Major Applied Sizes	3-27" by gen size	3-27" by gen size	3-15"	3-15"	3-5"	3-100"	3-32"
ID Customization	Yes	Yes	No	No	No	No	No
Common Part Sharing	Too ID customized	Too ID customized	Good for sharing	Good for sharing	Good for sharing	Limited for panel	Good for sharing
Cover Glass Support	2D	2D, 2.5D	2D, 2.5D	2D, 2.5D	2D, 2.5D	2D, 2.5D, 3D	2D, 2.5D, 3D
Module Thickness	Best	Best	Worse	Good	Good	Worse (two layers)	Worse (two layers)
Touch Module Cost	Good	Premium	By ITO film	Expensive	Economic	Good	Good
Cost-down Trend	Volume and glass	Limited or volume	ITO film spec	Limited or volume	ITO film spec	DITO structure	DITO structure
Major Appeal	Thin and light	Thin and strong	Sufficient sources	Thin and light	Affordable	Larger sizes	Larger sizes
Supply Chain	Mature	Mature	Mature	Mature	Mature	Mature	Young
Sensor Capacity	Sufficient	Less sufficient	Sufficient	Patent concern	Sufficient	More limited	More limited
Business Concerns	Module and cover glass finishing need integration.	Patterning yield rate and throughput must be improved.	Cost-down by ITO film spec. has sensitivity issue.	Patterning yield rate and patent are two major concerns.	It's not easy for bigger sizes with more channels.	New coating and patterning process have additional cost.	Makers need to convince brands for ITO replacement.

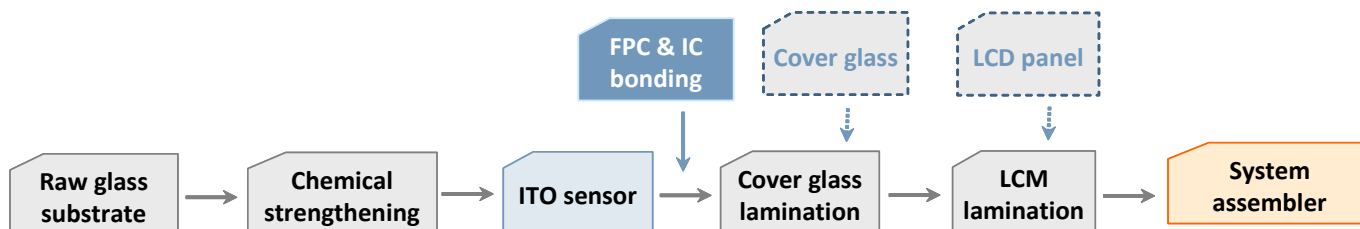
Source: Citi Research

Figure 61. Trend of Looking for ITO Replacement Technology (e.g., Metal Mesh and Silver Nanowires)



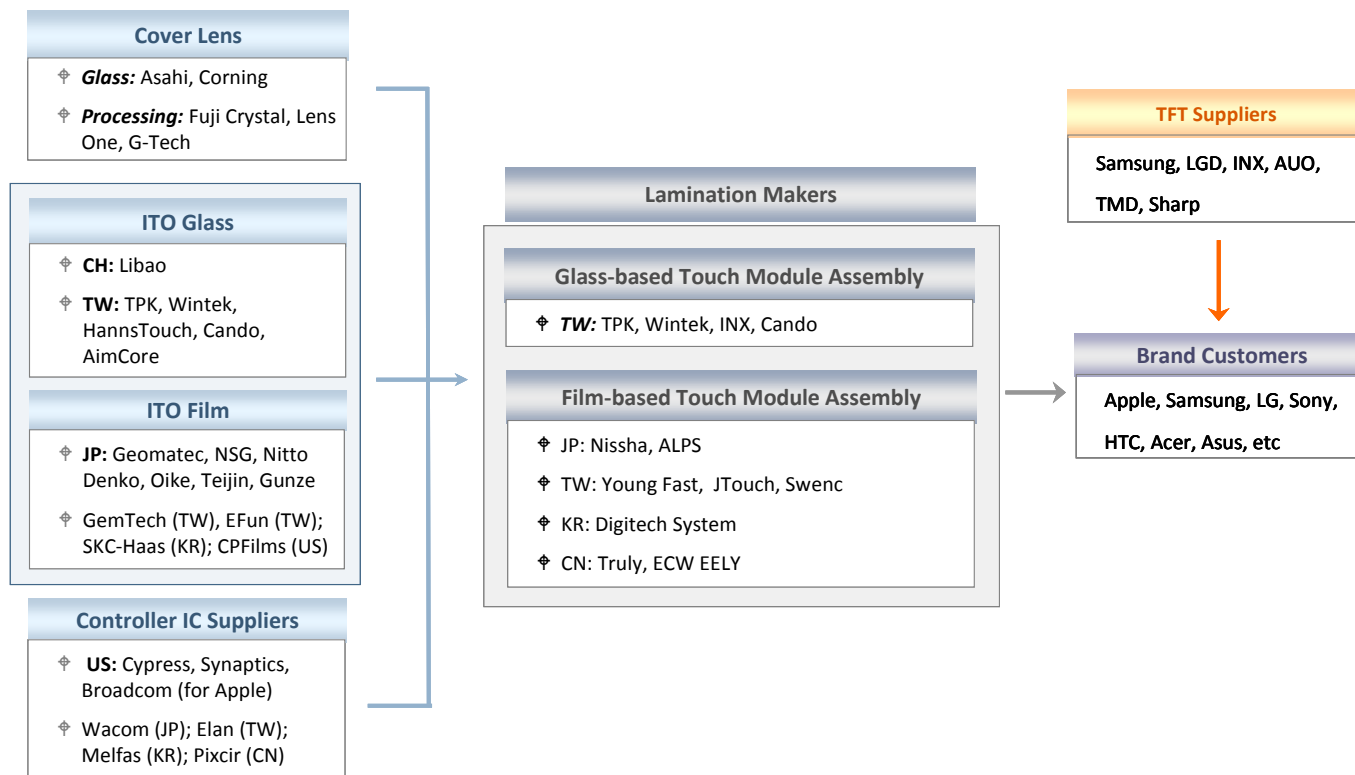
Source: DisplaySearch

Figure 62. Production supply chain of glass based capacitive touch



Source: Citi Research

Figure 63. Touch panel supply chain



Source: Companies, Citi Research

## Connectors

Connectors companies specialize in electronic and electrical interconnect products and assemblies. These products range in application from smartphone & tablet to industrial & automotive. While many think as technology moves to “wireless” that connectors are less needed, while in reality as products such as autos, smartphones, and tablets increase in complexity the more connectors are needed. As an example Bluetooth technology has reduced the needs for wired headsets in mobile phones minimizing the need for the 9mm headphone connection; however, the connection is now made internally on a smaller scale as the same information still needs to be “connected” to the device. In most phones you see both Bluetooth capabilities and the presence of the 9mm headphone connection outlining how increased complexity in devices simply increases the need for more complex connectors. Key players in this sub-segment are TE Connectivity, Amphenol, Molex, and Sensata. AVX and Vishay are key companies specialize in passive components such as capacitors and resistors. An evolving trend is the shift to hybrid or more efficient power usage in automobiles, airplanes, buildings, servers, and manufacturing processes all of which use more connectors. For example a hybrid automobile has twice the connectors as a combustion automobile. Finally the Internet of Things (IOT) is a new trend which could materially boost connector growth in years ahead as all these items need to be connected to antennas, power suppliers and displays.

Figure 64. Connectors – End Markets

Rev \$ By End Market	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Computers & Peripherals	\$6,048	\$6,810	\$6,384	\$6,813	\$8,084	\$8,767	\$8,665	\$6,886	\$9,253	\$9,674	\$9,433
Automotive	\$6,544	\$7,394	\$8,538	\$8,998	\$9,649	\$10,145	\$9,613	\$6,917	\$9,258	\$10,091	\$10,179
Telecom/Datacom	\$3,652	\$3,495	\$4,869	\$5,274	\$6,054	\$6,561	\$7,644	\$6,087	\$7,375	\$8,028	\$7,788
Industrial	\$2,836	\$3,276	\$3,890	\$4,133	\$4,603	\$4,875	\$5,779	\$3,997	\$5,224	\$5,687	\$5,579
Military/Aerospace	\$1,751	\$1,988	\$2,329	\$2,450	\$2,699	\$2,847	\$3,045	\$2,894	\$3,374	\$3,457	\$3,258
Consumer	\$1,043	\$1,244	\$1,840	\$1,984	\$2,301	\$2,514	\$2,379	\$1,958	\$2,605	\$2,661	\$2,559
Transportation (non-auto)	\$1,169	\$1,248	\$1,446	\$1,497	\$1,613	\$1,759	\$2,080	\$1,577	\$1,947	\$2,112	\$2,809
Other	\$1,098	\$1,326	\$2,018	\$2,103	\$2,436	\$2,664	\$3,000	\$2,168	\$2,704	\$2,848	\$2,408
Office Equipment	\$291	\$342	\$489	\$510	\$562	\$593	\$689	\$619	\$782	\$815	\$781
Instrumentation	\$503	\$577	\$795	\$835	\$934	\$987	\$998	\$919	\$1,155	\$1,218	\$1,153
Medical Equipment	\$553	\$651	\$820	\$886	\$1,018	\$1,109	\$1,348	\$1,281	\$1,664	\$1,765	\$1,663
<b>Total</b>	<b>\$25,489</b>	<b>\$28,352</b>	<b>\$33,419</b>	<b>\$35,483</b>	<b>\$39,953</b>	<b>\$42,821</b>	<b>\$45,239</b>	<b>\$35,304</b>	<b>\$45,341</b>	<b>\$48,355</b>	<b>\$47,610</b>
% By End Market	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Computers & Peripherals	23.7%	24.0%	19.1%	19.2%	20.2%	20.5%	19.2%	19.5%	20.4%	20.0%	19.8%
Automotive	25.7%	26.1%	25.5%	25.4%	24.2%	23.7%	21.2%	19.6%	20.4%	20.9%	21.4%
Telecom/Datacom	14.3%	12.3%	14.6%	14.9%	15.2%	15.3%	16.9%	17.2%	16.3%	16.6%	16.4%
Industrial	11.1%	11.6%	11.6%	11.6%	11.5%	11.4%	12.8%	11.3%	11.5%	11.8%	11.7%
Military/Aerospace	6.9%	7.0%	7.0%	6.9%	6.8%	6.6%	6.7%	8.2%	7.4%	7.1%	6.8%
Consumer	4.1%	4.4%	5.5%	5.6%	5.8%	5.9%	5.3%	5.5%	5.7%	5.5%	5.4%
Transportation (non-auto)	4.6%	4.4%	4.3%	4.2%	4.0%	4.1%	4.6%	4.5%	4.3%	4.4%	5.9%
Other	4.3%	4.7%	6.0%	5.9%	6.1%	6.2%	6.6%	6.1%	6.0%	5.9%	5.1%
Office Equipment	1.1%	1.2%	1.5%	1.4%	1.4%	1.4%	1.5%	1.8%	1.7%	1.7%	1.6%
Instrumentation	2.0%	2.0%	2.4%	2.4%	2.3%	2.3%	2.2%	2.6%	2.5%	2.5%	2.4%
Medical Equipment	2.2%	2.3%	2.5%	2.5%	2.5%	2.6%	3.0%	3.6%	3.7%	3.7%	3.5%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
% Y/Y By End Market	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012 Average
Computers & Peripherals	-10.3%	12.6%	-6.3%	6.7%	18.7%	8.4%	-1.2%	-20.5%	34.4%	4.6%	-2.5%
Automotive	33.5%	13.0%	15.5%	5.4%	7.2%	5.1%	-5.2%	-28.0%	33.9%	9.0%	0.9%
Telecom/Datacom	-5.5%	-4.3%	39.3%	8.3%	14.8%	8.4%	16.5%	-20.4%	21.2%	8.8%	-3.0%
Industrial	-2.4%	15.5%	18.7%	6.2%	11.4%	5.9%	18.5%	-30.8%	30.7%	8.9%	-1.9%
Military/Aerospace	-13.0%	13.6%	17.2%	5.2%	10.2%	5.5%	7.0%	-4.9%	16.6%	2.4%	-5.7%
Consumer	34.8%	19.3%	47.9%	7.8%	16.0%	9.3%	-5.3%	-17.7%	33.1%	2.1%	-3.8%
Transportation (non-auto)	-11.2%	6.8%	15.9%	3.5%	7.7%	9.0%	18.2%	-24.2%	23.4%	8.5%	33.0%
Other	10.7%	20.7%	52.3%	4.2%	15.8%	9.4%	12.6%	-27.7%	24.7%	5.3%	-15.5%
Office Equipment	-69.2%	17.5%	42.8%	4.4%	10.2%	5.4%	16.3%	-10.1%	26.3%	4.1%	-4.1%
Instrumentation	-15.1%	14.7%	37.7%	5.1%	11.8%	5.7%	1.1%	-7.9%	25.7%	5.5%	-5.4%
Medical Equipment	4.4%	17.8%	26.0%	8.1%	14.9%	9.0%	21.5%	-4.9%	29.9%	6.1%	-5.8%
<b>Total</b>	<b>-0.3%</b>	<b>11.2%</b>	<b>17.9%</b>	<b>6.2%</b>	<b>12.6%</b>	<b>7.2%</b>	<b>5.6%</b>	<b>-22.0%</b>	<b>28.4%</b>	<b>6.6%</b>	<b>-1.5%</b>
Global Light Vehicles Production (000s)	57	59	62	64	67	70	67	60	74	77	82
Content per car	\$ 114	\$ 125	\$ 137	\$ 140	\$ 145	\$ 144	\$ 142	\$ 116	\$ 125	\$ 131	\$ 125
Content growth y/y	27.8%	9.6%	9.6%	2.5%	3.3%	-0.4%	-1.2%	-18.4%	7.3%	5.2%	-5.0%
Content for Auto (equivalent unit)	\$ 109.24	\$ 120.55	\$ 132.09	\$ 137.06	\$ 143.03	\$ 141.16	\$ 144.21	\$ 133.17	\$ 144.69	\$ 147.32	\$ 149.86
Content growth y/y	30.1%	10.3%	9.6%	3.8%	4.4%	-1.3%	2.2%	-7.7%	8.7%	1.8%	1.7%

Average	Median
5.3%	4.2%
6.4%	4.1%

Source: Bishop (note 2013 data not yet available), Citi Research



Figure 65. Connectors – Top 10 Connector Manufacturers

\$ Millions					2009 Y/Y Change	2010 Y/Y Change	2011 Y/Y Change	2012 Y/Y Change	2009 Market Share	2010 Market Share	2011 Market Share	2012 Market Share
Rank	Manufacturer	2009	2010	2011	2012							
1	TE Connectivity	\$6,005	\$7,865	\$8,476	\$8,482	-26%	31%	8%	0%	17.5%	17.3%	17.5%
2	Amphenol Corporation	\$2,820	\$3,293	\$3,676	\$4,015	-13%	17%	12%	9%	8.2%	7.3%	7.6%
3	Molex Incorporated	\$2,480	\$3,403	\$3,582	\$3,580	-23%	37%	5%	0%	7.2%	7.5%	7.4%
4	Foxconn (Hon Hai)	\$1,146	\$1,547	\$2,718	\$2,683	-22%	35%	76%	-1%	3.3%	3.4%	5.6%
5	Delphi Connection System	\$726	\$1,228	\$2,522	\$2,589	-27%	69%	105%	3%	2.1%	2.7%	5.2%
6	Yazaki	\$1,260	\$1,777	\$2,176	\$2,278	-16%	41%	22%	5%	3.7%	3.9%	4.5%
7	JST	\$1,364	\$1,602	\$1,509	\$1,451	-12%	17%	-6%	-4%	4.0%	3.5%	3.1%
8	JAЕ	\$786	\$976	\$1,083	\$1,311	-25%	24%	11%	21%	2.3%	2.2%	2.2%
9	Hirose	\$939	\$1,155	\$1,160	\$1,185	-10%	23%	0%	2%	2.7%	2.5%	2.4%
10	Sumitomo Wiring Systems			\$859	\$904			5%				1.9%
Total Top 10		\$17,526	\$24,543	\$27,761	\$28,477	-21%	40%	13%	3%	51%	54%	57%
All Others		\$16,864	\$20,799	\$20,594	\$19,133	-23%	23%	-1%	-7%	49%	46%	43%
Total Market		\$34,390	\$45,341	\$48,355	\$47,610	-22%	32%	7%	-2%	100%	100%	100%

Source: Bishop (note 2013 data not yet available), Citi Research

Figure 66. Connectors – Top 10 Connector Manufacturers – Segment Rankings

World Rank	Computers and Peripherals	Business Retail Education	Instruments	Medical Equipment	Industrial Equipment	Automotive Equipment	Transportation Equipment	Military Aerospace	Telecom Datacom Equipment	Consumer Electronics	Other
1	Foxconn	Foxconn	Samtec	TE Connectivity	TE Connectivity	TE Connectivity	Delphi	Amphenol	TE Connectivity	Molex	TE Connectivity
2	Molex	TE Connectivity	TE Connectivity	Amphenol	Amphenol	Yazaki	TE Connectivity	TE Connectivity	Amphenol	TE Connectivity	Hirose
3	Amphenol	JST	LEMO SA	Molex	HARTING	Delphi	Molex	Glenair	Molex	JST	Delphi
4	Foxlink	Smiths	Rosenberger	LEMO SA	Molex	Sumitomo	Amphenol	ITT	JAЕ	PPC	Multi-Contact
5	LOTES	AVX/Elco	Foxconn	WAGO	JST	JAЕ	Sumitomo	China Aviation	Hirose	Yeonho	Sumitomo
6	FCI	Hirose	AVX/Elco	3M	I-PEX	JST	Yazaki	Souriau	Rosenberger	AVX/Elco	Foxconn
7	TE Connectivity	IRISO	WAGO	Delphi	Belden, Inc.	Molex	Carlisle	Radiall	Foxconn	Hirose	JST
8	Hosiden	3M	Multi-Contact	Sauriau	3M	Rosenberger	Korea Electric	Carlisle	DDK	JAЕ	3M
9	JAЕ	Sumitomo	JST	Samtec	Weidmuller	Hirose	JAЕ	AMETEK	Delphi	Delphi	JAЕ
10	IRISO	Rosenberger	3M	ITT	Phoenix	Amphenol	Souriau	Delphi	FCI	FCI	China Aviation

Source: Bishop (note 2013 data not yet available), Citi Research

Figure 67. Connectors – Top 10 Connector Manufacturers – Regional Sales Rank

Top 10 Connector Manufacturers - Regional Sales Rank

World Rank	Manufacturer	North America	Europe	Japan	China	Asia Pacific	ROW
1	TE Connectivity	1	1	2	2	1	1
2	Amphenol	2	3	13	4	3	3
3	Molex	3	4	3	3	5	87
4	Foxconn (Hon Hai)	48	33	20	1	2	6
5	Delphi Connection Systems	4	2	26	7	7	2
6	Yazaki	5	7	1	9	6	4
7	JST	12	30	4	6	8	51
8	JAЕ	15	42	5	5	14	88
9	Hirose	34	32	6	15	4	19
10	Sumitomo Wiring Systems	22	38	7	11	9	5

Source: Bishop (note 2013 data not yet available), Citi Research

## Electronic Manufacturing Services

Electronic Manufacturing Service companies test, manufacture, distribute, provide return/repair services and design for electronic components and assemblies for Original Equipment Manufacturers. The largest companies in this sub-industry are Hon Hai, Flextronics, Jabil Circuit, Benchmark Electronics, Sanmina, and Plexus. Large suppliers to EMS companies include Avnet, Arrow, and hundreds of semiconductor chip and component suppliers. EMS firms cater to OEMs; examples include Cisco, Juniper, Samsung, Apple, IBM and Coca-Cola. See the EMS framework below to better understand EMS relationships with OEM's.

The most advantageous time to own EMS stocks is during Phases Three and Four

Over the past decade we have written extensively about the "Four Phases" of the EMS economic cycle and cautioned investors that fundamentals across the industry would not stabilize until we reached Phase Three. In late 2011 we moved back to Phase One as Citi's economic team negatively revised their global growth forecasts and several OEMs began cutting orders which resulted in sales and margin pressure for EMS companies. Since the beginning of 2012, global growth forecasts have stabilized and have modestly ticked higher spurred by better-than-expected economic activity and central bank stimulus measures which have underpinned business and consumer confidence. However, recently, the EMU crisis appears to be worsening and global growth disappoints. We believe we have stalled in Late Phase One/Early Phase Two and continue to recommend an investing style that is more company specific (i.e., big new customers ramping) until we are able to see better visibility and order trends. At this time we prefer the connector sector given higher profitability and better cash flow characteristics which can be used for accretive M&A, dividends, stock buy backs all while support organic growth.

**We remind investors of our "Four Phase" framework to the EMS economic cycle:**

- **Phase One:** We are moving past Phase One as OEMs order cuts from lower demand have occurred and the downward GDP revisions have occurred. This is not the phase to build ownership positions in EMS stocks.
- **Phase Two:** OEMs also in-source production (i.e. shift it away from EMS) in the initial stages of a downturn in hopes of increasing utilization rates at company owned factories. By our estimate, this phase has cost the EMS industry \$7B to \$10B in annual revenues since the macro recession began in late 2007. We note at this time most in-sourcing changes have occurred as well as OEM restructuring announcements. GDP revisions have now started to stabilize.
- **Phase Three:** In the third phase the OEMs typically engage in restructuring efforts during which they begin to incrementally outsource more and/or try to sell assets to EMS companies in return for the promise of future business. We believe this phase occurred in 2010/2011 as we saw asset acquisition transactions (Sanmina's purchase of JDSU assets and Hon Hai's co-investment with HP for PC manufacturing capabilities). We have seen new outsourcing from HP for notebooks to FLEX and Hon Hai, as well as from Research in Motion for smart-phones to Jabil, Flextronics, and Celestica and several LCD TV makers outsourcing which occurred in early 2011 but since has come to an abrupt slow down. During 2009 to early 2011 the sector experienced this favorable phase.
- **Phase Four:** In the last phase, the economic recovery starts and OEMs find themselves with capacity shortages – thus pushing them to increase their outsourcing efforts. In our view, this is the most profitable phase of the cycle as the pure incremental outsourcing wins (without asset purchases) should push capacity utilization rates and margins higher across the industry. **During both Phase Three & Four we expect a series of positive estimate revisions and for the shares of EMS companies to materially appreciate over time.**

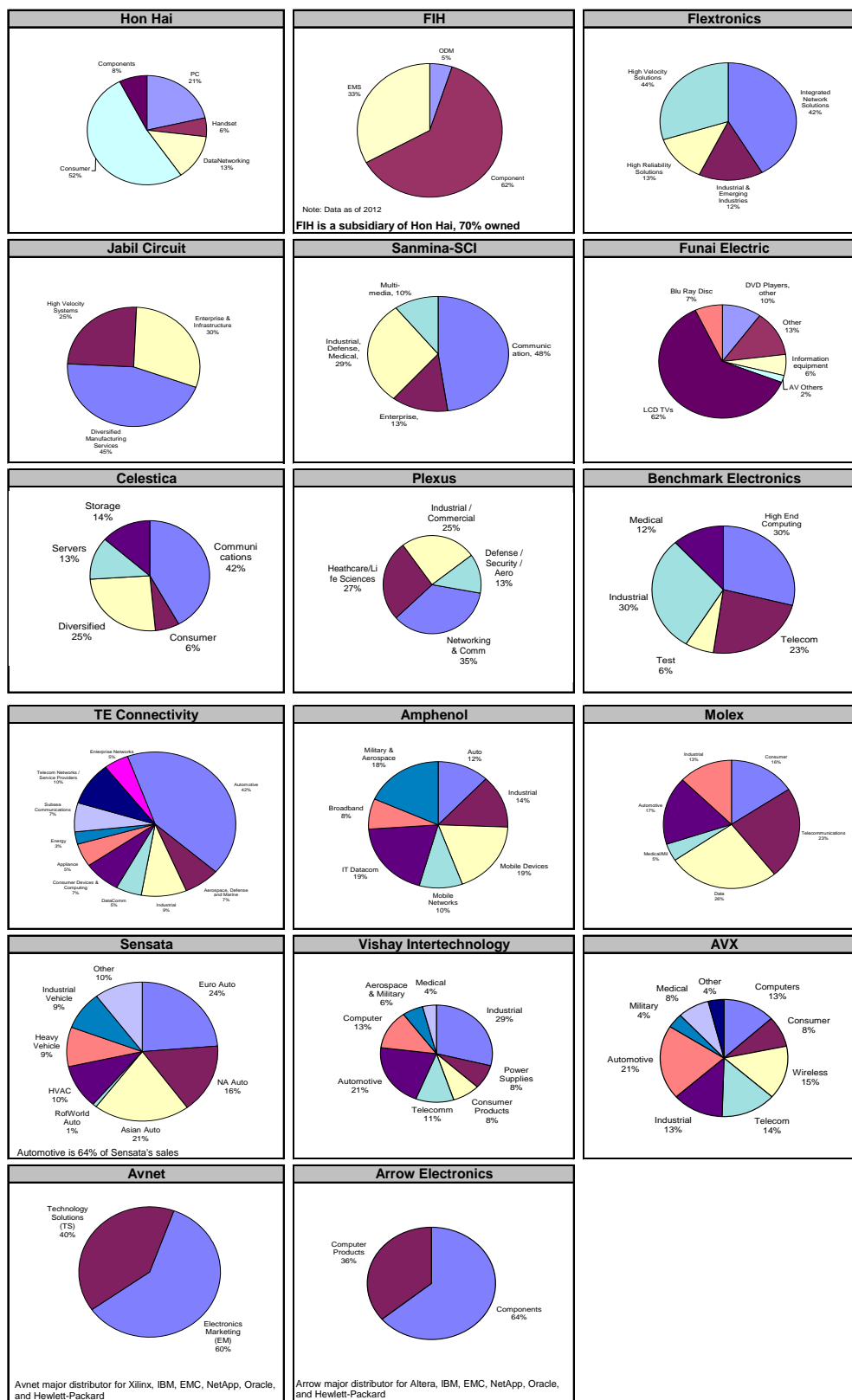
Figure 68. Citi Research Proprietary Customer Matrix Profile

Top Customers	BHE	CLS	FLEX	JBL	PLXS	SANM	Hon Hai	FIH	Funai
Abbot Labs	XX		XX						
Adaptec						XX			
Adtran		XX		XX					
Agilent			XX	XX		XX			
Alcatel-Lucent		XX	XX	XX		>10%			
Apple			XX	19%			48%	X	
Applied Materials	X	X	XX			XX			
Arris	X		X		XXX				
Avaya		XX	XX						
Blackberry				11%			X		
Boston Scientific	X								
Casio/Casio-NEC			X						
Ciena	XX	XX	XX			XX			
Cisco Systems		>10%	XX	XXX		XX	2%		
Coca-Cola					xxx				
Codan					XXX				
Denso						XX			
Echostar				X		XXX			
Draeger					XX				
EMC	8-9%	XX	XX	X		XX			
Emerson	XX			XX					
Emulex	XX								
Ericsson			XX	XX	XXX	XX			
Extreme			X						
F5			XX						
FitBit			X						
Ford			XX						
Foxconn International Holdings							2%		
Fujitsu						XX			
GE (Medical & Industrial)	X		XX	XX	8-10%				
General Dynamics						XX			
Harris						X			
Hitachi		XX	X						
Harmonic			X		XX				
Hewlett-Packard		XX	XXX	XXX		XXX	12%	8%	
Honeywell		X	X		XXX				
Huawei			XX				3%	8%	
IBM	21%	>10%	XX	XX		XX	X		
iDirect Tech									
Infinera				X		X			
Ingenico S.A.				XX					
Intel			X				X		
Intermec									
Jawbone			X						
JDS Uniphase	XX					XX			
Johnson & Johnson			XX		XX				
Juniper		>10%	XX						
KLA Tencor					XXX				
Kodak						XX			
Kontron					XXX				
Kyocera						XX	X		
Lenovo			XX						
Lexmark			X						
LG Electronics			X					7%	
Lockheed Martin			X			XX			
Medtronic	6-7%		X		XXX				
Microsoft			XXX				X		
Google Motorola Mobility	X		XXX	X				5%	
NCR									
NEC		XX	X	XX					
NMS Communications					xxx				
NetApp				XX					
NetGear			X						
Network Appliance				XX					
Nike			X						
Nokia			X	XX		XX		41%	
Oracle		X	X						
Panasonic									
Powerwave		X							
Pace Plc				XX					
Polycom		XX	X						
Qlogic				XX					
Qualcomm				XX					
Raytheon		X				XX			
Roche Diagnostics			X			XX			
Royal Philips Electronics			X	XX		XXX			
Samsung			X						
Schnieder			X						
SGI				XXX					
Siemens	X				XXX	XX			
Silver Spring					XXX				
Sony			X	X			4%	X	
TEK									
Tekelec	XX		X						
Telular									
Tellabs			X	XX		XX			
Teradyne			XX						
Valeo				XX					
Walmart									49%
Xerox			XX						

XXX denotes top customer, XX denotes greater than 2% rev customer, X denotes less than 2% rev customer. Avnet distributor for Xilinx. Arrow distributor for Altera.  
Source: Citi Investment Research

Source: Citi Research

Figure 69. Supply Chain End Market Exposures (2013 Data)



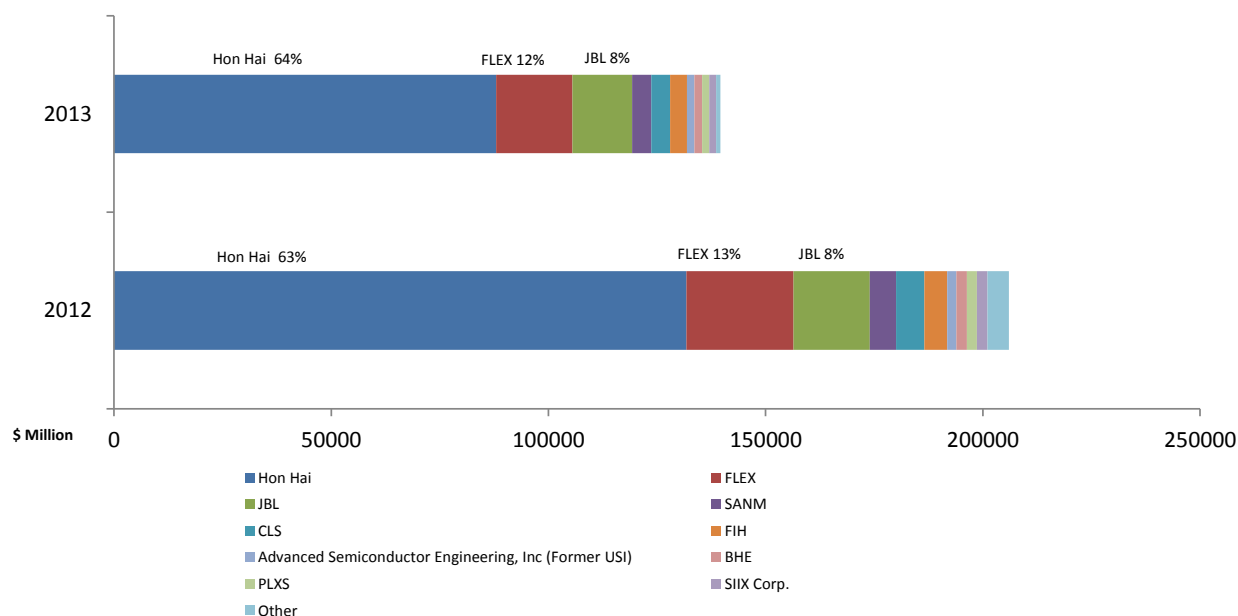
Source: Citi Research

**Figure 70. Revenue Analysis EMS/ODM**

Company Type	Company Name	2012 Total	2013 Total
EMS	Hon Hai Precision Industries Co., Ltd.	131,774.4	87,995.4
	Flextronics International	24,670.1	17,496.5
	Jabil Circuit, Inc.	17,507.5	13,748.4
	Sanmina-SCI Corp.	6,085.9	4,422.2
	Celestica, Inc.	6,507.2	4,359.4
	Foxconn International Holdings	5,239.8	3,893.7
	Advanced Semiconductor Engineering, Inc (Former USI)	2,109.4	1,681.2
	Benchmark Electronics, Inc.	2,468.2	1,749.6
	Plexus Corp.	2,307.6	1,697.5
	SILX Corp.	2,430.1	1,543.4
	Venture Corp	1,910.6	1,363.1
	Nam Tai Electronics, Inc.	1,141.7	629.6
	Xyratex Ltd	988.1	503.9
	CTS Corp.	576.9	460.6
	SMTC Corporation	296.3	203.2
EMS Total		206,013.8	141,748.0
ODM	Pegatron Corp.	25,502.8	22,934.1
	Quanta Computer Inc.	34,353.1	20,421.2
	Compal Electronics Inc.	23,046.7	16,748.0
	Wistron Corp.	22,179.3	16,134.8
	Inventec Corp.	13,851.8	10,948.4
	Lite-On Technology Corp.	7,283.3	5,159.5
	Qisda Corporation	3,929.9	2,913.3
	Cal-Comp Electronics PCL	4,481.8	2,966.6
	Compal Communications Inc.	1,531.4	742.3
	Wistron Neweb Corp.	1,160.6	914.8
	Arima Communications Corp.	719.3	785.8
	MITAC Holdings Corp.	1,500.4	900.9
	Clevo Company	613.2	439.8
	CyberTAN Technology, Inc.	327.8	312.3
	Getac Technology Corp.	558.0	367.8
	FIC Global, Inc.	462.6	296.7
	Gigabyte Technology Co., Ltd.	286.4	189.8
	Tecom Company, Ltd.	244.7	184.4
	Twinhead International Corp.	45.5	23.0
	Jean Company, Ltd.	29.6	18.8
	ASUSTEK Computer Inc.	509.1	13.0
	High Tech Computer Corp	0.0	0.0
ODM Total		142,617.3	103,415.0
Grand Total		348,631.1	245,163.0

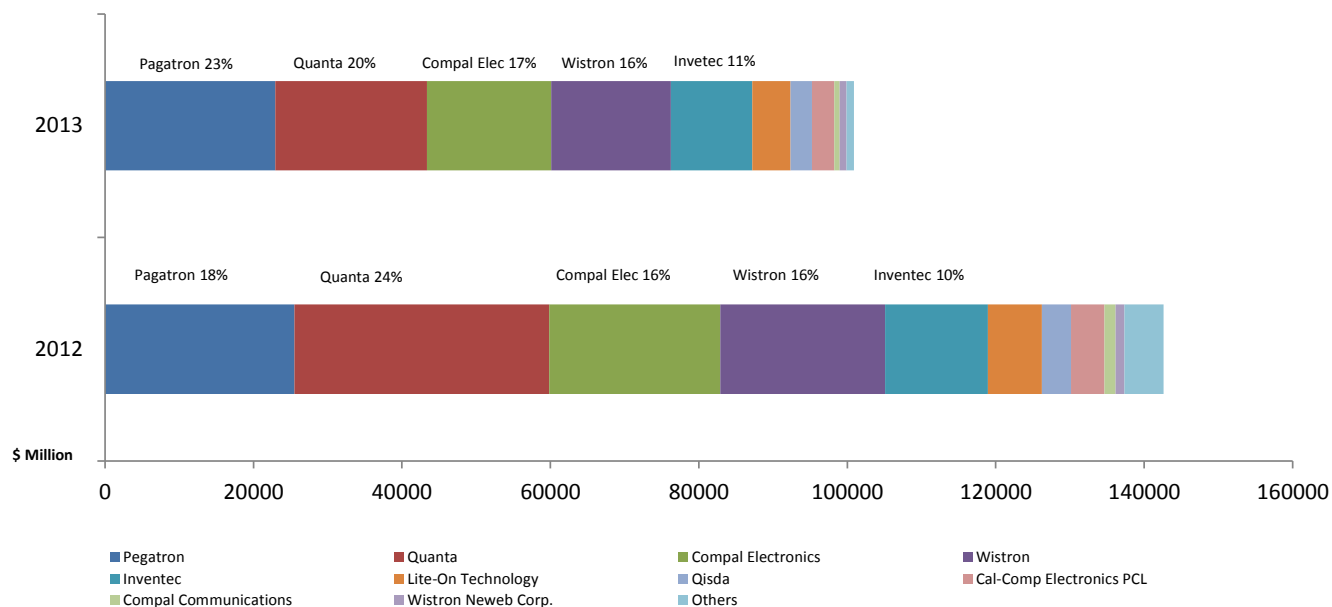
Source: IDC, Citi Research

Figure 71. EMS Revenue Market Share



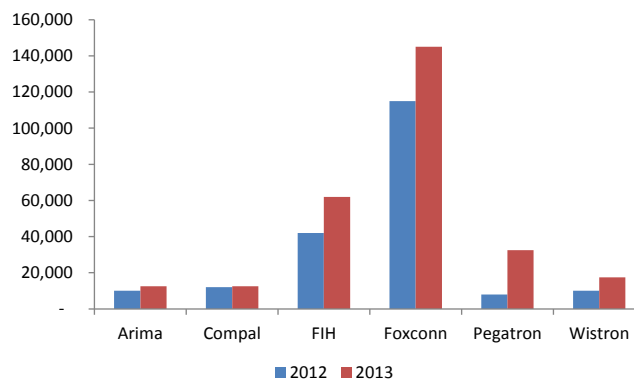
Source: IDC, Citi Research

Figure 72. ODM Revenue Market Share



Source: Citi Research

**Figure 73. Total EMS/ODM Production Accounted for ~30% of Total Smartphone Production (Thousands of Units)**



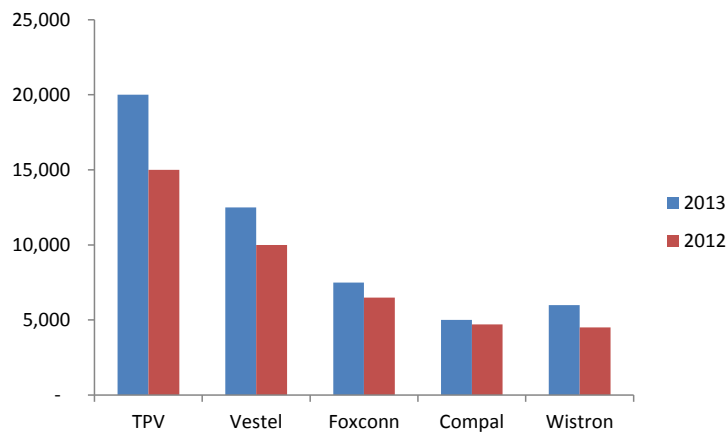
Source: Gartner (2013)

**Figure 74. Smartphone Production by EMS/ODM**

EMS/ODM	Outsourcing Clients in 2012 and 2013
Foxconn and FIH Mobile	Apple Xiaomi Huawei Sony Mobile Motorola InFocus
Compal Communication	Nokia Sony Mobile Lenovo
Arima Communication	Sony Mobile Motorola NCMC LG
Wistron	BlackBerry
Pegatron	Apple Asus Microsoft

Source: Gartner (2013)

**Figure 75. Total EMS/ODM Production Accounted for ~35% of Total LCD TV production (Thousands of Units)**



Source: Citi Research

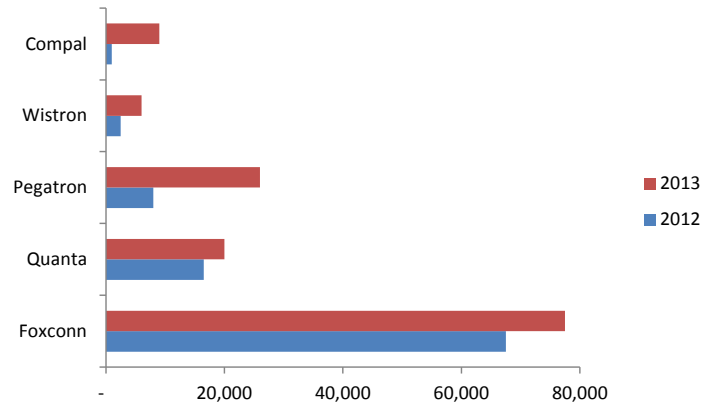
Figure 76. LCD TV Production by EMS/ODM

Vendor	Highlights
TPV Technology	<p>TPV started as an ODM but now also has its own-brand TV business.</p> <p>TV production reached 15 million units in 2012 and it will continue to lead in the EMS/ODM LCD TV market.</p> <p>Strong production capacity in China, Brazil, Mexico and Poland.</p> <p>Strong alliances and JVs with LCD panel vendors including Samsung, LG and AUO.</p> <p>A large client portfolio including Philips, LG, Toshiba, Sharp, AOC and some Chinese OEMs.</p>
Foxconn Technology Group	<p>Worldwide No. 1 contracted manufacturer and has shipped more than 6.7 million units of LCD TVs, mainly for Sony, Sharp and Vizio.</p> <p>Strong in business diversification, mainly with computing, communication and consumer electronics.</p> <p>Owns direct and reliable large LCD panel production capacity. (This comes from its subsidized company CMI and 50% ownership of Sharp's 10G LCD plant in Sakai.)</p> <p>Has its own globalized production sites across China, Brazil and the Czech Republic.</p> <p>Embraces the whole of the service breadth from manufacturing and software design support to sales services.</p>
Vestel Group	<p>No. 1 TV manufacturer in Europe — it has said it is the "Foxconn of TV in Europe."</p> <p>Employs more than 12,000 workers and is very strong with 32-inch TVs.</p> <p>Focuses on the European market and produced 10 million TV units in 2012 — 80% for Europe.</p> <p>Is mainly an ODM, but is also strong in re-labeled markets. For example, it penetrated European retail market vendors like Dixons, Sainsbury's, Tesco and Argos.</p>
Compal	<p>Manufactured 4.3 million units of LCD TVs in 2012 and may hit 5 million units in 2013.</p> <p>Major clients include Toshiba and Hitachi.</p> <p>Has production sites in China, Brazil, the Czech Republic and Malaysia.</p> <p>Has a strong alliance with LG to secure LCD panel supply and remain cost competitive.</p> <p>Active in component supply chain investment and software engineering.</p>
Wistron	<p>Has many clients, including Sony, Vizio, Sharp, Toshiba and Chinese OEMs like Haier. Produced around 4.3 million TVs in 2012 and will top 5 million units for the Chinese OEM market.</p> <p>Major production sites located in Quandong (China) and Mexico.</p> <p>Is strengthening its alliance with AUO to secure LCD panel supply and remain cost competitive.</p> <p>Its heavy investment in software engineering and production techniques highlights its differentiated value.</p>

Source: Gartner (2013)



**Figure 77. Total EMS/ODM Production Accounted for ~70% of Total Media Tablet production (Thousands of Units)**



Source: Gartner (2013)

**Figure 78. PC and Tablet Production by EMS/ODM**

EMS Companies/ODMs	Outsourcing Clients in 2012 and 2013
Foxconn	Apple, Amazon
Quanta	Amazon, Google/Asus
Compal	Amazon, Acer, Lenovo, Dell
Wistron	Asus, Acer, Lenovo, Dell
Pegatron	Apple, Microsoft, Asus, Lenovo, Toshiba

Source: Gartner (2013)

Figure 79. EMS, Connector, & Components Revenue Profiles

REVENUES (\$US M)	CY1998	CY1999	CY2000	CY2001	CY2002	CY2003	CY2004	CY2005	CY2006	CY2007	CY2008	CY2009	CY2010	CY2011	CY2012	CY2013
<b>Electronics Manufacturing Services (EMS)</b>																
Hon Hai	1,241	1,853	2,954	4,393	7,475	11,727	16,242	28,377	40,601	53,276	61,826	59,331	95,199	117,502	132,020	133,651
Flextronics	3,556	5,883	11,224	12,923	13,615	13,822	16,063	15,582	17,774	24,460	33,141	23,754	27,761	29,944	24,670	24,680
Jabil Circuit	1,406	2,308	3,997	4,086	3,729	5,170	6,577	8,095	11,085	12,435	12,794	11,398	14,403	16,763	17,462	18,311
Solectron	6,345	10,301	16,998	16,149	12,261	11,261	11,632	10,207	11,103	Acq'd	Acq'd	Acq'd	Acq'd	Acq'd	Acq'd	Acq'd
Sanmina-SCI	2,109	2,855	4,887	4,975	10,168	10,795	12,487	11,344	10,872	9,383	6,849	5,237	6,503	6,442	6,086	5,870
Celestica	3,249	5,296	9,752	10,004	8,271	6,735	8,840	8,471	8,812	8,070	7,678	6,092	6,526	7,213	6,507	5,796
Funai Electric				1,466	1,897	2,722	3,034	3,567	3,192	3,394	2,433	3,026	3,395	3,463	3,117	2,316
Benchmark Electronics	524	877	1,704	1,277	1,630	1,840	2,001	2,257	2,907	2,916	2,590	2,089	2,402	2,253	2,468	2,507
Plexus	420	518	876	980	889	841	1,090	1,270	1,513	1,624	1,839	1,591	2,149	2,195	2,308	2,231
<b>Memory Modules</b>																
SMART Modular						666	648	611	786	766	629	424	796	Private	Private	Private
<b>Connectors</b>																
Molex	1,647	1,907	2,437	1,957	1,788	1,965	2,493	2,614	3,171	3,233	3,200	2,480	3,403	3,582	3,580	Private
Amphenol	919	1,011	1,360	1,104	1,062	1,240	1,530	1,808	2,471	2,851	3,236	2,820	3,554	3,940	4,292	4,615
Tyco Electronics										12,576	13,450	13,620	10,435	12,378	14,185	13,246
Sensata										1,403	1,423	1,135	1,540	1,827	1,914	1,981
<b>Components</b>																
Vishay Intertechnology	1,573	1,760	2,465	1,655	1,823	2,171	2,414	2,295	2,581	2,833	2,822	2,042	2,725	2,594	2,230	2,371
AVX	1,232	1,450	2,506	1,576	1,148	1,082	1,293	1,301	1,458	1,593	1,524	1,209	1,600	1,602	1,417	1,452
<b>Component Distributors</b>																
Avnet	6,165	7,454	12,977	10,556	8,880	9,490	10,766	12,611	14,766	16,993	17,864	16,656	22,921	26,704	25,158	26,657
Arrow Electronics	8,345	9,313	12,959	10,128	7,498	8,528	10,646	11,164	13,577	15,985	16,761	14,684	18,745	21,390	20,405	21,357
<b>REVS Y/Y% CHG</b>																
<b>Electronics Manufacturing Services (EMS)</b>																
Hon Hai	71%	49%	59%	49%	70%	57%	39%	75%	43%	31%	16%	-4%	60%	23%	12%	1%
Flextronics	78%	65%	91%	15%	5%	2%	16%	-3%	14%	38%	35%	-28%	17%	8%	-18%	0%
Jabil Circuit	28%	64%	73%	2%	-9%	39%	27%	23%	37%	12%	3%	-11%	26%	16%	4%	5%
Solectron	58%	62%	65%	-5%	-24%	-8%	3%	-12%	9%	Acq'd	Acq'd	Acq'd	Acq'd	Acq'd	Acq'd	Acq'd
Sanmina-SCI	110%	35%	71%	2%	104%	6%	16%	-9%	-4%	-14%	-27%	-24%	24%	-1%	-6%	-4%
Celestica	113%	63%	84%	3%	-17%	-19%	31%	-4%	4%	-8%	-5%	-21%	7%	11%	-10%	-11%
Funai Electric				29%	43%	11%	18%	-11%	6%	-28%	24%	12%	2%	2%	-10%	-26%
Benchmark Electronics	61%	67%	94%	-25%	28%	13%	9%	13%	29%	0%	-11%	-19%	15%	-6%	10%	2%
Plexus	6%	23%	69%	12%	-9%	-5%	30%	17%	19%	7%	13%	-14%	35%	2%	5%	-3%
<b>Memory Modules</b>																
SMART Modular						-3%	-6%	29%	-3%	-18%	-33%	88%	Private	Private	Private	Private
<b>Connectors</b>																
Molex	2%	16%	28%	-20%	-9%	10%	27%	5%	21%	2%	-1%	-23%	37%	5%	0%	Private
Amphenol	4%	10%	35%	-19%	-4%	17%	23%	18%	37%	15%	14%	-13%	26%	11%	9%	8%
Tyco Electronics									5%	7%	1%	-23%	19%	15%	-7%	2%
Sensata											1%	-20%	36%	19%	5%	3%
<b>Components</b>																
Vishay Intertechnology	40%	12%	40%	-33%	10%	19%	11%	-5%	12%	10%	0%	-28%	33%	-5%	-14%	6%
AVX	-2%	18%	73%	-37%	-27%	-6%	20%	1%	12%	9%	-4%	-21%	32%	0%	-12%	2%
<b>Component Distributors</b>																
Avnet	9%	21%	74%	-19%	-16%	7%	13%	17%	17%	15%	5%	-7%	38%	17%	-6%	6%
Arrow Electronics	7%	12%	39%	-22%	-26%	14%	25%	5%	22%	18%	5%	-12%	28%	14%	-5%	5%

Source: Citi Research, Company Reports

Figure 80. EMS, Connector, Components & Distributors Margin Profiles

OPERATING MARGINS	CY1998	CY1999	CY2000	CY2001	CY2002	CY2003	CY2004	CY2005	CY2006	CY2007	CY2008	CY2009	CY2010	CY2011	CY2012	CY2013
<b>Electronics Manufacturing Services (EMS)</b>																
Hon Hai	14.6%	12.6%	10.7%	9.2%	7.4%	6.6%	6.2%	5.4%	5.7%	5.6%	3.8%	4.3%	2.9%	2.4%	2.8%	2.9%
Flextronics	5.5%	4.4%	4.5%	3.7%	2.3%	2.1%	3.1%	3.3%	3.1%	3.1%	3.1%	2.0%	2.9%	2.4%	2.7%	2.4%
Jabil Circuit	7.7%	6.8%	6.0%	4.1%	3.5%	4.0%	4.1%	4.3%	3.3%	3.0%	2.8%	2.2%	3.9%	4.3%	4.2%	3.9%
Selectron	5.5%	5.4%	4.8%	1.6%	-0.7%	-0.1%	1.6%	1.7%	1.5%	Acq'd	Acq'd	Acq'd	Acq'd	Acq'd	Acq'd	Acq'd
Sanmina-SCI	8.6%	9.9%	11.3%	4.6%	1.0%	1.5%	2.2%	2.1%	2.2%	1.6%	2.8%	2.1%	4.0%	3.7%	3.1%	3.3%
Celestica	0.9%	0.5%	0.5%	0.3%	0.7%	1.3%	1.0%	2.2%	1.9%	1.7%	3.0%	3.5%	3.6%	3.6%	3.3%	3.0%
Funai Electric				8.4%	8.4%	10.6%	10.7%	8.7%	6.5%	5.2%	-0.9%	0.5%	3.5%	0.3%	0.2%	-2.7%
Benchmark Electronics	5.9%	3.3%	3.1%	2.1%	3.7%	4.6%	4.6%	4.4%	4.5%	3.6%	3.3%	2.9%	4.0%	2.2%	3.5%	3.5%
Plexus	9.5%	8.6%	9.4%	4.8%	0.9%	-0.9%	1.8%	3.1%	5.7%	5.8%	5.1%	3.6%	5.0%	4.4%	4.4%	4.5%
<b>Memory Modules</b>																
SMART Modular						2.4%	3.3%	7.9%	7.8%	8.6%	4.9%	4.5%	11.6%	Private	Private	Private
<b>Connectors</b>																
Molex	15.3%	12.9%	14.9%	10.2%	7.3%	8.3%	11.0%	9.9%	12.1%	10.1%	9.4%	2.5%	11.9%	12.5%	11.2%	Private
Amphenol	16.3%	15.9%	18.0%	17.9%	16.4%	16.5%	18.1%	19.0%	18.0%	19.4%	19.5%	17.3%	19.7%	19.2%	19.3%	19.6%
Tyco Electronics										13.9%	12.4%	7.2%	14.4%	13.1%	13.3%	14.7%
Sensata										9.1%	21.3%	24.0%	26.9%	24.7%	25.0%	25.8%
<b>Components</b>																
Vishay Intertechnology	8.8%	11.0%	28.3%	9.8%	4.9%	4.8%	7.6%	6.5%	10.4%	9.0%	5.0%	1.4%	15.3%	13.6%	7.9%	8.4%
AVX	6.9%	9.0%	29.8%	14.0%	-1.6%	-4.7%	5.9%	4.8%	11.7%	10.6%	8.3%	10.8%	19.1%	19.2%	11.4%	10.4%
<b>Component Distributors</b>																
Avnet	4.6%	3.4%	5.1%	2.3%	1.1%	1.8%	2.9%	3.0%	4.1%	4.4%	3.9%	1.7%	3.8%	3.8%	3.3%	3.3%
Arrow Electronics	4.2%	3.1%	6.1%	2.4%	2.3%	2.8%	4.2%	4.4%	4.6%	4.4%	3.6%	2.6%	4.2%	4.5%	3.8%	3.8%
<b>GROSS MARGINS</b>																
<b>Electronics Manufacturing Services (EMS)</b>																
Hon Hai	29.6%	25.2%	22.0%	18.3%	14.7%	13.1%	12.2%	10.2%	9.8%	9.1%	8.8%	9.5%	8.1%	7.7%	8.4%	6.5%
Flextronics	11.6%	9.5%	8.2%	7.1%	5.7%	5.4%	6.6%	6.8%	5.9%	5.8%	5.7%	4.9%	5.6%	5.2%	5.8%	5.8%
Jabil Circuit	12.2%	11.1%	9.9%	8.9%	9.4%	9.1%	8.5%	8.3%	6.9%	6.9%	6.7%	6.4%	7.5%	7.7%	7.6%	7.5%
Selectron	9.6%	9.8%	8.7%	8.3%	6.8%	6.1%	5.2%	5.8%	5.3%	Acq'd	Acq'd	Acq'd	Acq'd	Acq'd	Acq'd	Acq'd
Sanmina-SCI	16.5%	16.7%	16.9%	10.0%	4.2%	4.6%	5.2%	5.5%	5.8%	5.6%	7.2%	6.8%	7.8%	7.7%	7.1%	7.6%
Celestica	7.1%	7.2%	7.1%	7.3%	6.7%	3.9%	5.3%	5.7%	5.2%	5.3%	6.9%	7.3%	7.1%	7.0%	6.8%	6.9%
Funai Electric				20.2%	19.7%	22.3%	22.2%	20.3%	20.5%	19.0%	18.6%	17.1%	20.6%	16.8%	18.3%	17.1%
Benchmark Electronics	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.9%	6.2%	7.2%	7.4%
Plexus	13.2%	13.7%	14.0%	10.2%	9.2%	6.8%	8.2%	9.0%	11.0%	11.1%	10.7%	9.4%	10.1%	9.6%	9.5%	9.6%
<b>Memory Modules</b>																
SMART Modular						8.8%	11.2%	18.0%	17.0%	18.7%	17.7%	21.9%	22.8%	Private	Private	Private
<b>Connectors</b>																
Molex	40.9%	38.5%	38.5%	33.7%	32.7%	33.5%	34.2%	32.3%	32.4%	30.3%	29.7%	25.6%	30.4%	29.4%	29.9%	Private
Amphenol	34.5%	34.3%	34.8%	36.2%	34.1%	33.8%	34.7%	35.7%	31.9%	32.6%	32.4%	31.4%	32.6%	31.6%	31.3%	31.4%
Tyco Electronics									26.7%	26.5%	28.7%	25.4%	32.0%	30.6%	31.5%	33.1%
Sensata										32.3%	33.8%	35.5%	38.3%	36.4%	35.2%	36.9%
<b>Components</b>																
Vishay Intertechnology	23.7%	25.5%	40.3%	27.3%	22.0%	22.4%	23.7%	22.9%	25.9%	24.5%	21.2%	19.0%	29.6%	27.8%	23.6%	23.9%
AVX	16.0%	16.9%	35.5%	21.5%	6.4%	3.2%	13.6%	13.4%	19.8%	18.3%	16.8%	25.7%	28.1%	23.3%	19.6%	18.7%
<b>Component Distributors</b>																
Avnet	15.7%	15.0%	15.1%	14.6%	13.8%	13.1%	13.5%	12.9%	13.0%	13.0%	12.9%	11.7%	11.9%	11.8%	11.8%	11.7%
Arrow Electronics	13.9%	14.0%	15.7%	15.0%	16.9%	16.7%	16.2%	15.6%	15.0%	14.3%	13.6%	11.9%	12.9%	13.8%	13.4%	13.1%

Source: Citi Research, Company Reports

Figure 81. Handset Supply Matrix

	Country	ODM	PCBA	HDI PCB	FPCB	Optical Lens	Cam Module	Keypad	Plastic cas	Mg alloy	LCD/LCM	Connector	Acoustic	BT/Wi-Fi	Battery cell	Battery Pack
FIH	TWN															
Flextronics	US															
Jabil/TGP	US/TWN															
Elcoteq	Fin															
BYD	China															
Cheng Uei	TWN															
Lite-On/Silitech	TWN															
Ichia	TWN															
Mogem	Korea															
Hi-P	Singapore															
Jurong Tech	Singapore															
Catcher	TWN															
Intops	Korea															
Merry	TWN															
AAC Acoustic	China															
BSE Holdings	Korea															
Hosiden	JPN															
Largan	TWN															
Asia Optical	TWN															
Career	TWN															
Interflex	Korea															
G-Flex	China															
Unimicron	TWN															
Compeq	TWN															

Source: Citi Research

## Citi's global inventory analysis includes over 280 technology companies. This detailed analysis is available quarterly.

Aggregate inventory decreased -6% q/q in 4Q'13, better than the 5 year and 10 year averages but worse than Mar quarter sales outlook of -9% q/q (a negative).

Figure 82. Total Aggregate Supply Chain (AAPL & Samsung Analysis)

### Total Aggregate Supply Chain

	4Q13 Inventory %Change Q/Q	1Q14E Sales %Change Q/Q
<b>Current</b>	-5.7%	-9.3%
<b>5-Year Average</b>	-2.7%	-4.6%
<b>10-Year Average</b>	0.0%	-2.9%

	4Q13 Inventory %Change Y/Y	1Q14E Sales %Change Y/Y
<b>Current</b>	-3.7%	1.1%
<b>5-Year Average</b>	7.1%	12.2%
<b>10-Year Average</b>	9.8%	10.0%

### Total Aggregate Supply Chain excluding Apple

	4Q13 Inventory %Change Q/Q	1Q14E Sales %Change Q/Q
<b>Current</b>	-5.3%	-7.8%

	4Q13 Inventory %Change Y/Y	1Q14E Sales %Change Y/Y
<b>Current</b>	-4.1%	1.2%

### Total Aggregate Supply Chain excluding Samsung

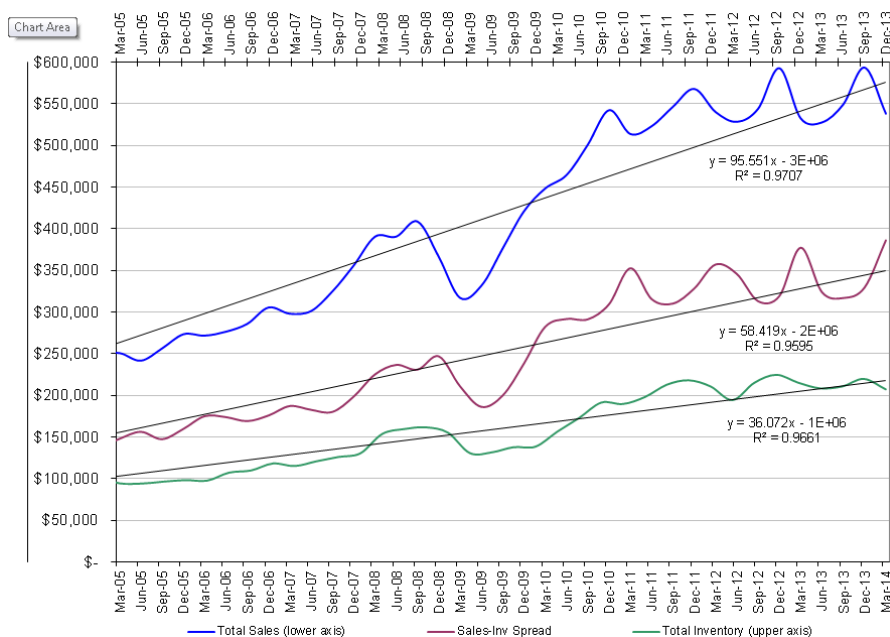
	4Q13 Inventory %Change Q/Q	1Q14E Sales %Change Q/Q
<b>Current</b>	-5.5%	-9.2%

	4Q13 Inventory %Change Y/Y	1Q14E Sales %Change Y/Y
<b>Current</b>	-5.0%	0.8%

Source: Citi Research, FactSet, FirstCall, Bloomberg

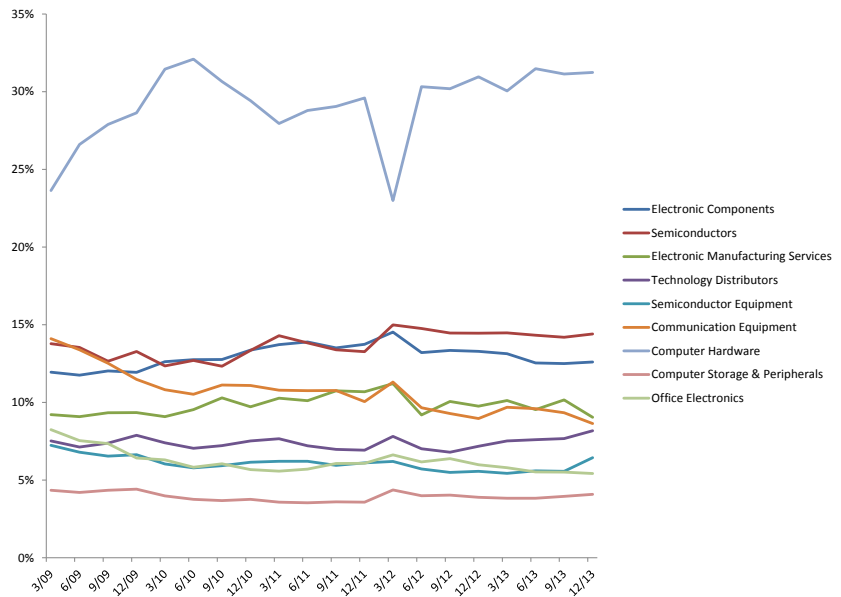
The technology supply chain is operating more efficiently; by looking at the respective trend lines in Figure 83, we see sales are increasing at ~3x the rate of inventories. Also, we see the spread between sales & inventories is increase at ~2x the rate of inventories. (Note: R-squared for all trend-lines are >95%, we view the relationship as statistically significant).

Figure 83. Total Supply Chain Inventory vs. Revenue Levels



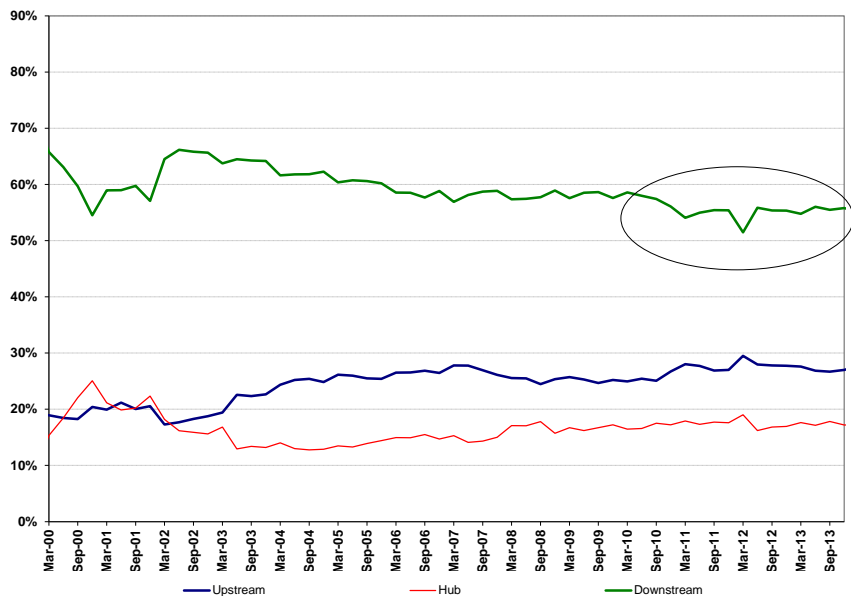
Source: Citi Research, FactSet, First Call, Bloomberg

Figure 84. Inventory - % Held At Each Sub-sector Along the Supply Chain: 2Q96–1Q12



Source: Citi Research, FactSet, First Call, Bloomberg

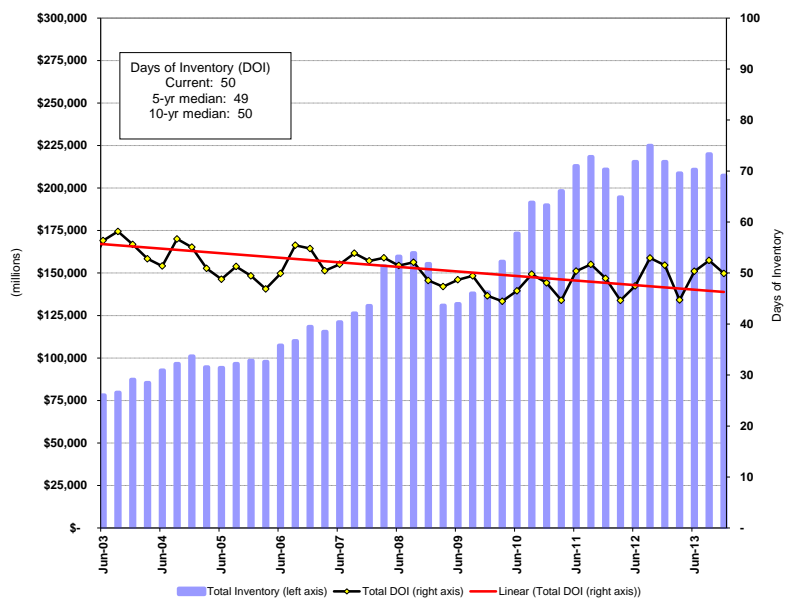
Figure 85. Inventory - % Held At Each Segment Along the Supply Chain: 2Q97–4Q13



Source: Citi Research, FactSet, First Call, Bloomberg

Supply Chain Days of Inventory decreased to 50 from 53, above the 5-year median of 49 days and in-line with the 10-year median of 50 days.

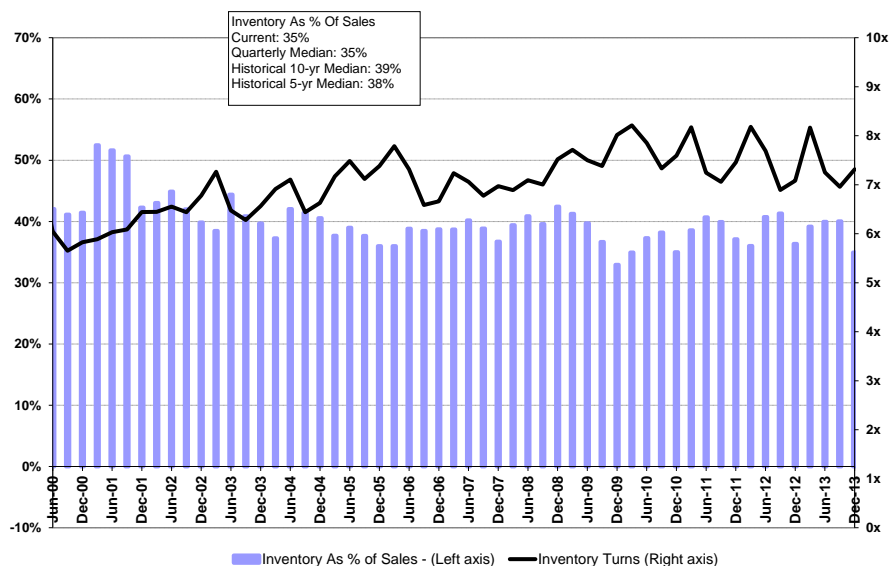
Figure 86. Total Inventory vs. Days of Inventory



Source: Citi Research, FactSet, First Call, Bloomberg

Inventories as a percent of sales remained flat at 35%. Inventory turns increased slightly in the Dec quarter

Figure 87. Inventories Throughout the Supply Chain



Source: Citi Research

## Distribution

IT broad-line distributors are essentially wholesalers of commodity technology products (such as PC, servers, printers and accessories) that serve the SMB market. The industry is highly fragmented, but includes some sizable companies such as Ingram Micro, Tech Data, and Synnex. Large vendors such as HP tend to leverage these distributors to cost-effectively sell their products into the VAR channel.

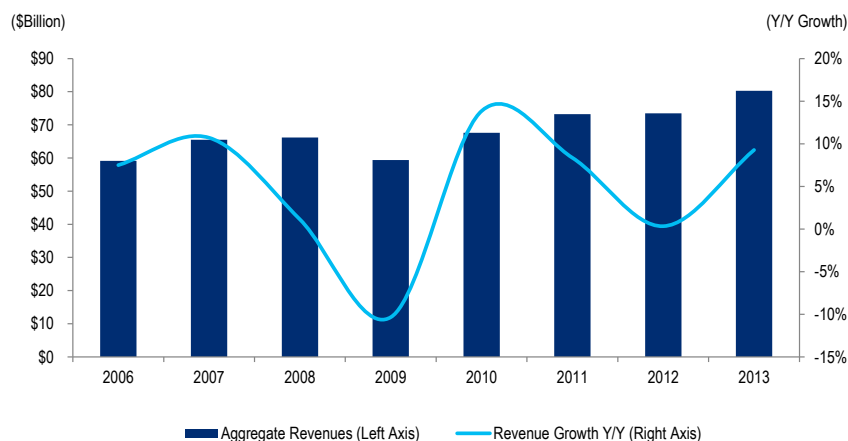
Arrow and Avnet are two of the large electronic component distributors in another highly fragmented market. These distributors sell products from hundreds of suppliers (large suppliers include Intel, NetApp, Hewlett Packard and IBM) and distribute these products to hundreds of thousands of customers.

Figure 88. Top Distributors by Revenue (2012 data as 2013 data is not yet available)

Company Name	Rank					Global Sales				% chg Y/Y					Ownership		Breakdown By Region (2012)		
	2012	2011	2010	2009	2008 (NA only)	2012	2011	2010	2009	2012	2011	2010	2009	2008	Public	Private	North America	Asia/Japan	Europe/Middle East/ROW
Avnet Inc.	1	1	1	1	1	\$ 25,160	\$ 26,700	\$ 22,920	\$ 16,656	-6%	16%	38%	-7%	5%	X		\$10,990	\$7,140	\$7,030
Arrow Electronics, Inc.	2	2	2	2	2	\$ 20,405	\$ 21,390	\$ 18,745	\$ 14,684	-5%	14%	28%	-12%	5%	X		\$10,641	\$3,836	\$5,927
World Peace Holdings	3	3	3	3		\$ 12,398	\$ 11,112	\$ 12,087	\$ 9,608	12%	-8%	26%	111%	-3%	X				
Future Electronics	4	4	4	4	3	\$ 4,831	\$ 5,107	\$ 4,520	\$ 3,453	-5%	13%	31%	-37%	23%		X			
WT Microelectronics	5					\$ 2,800	\$ 2,365			18%									
Electrocomponents plc (includes Allied)	6	5	5	8		\$ 2,028	\$ 1,900	\$ 1,700	\$ 1,550	7%	12%	10%	8%	-21%	X		\$444		
TTI Inc./Mouser Electronics Inc.	7	7	8	6	6	\$ 1,560	\$ 1,540	\$ 1,400	\$ 1,015	1%	10%	38%	-34%	12%	X		\$910	\$145	\$503
Premier Farnell plc (includes Newark)	8	6	6	7		\$ 1,544	\$ 1,600	\$ 1,526	\$ 1,265	-4%	5%	21%	-12%	-3%	X				
Digi-Key Corporation	9	8	7	9	5	\$ 1,417	\$ 1,536	\$ 1,519	\$ 927	-8%	1%	64%	-6%	4%		X	\$974	\$150	\$293
Rutronik Electronics	10	9				\$ 1,100	\$ 1,027			7%						X			
Mouser Electronics	11	10	11			\$ 615	\$ 582	\$ 498	\$ 285	6%	17%	75%			X		\$386	\$97	\$132
Excelpoint Technology Ltd	12	12	12	13		\$ 584	\$ 489	\$ 496	\$ 357	19%	-1%	39%	-18%	-10%	X		\$0	\$584	\$0
DAC Group	13	11	10	12	9	\$ 584	\$ 565	\$ 534	\$ 388	3%	6%	38%	-21%	-7%		X	\$574	\$10	\$0
Carlton - Bates	14	13	13		10	\$ 384	\$ 362	\$ 339		6%	7%				X				
Dependable Component Supply Corp	15	14	14	19	20	\$ 334	\$ 327	\$ 303	\$ 218	2%	8%	39%	-19%	70%	X				
PEI-Genesis	16	16	16	17	21	\$ 214	\$ 212	\$ 194	\$ 145	1%	9%	34%	-15%	18%	X				
Master Distributors	17	18	18	20	24	\$ 163	\$ 156	\$ 147	\$ 108	4%	6%	37%	-7%	3%		X	\$147		
Richardson Electronics, Ltd (*wireless & power)	18	17	17	11	16	\$ 149	\$ 161	\$ 156	\$ 492	-7%	3%	-68%	-13%	-21%	X				
Powell Electronics Inc.	19	19	20	21		\$ 120	\$ 120	\$ 100	\$ 90	0%	20%	11%	-18%	19%		X			
Bisco Industries Inc.	20	20	21	24	25	\$ 116	\$ 103	\$ 97	\$ 80	12%	6%	22%	-15%	8%	X		\$111	\$2	\$2
Flame Enterprises Inc.	21	21	22	23		\$ 98	\$ 101	\$ 91	\$ 82	-3%	11%	11%	-9%			X	\$84	\$4	\$9
Electro Sonic Inc.	22	22	19	22		\$ 70	\$ 75	\$ 125	\$ 89	-7%	-40%	39%	-15%	12%		X	\$68	\$1	\$1
Hughes Peters	23	24	24			\$ 63	\$ 59	\$ 48	\$ 39	7%	23%	23%				X	\$63	\$0	\$0
Steven Engineering	24	25				\$ 51	\$ 49			4%						X	\$45	\$3	\$3
Hammond	25					\$ 36	\$ 38			-5%						X	\$36	\$0	\$0
<b>TOTALS</b>						<b>\$ 76,824</b>	<b>\$ 77,677</b>	<b>\$ 67,544</b>	<b>\$ 51,531</b>										

Source: Citi Research, Company Data, Industry Sources

Figure 89. Broadline IT Distributor Growth (Aggregate Revenues of IM, TECD, & SNX)



Source: Citi Research

## Handsets

A mobile phone (also known as a cellular phone, cell phone, and a hand phone) is a device that can make and receive telephone calls over a radio link while moving around a wide geographic area. It does so by connecting to a cellular network provided by a mobile phone operator, allowing access to the public telephone network.

In addition to telephony, modern mobile phones also support a variety of other services such as text messaging, MMS, email, Internet access, Bluetooth, short-range wireless communications, business applications, gaming and photography. Mobile phones that offer these and general computing capabilities are referred to as smartphones.

Key handset players include Nokia, Samsung, Apple, Blackberry, LG, HTC and Sony. We are also seeing smaller whitebox manufacturers offer low cost smartphones in emerging countries. Examples of whitebox manufacturers include Yulong, Hisense and Xiaomi.



Figure 90. Handset Supply Chain

# Handset Supply Chain Semiconductors

<b>Basebands</b>
Broadcom
Ericsson
Freescall
Infineon
NXP
QCOM
STM.N
TXN
Mediatek (2454.TW)
Renesas (6723.JP)

<b>CMOS Image Sensors</b>
MU
OVTI
Sharp (6753.JP)
STM
Sony (6758.JP)
Toshiba (6502.JP)

<b>Memory (NAND Flash)</b>
Hynix (00660.KS)
Intel-Micron JV
SEC (05930.KS)
SNDK
Toshiba (6502.JP)
FLSH

<b>Memory (NOR Flash)</b>
Numonyx
SPSN
ST
INTC

<b>Multimedia ICs</b>
AMD
Core Logic (48870.KS)
Epson (6724.JP)
Freescall (FSL)
MtekVision (74000.KS)
NVDA
Marvell

<b>Power Amps</b>
RFMD
SWKS
Renesas
TQNT

<b>Semiconductors</b>
ARMHY
BRMC
CSR.L
NSM (acquired by Texas Instruments)
Wolfson (WIL.I)

<b>Transceivers</b>
IFX
QCOM
FSL
SLAB
RFMD
SWKS

<b>Coupler</b>
COSMO (2466.TW)
ECE (2483.TW)

<b>LCD Driver</b>
SEC (05930.KS)
Renesas (6723.JP)
Philips (PHG)
Seiko Epson (8050.JP)
Sharp (6753.JP)

<b>RF Filter</b>
Murata (6981.JP)
TDK (6762.JP)
Soshin Elec (6938.JP)
Miyazaki Matsushita
GOOG
EPC

<b>RF Power Amplifier</b>
FIH (2038.HK)
Hitachi (6501.JP)
RFMD

<b>Adaptor</b>
Delta (2308.TW)
Phihong (2457.TW)
Potrans (2378.TW)

<b>Power Management ICs</b>
FCS
MXIM
STMC
ISIL

## Semiconductors (ctd)

<b>LED</b>	
Bright (3031.TW)	SEMCO (09150.KS)
Everlight (2393.TW)	Citizen Electron (6892.JP)
Epistar (2448.TW)	Rohm (6963.JP)
Harvatek (6168.TW)	Stanley Elec (6923.JP)
Lite-On Tech (2301.TW)	Nichia
Opto Tech (2340.TW)	CREE
Tyntek (2426.TW)	LG Innotek (11070.KS)
UEC (2422.TW)	

<b>Crystal</b>	
Hoshiden (6804.JP)	Epson Toyocom
Toyo Comm (6708.JP)	Nihon Dempa Kogyo (6779.JP)
Daishinku (6962.JP)	Kyocera Elec Devices (KYO)
Kinseki (6949.JP)	TXC (3042.TW)
Tokyo Denpa (6900.JP)	

<b>Baseband ASIC</b>	
ADI	QCOM
AGR	STM
CNTX	TXN
IFX	ERIC
GOOG	FSL
PHG	

<b>Flash</b>
SEC (05930.KS)
Hynix (00660.KS)
INTC
AMD
ATML
STM

<b>Substrate</b>
Unimicron (3037.TW)
NYPCCB (8046.TW)
Kinsus (3189.TW)
SEMCO (09150.KS)
LG Innotek (011070.KS)
Ibiden (4062.JP)

<b>VCO</b>
Siward (2484.TW)
SEMCO (09150.KS)
Alpha Elec (6770.JP)
FDK (6955.JP)
Matsushita Elec Ind (4283.JP)
Murata (6981.JP)
TDK (6765.JP)

<b>Other</b>
Pan Overseas Elec (2370.TW)
Ralec (2437.TW)
Team Young (5345.TW)
Ta-I (2478.TW)
WTC (2492.TW)

## Components

<b>Batteries</b>	
Samsung SDI (06400.KS)	BYD (1211.HK)
LG Chem (051910.KS)	BAK (CBAK.O)
Panasonic (6752.JP)	Lishen (Unlisted)
Sony (6758.JP)	Simplo (6121.TWO)
Hitachi Maxell (6810.JP)	Dynapack (3211.TWO)
TDK (6762.JP)	

<b>Camera Modules</b>	
Toshiba (6502.JP)	STM
Sony (6758.JP)	Largan Precision (3008.TW)
Foxconn/Altus	Samsung Techwin (12450.KS)
Lite-On Tech (2301.TW)	SEMCO (09150.KS)
FLEX	LG Innotek (011070.KS)

<b>Connectors</b>
Cheng Uei Precision (2392.TW)
Hon Hai (2317.TW)
Hirose (6806.JP)
JAE (6807.JP)
APH
MOLX
SMK (6798.JP)

<b>Cover Glass</b>
Corning (Gorilla) (GLW)
Asahi Glass (Dragontrail) (5201.JP)
Nippon Electric Glass (Dinorex) (5214.JP)

<b>Flexible PCBs</b>	
Mflex/MFS (M-FLEX.US)	NTK
Foxconn Adv Tech	Ichia (2402.TW)
Global Flex (0471.HK)	Multi-Fineline Electronix
Career (6153.TW)	NOK
Interflex (051370.KS)	

<b>Keypads</b>
Ichia (2402.TW)
Lite-On Tech (2301.TW)
Silitech (3311.TW)
You Eal (49520.KS)
Shin Etsu (7970.JP)
Sunarrow
OK UIL
Polymatech

<b>LCD Screens</b>	
Toshiba Matsushita	Sharp (6753.JP)
Pivvue (2333.TW)	Seiko Epson (8050.JP)
United Radiant (5315.TW)	Philips (PHG)
Wintek (2384.TW)	Sayno Epson
Japan Display (6740.JP)	SEC(005930.KS)
LGDI(034220.KS)	

<b>Microphones/Speakers</b>
Hosiden (6804.JP)
Merry (2439.TW)
Panasonic
Philips (PHG)
Meiloon (2477.TW)

<b>Printed Circuit Boards (PCBs)</b>	
AT&S (ATSV.DE)	Elec. & Eltek (EELT.SI)
CMK (6958.JP)	Daeduck Elec (08060.KS)
Compeg (2313.TW)	Korea Circuit (07810.KS)
Ibiden (4062.JP)	Career (6153.TW)
SEMCO (09150.KS)	Ichia (2402.TW)
Unimicron (3037.TW)	Wus PCB (2316.TW)
Gold Circuit (2368.TW)	Nippon Mekton (NL)
Unicap (5307.TW)	Multek/Flextronics (FLEX)
Unitech PCB (2367.TW)	

<b>Power Supply</b>
Phihong (2457.TW)

<b>Lens</b>
Largan (3008.TW)
Genius (3406.TW)
Enplas (6961.TW)
Fujinon
Diostech

<b>Plastic Casing</b>
Taiwan Green Point (3007.TW) (acquired by Jabil)
FIH (2038.HK)
Flextronics (FLEX)
Hi-P (HIP.SP)

<b>Light Metal Casing</b>
Foxconn Tech (2354.TW)
Jabil (JBL)
Catcher (2474.TW)

## Components (ctd)

<b>Bluetooth Headset ODM</b>
Pan International (2328.TW)
Cheng Uei (2329.TW)
Primax (2336.TW)
Merry (2439.TW)

<b>Panel</b>
TPK (3673.TW)
Wintek (2384.TW)
CMI (3481.TW)

<b>Passive Components</b>
<b>Ceramic Capacitor</b>
SEMCO (09150.KS)
Yageo (2327.TW)
Walsin Tech (2492.TW)
Murata (6981.JP)
TDK (6762.JP)
Taiyo Yuden (6976.JP)

<b>Tantalum Capacitor</b>
NEC (6701.JP)
Kyocera (6971.JP)
KEMET (KEM)
AVX
VSH

<b>Diode</b>
Mospec (2434.TW)
Pan Jit (2481.TW)
Rectron (2302.TW)
Taiwan Semiconductor (5425.TW)
TKS (2428.TW)

<b>Gallium Arsenide</b>
Procomp Informatics (2398.TW)
VPEC (2455.TW)

<b>Inductor</b>
Yageo (2327.TW)
SEMCO (0915.KS)
Taiyo Yuden (6976.JP)

## End Products

<b>Handset OEMs</b>
AAFL
LG Electronics (66570.KS)
GOOG
Nokia
BBRY
SEC (05930.KS)
HTC (2498.TW)
Sony (6758.JP)

<b>Handset ODM/EMS</b>
Arima Comm (8101.TW)
Compal Comm (8078.TW)
Elcoteq (ELCQF)
FLEX
Hon Hai (2317.TW)
JBL
CLS
FIH (2038.HK)
LG Electronics (66570.KS)
Pantech
Solomon Tech (2359.TW)
Quanta (2382.TW)
Asustek (2357.TW)
HTC (2498.TW)
BenQ (2352.TW)
Compal (2324.TW)
Dbtel (5304.TW)
Inventec (2356.TW)
Kinop (2312.TW)
SEC (05930.KS)

Source: Citi Research

## Apple iPhone

Figure 91. Preliminary Teardown Bill of Materials and Manufacturing Cost Estimate for the Apple iPhone 5s (Cost in US Dollars)

Components / Hardware Elements	Details	16GB	32GB	64GB
	<b>Pricing without contract</b>	<b>\$649.00</b>	<b>\$749.00</b>	<b>\$849.00</b>
<b>Implied Margin</b>		<b>69%</b>	<b>72%</b>	<b>74%</b>
<b>Total BOM Cost</b>		<b>\$190.70</b>	<b>\$200.10</b>	<b>\$210.30</b>
<b>Manufacturing Cost</b>		<b>\$8.00</b>	<b>\$8.00</b>	<b>\$8.00</b>
<b>BOM + Manufacturing</b>		<b>\$198.70</b>	<b>\$208.10</b>	<b>\$218.30</b>
<b>Major Cost Drivers</b>				
Memory				
NAND Flash		\$9.40	\$18.80	\$29.00
DRAM	1GB LPDDR3	\$11.00	\$11.00	\$11.00
Display & Touch Sreen	4" Retina Display w/ Touch	\$41.00	\$41.00	\$41.00
Processor	64-Bit A7 Processor + M7 Co-Processor	\$19.00	\$19.00	\$19.00
Camera(s)	8MP (1.5-micron) + 1.2MP	\$13.00	\$13.00	\$13.00
Wireless Section - BB/RF/PA	Qualcomm MDM9615M+WTR1605L+Front End	\$32.00	\$32.00	\$32.00
User Interface & Sensors	Includes fingerprint sensor assembly	\$15.00	\$15.00	\$15.00
WLAN / BT / FM / GPS	Murata Dual-Band Wireless-N Module	\$4.20	\$4.20	\$4.20
Power Management	Dialog + Qualcomm	\$7.50	\$7.50	\$7.50
Battery	3.8V~1560mAh	\$3.60	\$3.60	\$3.60
Mechanical / Electro-Mechanical		\$28.00	\$28.00	\$28.00
Box Contents		\$7.00	\$7.00	\$7.00

Source: IHS Technology Teardown Research (September 2013)

Figure 92. Apple iPhone 5s Key Vendors and Parts (in Descending Order of Component Value)

Manufacturer	Part Number	Description
Toshiba Semiconductor	THGBX2G7B2JLA01	Display / Touch Screen Module - 4.0" Diagonal, 16.7M Color TFT, 1136 x 640 Pixels, 800:1 Contrast Ratio, 500cd/m2 Brightness, w/ In-Cell Multi-Touch
Samsung Semiconductor	APL0698	Flash - NAND, 16GB, MLC
Qualcomm	MDM9615M	A7 Application Processor - Dual-Core 64-Bit ARM Cortex CPU, Quad-Core GPU, PoP
		Baseband Processor - Multi-Mode, Multi-Band, GSM/CDMA/EVDO RevB/HSPA+/LTE, 28nm
		Primary Camera Module - 8MP, 1.5-micron BSI CMOS, Auto Focus Lens
Elpida (Micron)	EDF8164A1PD-GD-F	Enclosure, Main Chassis - Machined Aluminum, Anodized, Painted, Printed
		SDRAM - Mobile DDR3, 1GB, PoP
		Fingerprint Sensor Module
Murata		BT / WLAN Module - Contains BCM4334, BTv4.0, IEEE802.11 a/b/g/n
		Battery - Li-Polymer, 3.8V, 1560mAh
AT&S		10-Layer - FR4/RCF HDI, Any Layer Stacked Via, Lead-Free, Halogen-Free
Qualcomm	WTR1605L	RF Transceiver - Multi-Mode, Multi-Band, GSM/EDGE/HSPA+/LTE, GPS / GLONASS
Dialog Semiconductor		Power Management IC
		Secondary Camera Module - 1.2MP, BSI CMOS, 1/6" Format, Fixed Lens
Cirrus Logic		Audio Codec
Qualcomm	PM8018	Power Management IC
NXP	LPC18	Co-Processor
STMicroelectronics		Gyroscope - 3-Axis, Digital
Broadcom	BCM5976	Touchscreen Controller
Skyworks	SKY77572-18	Transmit Module
Avago	A792503	Transmit Module - Band 3/25, w/ Duplexer
RF Micro	RF3763	Transmit Module - Band 13/17, w/ Duplexer
Skyworks	SKY77810-12	Transmit Module
Skyworks	SKY496-16	Transmit Module
TriQuint	TQF6414	Transmit Module
Cirrus Logic		Audio Power Amplifier - w/ Signal Processing
AKM Semiconductor	AK8963C	Electronic Compass - 3-Axis, w/ Built-In ADC & 14/16-Bit Selectable Digital Output
Bosch Sensortech	BMA220	Accelerometer - 3-axis
RF Micro	RF1113	RF Switch
RF Micro	RF1112	RF Switch

Source: IHS Technology Teardown Research (September 2013)

Figure 93. Preliminary Teardown Bill of Materials and Manufacturing Cost Estimate for the Apple iPhone 5c (Cost in US Dollars)

Components/Hardware Elements	Details	16Gbyte	32Gbyte
	<b>Pricing without contract</b>	<b>\$549.00</b>	<b>\$649.00</b>
Implied Margin		68%	72%
Total BOM Cost		\$166.45	\$175.85
Manufacturing Cost		\$7.00	\$7.00
BOM + Manufacturing		\$173.45	\$182.85
<b>Major Cost Drivers</b>			
Memory			
NAND Flash		\$9.40	\$18.80
DRAM	1GB LPDDR2	\$9.50	\$9.50
Display & Touch Screen	4" Retina Display w/ Touch	\$41.00	\$41.00
Processor	A6 Processor	\$13.00	\$13.00
Camera(s)	8MP + 1.2MP	\$11.00	\$11.00
Wireless Section - BB/RF/PA	Qualcomm MDM9615M+WTR1605L+Front End	\$32.00	\$32.00
User Interface & Sensors		\$8.00	\$8.00
WLAN / BT / FM / GPS	Murata Dual-Band Wireless-N Module	\$4.20	\$4.20
Power Management	Dialog + Qualcomm	\$6.90	\$6.90
Battery	3.8V~1510mAh	\$3.45	\$3.45
Mechanical / Electro-Mechanical		\$20.00	\$20.00
Box Contents		\$8.00	\$8.00

Source: IHS Technology Teardown Research (September 2013)

Figure 94. Apple iPhone 5c Key Vendors and Parts (in Descending Order of Component Value)

Manufacturer	Part Number	Description
SK Hynix	H2JTDG8UD3MBR	Display / Touch Screen Module - 4.0" Diagonal, 16.7M Color TFT, 1136 x 640 Pixels, 800:1 Contrast Ratio, 500cd/m2 Brightness, w/ In-Cell Multi-Touch
Samsung Semiconductor	APL0598	Flash - NAND, 16Gbyte, MLC
Qualcomm	MDM9615M	A6 Application Processor - Dual-Core ARM Cortex CPU, Tri-Core GPU, PoP
		Baseband Processor - Multi-Mode, Multi-Band, GSM/CDMA/EVDO RevB/HSPA+/LTE, 28nm
		Primary Camera Module - 8MP, BSI CMOS, Auto Focus Lens
SK Hynix	H9TKNN8KDARBR-NGM	SDRAM - Mobile DDR2, 1Gbyte, PoP
Murata		BT / WLAN Module - Contains BCM4334, BTv4.0, IEEE802.11 a/b/g/n
		Battery - Li-Polymer, 3.8V, 1510mAh
AT&S		10-Layer - FR4/RCF HDI, Any Layer Stacked Via, Lead-Free, Halogen-Free
Qualcomm	WTR1605L	RF Transceiver - Multi-Mode, Multi-Band, GSM/EDGE/HSPA+/LTE, GPS / GLONASS
Dialog Semiconductor		Power Management IC
		Secondary Camera Module - 1.2MP, BSI CMOS, 1/6" Format, Fixed Lens
Cirrus Logic		Audio Codec
Qualcomm	PM8018	Power Management IC
STMicroelectronics		Gyroscope - 3-Axis, Digital
Broadcom	BCM5976	Touch Screen Controller
Skyworks	SKY77572-18	Transmit Module
RF Micro	RF3763	Transmit Module - Band 13/17, w/ Duplexer
Avago	A792503	Transmit Module - Band 3/25, w/ Duplexer
Skyworks	SKY77810-12	Transmit Module
Skyworks	SKY496-16	Transmit Module
TriQuint	TQF6414	Transmit Module
AKM Semiconductor	AK8963C	Electronic Compass - 3-Axis, w/ Built-In ADC & 14/16-Bit Selectable Digital Output
Cirrus Logic		Audio Power Amplifier - w/ Signal Processing
Bosch	BMA220	Accelerometer
RF Micro	RF1113	RF Switch
RF Micro	RF1112	RF Switch

Source: IHS Technology Teardown Research (September 2013)



Figure 95. Preliminary iPhone 5 vs. iPhone 4S Cost Estimates

Components / Hardware Elements	Apple iPhone 5 (Pricing as of Sept, 2012)				Apple iPhone 4S (Pricing as of Oct, 2011)			
	iPhone 5 Hardware Comments	16GB3	32GB4	64GB5	iPhone 4S Hardware Comments	16GB32	32GB43	64GB54
Pricing without Contract		\$649	\$749	\$849		\$649	\$749	\$849
Implied Margin		68%	71%	72%		70%	71%	70%
Total BOM Cost		\$199	\$209	\$230		\$188	\$207	\$245
Manufacturing Cost		\$8.00	\$8.00	\$8.00		\$8.00	\$8.00	\$8.00
BOM + Manufacturing		\$207	\$217	\$238		\$196	\$215	\$253
<b>Major Cost Drivers</b>								
Memory								
NAND Flash		\$10.40	\$20.80	\$41.60		\$19.20	\$38.40	\$76.80
DRAM	1GB LPDDR2	\$10.45	\$10.45	\$10.45	512MB LPDDR2	\$9.10	\$9.10	\$9.10
Display & Touchscreen	4" Retina Display w/ In-Cell Touch	\$44.00	\$44.00	\$44.00	3.5" Retina Display w/ Touch	\$37.00	\$37.00	\$37.00
Processor	A6 Processor	\$17.50	\$17.50	\$17.50	A5 Processor	\$15.00	\$15.00	\$15.00
Camera(s)	8MP + 1.2MP	\$18.00	\$18.00	\$18.00	8MP + VGA	\$17.60	\$17.60	\$17.60
Wireless Section - BB/RF/PA	Qualcomm MDM9615M+RTR8600 +Front End	\$34.00	\$34.00	\$34.00	Qualcomm MDM6610+RTR8605 +Front End	\$23.50	\$23.50	\$23.50
User Interface & Sensors		\$6.50	\$6.50	\$6.50		\$6.85	\$6.85	\$6.85
WLAN / BT / FM / GPS	Murata Dual-Band Wireless-N Module	\$5.00	\$5.00	\$5.00	Murata Single-Band Wireless-N Module	\$6.50	\$6.50	\$6.50
Power Management	Dialog + Qualcomm	\$8.50	\$8.50	\$8.50	Dialog + Qualcomm	\$7.20	\$7.20	\$7.20
Battery	3.8V ~1400mAh	\$4.50	\$4.50	\$4.50	3.7V ~1400mAh	\$5.90	\$5.90	\$5.90
Mechanical / Electro-Mechanical		\$33.00	\$33.00	\$33.00		\$33.00	\$33.00	\$33.00
Box Contents		\$7.00	\$7.00	\$7.00		\$7.00	\$7.00	\$7.00

Note: These teardown assessments are preliminary in nature, account only for hardware and manufacturing costs and do not include additional expenses such as software, licensing, royalties or other expenditures.

Source: IHS Technology Teardown Research, September 2012

iPhone 4S suppliers making a return engagement with the iPhone 5 include Samsung, Qualcomm, Murata, Dialog, Texas Instruments, STMicroelectronics, Cirrus Logic, Skyworks, NXP and AKM.

Nevertheless—from the advanced, \$17.50 A6 processor manufactured by Samsung, down to the relatively simple \$0.62 electronic compass from AKM Semiconductor—almost every part has been updated.

Figure 96. iPhone 5 Key Vendors and Parts – In Descending Order of Component Value

Manufacturer	Part Number	Description	Comment
		Display / Touchscreen Module - 4" Diagonal, Retina Display, w/ In-Cell Multi-Touch	Japan Display Inc, and LG Display are likely sources
Sandisk	SDMALBB4032G	Flash - NAND, 32GB, MLC	Hynix, Samsung, and Toshiba are other likely sources; Hynix is the supplier in A1429 (Verizon & Sprint version) we torn down
Samsung Semiconductor	APL0598	Apps Processor - PoP	New Apple A6 Processor
Qualcomm	MDM9615	Baseband Processor - Multi-Mode, Multi-Band, GSM/CDMA/EVDO RevB/LTE, w/ Elpida Mobile DDR	Was MDM9600 in the latest iPad
		Primary Camera Module - 8MP, BSI CMOS (TBD), Auto Focus Lens	
		Enclosure, Main, Center - Machined Aluminum Unibody	
Elpida	B8164B3PM-1D-F	SDRAM - Mobile DDR2, 1GB, PoP	Hynix, and Samsung are other likely sources
Murata		BT / WLAN Module - Contains BCM4334, BTv4.0, IEEE802.11 a/b/g/n	
Qualcomm	RTR8600	RF Transceiver - Multi-Band, GSM/EDGE/HSPA+/LTE, 65nm RF CMOS	Same RF transceiver in the latest iPad
Dialog Semiconductor		Power Management IC	PMIC for A6
Qualcomm	PM8018	Power Management IC	PMIC for MDM9615
Sony	US373291H	Battery - Li-Polymer, 3.8V, 1430mAh	ATL is another supplier in A1429 (Verizon & Sprint version) we torn down
		Secondary Camera Module - 1.2MP, BSI CMOS (TBD), Fixed Lens	
Broadcom	BCM5976	Touchscreen Controller	
Texas Instruments	CDPF3246	Touchscreen Controller (TBD)	
ST Microelectronics	L3G4200D	Gyroscope - 3-Axis, Digital	
Cirrus Logic	CS42L65	Audio Codec	This version is approximately 3 times the die size of the previous version in the 4S.
Avago	AFEM7814	PAM - w/ Duplexer	AFEM7813 in A1429 (Verizon & Sprint Version)
Skyworks	SKY77487-18	PAM	SKY77491-158 in A1429 (Verizon & Sprint Version)
Skyworks	SKY77352-15	PAM - Quad-Band GSM/EDGE	Same in A1429 (Verizon & Sprint Version)
NXP	CBTL1608	Interface IC - for Display	
Cirrus Logic	CS35L19	Audio Power Amplifier - w/ Signal Processing	
AKM Semiconductor	AK8963C	Electronic Compass - 3-Axis, w/ Built-In ADC & 14/16-Bit Selectable Digital Output	
Skyworks	SKY77729-4	PAM - LTE Band 17	Avago A5613 LTE Band 13 PAM in A1429 (Verizon & Sprint Version)
ST Microelectronics		Accelerometer	
Murata	SWUA127	FEM	SWUA147 in A1429 (Verizon & Sprint Version)
Skyworks	SKY70631	Antenna Switch Module	Same in A1429 (Verizon & Sprint Version)
RF Micro	RF1102	RF Switch	Same in A1429 (Verizon & Sprint Version)

Source: IHS Teardown Research (September 2012)

## Samsung Galaxy S4

The HSPA+ S4 with 16 gigabytes of NAND flash memory costs \$252.00 when the \$8.50 manufacturing cost is added in, as presented below.

Figure 97. Preliminary Samsung S4 Teardown Estimates (pricing in U.S. Dollars)

Components / Hardware Elements	Samsung Galaxy S4 Korean Version SHV-E300S (LTE & HSPA+)	Samsung Galaxy S4 US AT&T Version SGH-I337 (LTE & HSPA+)
Total BOM Cost	\$244	\$229
Manufacturing Cost	\$8.50	\$8.50
BOM + Manufacturing	\$252	\$237
<b>Major Cost Drivers</b>		
Memory - NAND Flash + DRAM	16GB eMMC + 2GB LPDDR3 + 1Gb LPDDR	16GB eMMC + 2GB LPDDR3
Display & Touchscreen	5" 1920x1080 Super AMOLED (441ppi), w/ Gorilla@Glass3 by Corning	5" 1920x1080 Super AMOLED (441ppi), w/ Gorilla@Glass3 by Corning
Processor	Samsung Exynos 5 Octa (5410)	Qualcomm Snapdragon 600 (APQ8064T) - Quad-Core
Camera(s)	13MP + 2MP	13MP + 2MP
Wireless Section - BB/RF/PA	Contains Samsung Baseband + RF Transceiver + Front End	Contains MDM9215 + WTR1605L + Front End
User Interface & Sensors	Contains Silicon Motion Mobile TV Soc, Broadcom NFC Controller, Atmel MCU and Sensors	Contains Fujitsu Image Processor, Qualcomm Audio Codec, Broadcom NFC Controller, Atmel MCU and Sensors
WLAN / BT / FM / GPS	Contains Broadcom BCM4335 + BCM47521	Contains Broadcom BCM4335
Power Management	Contains Samsung S2MPS11 & 60RZX6 PMICs, and Maxim MAX77803 Battery Charger IC	Qualcomm PM8917 + PM8821 PMICs and Maxim MAX77803 Battery Charger IC
Battery	3.8V, 2600mAh w/ NFC Antenna (Qty:2)	3.8V, 2600mAh w/ NFC Antenna
Mechanical / Electro-Mechanical	\$22.00	\$22.00
Box Contents	\$8.00	\$6.00

Source: IHS Teardown Research (May 2013)

Samsung makes extensive use of its own internally manufactured parts in all of its phones, including the Galaxy S4, as presented in table below.

The company is believed to supply the display and touch-screen module, as well as the apps processor and power management integrated circuit, according to the preliminary IHS analysis. Samsung also is the primary supplier of the SDRAM and flash memory, although the company could employ alternative sources for these commodity parts.



Figure 98. Samsung Galaxy S4 SHV-E300S 32 GB Key Key Vendors and Parts – In Descending Order of Component Value

Manufacturer	Part Number	Description
Samsung Mobile Display	AMS499QP01	Display / Touchscreen Module - 4.99" HD Super AMOLED, 1920x1080, 441ppi, Capacitive Multi-Touch
Samsung Semiconductor	Exynos 5410	Apps Processor - Exynos 5 Octa, Quad-Core ARM Cortex-A15 1.6GHz, & Quad-Core ARM Cortex-A7 1.2GHz, PoP
Samsung Semiconductor	KLMBG4GEAC-B001	Flash - eMMC NAND, 32GB, MLC
Samsung Semiconductor	K3QF2F200C-XGCE	SDRAM - Mobile DDR3, 2GB, PoP
		Primary Camera Module - Contains Sony Image Sensor, 13MP, BSI CMOS, Auto Focus Lens
Samsung Semiconductor		Baseband Processor - ARM-Core, PoP
		BT / WLAN Module - Contains Broadcom BCM4335, IEEE802.11a/b/g/n/ac, BT 4.0LE, & FM Radio
NP Tech		Battery - Li-Ion, 3.8V, 2600mAh, w/ NFC Antenna
Samsung Semiconductor		RF Transceiver
		Secondary Camera Module - Contains Samsung Image Sensor, 2MP, BSI CMOS, Fixed Lens
Triquint	TQP9058	PAM - Multi-Mode, Quad-Band GSM/EDGE, Penta-Band WCDMA/LTE
Murata	SWCGPF10	FEM - Contains Duplexer, Filter, & Antenna Switch
Samsung Semiconductor	S2MPS11	Power Management IC
Maxim	MAX77803EWJ	Battery Charger IC
Silicon Motion	FC8053	Mobile TV SoC - T-DMB/DAB
Broadcom	BCM47521	GPS / GNSS Receiver
Samsung Semiconductor		Power Management IC - for RF
Broadcom	BCM20794	NFC Controller
Samsung Semiconductor	K4X1G3333PK-XGC6	SDRAM - Mobile DDR, 1Gb, PoP
TBD		Audio Codec
Atmel	UC128L5-U	MCU
Silicon Image	SiI8240	MHL Transmitter
Sensirion AG	SHTC1	Humidity / Temperature Sensor
Bosch Sensortec	BMP182	Barometric Pressure Sensor
AKM Semiconductor	AK8963	Electronic Compass - 3-axis

Source: IHS Technology Teardown Research (May 2013)

Figure 99. Preliminary Nokia 105 Cost Estimates (Cost in U.S. Dollars)

Components / Hardware Elements	Descriptions	Cost/ Percentage
	Suggested Retail Price	\$20.00
Implied Margin		29%
Total BOM Cost		\$13.50
Manufacturing Cost		\$0.70
BOM + Manufacturing		\$14.20
Major Cost Drivers		
Display	1.4" Color TFT 128x128 Pixels	\$2.25
	Manufacturer: Tianma	
Baseband / RF / Memory	ICs, Passives, etc.	\$5.25
Skyworks	SKY77580--Transmit Module - Quad-Band GSM/GPRS PAM, with Antenna Switch	
Intel	PMB7900--Baseband / RF - Intel X-Gold 110, GSM/GPRS, Single-Chip, 65nm	
Micron	N25W064A--Flash - NOR, 64Mb, Serial	
Mechanical / Electro-Mechanical	Enclosures, Connectors, PCB, etc.	\$3.50
Box Contents	Includes 800mAh Battery, Charger, and Box	\$2.50

Source: IHS Technology Teardown Research (June 2013)

Figure 100. Semi-Analysis Handsets

	Traditional		Utility Smartphone		Premium Smartphone	
Units (M, 2013)	822.3		478.9		539.5	
Factory Average Selling Price (\$)	\$27.15		\$148.41		\$235.45	
	Semiconductor Content	Total Semi Content Cost	Semiconductor Content	Total Semi Content Cost	Semiconductor Content	Total Semi Content Cost
<b>General Purpose</b>	<b>\$7.21</b>	<b>48%</b>	<b>\$13.45</b>	<b>43%</b>	<b>\$0.47</b>	<b>47%</b>
Memory	\$2.41	16%	\$6.56	21%	\$20.31	31%
Microcomponent	\$0.15	1%	\$0.36	1%	\$0.50	1%
Logic IC	\$0.79	5%	\$0.98	3%	\$1.97	3%
Analog IC	\$1.13	8%	\$1.32	4%	\$1.46	2%
Discrete	\$0.60	4%	\$0.81	3%	\$1.07	2%
Optical	\$2.13	14%	\$3.43	11%	\$5.41	8%
<b>Nonoptical Sensors</b>	<b>\$0.11</b>	<b>1%</b>	<b>\$0.76</b>	<b>2%</b>	<b>\$2.46</b>	<b>4%</b>
<b>Application Specific</b>	<b>\$7.64</b>	<b>51%</b>	<b>\$17.43</b>	<b>55%</b>	<b>\$32.50</b>	<b>49%</b>
ASIC	\$0.10	1%	\$0.35	1%	\$5.96	9%
ASSP	\$7.54	50%	\$17.09	54%	\$26.54	40%
<b>Total</b>	<b>\$14.96</b>	<b>100%</b>	<b>\$31.64</b>	<b>100%</b>	<b>\$65.68</b>	<b>100%</b>
<b>Total Semi Content as % of ASP</b>	<b>55%</b>		<b>21%</b>		<b>28%</b>	

Source: Gartner (Dec 2013)

Source: Gartner (Dec 2013)

Figure 101. Top 7 Companies Revenue from Shipments of Total Memory - Communications - Wireless

Company Name	2013 Share (%)
Samsung Electronics	39%
SK Hynix	24%
Toshiba	13%
Micron Technology	11%
SanDisk	5%
Elpida Memory	4%
Nanya Technology	1%
Others	3%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

Figure 102. Top 20 Companies Revenue from Shipments of Total Microcomponents - Communications - Wireless

Company Name	2013 Share (%)
Freescale Semiconductor	29%
Atmel	18%
Texas Instruments	11%
Melfas	7%
Broadcom	6%
Cypress Semiconductor	4%
Cavium Networks	3%
Applied Micro Circuits	3%
EM Microelectronic	2%
Shanghai Huahong Integrated Circuit	2%
Datang Microelectronics Technology	2%
Microchip Technology	2%
Silicon Laboratories	2%
STMicroelectronics	2%
Renesas Electronics	1%
Intel	1%
NXP	1%
Shanghai Fudan Microelectronics	1%
Nationz Technologies	1%
Infineon Technologies	1%
Others	1%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014



**Figure 103. Top 20 Companies Revenue from Shipments of Total General Purpose Logic - Communications - Wireless**

Company Name	2013 Share (%)
Samsung Electronics	14%
Xilinx	13%
Altera	13%
Renesas Electronics	11%
Novatek	8%
Himax Technologies	8%
Ilitek	7%
Orise Technology	7%
Sitronix	4%
Lattice Semiconductor	3%
Texas Instruments	3%
Fairchild Semiconductor	1%
Solomon Systech	1%
Magnachip Semiconductor	1%
Raydium Semiconductor	1%
Galaxycore	1%
ON Semiconductor	0%
Rohm	0%
NXP	0%
Maxim Integrated Products	0%
Others	1%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 104. Top 20 Companies Revenue from Shipments of Total Analog - Communications - Wireless**

Company Name	2013 Share (%)
Texas Instruments	27%
Analog Devices	8%
Cirrus Logic	7%
Maxim Integrated Products	7%
Qualcomm	6%
STMicroelectronics	4%
ON Semiconductor	4%
Microsemi	4%
Ricoh	3%
Seiko Instruments	2%
Intersil	2%
Mitsumi Electric	2%
Linear Technology	2%
Alpha & Omega Semiconductor	1%
Asahi Kasei Microdevices	1%
NXP	1%
Richtek Technology	1%
Skyworks Solutions	1%
Power Integrations	1%
Others	12%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 105. Top 20 Companies Revenue from Shipments of Total Discrete - Communications - Wireless**

Company Name	2013 Share (%)
Freescale Semiconductor	14%
NXP	10%
Toshiba	10%
ON Semiconductor	7%
Mitsubishi	6%
Fairchild Semiconductor	5%
Renesas Electronics	4%
CREE	4%
STMicroelectronics	3%
Alpha & Omega Semiconductor	3%
TriQuint Semiconductor	3%
Rohm	3%
Infineon Technologies	2%
Pan Jit	2%
KEC	2%
Skyworks Solutions	2%
Microsemi	1%
Shindengen Electric	1%
Panasonic	1%
Others	8%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 106. Top 20 Companies Revenue from Shipments of Total Optoelectronics - Communications - Wireless**

Company Name	2013 Share (%)
Omnivision	14%
Samsung Electronics	13%
Sony	13%
Sharp	10%
Aptina	10%
Toshiba	6%
STMicroelectronics	4%
Everlight Electronics	4%
Toyoda Gosei	3%
Galaxycore	3%
Lite-On Technology	3%
Nichia	3%
Kingbright	1%
Seoul Semiconductor	1%
SK Hynix	1%
CREE	1%
Rohm	1%
Citizen Electronics	1%
Philips Electronics	1%
Others	5%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 107. Top 20 Companies Revenue from Shipments of Total Nonoptical Sensors - Communications - Wireless**

<b>Company Name</b>	<b>2013 Share (%)</b>
STMicroelectronics	28%
Asahi Kasei Microdevices	19%
Knowles	15%
Robert Bosch	13%
InvenSense	9%
Analog Devices	4%
Rohm	3%
MEMSIC	2%
Diodes	2%
Maxim Integrated Products	1%
Hokuriku Electric Industry	1%
Sanken	1%
Yamaha	1%
Magnachip Semiconductor	1%
Seiko Instruments	1%
Murata Manufacturing	0%
Omron	0%
Fujikura	0%
Mitsumi Electric	0%
Panasonic	0%
BCD Semiconductor Manufacturing	0%
Others	0%
Total Market	100%

Source: Citi Research, Gartner, March 2014

**Figure 108. Top 20 Communications - Wireless ASIC Vendor Market Share By Revenue**

Company	Market Share 2013
Samsung Electronics*	23.4%
Dialog Semiconductor	8.4%
Texas Instruments	3.8%
IBM Microelectronics	3.0%
HiSilicon Technologies	2.0%
Toshiba	1.9%
STMicroelectronics	1.9%
ams	1.8%
Renesas Electronics	1.4%
Panasonic	1.1%
Faraday Technology	0.7%
LSI	0.7%
TriQuint Semiconductor	0.6%
Rohm	0.5%
Fujitsu Semiconductor	0.4%
Altera	0.3%
GigOptix	0.3%
IXYS	0.2%
Nationz Technologies	0.2%
Ricoh	0.2%
Others	47.2%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, March 2014

**Figure 109. Top 20 Communications - Wireless ASSP Vendor Market Share By Revenue**

Company	Market Share 2013
Qualcomm	43.7%
MediaTek	9.0%
Broadcom	8.0%
Intel	3.9%
Skyworks Solutions	3.7%
Samsung Electronics	3.7%
Spreadtrum Communications	2.8%
RF Micro Devices	2.8%
STMicroelectronics	1.8%
TriQuint Semiconductor	1.4%
Marvell Technology Group	1.3%
RDA Microelectronics	1.0%
Murata Manufacturing	1.0%
Maxim Integrated Products	0.8%
Texas Instruments	0.8%
HiSilicon Technologies	0.8%
Fujitsu Semiconductor	0.8%
Synaptics	0.7%
Toshiba	0.6%
Others	10.2%
<b>Total Market</b>	<b>100.0%</b>

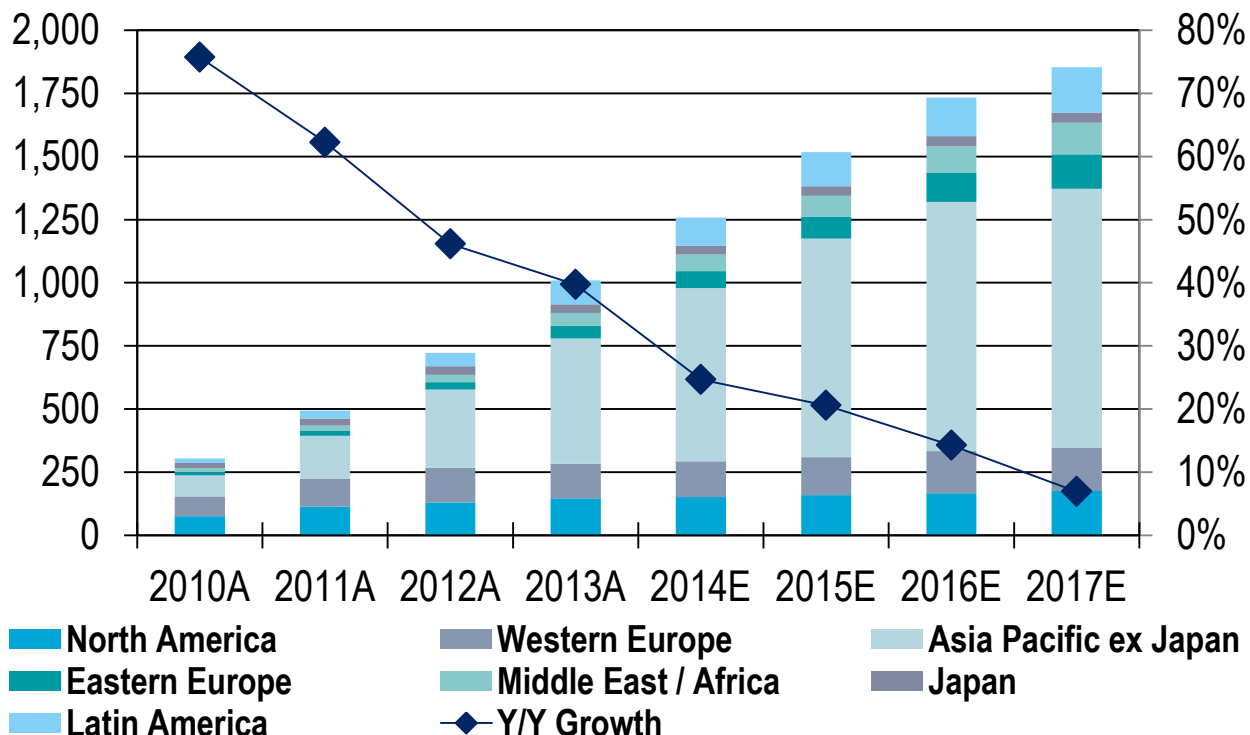
Source: Citi Research, Gartner, March 2014

**Figure 110. Top 20 Communications - Wireless FPGA/PLD Vendor Market Share By Revenue**

Company	Market Share 2013
Xilinx	44.9%
Altera	43.9%
Lattice Semiconductor	10.4%
Microsemi	0.7%
Cypress Semiconductor	0.1%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, March 2014

Figure 111. Citi Global Smartphone Forecasts – We Forecast 1.85B Smartphone by 2017, growth at a 16% CAGR from 2013



Source: Citi Research

Figure 112. Regional Smartphone Forecast

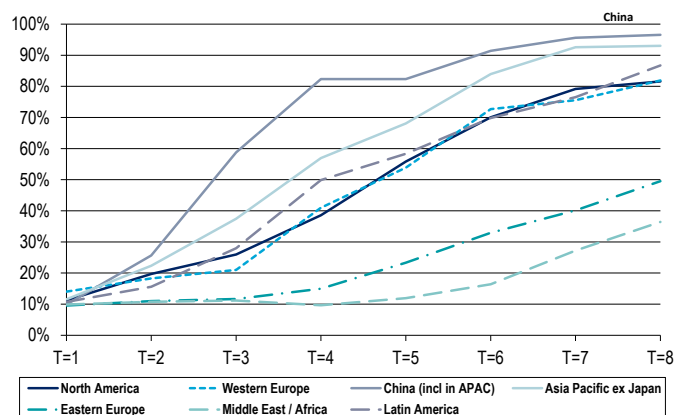
Regional Smartphones	2010A	2011A	2012A	2013A	2014E	2015E	2016E	2017E	'13-'17 CAGR
North America	75.0	113.4	130.2	146.6	150.9	158.8	167.1	175.0	5%
Western Europe	79.2	111.5	136.9	135.8	141.6	150.4	165.7	171.1	6%
China (incl in APAC)	36	91	213	351	432	495	539	577	13%
Asia Pacific ex Japan	83	169	310	496	686	865	988	1,026	20%
Eastern Europe	12	19	29	51	67	87	115	137	28%
Middle East / Africa	16	22	29	50	66	82	104	125	25%
Japan	20	28	34	34	36	38	40	40	4%
Latin America	19	32	53	96	112	136	154	180	17%
<b>Total</b>	<b>305</b>	<b>494</b>	<b>723</b>	<b>1,010</b>	<b>1,259</b>	<b>1,518</b>	<b>1,734</b>	<b>1,854</b>	<b>16%</b>
<b>Y/Y Growth</b>	<b>76%</b>	<b>62%</b>	<b>46%</b>	<b>40%</b>	<b>25%</b>	<b>21%</b>	<b>14%</b>	<b>7%</b>	

Y/Y Growth	2010A	2011A	2012A	2013A	2014E	2015E	2016E	2017E
North America	52%	51%	15%	13%	3%	5%	5%	5%
Western Europe	138%	41%	23%	-1%	4%	6%	10%	3%
China (incl in APAC)	106%	151%	135%	65%	23%	15%	9%	7%
Asia Pacific ex Japan	111%	103%	83%	60%	38%	26%	14%	4%
Eastern Europe	28%	49%	57%	75%	31%	31%	32%	18%
Middle East / Africa	-2%	33%	35%	72%	30%	25%	27%	19%
Japan	14%	41%	20%	1%	5%	7%	4%	2%
Latin America	142%	70%	67%	79%	17%	21%	13%	17%
<b>Total</b>	<b>76%</b>	<b>62%</b>	<b>46%</b>	<b>40%</b>	<b>25%</b>	<b>21%</b>	<b>14%</b>	<b>7%</b>

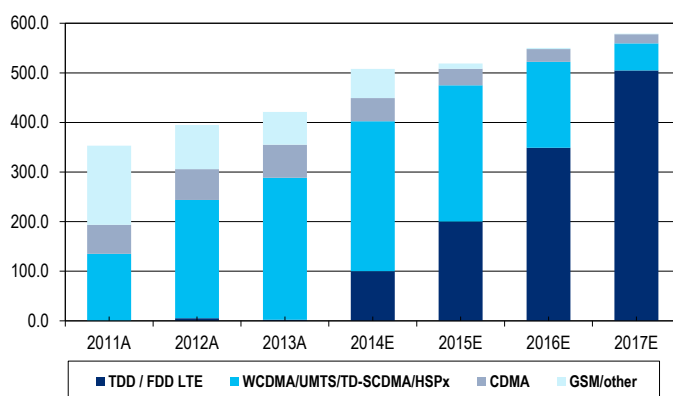
Source: Citi Research

Figure 113. Smartphone Penetration by Regions



Source: Citi Research

Figure 114. China Handset Shipments Forecasts



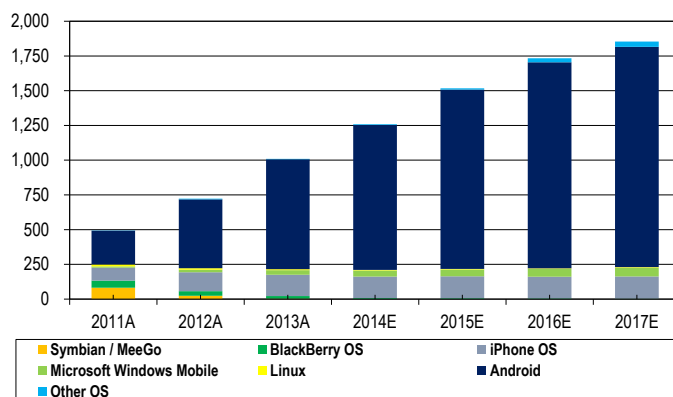
Source: IDC, Citi Research

Figure 115. China Handset Market Forecast

CHINA HANDSETS FORECAST							
Shipments by Region	2011A	2012A	2013A	2014E	2015E	2016E	2017E
China Feature Phones	262.8	149.3	69.9	75.8	23.6	11.4	1.9
Featurephone ASP \$	57.2	27.9	36.8	30.6	26.1	21.9	20.0
Featurephone Market Value \$M	15,033	4,170	2,568	2,317	615	251	38
China Smartphones	90.5	212.8	351.3	432.3	495.4	538.8	577.3
Smartphone ASP \$	437.6	288.5	196.0	202.7	176.1	139.2	109.9
Smartphone Market Value \$M	39,621	61,409	68,838	87,613	87,255	75,024	63,446
China Handsets	353.3	362.2	421.2	508.1	519.0	550.3	579.2
Total ASP \$	154.7	181.1	169.6	177.0	169.3	136.8	109.6
Total Market Value \$M	54,654	65,579	71,406	89,930	87,870	75,274	63,483

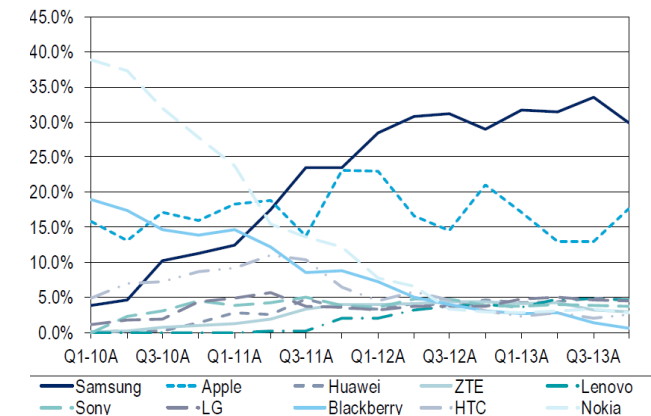
Source: IDC, Citi Research

Figure 116. Smartphone Forecast by Operating System



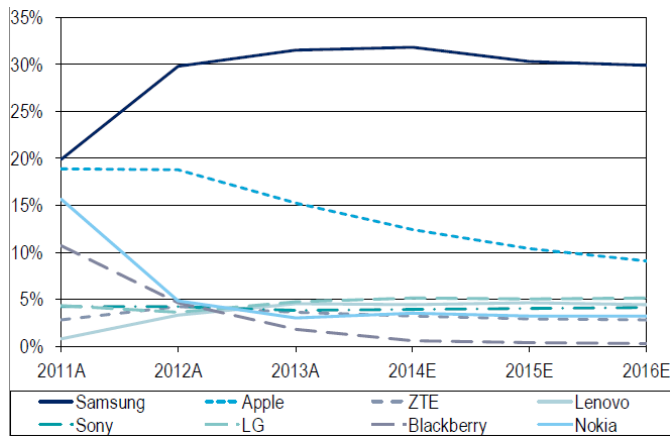
Source: Citi Research

Figure 117. Historical Smartphone Shares Q1'10 through Q4'13



Source: IDC, Citi Research

Figure 118. Smartphone Vendor Shares Forecast Through 2016



Source: Citi Research

Figure 119. Smartphone Vendor Shares Forecast Through 2016 (Details)

Vendor Breakdown	2011A	2012A	2013A	2014E	2015E	2016E
Samsung	98.3	215.5	318.8	400.3	459.7	519.5
Apple	93.1	135.8	153.5	155.6	158.3	157.0
ZTE	13.8	30.8	36.2	39.8	43.8	48.1
Lenovo	3.7	24.2	45.1	55.3	70.1	75.7
Sony	21.0	30.3	38.5	49.7	61.2	70.4
LG	21.4	26.3	47.6	64.2	75.7	89.3
Blackberry	52.8	33.2	18.4	6.7	6.0	4.4
Nokia	77.3	35.0	30.5	43.7	48.9	55.2
Top Covered Vendor	381.5	531.2	688.6	815.2	923.7	1,019.6
+ Other Vendors	112.9	191.3	321.0	443.5	593.9	714.3
<b>Total Smartphones</b>	<b>494.4</b>	<b>722.5</b>	<b>1,009.6</b>	<b>1,258.6</b>	<b>1,517.6</b>	<b>1,733.9</b>
Growth, y/y	62%	46%	40%	25%	21%	14%

Vendor Mkt Share	2011A	2012A	2013A	2014E	2015E	2016E
Samsung	20%	30%	32%	32%	30%	30%
Apple	19%	19%	15%	12%	10%	9%
ZTE	3%	4%	4%	3%	3%	3%
Lenovo	1%	3%	4%	4%	5%	4%
Sony	4%	4%	4%	4%	4%	4%
LG	4%	4%	5%	5%	5%	5%
Blackberry	11%	5%	2%	1%	0%	0%
Nokia	16%	5%	3%	3%	3%	3%
Top Covered Vendor	90%	82%	75%	71%	67%	65%
+ Other Vendors	10%	18%	25%	29%	33%	35%
<b>Total Smartphones</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: IDC, Citi Research

Figure 120. Global Smartphone Model Forecast Details

Regional Smartphones	2010A	2011A	2012A	2013A	2014E	2015E	2016E	2017E	'13-'17 CAGR
North America	75.0	113.4	130.2	146.6	150.9	158.8	167.1	175.0	5%
Western Europe	79.2	111.5	136.9	135.8	141.6	150.4	165.7	171.1	6%
China (incl in APAC)	36	91	213	351	432	495	539	577	13%
Asia Pacific ex Japan	83	169	310	496	686	865	988	1,026	20%
Eastern Europe	12	19	29	51	67	87	115	137	28%
Middle East / Africa	16	22	29	50	66	82	104	125	25%
Japan	20	28	34	34	36	38	40	40	4%
Latin America	19	32	53	96	112	136	154	180	17%
<b>Total</b>	<b>305</b>	<b>494</b>	<b>723</b>	<b>1,010</b>	<b>1,259</b>	<b>1,518</b>	<b>1,734</b>	<b>1,854</b>	<b>16%</b>
<b>Y/Y Growth</b>	<b>76%</b>	<b>62%</b>	<b>46%</b>	<b>40%</b>	<b>25%</b>	<b>21%</b>	<b>14%</b>	<b>7%</b>	

Y/Y Growth	2010A	2011A	2012A	2013A	2014E	2015E	2016E	2017E
North America	52%	51%	15%	13%	3%	5%	5%	5%
Western Europe	138%	41%	23%	-1%	4%	6%	10%	3%
China (incl in APAC)	106%	151%	135%	65%	23%	15%	9%	7%
Asia Pacific ex Japan	111%	103%	83%	60%	38%	26%	14%	4%
Eastern Europe	28%	49%	57%	75%	31%	31%	32%	18%
Middle East / Africa	-2%	33%	35%	72%	30%	25%	27%	19%
Japan	14%	41%	20%	1%	5%	7%	4%	2%
Latin America	142%	70%	67%	79%	17%	21%	13%	17%
<b>Total</b>	<b>76%</b>	<b>62%</b>	<b>46%</b>	<b>40%</b>	<b>25%</b>	<b>21%</b>	<b>14%</b>	<b>7%</b>

Smartphone Share of Total Phones	2010A	2011A	2012A	2013A	2014E	2015E	2016E	2017E
North America	39%	56%	70%	79%	84%	87%	92%	96%
Western Europe	41%	54%	73%	75%	77%	82%	90%	92%
China (incl in APAC)	10%	26%	59%	83%	85%	95%	98%	100%
Asia Pacific ex Japan	12%	22%	37%	54%	68%	84%	93%	93%
Eastern Europe	12%	15%	23%	40%	50%	63%	82%	95%
Middle East / Africa	10%	12%	16%	28%	36%	43%	53%	62%
Japan	55%	74%	84%	86%	87%	91%	92%	92%
Latin America	11%	16%	28%	50%	58%	70%	77%	87%
<b>Total</b>	<b>19%</b>	<b>29%</b>	<b>42%</b>	<b>55%</b>	<b>66%</b>	<b>77%</b>	<b>86%</b>	<b>90%</b>

OS Smartphones	2010A	2011A	2012A	2013A	2014E	2015E	2016E	2017E
Symbian / MeeGo	110.8	81.5	24.1	2.9	0.0	0.0	0.0	0.0
BlackBerry OS	48.8	51.1	33.2	18.4	6.7	6.0	4.4	3.2
iPhone OS	47.5	93.1	135.8	153.5	155.6	158.3	157.0	160.2
Microsoft Windows Mobile	15.0	9.0	17.8	33.5	43.7	48.9	55.2	62.2
Linux	9.2	14.4	11.3	6.3	4.0	4.0	4.0	4.0
Android	71.1	243.4	495.7	791.9	1,043.5	1,290.8	1,484.0	1,585.9
Other OS	2.4	1.8	4.7	3.2	5.2	9.5	29.3	38.5
<b>Total</b>	<b>304.7</b>	<b>494.4</b>	<b>722.5</b>	<b>1,009.6</b>	<b>1,258.6</b>	<b>1,517.6</b>	<b>1,733.9</b>	<b>1,854.0</b>

OS Smartphone Share	2010A	2011A	2012A	2013A	2014E	2015E	2016E	2017E
Symbian / MeeGo	36%	16%	3%	0%	0%	0%	0%	0%
BlackBerry OS	16%	10%	5%	2%	1%	0%	0%	0%
iPhone OS	16%	19%	19%	15%	12%	10%	9%	9%
Microsoft Windows Mobile	5%	2%	2%	3%	3%	3%	3%	3%
Linux	3%	3%	2%	1%	0%	0%	0%	0%
Android	23%	49%	69%	78%	83%	85%	86%	86%
Other OS	1%	0%	1%	0%	0%	1%	2%	2%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Global Smartphone Analysis	2010A	2011A	2012A	2013A	2014E	2015E	2016E	2017E	CAGR
Global Subscribers	4,060.3	4,495.3	4,749.9	4,988.6	5,217.7	5,448.0	5,651.0	5,857.9	4%
Smartphone Subscribers	515.3	746.2	1,090.9	1,589.9	2,248.5	2,885.0	3,523.1	4,062.9	26%
<b>% Smartphone Subscribers</b>	<b>13%</b>	<b>17%</b>	<b>23%</b>	<b>32%</b>	<b>43%</b>	<b>53%</b>	<b>62%</b>	<b>69%</b>	
Replacement Rate	41%	62%	58%	55%	45%	46%	43%	41%	
Replacement Smartphone Units	123.0	263.5	363.2	506.0	600.0	881.1	1,095.9	1,314.2	27%
Smartphone net additions	181.7	230.9	344.7	499.0	658.6	636.5	638.1	539.8	2%
<b>Total Smartphone Units</b>	<b>304.7</b>	<b>494.4</b>	<b>725.0</b>	<b>1,004.9</b>	<b>1,258.6</b>	<b>1,517.6</b>	<b>1,733.9</b>	<b>1,854.0</b>	<b>17%</b>
Total Handset Units	1,595.7	1,715.9	1,736.4	1,827.5	1,919.1	1,960.4	2,015.4	2,069.9	3%
<b>% Smartphone Units</b>	<b>19.1%</b>	<b>28.8%</b>	<b>41.8%</b>	<b>55.0%</b>	<b>65.6%</b>	<b>77.4%</b>	<b>86.0%</b>	<b>89.6%</b>	

Source: Citi Research

Figure 121. Global Handset Model Regional Forecast Detail

Handset Sales (in millions)	2008A	2009A	2010A	2011A	2012A	2013A	2014E	2015E	2016E	2017E	'13-'17 CAGR
China	250.8	318.0	364.5	353.3	362.2	421.2	508.1	519.0	550.3	579.2	8%
India	142.8	169.8	207.7	183.4	221.6	219.8	219.9	224.6	227.9	230.7	1%
Japan	42.3	34.0	36.1	38.0	40.2	39.6	40.9	41.9	43.0	44.1	3%
Korea	23.3	18.0	21.1	21.6	21.3	19.2	19.8	20.4	21.0	21.6	3%
Other Asia Pacific	103.6	87.0	127.8	199.0	223.0	263.3	260.1	267.0	268.1	271.2	1%
Total Asia Pacific	562.8	626.7	757.3	795.2	868.3	963.1	1,048.9	1,072.8	1,110.2	1,146.8	4%
Latin America	163.6	127.3	174.8	204.6	191.0	190.7	191.7	194.1	200.9	207.7	2%
North America	186.0	189.6	194.5	203.0	185.8	184.8	179.8	181.5	182.2	183.2	0%
Western Europe	171.1	158.8	193.3	207.0	188.3	181.6	184.0	184.4	184.8	185.1	0%
Eastern Europe	91.3	88.7	106.9	123.8	124.6	127.3	134.1	137.5	140.9	144.4	3%
Middle East, Africa	140.0	149.0	168.9	182.3	178.4	179.9	180.6	190.0	196.3	202.7	3%
<b>Total Handset Shipments</b>	<b>1,314.7</b>	<b>1,340.2</b>	<b>1,595.7</b>	<b>1,715.9</b>	<b>1,736.4</b>	<b>1,827.5</b>	<b>1,919.1</b>	<b>1,960.4</b>	<b>2,015.4</b>	<b>2,069.9</b>	<b>3%</b>
% Growth	15.1%	1.9%	19.1%	7.5%	1.2%	5.2%	5.0%	2.2%	2.8%	2.7%	
Total developed markets	422.7	400.4	445.1	469.6	435.6	425.2	424.5	428.3	431.0	434.0	1%
Total developing markets	892.1	939.8	1,150.7	1,246.3	1,300.8	1,402.3	1,494.6	1,532.1	1,584.4	1,635.8	4%
Developing markets as % of total	68%	70%	72%	73%	75%	77%	78%	78%	79%	79%	
Replacement handsets as % of total	71%	80%	80%	82%	88%	90%	90%	90%	92%	92%	

Replacement Rate (adjusted subs)	2008A	2009A	2010A	2011A	2012A	2013A	2014E	2015E	2016E	2017E
China	41%	48%	48%	41%	34%	38%	42%	39%	38%	37%
India	45%	38%	33%	23%	34%	29%	28%	28%	27%	27%
Japan	38%	30%	29%	31%	32%	31%	31%	31%	31%	31%
Korea	50%	37%	43%	42%	40%	35%	35%	35%	35%	35%
Other Asia Pacific	1%	7%	15%	16%	24%	28%	27%	27%	29%	28%
Total Asia Pacific	30%	31%	33%	28%	31%	27%	27%	26%	26%	26%
Latin America	46%	33%	43%	49%	44%	41%	40%	39%	39%	39%
North America	66%	62%	60%	62%	55%	53%	52%	52%	51%	51%
Western Europe	45%	42%	50%	54%	46%	45%	45%	45%	44%	44%
Eastern Europe	34%	32%	38%	42%	42%	43%	44%	44%	45%	45%
Middle East, Africa	24%	32%	27%	30%	26%	25%	25%	25%	25%	25%
<b>Total</b>	<b>38%</b>	<b>36%</b>	<b>38%</b>	<b>37%</b>	<b>36%</b>	<b>35%</b>	<b>36%</b>	<b>35%</b>	<b>35%</b>	<b>34%</b>
Implied years	2.7	2.8	2.6	2.7	2.8	2.8	2.8	2.9	2.9	2.9

Source: Citi Research



Figure 122. Global Handset Model Regional Forecast Detail (Continued)

Handset Sales (in millions)	2008A	2009A	2010A	2011A	2012A	2013A	2014E	2015E	2016E	2017E
<b>Subscribers (adjusted)</b>	<b>2008A</b>	<b>2009A</b>	<b>2010A</b>	<b>2011A</b>	<b>2012A</b>	<b>2013A</b>	<b>2014E</b>	<b>2015E</b>	<b>2016E</b>	<b>2017E</b>
China	567.5	650.3	739.1	822.2	942.9	1,051.3	1,156.4	1,260.5	1,367.6	1,477.0
India	292.8	393.9	628.3	762.8	732.9	737.3	762.8	785.6	809.2	833.5
Japan	105.8	108.8	114.1	117.6	120.5	123.5	126.6	129.8	133.0	136.3
Korea	46.0	47.2	48.3	49.8	51.3	52.8	54.4	56.0	57.7	59.4
Other Asia Pacific	491.8	558.9	614.1	740.8	811.3	852.3	890.3	931.3	941.0	951.3
<b>Total Asia Pacific</b>	<b>1,503.9</b>	<b>1,759.0</b>	<b>2,144.0</b>	<b>2,493.1</b>	<b>2,658.8</b>	<b>2,817.2</b>	<b>2,990.4</b>	<b>3,163.2</b>	<b>3,308.5</b>	<b>3,457.6</b>
Latin America	342.1	365.7	393.4	416.3	433.6	451.2	468.6	486.0	503.4	520.8
North America	286.0	302.3	320.9	329.6	336.7	340.4	344.1	349.4	354.7	360.1
Western Europe	377.5	380.7	383.0	384.5	394.5	400.0	405.2	410.5	415.8	421.2
Eastern Europe	262.0	273.4	281.1	292.9	299.4	303.6	307.8	312.1	316.4	320.6
Middle East, Africa	442.7	473.7	538.1	579.0	626.9	676.2	701.5	726.9	752.2	777.6
<b>Total</b>	<b>3,214.2</b>	<b>3,554.9</b>	<b>4,060.3</b>	<b>4,495.3</b>	<b>4,749.9</b>	<b>4,988.6</b>	<b>5,217.7</b>	<b>5,448.0</b>	<b>5,651.0</b>	<b>5,857.9</b>
% growth	17.6%	10.6%	14.2%	10.7%	5.7%	5.0%	4.6%	4.4%	3.7%	3.7%
Total developed markets	815.3	839.0	866.3	881.4	903.0	916.7	930.3	945.6	961.3	977.1
Total developing markets	2,398.9	2,715.9	3,194.0	3,613.9	3,846.9	4,071.9	4,287.4	4,502.4	4,689.8	4,880.8
Developing markets as % of total	75%	76%	79%	80%	81%	82%	82%	83%	83%	83%
Developed markets as % of total	25%	24%	21%	20%	19%	18%	18%	17%	17%	17%

Net additions (adjusted)	2008A	2009A	2010A	2011A	2012A	2013A	2014E	2015E	2016E	2017E
China	80.6	82.8	88.8	83.1	120.6	108.4	105.1	104.1	107.1	109.4
India	89.1	101.0	234.5	134.4	(29.9)	4.5	25.4	22.9	23.6	24.3
Japan	5.3	2.9	5.4	3.4	2.9	3.0	3.1	3.2	3.2	3.3
Korea	2.5	1.2	1.1	1.4	1.5	1.5	1.6	1.6	1.7	1.7
Other Asia Pacific	118.0	67.1	55.2	126.7	70.6	41.0	38.0	41.0	9.7	10.3
<b>Total Asia Pacific</b>	<b>295.4</b>	<b>255.1</b>	<b>384.9</b>	<b>349.1</b>	<b>165.7</b>	<b>158.4</b>	<b>173.2</b>	<b>172.8</b>	<b>145.3</b>	<b>149.0</b>
Latin America	41.0	23.6	27.7	22.9	17.3	17.6	17.4	17.4	17.4	17.4
North America	16.0	16.4	18.6	8.7	7.1	3.8	3.7	5.2	5.4	5.4
Western Europe	7.3	3.2	2.3	1.5	10.1	5.4	5.2	5.3	5.3	5.4
Eastern Europe	22.2	11.4	7.7	11.8	6.5	4.2	4.3	4.3	4.3	4.3
Middle East, Africa	99.8	31.0	64.3	41.0	47.9	49.3	25.3	25.3	25.4	25.4
<b>Total</b>	<b>481.7</b>	<b>340.7</b>	<b>505.4</b>	<b>435.0</b>	<b>254.5</b>	<b>238.7</b>	<b>229.1</b>	<b>230.3</b>	<b>203.0</b>	<b>206.9</b>
% growth	(3.8)%	(29.3)%	48.4%	(13.9)%	(41.5)%	(6.2)%	(4.0)%	0.5%	(11.8)%	1.9%

Wireless Penetration (adjusted)	2008A	2009A	2010A	2011A	2012A	2013A	2014E	2015E	2016E	2017E
China	43%	49%	55%	61%	69%	77%	84%	92%	100%	108%
India	26%	34%	54%	65%	58%	61%	63%	65%	67%	69%
Japan	83%	85%	89%	92%	94%	97%	99%	101%	104%	107%
Korea	93%	95%	97%	100%	102%	105%	108%	111%	115%	118%
Other Asia Pacific	47%	52%	56%	67%	73%	75%	78%	82%	82%	83%
<b>Total Asia Pacific</b>	<b>41%</b>	<b>47%</b>	<b>57%</b>	<b>65%</b>	<b>68%</b>	<b>72%</b>	<b>77%</b>	<b>81%</b>	<b>85%</b>	<b>88%</b>
Latin America	62%	65%	69%	73%	75%	77%	80%	83%	86%	89%
North America	84%	88%	93%	95%	96%	96%	96%	97%	97%	98%
Western Europe	100%	101%	101%	101%	102%	102%	103%	103%	103%	104%
Eastern Europe	87%	91%	94%	98%	100%	101%	102%	104%	105%	107%
Middle East, Africa	37%	39%	43%	45%	48%	50%	52%	54%	56%	58%
<b>Total</b>	<b>50%</b>	<b>54%</b>	<b>61%</b>	<b>67%</b>	<b>69%</b>	<b>73%</b>	<b>76%</b>	<b>79%</b>	<b>82%</b>	<b>85%</b>

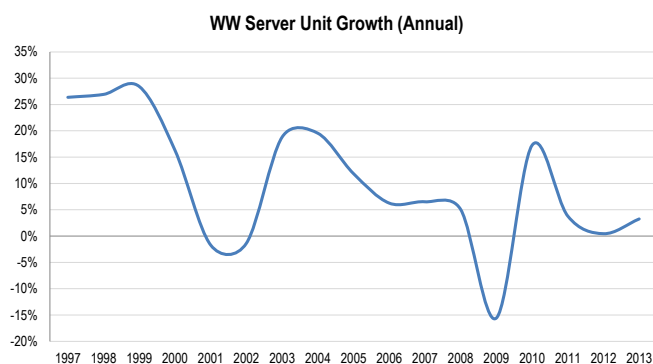
Source: Citi Research

## Servers, PCs & Tablets

A server is a system (software and suitable computer hardware) that responds to requests across a computer network to provide, or help to provide, a network service. Servers can be run on a dedicated computer, which is also often referred to as "the server", but many networked computers are capable of hosting servers. In many cases, a computer can provide several services and have several servers running. Servers often provide essential services across a network, either to private users inside a large organization or to public users via the Internet. Typical computing servers are database server, file server, mail server, print server, web server, gaming server, application server, or some other kind of server. Major server vendors are IBM, HP and Dell.

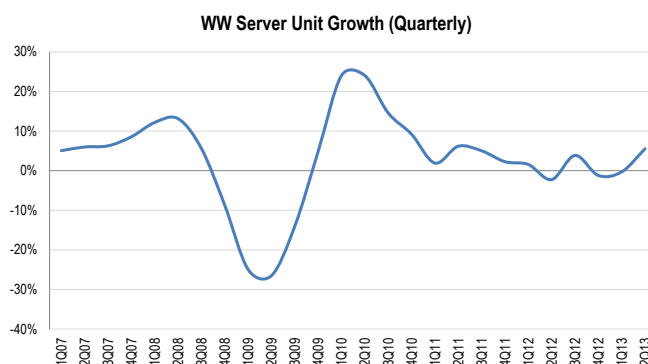
The largest global PC vendors are HP, Lenovo, Acer and Asustek. These OEMs outsource much of the actual PC assembly to Asian manufacturers, particularly notebooks which are almost all made by Taiwanese ODMs. Tablets, a category that was reinvented by the introduction of the iPad, remains dominated by Apple with Samsung the only other major contender. However, we will likely see continued market share gains by Asian whitebox makers who are offering sub-\$100 tablets.

Figure 123. WW Server Units Growth (Annual)



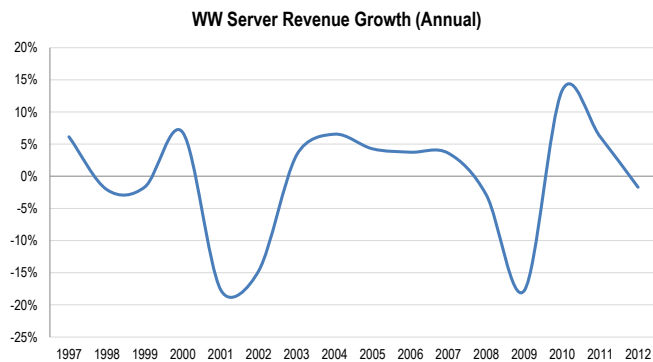
Source: Citi Research

Figure 124. WW Server Units Growth (Quarterly)



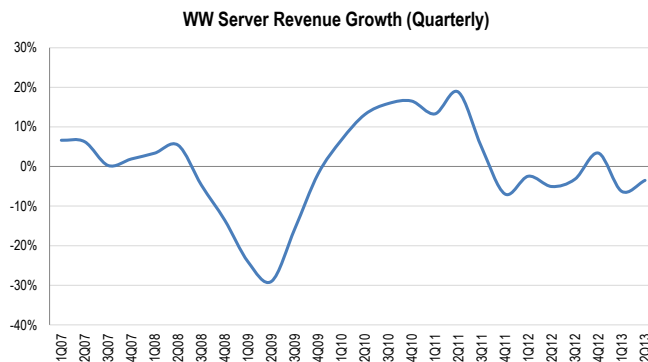
Source: Citi Research

Figure 125. WW Server Revenue Growth (Annual)



Source: Citi Research

Figure 126. WW Server Revenue Growth (Quarterly)



Source: Citi Research

Figure 127. WW Server Market Share (Units)

Units	1Q11	2Q11	3Q11	4Q11	2011	1Q12	2Q12	3Q12	4Q12	2012	1Q13	2Q13	3Q13	4Q13	2013
WW by vendor															
Hewlett-Packard	34.3%	33.8%	31.7%	30.3%	32.4%	33.6%	32.7%	27.9%	28.8%	30.7%	28.5%	26.8%	29.5%	29.0%	28.5%
Dell	25.4%	24.1%	23.7%	24.7%	24.4%	24.0%	25.4%	24.9%	23.2%	24.4%	25.5%	25.3%	21.2%	20.3%	22.9%
IBM	12.8%	13.1%	13.3%	13.6%	13.2%	12.7%	11.3%	12.6%	12.3%	12.2%	11.2%	9.9%	9.0%	9.0%	9.7%
Fujitsu	3.8%	3.4%	3.6%	3.0%	3.4%	4.2%	2.9%	3.4%	3.1%	3.4%	3.6%	2.4%	3.0%	3.0%	3.0%
Cisco	1.1%	1.5%	1.8%	1.9%	1.6%	2.0%	2.4%	2.5%	2.7%	2.4%	2.7%	3.5%	3.0%	2.7%	3.0%
Lenovo	1.4%	1.7%	2.2%	2.1%	1.8%	1.4%	2.5%	2.4%	2.4%	2.2%	2.1%	2.4%	2.6%	2.8%	2.5%
Inspur	0.6%	0.8%	0.9%	1.1%	0.9%	0.7%	1.1%	1.8%	1.5%	1.3%	1.0%	2.0%	2.1%	1.9%	1.7%
NEC	1.7%	1.4%	1.7%	1.4%	1.6%	1.8%	1.6%	1.7%	1.4%	1.6%	1.7%	1.4%	1.7%	1.3%	1.5%
Sugon	0.8%	0.6%	0.9%	1.2%	0.9%	1.1%	1.4%	1.2%	1.6%	1.3%	1.1%	1.7%	1.7%	1.6%	1.5%
Oracle	1.4%	1.5%	1.2%	1.1%	1.3%	1.2%	1.2%	0.9%	0.9%	1.0%	0.8%	0.8%	0.6%	0.6%	0.7%
SGI	0.6%	0.7%	1.0%	0.6%	0.7%	0.9%	0.9%	0.8%	0.9%	0.9%	1.6%	0.9%	0.8%	0.5%	0.9%
Huawei	0.2%	0.7%	0.8%	0.8%	0.7%	0.6%	0.5%	0.6%	0.9%	0.7%	1.5%	1.9%	2.3%	2.5%	2.1%
Hitachi Ltd	0.4%	0.3%	0.4%	0.3%	0.4%	0.4%	0.3%	0.4%	0.4%	0.4%	0.4%	0.3%	0.5%	0.4%	0.4%
Powerleader	0.3%	0.4%	0.4%	0.3%	0.3%	0.4%	0.4%	0.3%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%
Acer Group	0.6%	0.4%	0.2%	0.2%	0.3%	0.3%	0.3%	0.2%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Wortmann	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.2%	0.3%
Toshiba	0.2%	0.1%	0.2%	0.1%	0.2%	0.2%	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%	0.2%	0.1%	0.1%
Groupe Bull	0.1%	0.1%	0.1%	0.2%	0.1%	0.5%	0.1%	0.1%	0.2%	0.2%	0.1%	0.2%	0.1%	0.1%	0.1%
Others	14.1%	15.1%	15.8%	16.8%	15.5%	13.7%	14.7%	17.9%	18.8%	16.4%	17.3%	19.5%	21.1%	23.6%	20.6%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Source: Citi Research

Figure 128. WW Server Market Share (Revenue)

Revenues	1Q11	2Q11	3Q11	4Q11	2011	1Q12	2Q12	3Q12	4Q12	2012	1Q13	2Q13	3Q13	4Q13	2013
WW by vendor															
IBM	28.5%	29.9%	29.2%	36.0%	31.1%	27.1%	29.0%	27.9%	35.9%	30.3%	25.1%	27.0%	23.4%	26.8%	25.6%
Hewlett-Packard	31.5%	29.3%	29.3%	26.0%	28.9%	29.1%	29.3%	26.6%	24.3%	27.2%	26.5%	25.0%	28.1%	26.9%	26.6%
Dell	15.4%	14.3%	14.9%	14.6%	14.8%	15.5%	15.9%	16.6%	14.2%	15.5%	18.2%	18.2%	16.2%	14.5%	16.6%
Oracle	6.4%	7.0%	5.9%	5.1%	6.1%	6.0%	5.9%	4.7%	4.0%	5.1%	4.7%	5.8%	4.2%	4.1%	4.7%
Fujitsu	4.7%	6.3%	4.6%	3.3%	4.7%	5.2%	3.8%	3.7%	3.4%	4.0%	5.0%	2.5%	3.6%	3.2%	3.5%
Cisco	1.6%	1.8%	2.0%	2.2%	1.9%	2.8%	3.0%	3.3%	3.2%	3.1%	4.0%	4.4%	5.0%	4.5%	4.5%
NEC	2.2%	1.6%	2.2%	1.4%	1.8%	2.3%	1.8%	2.2%	1.6%	2.0%	2.4%	1.4%	2.6%	1.9%	2.1%
Hitachi Ltd	1.1%	0.9%	1.4%	0.9%	1.1%	1.8%	1.1%	2.0%	1.2%	1.5%	1.1%	0.9%	1.7%	1.0%	1.2%
Inspur	0.2%	0.3%	0.4%	0.5%	0.3%	0.5%	0.6%	1.0%	0.7%	0.7%	0.5%	1.3%	1.3%	1.0%	1.0%
Unisys	0.7%	0.4%	0.9%	0.6%	0.6%	0.7%	0.7%	0.8%	0.7%	0.7%	0.7%	0.9%	0.4%	1.1%	0.8%
Lenovo	0.4%	0.5%	0.6%	0.6%	0.5%	0.4%	0.7%	0.8%	0.7%	0.7%	0.7%	0.7%	0.9%	0.9%	0.8%
SGI	0.5%	0.6%	0.7%	0.7%	0.6%	0.9%	0.8%	0.8%	0.7%	0.8%	1.8%	1.0%	0.8%	0.4%	1.0%
Cray Inc	0.1%	0.4%	0.1%	0.5%	0.3%	0.8%	0.5%	0.6%	0.9%	0.7%	0.5%	0.5%	0.3%	2.3%	1.0%
Sugon	0.3%	0.3%	0.3%	0.5%	0.4%	0.5%	0.6%	0.6%	0.7%	0.6%	0.6%	0.8%	0.8%	0.8%	0.8%
Groupe Bull	0.3%	0.4%	0.2%	0.6%	0.4%	0.5%	0.4%	0.2%	0.4%	0.4%	0.2%	0.4%	0.2%	0.4%	0.3%
Huawei	0.0%	0.1%	0.2%	0.2%	0.1%	0.2%	0.1%	0.2%	0.3%	0.2%	0.6%	0.7%	0.9%	1.1%	0.8%
Toshiba	0.2%	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Stratus Computer	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Others	5.7%	5.8%	6.7%	6.4%	6.2%	5.5%	5.7%	7.4%	6.9%	6.4%	7.1%	8.2%	9.5%	8.9%	8.5%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Source: Citi Research

Figure 129. PC/Motherboard & Notebook Supply Chain

**PC/Motherboard & Notebook Supply Chain**  
**Semiconductors**

<b>Chipsets</b>
AMD
INTC
NVDA
SIS (2363.TW)
VIA (2388.TW)
ALI (3041.TW)

<b>Graphics ICS/ Video Cards</b>
NVDA
INTC
S3 (merged by VIA)
AMD

<b>Memory (DRAM)</b>
Hynix (00660.KS)
MU
ProMOS (5387.TW)
QI
SEC (005930.KS)
Mosel (2342.TW)
Nan Ya Tech (2408.TW)
Powerchip (5346.TW)
Vanguard (5347.TW)
Winbond (2344.TW)

<b>Microprocessors</b>
AMD
INTC

<b>Power Management ICS</b>
International Rectifier
Intersil
Maxim
Q2 Micro (Caymans)
Semtec

<b>Wireless LANs (WLAN)</b>
Atheros (acquired by Qualcomm)
Broadcom
D-Link (TW)
INTC
Marvell
Microsemi
LSI
Realtek (TW)

<b>Semiconductors</b>
MCRL
NSM (acquired by Texas Instruments)
ONNN

<b>VGA Card</b>
Asustek (2357.TW)
Abit (2407.TW)
Elitegroup (2331.TW)
Gigabyte (2376.TW)
Leadtek (2465.TW)
Microstar (2377.TW)
TUL (6150.TW)

<b>LAN Card</b>
Abocom (2444.TW)
Accton (2345.TW)
CIS Tech (2326.TW)
D-Link (2332.TW)

<b>NIC IC</b>
Realtek (2379.TW)
COMS
INTC

<b>IC Packages</b>
Ibiden (4062.JP)
Nanya Plastic (1303.TW)
LG Innotek (011070.KS)
NGK Spark Plug (NGK)
SEMCO (09150.KS)
Shinko Elec (6967.JP)

**Components**

<b>CPU</b>
VIA (2388.TW)
AMD
INTC
TMTA

<b>Sound Card</b>
Creative Lab (CREA.SI)
YAMAHA (7951.JP)

**Components (ctd)**

<b>Batteries</b>
Samsung SDI (06400.KS)
LG Chem (051910.KS)
Panasonic (6752.JP)
Sony (6758.JP)
Simplo (TW)

<b>Hard Disk Drives</b>
STX
Toshiba (6502.JP)
WDC

<b>Keyboards</b>
Minebea (6479.JP)
Sunrex (2387.TW)
Chicony (2385.TW)
Huan Hsin (H16.SI)
BenQ (2352.TW)
Behavior Tech (2341.TW)
Ichia (2402.TW)
KYE Systems (2365.TW)
Lite-On Tech (2301.TW)
Hon Hai (2317.TW)

<b>LCD Panels</b>
LGD (34220.KS)
AU Optonics (TW)
SEC (05930.KS)
Sharp (JP)

<b>LCD/CRT Monitor</b>
Amtran (2489.TW)
BenQ (2352.TW)
Lite-On Tech (2301.TW)
Coretronic (5371.TW)
Jean (2442.TW)
Sampo (6137.TW)
Delta Elec (DELT.BK)
Hansol Electronics (0471.KS)
Hynix (00660.KS)
LGE (66570.KS)
LGD (34220.KS)
Orion Electric (0439.KS)
SEC (005930.KS)
TPV (0903.HK)
AUO (2409.TW)
Chi Mei (3009.TW)
CPT (2475.TW)
HannStar (6116.TW)
CMI
Picvue (2333.TW)
Quanta Display (3012.TW)
Wintek (2384.TW)
Hitachi (6501.JP)
Sharp (6753.JP)

<b>Motherboards</b>
Abit (2407.TW)
Aopen (3046.TW)
Asustek (2357.TW)
Hon Hai (2317.TW)
DFI (2397.TW)
Elitegroup (2331.TW)
Gigabyte (2376.TW)
Mitac (2315.TW)
Microstar (2377.TW)
Procomp (2398.TW)
Shuttle (2405.TW)
USI (2350.TW)

<b>Operating Systems</b>
MSFT
AAPL

<b>Optical Disk Drives (CD/DVD Drives)</b>
Asia Optical (3019.TW)
Lite-On Tech (2301.TW)
MediaTek (2454.TW)
Quanta Storage (TW)

<b>PC Camera Module</b>
Chicony (2385.TW)

<b>Pointers/Trackpads</b>
Synaptics (US)
Alps Electric (JP)

<b>Power Supply</b>
Asustek (2357.TW)
Chicony (2385.TW)
Chroma (2360.TW)
Delta (2308.TW)
Hon Hai (2317.TW)
Lite-ON Tech (2301.TW)
Phihong (2457.TW)
Potrans (2378.TW)
UMEC (2413.TW)

<b>Driver IC/Module</b>
Data Intl (5432.TW)
Novatek (3034.TW)
Myson Tech (5314.TW)
Winbond (2344.TW)
Weltrend (2436.TW)

<b>PCB</b>
Boardtek (5349.TW)
Chin Poon (2355.TW)
Compeq (2313.TW)
Gold Circuit (2368.TW)
Tripod (3044.TW)
Unicap (5307.TW)
Unimicron (3037.TW)
Unitech PCB (2367.TW)
Wus PCB (2316.TW)
Ya Hsin (2418.TW)
Elec. & Eltek (EELT.SI)
Daeduck Elec (08060.KS)
Legend (0992.HK)
Korea Circuit (07810.KS)
SEMCO (09150.KS)
LG Innotek (011070.KS)

**Components (ctd)**

<b>Passive Components</b>
Chilisin (2456.TW)
Cyntec (2452.TW)
Holy Stone Ent. (3026.TW)
Lelon (2472.TW)
Luxon (2389.TW)
Pan Overseas Elec. (2370.TW)
Ralec (2437.TW)
Team Young (5345.TW)
Ta-I (2478.TW)
Yageo (2327.TW)
WTC (2492.TW)
LGE (66570.KS)
SEC (005930.KS)
Trigem Computer

<b>CD/CD-RW</b>
CMC (2323.TW)
Gigastorage (2406.TW)
Infodisk (2491.TW)
Lead Data (2443.TW)
Prodisc (2396.TW)
Ritek (2349.TW)

<b>CD/DVD/CD-RW ROM IC</b>
Mediatek (2454.TW)
VIA (2388.TW)
Sony (6758.JP)

<b>CD/DVD/CD-RW ROM</b>
Aopen (3046.TW)
QSI (6188.TW)
Lite-On IT (8008.TW)
Asustek (2357.TW)
BenQ (2352.TW)
Behavior Tech (2341.TW)
Asia Optical (3019.TW)
Lite-On Tech (2301.TW)
Hon Hai (2317.TW)
LGE (66570.KS)
SEC (05930.KS)
Toshiba (6502.JP)
Sony (6758.JP)

<b>Case</b>
Catcher (2474.TW)
Compucase (3032.TW)
Enlight (2438.TW)
Foxconn Tech (2354.TW)
Hon Hai (2317.TW)
In Win Dev (6117.TW)
Loyalty Founder (5465.TW)

<b>Printer</b>
Kinpo (2312.TW)
Lite-On Tech (2301.TW)
Cal-Comp (CCET.BK)

**End Products**

<b>PC OEMs</b>
Hewlett-Packard (HPQ)
Dell
Acer
Lenovo (0992.HK)
LGE (066570.KS)
Toshiba
Asustek
Apple
SEC (05930.KS)
Sony (6758.JP)
Fujitsu

Source: Citi Research

## Apple iPad

Figure 130. Preliminary BOM and Manufacturing Costs for the iPad Air (16GB and Wi-Fi, USD)

Preliminary iPad Air Cost Estimates									
Components / Hardware Elements	Hardware Comments	Wi-Fi + Cellular				Wi-Fi			
		16GB	32GB	64GB	128GB	16GB2	32GB3	64GB4	128GB5
	Retail Pricing	\$629	\$729	\$829	\$929	\$499	\$599	\$699	\$799
Implied Margin		51%	56%	60%	61%	45%	53%	58%	59%
Total BOM Cost		\$304	\$313	\$325	\$355	\$269	\$278	\$290	\$320
Manufacturing Cost		\$6	\$6	\$6	\$6	\$5	\$5	\$5	\$5
BOM + Manufacturing		\$310	\$319	\$331	\$361	\$274	\$283	\$295	\$325
Major Cost Drivers									
Memory									
NAND Flash		\$9.20	\$18.00	\$30.00	\$60.00	\$9.20	\$18.00	\$30.00	\$60.00
DRAM	1GB LPDDR3	\$10.50	\$10.50	\$10.50	\$10.50	\$10.50	\$10.50	\$10.50	\$10.50
Display	9.7" 2048 x 1536	\$90.00	\$90.00	\$90.00	\$90.00	\$90.00	\$90.00	\$90.00	\$90.00
Touch Screen	COP Film Sensor	\$43.00	\$43.00	\$43.00	\$43.00	\$43.00	\$43.00	\$43.00	\$43.00
Processor									
	64-Bit A7 Processor + M7 Co-Processor	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00
Camera(s)									
	5MP + 1.2MP	\$9.00	\$9.00	\$9.00	\$9.00	\$9.00	\$9.00	\$9.00	\$9.00
Wireless Section - BB/RF/PA	Qualcomm MDM9615M+WTR1605L+Front End	\$32.00	\$32.00	\$32.00	\$32.00				
User Interface & Sensors		\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00
WLAN / BT / FM / GPS	Dual-Band Wireless-N Module	\$5.00	\$5.00	\$5.00	\$5.00	\$5.00	\$5.00	\$5.00	\$5.00
Power Management	Dialog + Qualcomm	\$7.25	\$7.25	\$7.25	\$7.25	\$7.25	\$7.25	\$7.25	\$7.25
Battery	32.9Wh Pack	\$19.00	\$19.00	\$19.00	\$19.00	\$19.00	\$19.00	\$19.00	\$19.00
Mechanical / Electro-Mechanical		\$45.00	\$45.00	\$45.00	\$45.00	\$42.00	\$42.00	\$42.00	\$42.00
Box Contents		\$6.00	\$6.00	\$6.00	\$6.00	\$6.00	\$6.00	\$6.00	\$6.00

Note: These teardown assessments are preliminary in nature, account only for hardware and manufacturing costs and do not include additional expenses such as software, licensing, royalties or other expenditures.

Source: IHS Technology Teardown Research (November 2013)

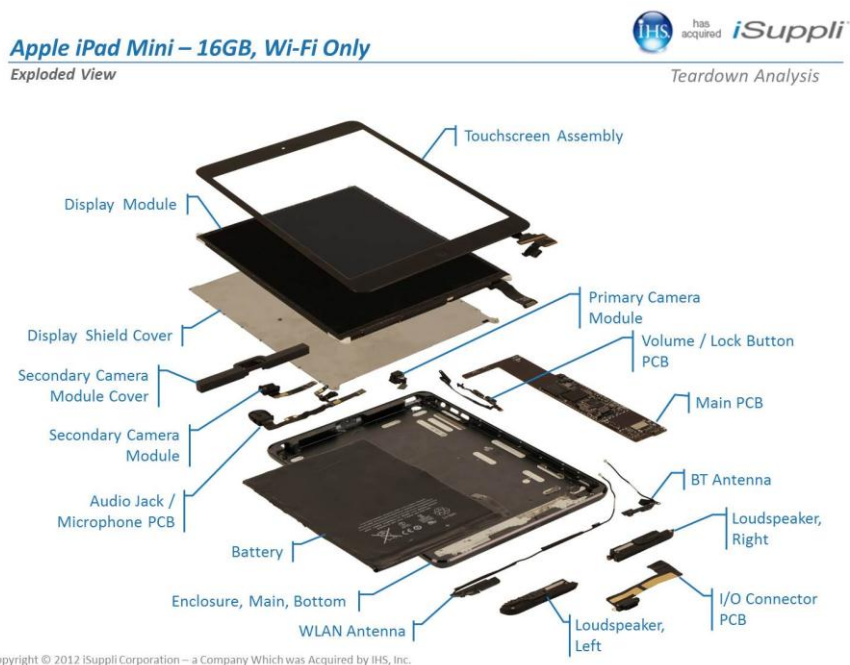


Figure 131. iPad mini Key Identified Vendors and Parts in Descending Order of Component Value

Manufacturer	Part Number	Description	Comment
		Display Module - 7.9" Diagonal, 1024x768 Pixels	LG Display, and AU Optonics are likely sources
		Touchscreen / Display Window - 7" Diagonal, Capacitive, GF2 Technology, Contains 2 Broadcom BCM5976 Controllers	
Dynapack		Battery Pack - Li-Polymer, 3.72V, 4440mAh, 16.5Wh	Other likely suppliers include Amperex Technology, Simplo Technology, & Sony 1 Cell ~528Wh/L
Samsung Semiconductor	APL2498	Apps Processor - Dual ARM Core, 32nm, PoP	
SK Hynix	H2JTDG8UD2MBR	Flash - MLC NAND, 16GB	Sandisk, and Toshiba are other likely sources.
		Primary Camera Module - 5MP, BSI CMOS, Auto Focus Lens	
Compeq		10-Layer - FR4/RCF HDI, Any Layer Stacked Via	
Elpida	EDB4064B3PM-8D-F	SDRAM - Mobile DDR2, 512MB, PoP	SK Hynix is another likely supplier.
Murata		BT / WLAN Module - Contains Broadcom BCM4334, IEEE802.11 a/b/g/n, Bluetooth V4.0+HS	Same module in iPhone 5
Dialog Semiconductor		Power Management IC	PMIC for A5
		Secondary Camera Module - 1.2MP, BSI CMOS, 1/6" Format, Fixed Lens	
Cirrus Logic		Audio Codec	
ST Microelectronics	A3G4250D	Gyroscope - 3-Axis, Digital	
AKM Semiconductor	AK8963C	Electronic Compass - 3-Axis, w/ Built-In ADC & 14/16-Bit Selectable Digital Output	
Cirrus Logic	CS35L19	Audio Power Amplifier - w/ Signal Processing (Qty:2)	
NXP	CBTL1608	Interface IC	
ST Microelectronics	LIS3DSH	Accelerometer - MEMS, 3-Axis, $\pm 2g/\pm 4g/\pm 6g/\pm 8g/\pm 16g$ , Digital Output	

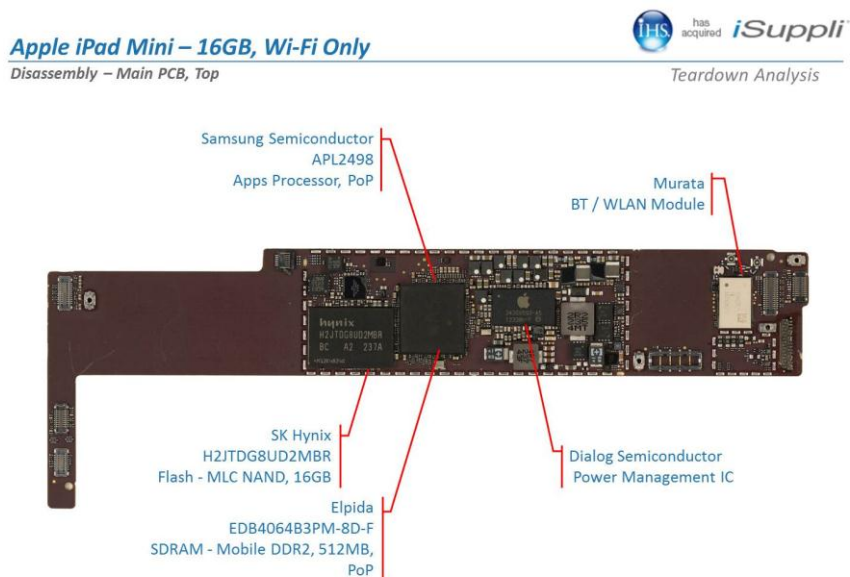
Source: IHS Teardown Research (November 2012)

Figure 132. Apple iPad Mini – 16GB, Wi-Fi Only



Source: IHS Teardown Research (November 2012)

Figure 133. Apple iPad Mini – 16GB, Wi-Fi Only Main PCB



Source: IHS Teardown Research (November 2012)

## Microsoft Surface

Figure 134. Microsoft Surface BOM

Components / Hardware Elements	Price
Retail Pricing (As of November 2012)	\$599
Total BOM Cost	\$271
Manufacturing Cost	\$13
BOM + Manufacturing	\$284
<b>Major Cost Drivers</b>	
Memory: 2GB DDR3L + 32GB eMMC	
NAND Flash + DRAM	\$34.00
Display & Touchscreen: 10.6" 1366x768 w/ Multitouch	\$101.00
Processors: Nvidia Tegra3	\$21.50
Camera(s): 1MP 720p BSI (Qty: 2)	\$5.00
User Interface & Sensors & Combo Module (WLAN/BT/FM)	\$20.00
Power Management	\$8.00
Battery: 7.4V 31.5Wh Li-Polymer	\$20.00
Mechanical / Electro-Mechanical / Other	\$36.00
Box Contents	\$25.00

Note: These teardown assessments are preliminary in nature, account only for hardware and manufacturing costs and do not include additional expenses such as software, licensing, royalties or other expenditures.

Source: IHS Teardown Research (November 2012)

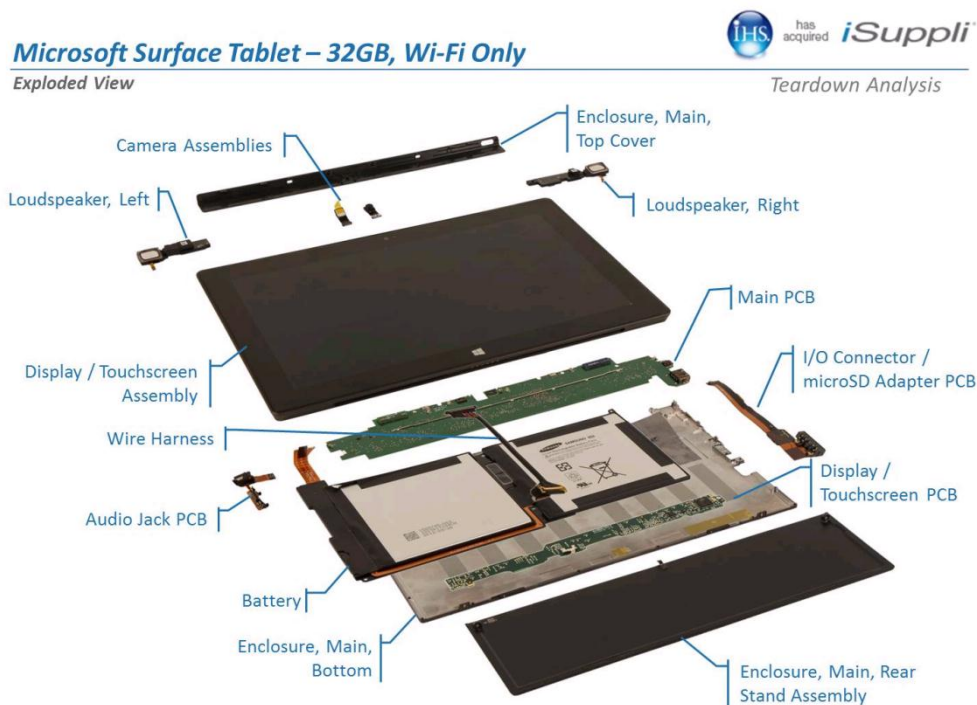


Figure 135. Microsoft Surface RT Key Identified Vendors and Parts in Descending Order of Component Value

Manufacturer	Part Number	Description	Comment
Samsung	LTL106AL01-001	Display Module - 10.6" Diagonal, 1366x768 Pixels	
		Touchscreen / Display Window - 10.6" Diagonal, Glass Over ITO Film, Capacitive, Contains Atmel mXT1386E & mXT154E Master & Slave Controllers	
Samsung	KLMBG4GE4A-A001	Flash - eMMC NAND, 32GB	Conventional eMMC flash memory as applied by many handset/tablets OEMs
Nvidia	Tegra 3	Mobile Processor - SoC, Quad-Core ARM Cortex A9, 1.4GHz, 1MB L2 Cache, 12 3D ULP GeForce GPU Cores, 1080p HD Video, Support DDR3-L1500 and LPDDR2-1066, 40nm Process	
Samsung SDI		Battery Pack - Li-Ion, 7.4V, 4250mAh, 31.5Wh	2 Cells, ~500Wh/L each
Micron Technology	MT41K512M8RH-125:E	SDRAM - DDR3L-1600, 4Gb, 512Mx8, 1.35V (Qty:4)	
Unimicron		8-Layer - FR4/RCF HDI, 1+6+1, Lead-Free	
Marvell	88W8797	WLAN / Bluetooth / FM - IEEE802.11 a/b/g/n, MIMO, Bluetooth V4.0, FM Radio Transceiver	
Texas Instruments	TPS6591104AA2	Power Management IC - w/ 3 Step-Down Converters, 1 Controller for external FETs, 8 LDOs	
IDT	V1038BVG	LVDS Transmitter	
Atmel	AT32UC3L0256	MCU - 32-Bit, RISC, 50MHz, 256KB Flash, 32KB SRAM, 8-Channel 12-Bit ADC, Capacitive Touch Module, 36 I/Os	
Wolfson Micro	WM8962BECN	Audio Codec - Stereo, w/ Audio Enhancement DSP, and Integrated 2W Class D Amplifier	
		Camera Module - Contains OmniVision OV9726 1MP 720p Image Sensor, 1/6.5" Format, Fixed Lens (Qty: 2)	
ST Microelectronics		Gyroscope - MEMS	
Cypress Semiconductor	CY8C20466A-24LQXI	Touch Panel Controller - Capacitive, 32KB Flash, 2KB SRAM, 28 GPIOs, w/ Auto-tuning	
Rf Micro Devices	RFFM8500	WLAN FEM - 5GHz, IEEE802.11a/n/ac, PAM, LNA, w/ Integrated SPDT Switch, and Power Detector Coupler	
Kionix	KXTJ9-1007	Accelerometer - MEMS, 3-Axis, ±2g/±4g/±8g, Digital Output	
RF Micro Devices	RFFM8200	WLAN FEM - 2.4GHz, IEEE802.11b/g/n, PAM, LNA, w/ Integrated SP3T Switch, and Power Detector Coupler	
Texas Instruments	MSP430G2402IRSA16	MCU - Mixed Signal, 16-Bit RISC, 1MHz, 8KB Flash Memory, 256B RAM, 10-Bit 200 kcps ADC, 10 I/Os	
From the Keyboard Accessory			
Freescale	MK10DN512ZCAB10	MCU - 32-Bit, ARM-M4 Core, 100MHz, 512KB Flash, 128KB RAM	
Atmel	mXT112E	Touchscreen Controller - Capacitive, 4 Point Multitouch, 12Bit x 12Bit Touch Position	

Source: IHS Teardown Research (November 2012)

Figure 136. Microsoft Surface Tablet – 32GB, Wi-Fi Only



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Source: Citi Research

Figure 137. Microsoft Surface Tablet – 32GB, Wi-Fi Only – Main PCB, Top



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Source: IHS Teardown Research (November 2012)

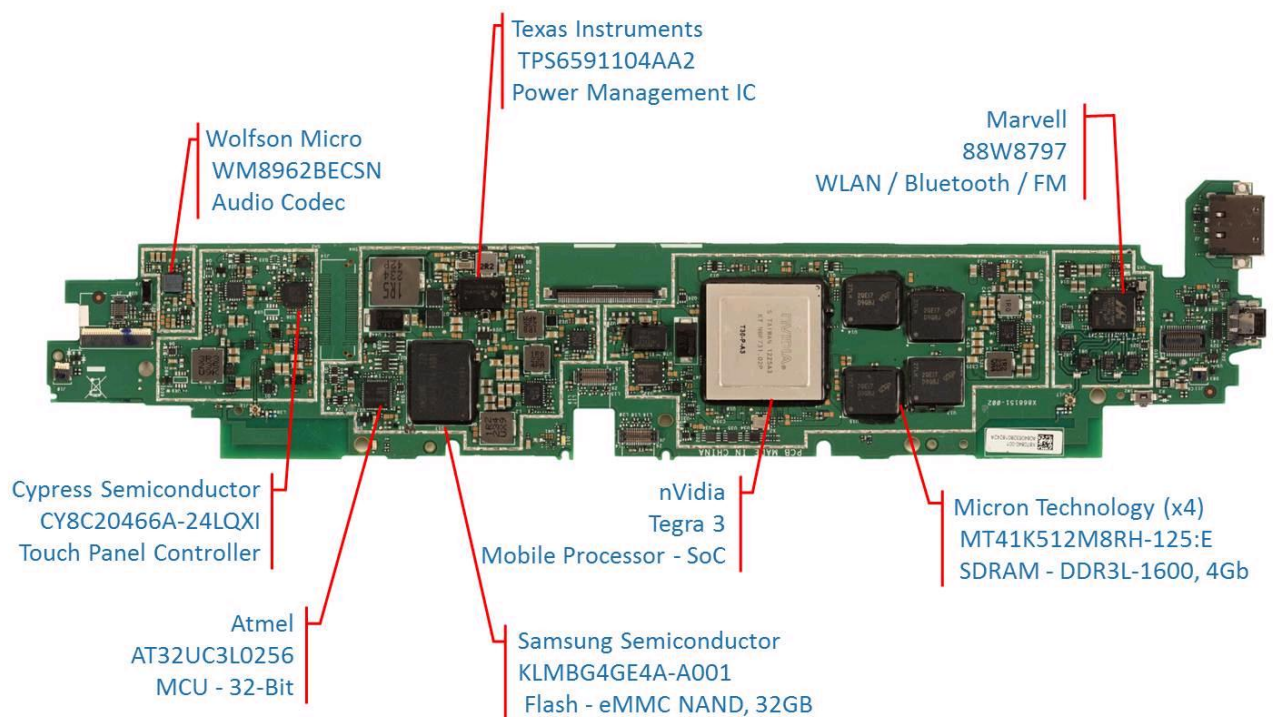
Figure 138. Microsoft Surface Tablet – 32GB, Wi-Fi Only, Main PCB, Bottom

### Microsoft Surface Tablet – 32GB, Wi-Fi Only

Disassembly – Main PCB, Bottom



Teardown Analysis



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Source: IHS Teardown Research (November 2012)

## Kindle Fire HD

The low-end Kindle Fire HD—with a 7-inch display, 16 gigabytes of NAND flash and Wi-Fi wireless only—carries a bill of materials (BOM) cost of \$165.00. When the \$9.00 manufacturing cost is added in, the cost to produce this model of the Kindle Fire HD increases to \$174.00.

**Figure 139. Preliminary BOM and Mfg Costs for Amazon Kind Fire HD (16gb, Wi-Fi Only)**

Components / Hardware Elements	Price
Retail Pricing (As of November 2012)	\$199
Total BOM Cost	\$165
Manufacturing Cost	\$9
BOM + Manufacturing	\$174
<b>Major Cost Drivers</b>	
Memory: 1GB LPDDR2 + 16GB eMMC	
NAND Flash + DRAM	\$23.00
Display & Touchscreen: 7" 1280x800 w/ Multitouch	\$64.00
Processors: TI OMAP4460BCBS	\$16.50
Camera(s): 1MP 720p BSI	\$2.50
User Interface & Sensors & Combo Module (WLAN/BT/FM)	\$12.00
Power Management	\$7.00
Battery: 3.7V 16.4Wh Li-Polymer	\$15.00
Mechanical / Electro-Mechanical / Other	\$22.00
Box Contents	\$3.00

Source: IHS Teardown Research (November 2012)



Figure 140. Kindle Fire HD Key Identified Vendors and Parts – In Descending Order of Component Value

Manufacturer	Part Number	Description	Comment
LG Display		Display Module - 7" Diagonal, 1280x800 Pixels	LGD and Panasonic are the likely suppliers
		Touchscreen / Display Window - 7" Diagonal, Glass Over ITO Film, Capacitive, Contains Atmel ATMXT768-CU Controller	
Texas Instruments	OMAP4460BCBS	Application Processor - TI OMAP4, Dual-Core ARM Cortex-A9 1.5GHz, IVA 3 Hardware Accelerator, SGX540 3D Graphic Core, 1080P 2D/3D, 45nm Process, PoP	
Desay Battery		Battery Pack - Li-Polymer, 3.7V, 4400mAh, 16.43Wh	1 Cell ~545Wh/L
Samsung Semiconductor	KLMAG2GE4A-A001	Flash - eMMC NAND, 16GB	Conventional eMMC flash memory as applied by many handset/tablets OEMs
SK Hynix	H9TKNN8KDMP	SDRAM - Mobile DDR2, 1GB, PoP	
		WLAN Module - Contains Broadcom BCM43239KWBG, 802.11a/b/g/n	
Texas Instruments	TWL6032A1B4YFF	Power Management IC - w/ 5 Step-Down DC-DC Converters & 11 LDOs, w/ USB OTG Module & Battery Charger	
Broadcom	BCM2076HB1KUVBG	Bluetooth / FM / GPS - Single Chip, Bluetooth V4.0, GPS, FM Radio Transceiver	
Dynamic Electronics		8-Layer - FR4/RCF HDI, 2+4+2, Lead-Free	
Wolfson Micro	WM8962BECSN	Audio Codec - Stereo, w/ Audio Enhancement DSP, and Integrated 2W Class D Amplifier	
		Camera Module - Contains OmniVision OV9726 1MP 720p Image Sensor, 1/6.5" Format, Fixed Lens	
Invensense	MPU-6050	Gyroscope / Accelerometer - 6-Axis, 16-Bit, $\pm 250/\pm 500/\pm 1000/\pm 2000$ dps, $\pm 2g/\pm 4g/\pm 8g/\pm 16g$ , Digital Output, w/ Integrated Temperature Sensor	
Texas Instruments	TPD12S015AYFF	HDMI Companion IC - HDMI1.4, w/ Integrated Step-Up DC-DC Converter, I2C Level Shifter & ESD Clamps	

Source: IHS Teardown Research (November 2012)

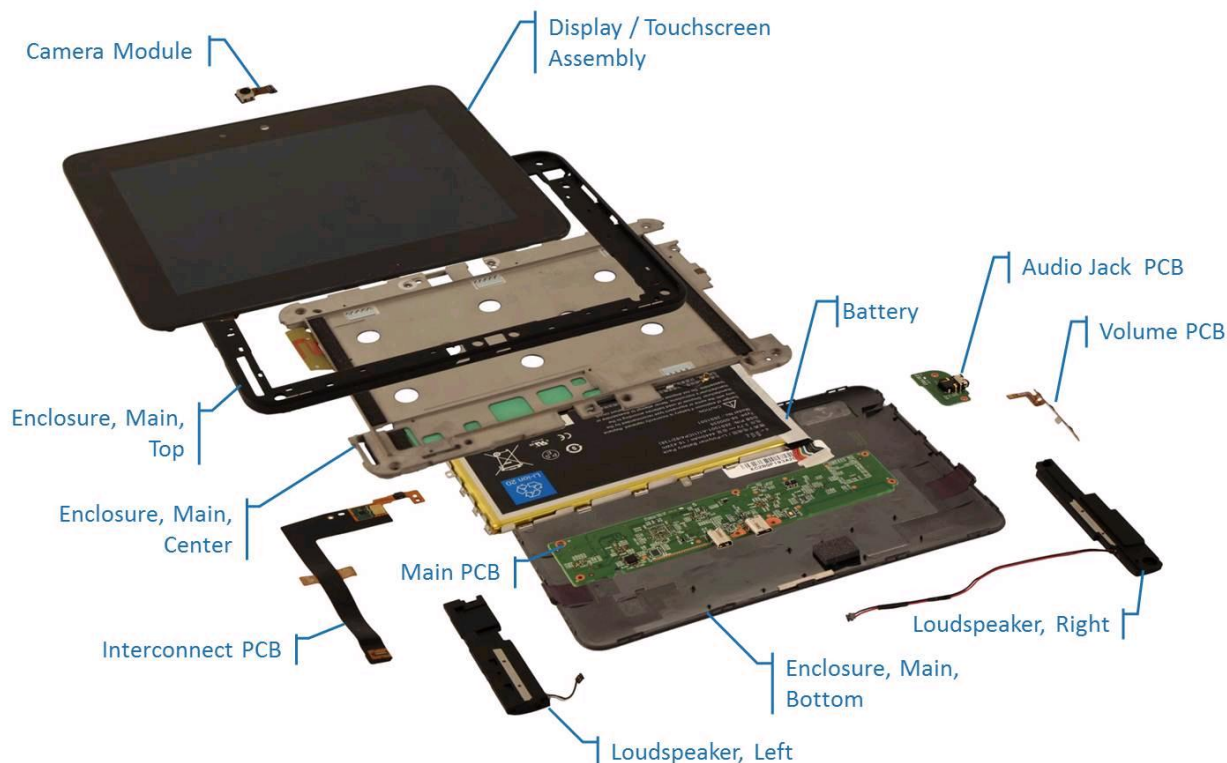
Figure 141. Amazon Kindle Fire HD 7-inch – 16GB, Wi-Fi Only

## Amazon Kindle Fire HD 7-inch – 16GB, Wi-Fi Only

Exploded View



Teardown Analysis



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Source: IHS Teardown Research (November 2012)

Figure 142. Amazon Kindle Fire HD 7-inch – 16GB, Wi-Fi Only  
Main PCB, Top

## Amazon Kindle Fire HD 7-inch – 16GB, Wi-Fi Only

Disassembly – Main PCB, Top



Teardown Analysis



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Source: Citi Research

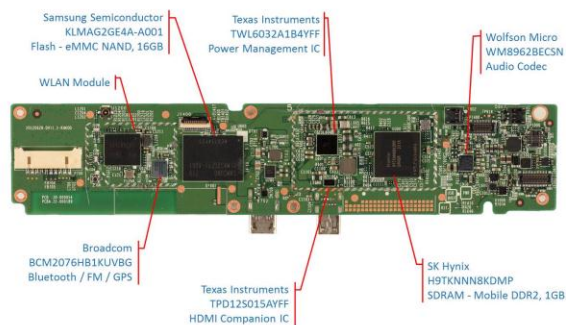
Figure 143. Amazon Kindle Fire HD 7-inch – 16GB, Wi-Fi Only  
Main PCB, Bottom

## Amazon Kindle Fire HD 7-inch – 16GB, Wi-Fi Only

Disassembly – Main PCB, Bottom



Teardown Analysis



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Source: Citi Research

## Galaxy Note 10.1

Table 1 below presents the preliminary results of the IHS iSuppli teardown analysis of the Samsung Galaxy Note 10.1 media tablet. Please note that this teardown assessment is preliminary in nature, accounts only for hardware and manufacturing costs and does not include additional expenses such as software, licensing, royalties or other expenditures.

**Figure 144. Preliminary Summary of Major Component Costs in Samsung Galaxy Note 10.1**

<b>Components / Hardware Elements</b>	
<b>Retail Pricing (As of August 2012)</b>	<b>~\$640</b>
<b>Total BOM Cost</b>	<b>\$283</b>
Manufacturing Cost	\$10.00
<b>BOM + Manufacturing</b>	<b>\$293</b>
<b>Major Cost Drivers</b>	
<b>Memory</b>	
NAND Flash + DRAM	\$45.00
<b>Display &amp; Touchscreen</b>	
Display + Touchscreen	\$100.00
<b>Processor</b>	\$18.80
<b>Camera(s)</b>	\$15.00
<b>Wireless Section - BB/RF/PA</b>	\$15.00
<b>User Interface &amp; Sensors &amp; Combo Module (WLAN/BT/FM)</b>	\$18.00
<b>Power Management</b>	\$12.00
<b>Battery</b>	\$18.00
<b>Mechanical / Electro-Mechanical / Other</b>	\$35.00
<b>Box Contents</b>	\$6.00

Source: IHS Teardown Research (August 2012)



**Figure 145. Preliminary Estimate of Key Identified Vendors and Parts in Samsung Galaxy Note 10.1 – In Descending Order of Component Value**

Manufacturer	Part Number	Description	Comment
Samsung Mobile Display	LTL101AL01	Display Module - 10.1" Diagonal, 1280x800 Pixels, LED Edge-Lit, w/ Integrated Electro-Magnetic Resonance Sensor Board	LED edge-lit LCD display, with integrated Electro-Magnetic Resonance (EMR) sensor board
		Touchscreen / Display Window - 10.1" Diagonal, Glass Over ITO Film, Capacitive	
Samsung Semiconductor	K3PE0E000M-XGC1	SDRAM - Mobile DDR2, 2GB, PoP	Doubled the RAM capacity in Galaxy S3
Samsung Semiconductor	KLMA2GE4A-A002	Flash - eMMC NAND, 16GB	Conventional eMMC flash memory as
Samsung		Battery Pack - Li-Polymer, 3.7V, 7000mAh,	~520Wh/L energy density comparing to
Samsung Semiconductor	S5E4412A01	Apps Processor - Exynos 4 Quad, ARM Cortex A9 Quad-Core 1.4GHz, 32nm, PoP	Same Quad-Core processor in Galaxy S3
		Primary Camera Module - 5MP, BSI CMOS (TBD), Auto Focus Lens	
		Enclosure, Main, Center - Die-Cast Magnesium, w/ Injection Molded Plastic Frame	
DAP Corp		PCB - FR4/RCF HDI, Lead-Free, Halogen-Free (for Main PCB)	
Intel	PMB9811	Baseband / Power Management - Quad-Band GSM/EDGE, WCDMA/HSPA+, ARM Core, 40nm	Same baseband processor in Galaxy S3
Murata		BT / WLAN Module - BTv4.0, IEEE802.11 a/b/g/n	
		Secondary Camera Module - 1.9MP, BSI CMOS (TBD), Fixed Lens	
Intel	PMB5712	RF Transceiver - Quad-Band GSM/EDGE, WCDMA/HSPA+	Same RF transceiver in Galaxy S3
Wacom	W8008	Touch Digitizer Controller	Same solution seen in Samsung Series 7
Atmel	mXT1664S	Touchscreen Controller - Capacitive	Single chip solution comparing to 4-chips
Skyworks	SKY77604-31	PAM - Multi-Mode, Multi-Band, GSM/EDGE/UMTS	Same single PAM solution in Galaxy S3
Winbond	W949D6CBHX5I	SDRAM - Mobile DDR, 512Mb	
ST Microelectronics	LSM330DLC	Accelerometer / Gyroscope - 6-Axis, +- 2/4/8/16g, 16-Bit Data Output	Same accelerometer / gyroscope combo in Galaxy S3; also in addition to this
Maxim	MAX77686EWE	Power Management IC	Same PMIC in Galaxy S3
Silicon Image	SI9244BO	Mobile High-Definition Link Transmitter - TMDS Core, w/ HDMI Interface	Same MHL Transmitter in Galaxy S3
Doestek	DTC34LM85AM	LVDS Transmitter	
Wolfson Micro	WM1811AE	Audio Codec - 24-Bit, 2-Channel DAC & 2-Channel ADC, 100dB SNR, 2W Stereo Class D Speaker & Class W Headphone Driver, w/ Integrated LDOs	Same Audio Codec in Galaxy S3

Source: IHS Teardown Research (August 2012)



Figure 146. Semi-Analysis PCs

Units (M, 2013)	PC Desktop		PC Notebook		PC Ultramobile		PC - Basic Tablet		PC - Premium Tablet	
	136		151		32		169		62	
Factory Average Selling Price (\$)	\$300.66		\$502.06		\$623.42		\$131.00		\$292.00	
	Semiconductor Content	Share of Total Semi Content Cost	Semiconductor Content	Share of Total Semi Content Cost	Semiconductor Content	Share of Total Semi Content Cost	Semiconductor Content	Share of Total Semi Content Cost	Semiconductor Content	Share of Total Semi Content Cost
General Purpose	\$130.43	83%	\$120.89	82%	\$182.07	87%	\$22.71	58%	\$48.01	45%
Memory	\$24.87	16%	\$26.21	18%	\$33.37	16%	\$13.48	34%	\$30.91	29%
Microcomponent	\$96.19	61%	\$76.98	52%	\$123.06	59%	\$1.39	4%	\$0.91	1%
Logic IC	\$0.40	0%	\$3.52	2%	\$5.06	2%	\$1.96	5%	\$4.32	4%
Analog IC	\$5.06	3%	\$4.93	3%	\$7.83	4%	\$1.52	4%	\$3.13	3%
Discrete	\$3.32	2%	\$3.19	2%	\$3.89	2%	\$0.73	2%	\$1.58	1%
Optical	\$0.60	0%	\$6.06	4%	\$8.86	4%	\$3.63	9%	\$7.17	7%
Nonoptical Sensors	\$0.13	0%	\$0.52	0%	\$1.55	1%	\$1.26	3%	\$3.59	3%
Application Specific	\$26.60	17%	\$26.17	18%	\$24.56	12%	\$15.31	39%	\$54.17	51%
ASIC	\$0.00	0%	\$0.00	0%	\$0.00	0%	\$3.46	9%	\$14.20	13%
ASSP	\$26.60	17%	\$26.17	18%	\$24.56	12%	\$11.85	30%	\$39.97	38%
Total	\$ 157	100%	\$ 148	100%	\$ 208	100%	\$ 39	100%	\$ 106	100%
Total Semi Content as % of ASP	52%		29%		33%		30%		36%	

Source: Gartner (Dec 2013)

Figure 147. Top 20 Companies Revenue from Shipments of Total Memory - Data Processing - Compute

Company Name	2013 Share (%)
Samsung Electronics	32%
SK Hynix	20%
Micron Technology	19%
SanDisk	9%
Toshiba	8%
Elpida Memory	5%
Nanya Technology	3%
Powerchip Technology	1%
Winbond Electronics	1%
NXP	0%
Cypress Semiconductor	0%
Macronix International	0%
Atmel	0%
STMicroelectronics	0%
Rohm	0%
Microchip Technology	0%
Fujitsu Semiconductor	0%
GigaDevice Semiconductor	0%
Infineon Technologies	0%
Eon Silicon Solution	0%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

Figure 148. Top 10 Companies Revenue from Shipments of Total Microcomponents - Data Processing - Compute

Company Name	2013 Share (%)
Intel	84%
AMD	7%
NXP	2%
Infineon Technologies	1%
Samsung Electronics	1%
Renesas Electronics	1%
Sun Microelectronics	1%
STMicroelectronics	1%
Microchip Technology	0%
Inside Secure	0%
Others	2%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 149. Top 20 Companies Revenue from Shipments of Total General Purpose Logic - Data Processing - Compute**

Company Name	2013 Share (%)
Samsung Electronics	31%
Novatek	14%
Raydium Semiconductor	8%
Himax Technologies	7%
Magnachip Semiconductor	6%
Silicon Works	5%
Texas Instruments	5%
NXP	4%
Renesas Electronics	4%
Altera	3%
Sitronix	2%
Xilinx	2%
Toshiba	2%
Orise Technology	2%
Integrated Device Technology	1%
Lattice Semiconductor	1%
ON Semiconductor	1%
Ilitek	1%
Intersil	1%
Fairchild Semiconductor	0%
Others	1%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 150. Top 20 Companies Revenue from Shipments of Total Analog - Data Processing - Compute**

Company Name	2013 Share (%)
Texas Instruments	30%
Maxim Integrated Products	8%
Richtek Technology	5%
Cirrus Logic	4%
ON Semiconductor	4%
Linear Technology	4%
NXP	3%
Intersil	3%
Integrated Device Technology	3%
Global Mixed-mode Technology	3%
International Rectifier	3%
Anpec Electronics	2%
Volterra	2%
Infineon Technologies	2%
Monolithic Power Systems	1%
Alpha & Omega Semiconductor	1%
Diodes	1%
Fairchild Semiconductor	1%
Rohm	1%
Micrel Semiconductor	1%
Others	18%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 151. Top 20 Companies Revenue from Shipments of Total Discrete - Data Processing - Compute**

Company Name	2013 Share (%)
Infineon Technologies	12%
Toshiba	9%
NXP	9%
ON Semiconductor	8%
International Rectifier	7%
STMicroelectronics	6%
Diodes	6%
Vishay	5%
Rohm	5%
Renesas Electronics	4%
Pan Jit	3%
Fairchild Semiconductor	3%
Lite-On Semiconductor	3%
Semtech	3%
Advanced Power Electronics	2%
Microsemi	2%
Fuji Electric	2%
Alpha & Omega Semiconductor	2%
Panasonic	2%
Texas Instruments	1%
Others	5%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 152. Top 20 Companies Revenue from Shipments of Total Optoelectronics - Data Processing - Compute**

Company Name	2013 Share (%)
Samsung Electronics	11%
Omnivision	10%
LG	8%
Seoul Semiconductor	8%
Nichia	8%
Sony	5%
Everlight Electronics	4%
Lite-On Technology	3%
SK Hynix	3%
Sharp	3%
Toshiba	3%
Panasonic	3%
Lextar	3%
Kingbright	3%
Osram	2%
STMicroelectronics	2%
Citizen Electronics	2%
Unity Opto Technology	2%
Lite-On Semiconductor	1%
Others	11%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 153. Top 15 Companies Revenue from Shipments of Nonoptical Sensors - Data Processing - Compute**

Company Name	2013 Share (%)
STMicroelectronics	19%
Analog Devices	16%
Robert Bosch	15%
Asahi Kasei Microdevices	13%
Knowles	11%
InvenSense	11%
Maxim Integrated Products	7%
Sanken	2%
Rohm	2%
MEMSIC	1%
Microchip Technology	1%
Hokuriku Electric Industry	1%
Mitsumi Electric	0%
Seiko Instruments	0%
Yamaha	0%
BCD Semiconductor Manufacturing	0%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 154. Top 20 Compute ASIC Vendor Revenue Market Share By Revenue**

Company	Market Share 2013
Samsung Electronics*	19.9%
IBM Microelectronics	10.2%
Dialog Semiconductor	6.6%
Texas Instruments	6.3%
Fujitsu Semiconductor	5.6%
STMicroelectronics	5.2%
Marvell Technology Group	3.6%
Faraday Technology	2.4%
MegaChips	2.0%
Rohm	1.7%
Renesas Electronics	1.5%
Ricoh	1.4%
ON Semiconductor	1.2%
Sanken	0.8%
LSI	0.8%
ams	0.8%
Global Unichip	0.7%
Toshiba	0.4%
CEC Huada Electronic Design	0.4%
Others	27.2%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, March 2014

**Figure 155. Top 20 Compute ASSP Vendor Revenue Market Share By Revenue**

Company	Market Share 2013
Intel	38.4%
Nvidia	15.3%
AMD	8.0%
Qualcomm	4.3%
Broadcom	3.8%
Texas Instruments	2.2%
Samsung Electronics	2.2%
Realtek Semiconductor	2.1%
MediaTek	2.1%
Fuzhou Rockchip Electronics	1.1%
STMicroelectronics	1.1%
Mellanox Technologies	0.9%
Skyworks Solutions	0.9%
Allwinner Technology	0.9%
Synaptics	0.8%
Elan Microelectronics	0.8%
Parade Technologies	0.8%
Marvell Technology Group	0.7%
Pixart Imaging	0.7%
Winbond Electronics	0.6%
Others	12.3%
<b>Total Market</b>	<b>100.0%</b>

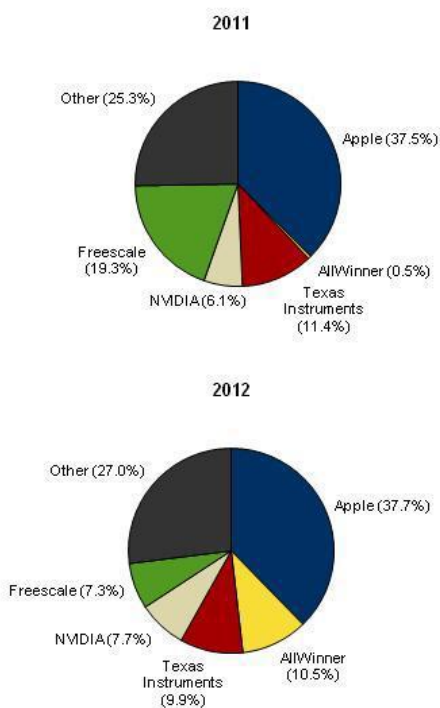
Source: Citi Research, Gartner, March 2014

Figure 156. Compute FPGA/PLD Vendor Market Share by Revenue

Company	Market Share
	<b>2013</b>
Altera	49.3%
Xilinx	30.6%
Lattice Semiconductor	17.9%
Microsemi	1.5%
Cypress Semiconductor	0.7%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, March 2014

Figure 157. Top Five eReaders & Tablet Application Processor Vendors (Unit Shipments)



Source: IDC

Figure 158. Global PC Shipment Forecast

Quarterly PC Shipment Forecast													PC Shipment Estimate Revisions							
(M Units)	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14E	2Q14E	3Q14E	4Q14E	(M Units)	1Q14E		2014E		2015E		
														New	Old	New	Old	New	Old	
Desktop	38.6	36.6	36.5	36.6	33.9	33.2	34.1	35.5	32.7	32.2	33.5	33.9	Desktop	32.7	32.6	132.4	132.7	130.4	129.8	
Change y/y	4%	-4%	-9%	-7%	-12%	-9%	-6%	-3%	-3%	-3%	-2%	-4%	Change y/y	-3%	-4%	-3%	-2%	-1%	-2%	
Change q/q	-2%	-5%	0%	0%	-7%	-2%	3%	4%	-8%	-2%	4%	1%	Change q/q	-8%	-5%					
Notebook	49.9	48.8	51.8	50.4	42.9	42.5	45.8	47.3	41.2	40.7	44.9	44.3	Notebook	41.2	39.5	170.9	166.2	167.8	163.1	
Change y/y	4%	0%	-7%	-10%	-14%	-13%	-12%	-6%	-4%	-4%	-2%	-6%	Change y/y	-4%	-8%	-4%	-5%	-2%	-2%	
Change q/q	-11%	-2%	6%	-3%	-15%	-1%	8%	3%	-13%	-1%	10%	-1%	Change q/q	-13%	-11%					
Total Client PCs	88.6	85.4	88.3	87.0	76.8	75.7	79.9	82.8	73.9	72.9	78.4	78.2	Total PCs	73.9	72.0	303.3	298.8	298.3	292.9	
Change y/y	4%	-2%	-8%	-9%	-13%	-11%	-10%	-5%	-4%	-4%	-2%	-6%	Change y/y	-4%	-6%	-4%	-4%	-2%	-2%	
Change q/q	-8%	-4%	3%	-2%	-12%	-1%	6%	4%	-11%	-1%	8%	0%	Change q/q	-11%	-8%					
Tablets	20.4	27.4	33.8	57.9	46.7	43.3	46.1	76.3	59.0	58.7	62.0	80.4	Tablets	59.0	65.7	260.0	297.0	291.0	332.5	
Change y/y	155%	80%	71%	84%	128%	58%	37%	32%	26%	36%	34%	5%	Change y/y	26%	35%	22%	30%	12%	12%	
Change q/q	-35%	34%	23%	71%	-19%	-7%	7%	65%	-23%	-1%	6%	30%	Change q/q	-23%	-25%					

Source: Citi Research

Figure 159. Global PC and Tablet Shipment Forecast (Units)

(M Units)	03	04	05	06	07	08	09	10	11	12	13	14E	15E
<b>Desktop</b>	<b>116</b>	<b>131</b>	<b>146</b>	<b>152</b>	<b>163</b>	<b>157</b>	<b>146</b>	<b>157</b>	<b>155</b>	<b>148</b>	<b>137</b>	<b>132</b>	<b>130</b>
Change y/y	8%	12%	12%	4%	8%	-4%	-7%	8%	-1%	-4%	-8%	-3%	-1%
<b>Notebook</b>	<b>38</b>	<b>47</b>	<b>63</b>	<b>80</b>	<b>107</b>	<b>142</b>	<b>169</b>	<b>201</b>	<b>209</b>	<b>201</b>	<b>178</b>	<b>171</b>	<b>168</b>
Change y/y	27%	24%	34%	28%	34%	33%	19%	19%	4%	-4%	-11%	-4%	-2%
<b>Total PCs</b>	<b>154</b>	<b>178</b>	<b>209</b>	<b>232</b>	<b>271</b>	<b>300</b>	<b>315</b>	<b>358</b>	<b>364</b>	<b>349</b>	<b>315</b>	<b>303</b>	<b>298</b>
Change y/y	12%	15%	17%	11%	17%	11%	5%	14%	2%	-4%	-10%	-4%	-2%
<b>Tablets</b>								<b>19</b>	<b>74</b>	<b>139</b>	<b>212</b>	<b>260</b>	<b>291</b>
Change y/y								-	285%	87%	52%	22%	12%

Source: Citi Research

Figure 160. PC Market Share

MARKET SHARE (Units)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
HP	15%	15%	16%	18%	18%	19%	18%	17%	17%	17%
Dell	17%	17%	16%	14%	14%	12%	12%	12%	11%	12%
Acer	4%	5%	6%	8%	10%	12%	12%	10%	10%	8%
Lenovo	3%	6%	7%	7%	7%	8%	10%	12%	15%	17%
Toshiba	3%	3%	4%	4%	5%	5%	5%	5%	5%	5%
ASUS	1%	1%	1%	2%	3%	4%	5%	6%	7%	6%
Apple	2%	2%	2%	3%	3%	4%	4%	5%	5%	5%
Samsung	1%	1%	1%	1%	1%	2%	3%	4%	4%	4%
Sony	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Fujitsu	2%	1%	1%	1%	1%	1%	2%	2%	2%	2%
Others	52%	47%	44%	40%	34%	30%	27%	25%	23%	23%
<b>Total Client PC</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: Citi Research

Figure 161. IT Tablet Market Share

(M Units)	2010	2011	2012	2013
Apple	76.5%	54.5%	47.2%	35.0%
Samsung	6.4%	7.7%	11.7%	18.4%
Amazon.com Inc.	0.0%	6.4%	7.5%	4.6%
ASUS	0.0%	0.0%	2.4%	4.9%
Lenovo	0.0%	1.0%	1.5%	3.6%
Acer	0.0%	2.6%	1.0%	2.1%
HP	0.0%	1.3%	0.0%	0.7%

Source: Citi Research

## Enterprise Storage

The Enterprise Storage market remains fragmented, with dedicated vendors such as EMC and Netapp capturing less than half of the total available market, while server vendors such as HP and IBM hold smaller shares and lag in terms of product portfolio and sales resource. Hard disk drives represent the largest single component cost for Storage vendors, and the industry has now consolidated into three major players: Seagate, Western Digital, and Toshiba.

Figure 162. HDD Shipments Forecast and Growth

(1,000 units)	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014E
Desktop	215,067	229,917	250,220	241,330	229,650	233,660	206,270	176,830	168,670	166,899
Y/Y Growth	15%	7%	9%	-4%	-5%	2%	-12%	-14%	-5%	-1%
Notebook	72,000	67,990	62,210	270,590	62,150	61,930	63,600	63,880	251,560	252,210
Y/Y Growth	43%	31%	42%	30%	25%	20%	0%	-3%	-7%	0%
PC	292,198	331,271	393,800	427,520	461,520	511,010	484,500	447,420	420,230	419,110
Y/Y Growth	21%	13%	19%	9%	8%	11%	-5%	-8%	-6%	0%
Enterprise	26,197	27,712	29,870	31,860	25,610	51,400	56,380	63,630	67,310	70,271
Y/Y Growth	11%	6%	8%	7%	-20%	101%	10%	13%	6%	4%
CE	61,588	76,467	78,210	80,900	70,020	88,910	81,530	67,420	64,420	70,684
Y/Y Growth	53%	24%	2%	3%	-13%	27%	-8%	-17%	-4%	10%
Total HDD Units	379,983	435,450	501,880	540,280	557,150	651,320	622,410	578,470	551,960	560,064
Y/Y Growth	25%	15%	15%	8%	3%	17%	-4%	-7%	-5%	1%

Source: Citi Research

Figure 163. HDD Unit Market Share

HDD Industry Market Share								
	2006	2007	2008	2009	2010	2011	2012	2013
Seagate	32.0%	35.0%	31.6%	31.4%	30.0%	31.9%	41.9%	40.2%
Western Digital	19.6%	22.5%	26.8%	29.6%	31.3%	30.5%	39.4%	44.5%
Hitachi GST	16.1%	17.8%	16.9%	16.4%	17.5%	16.8%	-	-
Toshiba	9.1%	7.5%	8.7%	9.9%	10.9%	12.6%	13.5%	15.3%
Samsung	10.9%	9.5%	8.2%	9.2%	10.3%	8.1%	-	-
Others	12.4%	7.7%	8.0%	3.4%	0.0%	0.0%	-	-

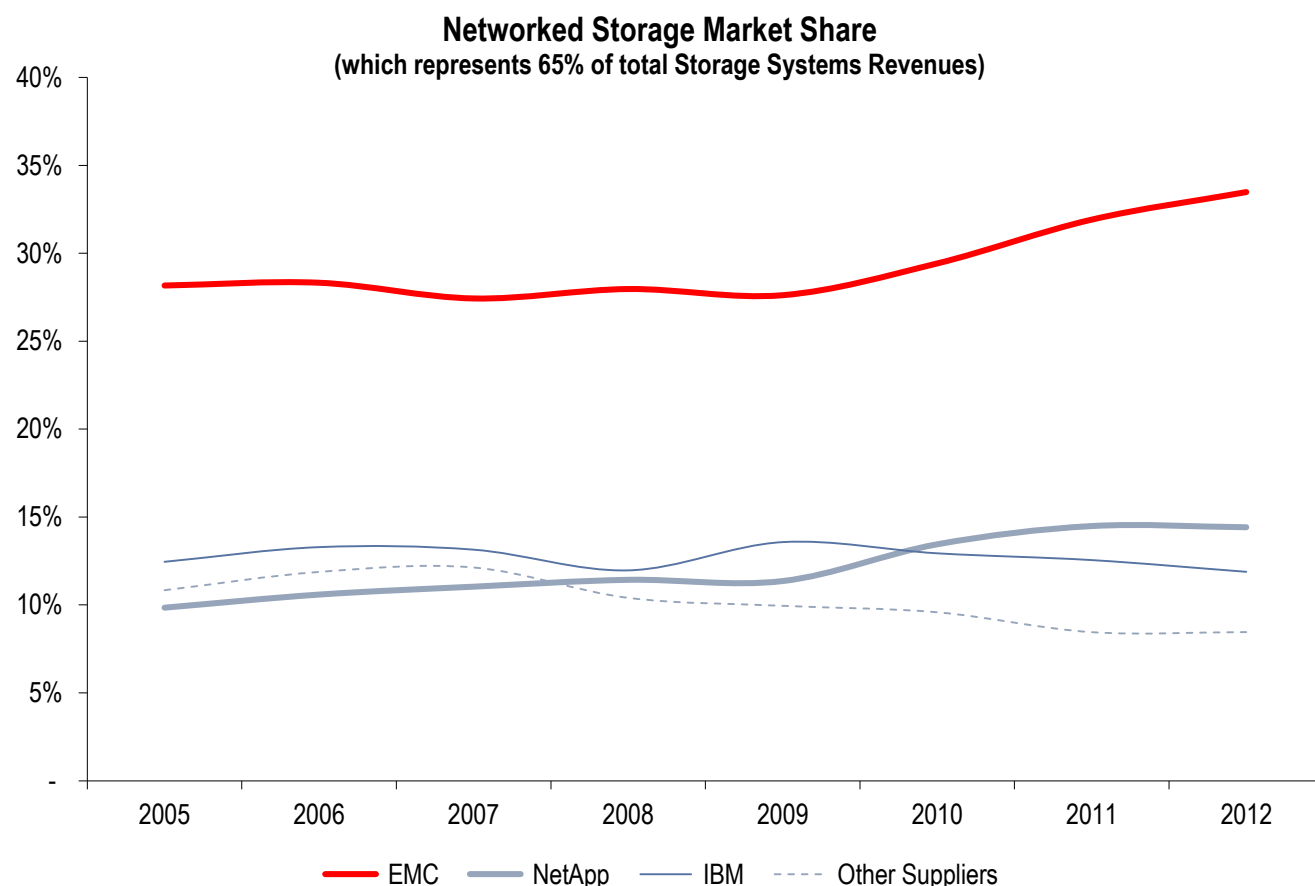
Source: Citi Research

Figure 164. Enterprise Storage Systems Revenue

(US\$ Billion)	2007	2008	2009	2010	2011	2012	2013	2014E	2015E	2016E	CAGR	
											CY08-12	CY13-16
Enterprise Storage Systems	\$28.9	\$29.8	\$26.0	\$30.6	\$33.4	\$35.0	\$36.1	\$37.8	\$39.5	\$41.1		
Y/Y Change		3.0%	-12.8%	17.7%	9.2%	4.8%	3.1%	4.7%	4.5%	4.1%	3.9%	4.1%
Storage Services	\$31.7	\$32.8	\$31.4	\$32.4	\$33.9	\$35.7	\$37.8	\$40.2	\$42.7	\$45.3		
Y/Y Change		3.5%	-4.3%	3.2%	4.6%	5.3%	5.9%	6.3%	6.2%	6.1%	2.4%	6.1%
Storage Software	\$11.2	\$12.1	\$11.6	\$12.6	\$13.9	\$14.8	\$15.7	\$16.6	\$17.5	\$18.5		
Y/Y Change		8.0%	-4.1%	8.6%	10.3%	6.5%	6.1%	5.7%	5.4%	5.7%	5.7%	5.7%
Tape Automation					\$0.04	\$0.07	\$0.10	\$0.12	\$0.14	\$0.16		
Y/Y Change						75.0%	42.9%	20.0%	16.7%	14.3%		23.0%
Total	\$71.8	\$74.7	\$69.0	\$75.6	\$81.2	\$85.6	\$89.7	\$94.7	\$99.8	\$105.1		
Y/Y Change		4.0%	-7.6%	9.6%	7.5%	5.3%	4.8%	5.6%	5.4%	5.2%	3.6%	5.3%
Overall IT Spending (Gartner: updated 2Q13)	\$3,181	\$3,403	\$3,239	\$3,269	\$3,560	\$3,648	\$3,723	\$3,875	\$4,039	\$4,198		
Y/Y Change		7.0%	-4.8%	0.9%	8.9%	2.5%	2.1%	4.1%	4.2%	3.9%	2.8%	3.5%
Enterprise Storage as % of Total IT Spend	2.3%	2.2%	2.1%	2.3%	2.3%	2.3%	2.4%	2.4%	2.5%	2.5%		

Source: IDC 1Q 2013, Gartner 3Q13

Figure 165. Revenue Market Share within Networked Storage



Source: IDC

Figure 166. Semi-Analysis Servers and Storage

	Low End Server		High End Server		Direct/Fiber Attached Storage		Optical		Solid State Drives	
Units (M, 2013)	9.3		0.7		6.5		292		77	
Factory Average Selling Price (\$)	\$2,825		\$23,782		\$4,521		\$31		\$155	
	Semiconductor Content	Share of Total Semi Content Cost	Semiconductor Content	Share of Total Semi Content Cost	Semiconductor Content	Share of Total Semi Content Cost	Semiconductor Content	Share of Total Semi Content Cost	Semiconductor Content	Share of Total Semi Content Cost
<b>General Purpose</b>	\$966.87	90%	\$2,977.40	72%	\$492.08	48%	\$3.23	39%	\$124.02	98%
Memory	\$150.65	24%	\$540.54	21%	\$14.30	1%	\$0.65	7%	\$122.53	97%
Microcomponent	\$757.37	62%	\$2,243.56	46%	\$440.12	44%	\$0.12	2%	\$0.00	0%
Logic IC	\$4.72	0%	\$51.60	1%	\$15.81	1%	\$0.02	0%	\$1.09	1%
Analog IC	\$42.29	3%	\$124.30	2%	\$12.94	1%	\$0.32	4%	\$0.30	0%
Discrete	\$10.84	1%	\$12.90	0%	\$6.36	0%	\$0.42	4%	\$0.10	0%
Optical	\$0.99	0%	\$4.51	0%	\$2.54	0%	\$1.69	22%	\$0.00	0%
<b>Nonoptical Sensors</b>	\$0.00	0%	\$0.00	0%	\$0.00	0%	\$0.06	1%	\$0.00	0%
<b>Application Specific</b>	\$124.80	10%	\$1,459.01	28%	\$599.60	52%	\$5.10	60%	\$3.69	2%
ASIC	\$11.57	1%	\$1,203.98	23%	\$235.08	20%	\$0.00	0%	\$0.00	0%
ASSP	\$113.23	9%	\$255.03	5%	\$364.52	32%	\$5.10	60%	\$3.69	2%
<b>Total</b>	\$ 1,296	100%	\$ 5,014	100%	\$ 503	100%	\$ 8	100%	\$ 131	100%
<b>Total Semi Content as % of ASP</b>	46%		21%		11%		25%		85%	

Source: Gartner (Dec 2013)

**Figure 167. Top 10 Companies Revenue from Shipments of Total Memory - Data Processing - Storage**

Company Name	2013 Share (%)
Samsung Electronics	31%
Micron Technology	21%
Toshiba	18%
Intel	11%
SanDisk	10%
SK Hynix	5%
Winbond Electronics	2%
Spansion	1%
Elpida Memory	0%
Cypress Semiconductor	0%
Others	1%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 168. Top 10 Companies Revenue from Shipments of Total Microcomponents - Data Processing - Storage**

Company Name	2013 Share (%)
Intel	86%
AMD	5%
Toshiba	3%
Broadcom	2%
Cavium Networks	1%
Panasonic	1%
IBM Microelectronics	1%
Texas Instruments	1%
Applied Micro Circuits	0%
Renesas Electronics	0%
Others	1%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 169. Top 10 Companies Revenue from Shipments of Total General Purpose Logic - Data Processing - Storage**

Company Name	2013 Share (%)
Altera	41%
Xilinx	33%
Toshiba	16%
Lattice Semiconductor	4%
Microsemi	1%
Texas Instruments	1%
Atmel	1%
Fairchild Semiconductor	1%
Pericom Semiconductor	1%
Rohm	1%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 170. Top 20 Companies Revenue from Shipments of Total Analog - Data Processing - Storage**

Company Name	2013 Share (%)
Texas Instruments	32%
Linear Technology	13%
Maxim Integrated Products	13%
Intersil	10%
Volterra	7%
Richtek Technology	5%
Asahi Kasei Microdevices	5%
International Rectifier	3%
Toshiba	2%
NXP	2%
Mitsumi Electric	1%
Rohm	1%
Cypress Semiconductor	1%
Seiko Instruments	1%
Fairchild Semiconductor	1%
KEC	1%
Pericom Semiconductor	1%
Seiko NPC	1%
Microchip Technology	0%
O2Micro	0%
Others	1%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014



**Figure 171. Top 11 Companies Revenue from Shipments of Discrete Sensors - Data Processing - Compute**

<b>Company Name</b>	<b>2013 Share (%)</b>
Toshiba	23%
Rohm	23%
Renesas Electronics	22%
NXP	9%
Vishay	6%
Diodes	6%
Fairchild Semiconductor	3%
Panasonic	3%
Mitsubishi	3%
Shindengen Electric	1%
Suzhou Good-Ark Electronics	1%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 172. Top 15 Companies Revenue from Shipments of Total Optoelectronics - Data Processing - Compute**

<b>Company Name</b>	<b>2013 Share (%)</b>
Mitsubishi	18%
Sony	15%
Sharp	14%
Rohm	9%
Toshiba	7%
Nichia	7%
Sumitomo Electric Device Innovations	5%
Panasonic	4%
Renesas Electronics	4%
Vishay	2%
Kodenshi	1%
Toyoda Gosei	1%
ON Semiconductor	0%
Stanley Electric	0%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 173. Top 5 Companies Revenue from Shipments of Nonoptical Sensors - Data Processing - Storage**

<b>Company Name</b>	<b>2013 Share (%)</b>
Rohm	35%
Diodes	29%
Asahi Kasei Microdevices	24%
Hokuriku Electric Industry	6%
MEMSIC	6%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 174. Top 10 Storage ASIC Vendor Market Share By Revenue**

<b>Company</b>	<b>Market Share 2013</b>
LSI	64.9%
Renesas Electronics	7.0%
IBM Microelectronics	3.8%
Toshiba	1.9%
Faraday Technology	1.6%
eSilicon	1.1%
Fujitsu Semiconductor	1.0%
Open-Silicon	0.7%
Rohm	0.6%
Altera	0.6%
Others	16.9%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, March 2014

**Figure 175. Top 20 Storage ASSP Vendor Market Share By Revenue**

<b>Company</b>	<b>Market Share 2013</b>
Marvell Technology Group	33.7%
Texas Instruments	12.2%
LSI	11.7%
Intel	8.9%
MediaTek	6.7%
PMC-Sierra	6.5%
STMicroelectronics	3.6%
Panasonic	2.3%
Renesas Electronics	1.9%
Toshiba	1.8%
Samsung Electronics	1.2%
Alcor Micro	1.1%
Sony	1.1%
Pioneer Micro Technology	0.8%
Maxim Integrated Products	0.7%
Skymedi	0.6%
PLX Technology	0.6%
Asahi Kasei Microdevices	0.5%
Integrated Device Technology	0.5%
Mellanox Technologies	0.5%
Others	3.0%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, March 2014

**Figure 176. Storage FPGA/PLD Vendor Market Share By Revenue**

<b>Company</b>	<b>Market Share 2013</b>
Altera	50.9%
Xilinx	41.1%
Lattice Semiconductor	5.4%
Microsemi	1.8%
Atmel	0.9%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, March 2014

## Consumer Electronics

Consumer electronics are electronic devices intended for the average person's use for entertainments, communications, or work. These electronics can range from smartphones and TV's to computers and calculators. OEM's design and develop consumer electronics and tend to have intense competition for market share. Due to the variety of consumer electronics it is difficult to pin the "big players" as each sub-segment has its own. However, some large companies in the consumer electronics space include: Apple, Samsung, Hewlett-Packard, LG Electronics, Toshiba, Huawei, and Nokia. The below charts are primarily focused on TV's, STB's, and Gaming consoles collectively. For deeper analysis on the various consumer electronics categories please see: pg. 58 for handsets, pg. 76 for PC & tablets, pg. 105 for TV's, pg. 109 for gaming consoles, and pg. 118 for printers.

Figure 177. Semi-Analysis– TV's, STB, and Video Gaming Devices

	LCD TV			Cable STB			IP STB			Video Game Consoles			Video Game Handhelds		
Units (M, 2013)	202			50			68			34			19		
Factory Average Selling Price	\$143.50			\$47.50			\$33.24			\$224.31			\$142.11		
	Share of Semiconductor Content			Share of Semiconductor Content			Share of Semiconductor Content			Share of Semiconductor Content			Share of Semiconductor Content		
	Cost	Total Semi Content	Cost	Cost	Total Semi Content	Cost	Cost	Total Semi Content	Cost	Cost	Total Semi Content	Cost	Cost	Total Semi Content	Cost
General Purpose	\$40.66	71%		\$15.26	58%		\$18.41	69%		\$38.88	36%		\$29.27	44%	
Memory	\$8.22	14%		\$4.47	17%		\$5.80	22%		\$27.21	25%		\$14.51	22%	
Microcomponent	\$2.03	4%		\$2.14	8%		\$2.21	8%		\$1.62	2%		\$0.00	0%	
Logic IC	\$9.87	17%		\$0.35	1%		\$0.70	3%		\$0.28	0%		\$2.69	4%	
Analog IC	\$4.79	8%		\$6.07	23%		\$6.73	25%		\$2.65	2%		\$0.98	1%	
Discrete	\$3.60	6%		\$1.83	7%		\$2.52	9%		\$4.64	4%		\$3.86	6%	
Optical	\$12.16	21%		\$0.40	2%		\$0.44	2%		\$2.48	2%		\$7.24	11%	
Nonoptical Sensors	\$0.00	0%		\$0.00	0%		\$0.00	0%		\$0.00	0%		\$2.72	4%	
Application Specific	\$16.66	29%		\$11.20	42%		\$8.18	31%		\$67.93	64%		\$34.07	52%	
ASIC	\$1.43	2%		\$0.69	3%		\$1.68	6%		\$51.51	48%		\$22.80	35%	
ASSP	\$15.23	27%		\$10.51	40%		\$6.50	24%		\$16.42	15%		\$11.26	17%	
Total	\$57.32	100%		\$26.45	100%		\$26.59	100%		\$106.81	100%		\$66.05	100%	
Total Semi Content as % of	40%			56%			80%			48%			46%		

Source: Gartner (Dec 2013)

Source: Gartner (Dec 2013)

**Figure 178. Top 20 Companies Revenue from Shipments of Total Memory - Consumer**

Company Name	2013 Share (%)
Samsung Electronics	24%
SK Hynix	20%
Micron Technology	11%
Toshiba	10%
Nanya Technology	7%
Macronix International	6%
Spansion	4%
Elpida Memory	4%
Winbond Electronics	3%
SanDisk	2%
Etron Technology	1%
Elite Semiconductor Memory Technology	1%
STMicroelectronics	1%
Fujitsu Semiconductor	1%
Zentel Electronics	1%
Integrated Silicon Solution	1%
GigaDevice Semiconductor	1%
Rohm	0%
Microchip Technology	0%
ON Semiconductor	0%
Others	2%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 179. Top 20 Companies Revenue from Shipments of Total Microcomponents - Consumer**

Company Name	2013 Share (%)
Microchip Technology	16%
Freescale Semiconductor	13%
Renesas Electronics	12%
Atmel	8%
STMicroelectronics	7%
Analog Devices	4%
Fujitsu Semiconductor	4%
Spansion	4%
Texas Instruments	3%
Melfas	2%
Holtek Semiconductor	2%
Datang Microelectronics Technology	2%
Winbond Electronics	2%
Cirrus Logic	2%
Panasonic	2%
Intel	1%
Sony	1%
Sonix Technology	1%
AMD	1%
Toshiba	1%
Others	9%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 180. Top 20 Companies Revenue from Shipments of Total General Purpose Logic - Consumer**

Company Name	2013 Share (%)
Novatek	21%
Samsung Electronics	13%
Xilinx	10%
Himax Technologies	7%
Silicon Works	6%
Altera	6%
Raydium Semiconductor	6%
Renesas Electronics	6%
Rohm	5%
Magnachip Semiconductor	3%
Toshiba	3%
Ilitek	2%
Texas Instruments	1%
NXP	1%
Sitronix	1%
Microsemi	1%
Lattice Semiconductor	1%
Orise Technology	1%
Princeton Technology	1%
ON Semiconductor	1%
Others	3%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 181. Top 20 Companies Revenue from Shipments of Total Analog - Consumer**

Company Name	2013 Share (%)
Maxim Integrated Products	8%
Texas Instruments	7%
Analog Devices	6%
Sanken	5%
New JRC	5%
ON Semiconductor	4%
Power Integrations	4%
STMicroelectronics	4%
Intersil	3%
Wolfson Microelectronics	3%
Richtek Technology	3%
Monolithic Power Systems	3%
Integrated Device Technology	3%
Cirrus Logic	3%
Fairchild Semiconductor	2%
Toshiba	2%
Asahi Kasei Microdevices	2%
Diodes	2%
Renesas Electronics	2%
Seiko Instruments	2%
Others	24%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 182. Top 20 Companies Revenue from Shipments of Total Discrete - Consumer**

<b>Company Name</b>	<b>2013 Share (%)</b>
Toshiba	10%
Infineon Technologies	8%
Rohm	8%
ON Semiconductor	8%
International Rectifier	6%
Diodes	6%
Mitsubishi	5%
NXP	5%
STMicroelectronics	5%
Fairchild Semiconductor	4%
KEC	4%
Hangzhou Silan Microelectronics	3%
Renesas Electronics	3%
Vishay	3%
Jilin Sino-Microelectronics	2%
Panasonic	2%
Sanken	2%
Pan Jit	2%
Tianjin Zhonghuan Semiconductor	2%
Semtech	2%
Others	11%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 183. Top 20 Companies Revenue from Shipments of Total Optoelectronics - Consumer**

<b>Company Name</b>	<b>2013 Share (%)</b>
Samsung Electronics	22%
LG	12%
Sony	7%
Nichia	7%
Seoul Semiconductor	4%
Panasonic	4%
Unity Opto Technology	3%
Everlight Electronics	3%
Advanced Optoelectronic Technology	3%
Lextar	3%
Renesas Electronics	3%
Sharp	2%
Aptina	2%
Omnivision	2%
Canon	2%
Lite-On Technology	2%
Citizen Electronics	1%
Rohm	1%
Osram	1%
Toshiba	1%
Others	13%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 184. Top 20 Companies Revenue from Shipments of Nonoptical Sensors - Consumer (Millions of \$US)**

<b>Company Name</b>	<b>2013 Share (%)</b>
STMicroelectronics	28%
InvenSense	13%
Freescale Semiconductor	11%
Robert Bosch	10%
Melexis Microelectronic Systems	8%
Rohm	5%
Seiko Instruments	4%
Omron	3%
Sanken	3%
Fujikura	2%
Maxim Integrated Products	2%
Microchip Technology	2%
Knowles	1%
MEMSIC	1%
Murata Manufacturing	1%
Hokuriku Electric Industry	0%
Mitsumi Electric	0%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 185. Top 20 Consumer ASIC Vendor Market Share  
By Revenue**

<b>Company</b>	<b>Market Share 2013</b>
AMD	14.0%
Samsung Electronics	12.5%
MegaChips	9.1%
Sharp	7.0%
IBM Microelectronics	6.9%
Renesas Electronics	6.7%
Toshiba	4.9%
Sony	4.8%
Fujitsu Semiconductor	3.9%
Rohm	3.7%
STMicroelectronics	1.9%
Global Unichip	1.9%
Marvell Technology Group	1.5%
Faraday Technology	1.4%
Alchip Technologies	1.4%
Panasonic	1.1%
Infineon Technologies	1.0%
Open-Silicon	0.8%
NXP Semiconductors	0.6%
Others	14.9%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, March 2014

**Figure 186. Top 20 Consumer ASSP Vendor Market Share  
By Revenue**

<b>Company</b>	<b>Market Share 2013</b>
Broadcom	17.3%
MStar Semiconductor	10.4%
Sony	6.4%
MediaTek	5.8%
CSR	5.2%
STMicroelectronics	4.6%
Panasonic	3.5%
Qualcomm	2.7%
Realtek Semiconductor	2.4%
Texas Instruments	2.3%
Novatek	2.1%
Toshiba	2.0%
Renesas Electronics	1.8%
Rohm	1.5%
Marvell Technology Group	1.4%
ALi	1.4%
Sigma Designs	1.4%
Entropic Communications	1.3%
HiSilicon Technologies	1.2%
ON Semiconductor	1.1%
Others	24.2%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, March 2014

**Figure 187. Consumer FPGA/PLD Vendor Market Share By Revenue**

<b>Company</b>	<b>Market Share 2013</b>
Xilinx	54.6%
Altera	32.2%
Microsemi	6.8%
Lattice Semiconductor	6.4%
<b>Total Market</b>	<b>100.0%</b>

Source: Gartner, March 2014

## TVs

Liquid-crystal-display televisions (LCD TV) are television sets that use LCD display technology to produce images. LCD televisions are thinner and lighter than cathode ray tube (CRTs) of similar display size, and are available in much larger sizes. When manufacturing costs fell, this combination of features made LCDs practical for television receivers. In 2007, LCD televisions surpassed sales of CRT-based televisions worldwide for the first time and their sales figures relative to other technologies are accelerating. LCD TVs are quickly displacing the only major competitors in the large-screen market, the plasma display panel and rear-projection television. LCDs are, by far, the most widely produced and sold television display type. Key LCD TV manufacturers are Samsung, LG Electronics, Sony.

Figure 188. TFT-LCD Supply Chain

### TFT-LCD Supply Chain Semiconductors

**Driver IC**  
SEC (05930.KS)  
Novatek (3034.TW)  
Himax (3222.TW)  
Panasonic  
Renesas  
Sharp (6753.JP)  
Hynix (00660.KS)  
Toshiba (6502.JP)  
Winbond (2344.TW)

**CCFL**  
Harrison-Toshiba  
Sanken (6707.JP)  
Panasonic  
Stanley Electric (6923.JP)  
Kumho Electric (01210.KS)  
Wellypower (3080.TW)

### Components

**Glass Substrate**  
GLW  
Asahi Glass (5201.JP)  
Nippon Electric Glass (5214.JP)  
AvanStrate  
Dongxu Group (000413.CH)  
LG Chemical (051910.KS)

**TAC Film and Retardation Film**  
Zeon (4205.JP)  
Konica (4902.JP)  
Fuji Film (4901.JP)

**Polarizers**  
Nitro Denko (6988.JP)  
Optimas (3051.TW)  
Sumitomo Chemical (4005.JP)  
Sanritz  
LG Chemical (05190.KS)  
Cheil Ind (01300.KS)  
Ace Digitech (36550.KS)

**Backlight Module**  
Coretronic (5371.TW)  
Forhouse (6120.TW)  
K-Bridge (6156.TW)  
Radiant Opto-Elec (6176.TW)  
Raygen (47440.KS)  
Taesan LCD (36550.KS)  
Empras

**RGB Color Resist**  
JSR (4185.JP)  
Fuji Film (4901.JP)  
Toyo Ink (4634.JP)  
Hitachi Chemical (4217.JP)  
Arch Chemicals (ARJ.US)  
Zeon Corp (4205.JP)

**Liquid Crystal**  
Merck  
Chisso

**Color Filter (ex In-House)**  
Toppan (7911.JP)  
DNP (7912.JP)  
Sintek (3049.TW)  
Toray (3402.JP)  
Cando (8055.TW)  
AMTC (8017.TW)  
CFI

**TFT-LCD Panel**  
SEC (05930.KS)  
AU Optronics (2409.TW)  
LGD (34220.KS)  
Chimei Innolux  
CPT (2475.TW)  
Panasonic  
Hannstar (6116.TW)  
Sharp (6753.JP)  
Toshiba (small/mid size panel)  
Beijing BOE Display Technology  
China Star Optoelectronics Technology  
Japan Display Inc. (6740.JP)  
Hitachi (small/mid size panel)

### End Products

**Note Book**  
DELL  
HPQ  
IBM  
Quanta (2382.TW)  
SEC (005930.KS)  
LGE (066570.KS)  
Compal (2324.TW)

**LCD TV**  
TPV (903.HK)  
TECO (1504.TW)  
BenQ (2352.TW)  
Sampo (6137.TW)  
Tatung (2371.TW)  
Sharp (6753.JP)  
LGE (66570.KS)  
Panasonic  
Philips  
Vizio  
Funai Electric  
Toshiba  
SEC (05930.KS)  
TCL (000100.CH)  
Skyworth (0751.HK)  
Sony (6758.TW)

**TFT-LCD Monitors**  
SEC (05930.KS)  
BenQ (2352.TW)  
Amtran (2489.TW)  
Jean (2442.TW)  
LGE (066570.KS)  
Lite-On Tech (2301.TW)

Source: Citi Research

Figure 189. LCD and TV Trends

	Mar-12	Jun-12	Sep-12	Dec-12	Mar-13	Jun-13	Sep-13	Dec-13	Mar-14	Jun-14	Sep-14	Dec-14	2008A	2009A	2010A	2011A	2012A	2013E	2014E	2015E
	Q1-12A	Q2-12A	Q3-12A	Q4-12A	Q1-13A	Q2-13A	Q3-13A	Q4-13E	Q1-14E	Q2-14E	Q3-14E	Q4-14E								
<b>Unit Demand (M)</b>																				
LCD TVs	43.2	44.3	51.1	64.7	44.8	45.9	50.9	64.8	46.3	47.7	52.8	66.8	106	145	192	205	203	206	214	223
Notebooks	49.9	48.8	51.8	50.4	42.9	42.5	44.2	43.6	39.0	39.2	42.8	43.1	142	169	201	209	201	173	164	161
Tablets	21.1	28.3	34.8	60.0	48.4	44.3	55.3	91.3	68.5	75.3	79.1	106.8	0	0	19	76	144	239	330	380
Desktops	38.6	36.6	36.5	36.5	33.9	33.1	34.2	34.5	32.5	32.2	33.6	34.1	157	146	157	155	148	136	132	130
Handhelds	<u>402.9</u>	<u>409.5</u>	<u>444.2</u>	<u>483.2</u>	<u>428.8</u>	<u>450.9</u>	<u>465.9</u>	<u>517.1</u>	<u>450.1</u>	<u>465.3</u>	<u>486.2</u>	<u>540.3</u>	<u>1,315</u>	<u>1,340</u>	<u>1,596</u>	<u>1,716</u>	<u>1,740</u>	<u>1,863</u>	<u>1,942</u>	<u>2,009</u>
Total	555.7	567.4	618.4	694.9	598.7	616.7	650.6	751.1	636.4	659.7	694.5	791.1	1,721	1,800	2,165	2,361	2,436	2,617	2,655	2,698
<b>YoY Growth</b>																				
LCD TVs	-3%	-1%	-1%	1%	4%	4%	0%	0%	3%	4%	4%	3%	34%	37%	32%	7%	-1%	2%	3%	4%
Notebooks	4%	0%	-7%	-10%	-14%	-13%	-15%	-14%	-9%	-8%	-3%	-1%	33%	19%	19%	4%	-4%	-14%	-5%	-2%
Tablets	162%	81%	70%	87%	130%	56%	59%	52%	42%	70%	43%	17%				294%	89%	66%	38%	15%
Desktops	4%	-4%	-9%	-7%	-12%	-9%	-6%	-6%	-4%	-3%	-2%	-1%	-4%	-7%	7%	-1%	-4%	-8%	-2%	-2%
Handhelds	<u>-1%</u>	<u>2%</u>	<u>2%</u>	<u>2%</u>	<u>6%</u>	<u>10%</u>	<u>5%</u>	<u>7%</u>	<u>5%</u>	<u>3%</u>	<u>4%</u>	<u>4%</u>	<u>15%</u>	<u>2%</u>	<u>19%</u>	<u>8%</u>	<u>1%</u>	<u>7%</u>	<u>4%</u>	<u>3%</u>
Total	2%	3%	3%	4%	8%	9%	5%	8%	6%	7%	7%	5%	15%	5%	20%	9%	3%	7%	1%	2%
<b>Screen/ Finished Product (M)</b>																				
LCD TVs	1	1	1	1	1	1	1	1	1	1	1	1								
Notebooks	1	1	1	1	1	1	1	1	1	1	1	1								
Tablets	1	1	1	1	1	1	1	1	1	1	1	1								
Desktops	1.19	1.23	1.22	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2								
Handhelds	1	1	1	1	1	1	1	1	1	1	1	1								
<b>Screen Unit Demand (M)</b>																				
LCD TVs	43.2	44.3	51.1	64.7	44.8	45.9	50.9	64.8	46.3	47.7	52.8	66.8	106	145	192	205	203	206	214	223
Notebooks	49.9	48.8	51.8	50.4	42.9	42.5	44.2	43.6	39.0	39.2	42.8	43.1	142	169	201	209	201	173	164	161
Tablets	21.1	28.3	34.8	60.0	48.4	44.3	55.3	91.3	68.5	75.3	79.1	106.8	0	0	19	76	144	239	330	380
Monitors	46.0	45.1	44.5	44.5	41.3	40.4	41.7	42.0	39.6	39.3	41.0	41.5	174	177	199	197	180	165	161	158
Handhelds	<u>402.9</u>	<u>409.5</u>	<u>444.2</u>	<u>483.2</u>	<u>428.8</u>	<u>450.9</u>	<u>465.9</u>	<u>517.1</u>	<u>450.1</u>	<u>465.3</u>	<u>486.2</u>	<u>540.3</u>	<u>1,315</u>	<u>1,340</u>	<u>1,596</u>	<u>1,716</u>	<u>1,740</u>	<u>1,863</u>	<u>1,942</u>	<u>2,009</u>
Total	563.1	576.0	626.4	702.9	606.2	624.0	658.1	758.7	643.5	666.8	701.9	798.5	1,737	1,831	2,207	2,403	2,468	2,647	2,811	2,931
<b>YoY Growth</b>																				
LCD TVs	-3%	-1%	-1%	1%	4%	4%	0%	0%	3%	4%	4%	3%	34%	37%	32%	7%	-1%	2%	3%	4%
Notebooks	4%	0%	-7%	-10%	-14%	-13%	-15%	-14%	-9%	-8%	-3%	-1%	33%	19%	19%	4%	-4%	-14%	-5%	-2%
Tablets	162%	81%	70%	87%	130%	56%	59%	52%	42%	70%	43%	17%				294%	89%	66%	38%	15%
Monitors	-7%	-11%	-8%	-7%	-10%	-10%	-6%	-6%	-4%	-3%	-2%	-1%	-6%	2%	13%	-1%	-8%	-8%	-2%	-2%
Handhelds	<u>-1%</u>	<u>2%</u>	<u>2%</u>	<u>2%</u>	<u>6%</u>	<u>10%</u>	<u>5%</u>	<u>7%</u>	<u>5%</u>	<u>3%</u>	<u>4%</u>	<u>4%</u>	<u>15%</u>	<u>2%</u>	<u>19%</u>	<u>8%</u>	<u>1%</u>	<u>7%</u>	<u>4%</u>	<u>3%</u>
Total	1%	2%	3%	4%	8%	8%	5%	8%	6%	7%	7%	5%	15%	5%	21%	9%	3%	7%	6%	4%

Source: Citi Research

Figure 190. LCD TV Unit Shipment By Region

LCD TV unit	2009	2010	2011	2012	2013	2014E	2015E	2016E	2017E
North America	37,319	38,291	38,229	39,479	38,612	39,200	39,730	39,950	40,050
Western Europe	33,264	38,714	34,430	29,906	27,248	27,460	27,800	27,820	27,610
Eastern Europe	9,638	14,401	16,943	20,422	20,114	20,340	21,100	19,780	19,180
China	29,296	37,930	44,522	49,021	54,778	55,530	56,610	58,790	61,200
Asia Pacific	10,259	14,423	20,518	23,670	25,628	28,400	33,430	38,140	41,600
Japan	12,534	23,388	19,368	6,290	5,453	5,999	6,980	7,940	8,360
Latin America	8,226	16,123	19,472	21,736	22,068	25,080	25,510	27,930	27,060
Middle East & Africa	4,860	8,287	11,589	12,680	13,855	15,500	17,410	19,030	20,060
LCD TV total	145,397	191,556	205,071	203,202	207,756	217,509	228,570	239,380	245,120
Regional proportion	2009	2010	2011	2012	2013	2014E	2015E	2016E	2017E
North America	26%	20%	19%	19%	19%	18%	17%	17%	16%
Western Europe	23%	20%	17%	15%	13%	13%	12%	12%	11%
Eastern Europe	7%	8%	8%	10%	10%	9%	9%	8%	8%
China	20%	20%	22%	24%	26%	26%	25%	25%	25%
Asia Pacific	7%	8%	10%	12%	12%	13%	15%	16%	17%
Japan	9%	12%	9%	3%	3%	3%	3%	3%	3%
LCD TV total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: NPDDisplaySearch



**Figure 191. LCD TV Unit Shipment Growth**

Regional growth	2010	2011	2012	2013	2014E	2015E	2016E	2017E
North America	3%	0%	3%	-2%	2%	1%	1%	0%
Western Europe	16%	-11%	-13%	-9%	1%	1%	0%	-1%
Eastern Europe	49%	18%	21%	-2%	1%	4%	-6%	-3%
China	29%	17%	10%	12%	1%	2%	4%	4%
Asia Pacific	41%	42%	15%	8%	11%	18%	14%	9%
Japan	87%	-17%	-68%	-13%	10%	16%	14%	5%
LCD TV total	32%	7%	-1%	2%	5%	5%	5%	2%

Source: NPDDisplaySearch

**Figure 192. LCD TV Penetration by Region**

LCD TV penetration	2009	2010	2011	2012	2013	2014E	2015E	2016E	2017E
North America	89%	87%	88%	91%	95%	98%	99%	99%	99%
Western Europe	91%	91%	93%	94%	97%	98%	99%	99%	98%
Eastern Europe	80%	86%	91%	94%	97%	99%	99%	99%	98%
China	69%	86%	91%	94%	96%	98%	99%	99%	99%
Asia Pacific	31%	40%	54%	65%	79%	89%	98%	99%	99%
Japan	91%	94%	96%	98%	100%	100%	100%	99%	98%
Latin America	43%	64%	78%	87%	90%	96%	99%	100%	99%
Middle East & Africa	41%	54%	66%	78%	85%	91%	96%	99%	99%
LCD TV total	69%	77%	82%	87%	92%	96%	99%	99%	99%

Source: NPDDisplaySearch

**Figure 193. LCD TV Revenues By Region**

LCD TV revenue mkt (US\$, bn)	2011	2012	2013	2014E	2015E	2016E	2017E
North America	21	20	19	19	19	17	16
Western Europe	19	17	13	12	11	11	10
Eastern Europe	8	10	9	8	8	7	6
China	24	25	27	28	27	25	23
Asia Pacific	9	10	9	9	10	10	11
Japan	8	3	2	2	3	3	3
Latin America	9	10	9	9	9	9	8
Middle East & Africa	6	6	5	5	6	6	6
LCD TV total	103	101	93	91	92	88	82

Source: NPDDisplaySearch

**Figure 194. LCD TV Revenue Growth**

LCD TV revenue mkt growth	2011	2012	2013	2014E	2015E	2016E	2017E
North America		-3%	-6%	-1%	2%	-7%	-9%
Western Europe		-11%	-23%	-8%	-3%	-7%	-8%
Eastern Europe		23%	-16%	-9%	2%	-12%	-10%
China		8%	8%	2%	-4%	-7%	-7%
Asia Pacific		7%	-9%	-4%	13%	6%	1%
Japan		-64%	-18%	4%	12%	6%	-2%
Latin America		7%	-11%	0%	-1%	2%	-11%
Middle East & Africa		6%	-9%	-4%	8%	2%	-3%
LCD TV total		-2%	-8%	-2%	1%	-4%	-7%

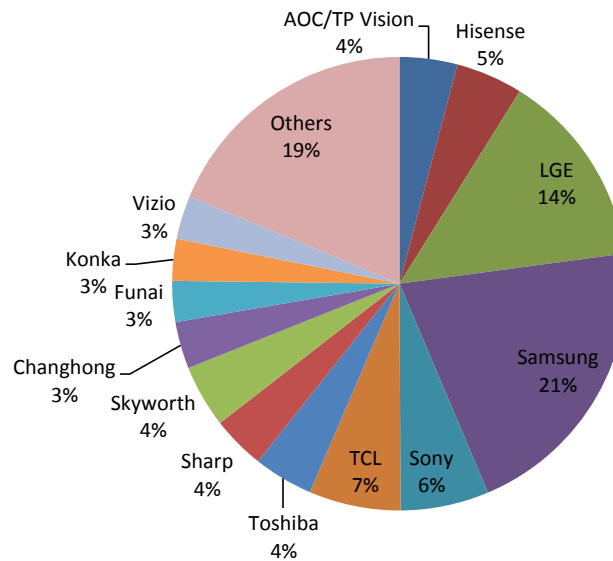
Source: NPDDisplaySearch

**Figure 195. LCD Size Distribution, Average Size and Average ASP**

LCD Size Distribution, Average Size and Average ASP	2011	2012	2013	2014E	2015E	2016E	2017E
10"-14"	206	72	112	97	72	45	12
15"-19"	10,820	6,158	3,738	2,929	2,507	2,310	2,122
20"-21"	275	123	79	58	-	-	-
22"-24"	19,885	17,028	17,448	16,516	16,559	16,729	16,525
25"-29"	12,987	8,912	6,453	6,031	6,088	5,932	5,738
30"-34"	82,551	81,036	78,580	76,732	75,604	75,242	73,041
35"-39"	9,256	11,268	17,578	11,883	5,784	3,698	2,708
40"-44"	45,489	46,082	41,534	51,767	63,005	70,753	76,071
45"-49"	15,815	17,714	18,225	20,855	23,289	25,520	27,213
50"-54"	601	3,543	8,974	10,723	11,771	12,515	13,016
55"-59"	5,759	8,042	9,410	12,816	15,644	17,471	18,834
60"+	1,635	3,311	5,624	7,103	8,247	9,165	9,840
LCD TV total	205,279	203,289	207,756	217,509	228,570	239,380	245,120
LCD Average Size (inches)	33.5	34.2	36.0	37.2	38.3	39.2	40.1
Y/Y Growth		2.0%	5.1%	3.5%	3.0%	2.3%	1.0%
LCD Average ASP (\$)	521	501	496	419	402	368	335
Y/Y Growth		-4%	-1%	-9%	-7%	-4%	-9%
LCD Average ASP per inch (\$)	15.6	14.7	13.8	12.1	10.9	10.3	8.3
Y/Y Growth		-6%	-6%	-13%	-9%	-6%	-10%

Source: NPDDisplaySearch

**Figure 196. 2013 LCD TV Unit Shipment Share**



Source: NPDDisplaySearch

## Gaming Consoles

A gaming console is an computer or customized computer system used for interactive entertainment which can be used with a TV or monitor (as opposed to an arcade machine) to display the game. The terminology of a “gaming console” is used to distinguish the primary use of the device (i.e. PC, tablet, gaming console). Gaming consoles come in a variety of sized from handhelds to home computers.

Figure 197. Supply Chain – Gaming Consoles

### Game Console Supply Chain Semiconductors

<b>CPU</b> Toshiba (6502.JP) IBM (Wii) IBM (Xbox 360)
<b>CPU (Foundry)</b> IBM (Xbox 360) IBM (Wii) Chartered (CSM.SP) (Wii)
<b>CPU (Assembly + Test)</b> IBM (Xbox 360) AMKR (Xbox 360)
<b>Connector</b> Cheng Uei (2392.TW) (Xbox 360)
<b>HDD</b> Toshiba (6502.JP) (PS3) STX (Xbox 360)
<b>ODD</b> Panasonic Sony (6758.JP) (PS3) Toshiba (6502.JP) (Xbox 360) SEC (005930.KS) (Xbox 360) Lite-On Tech (2301.TW) (Xbox 360)
<b>Memory (ROM)</b> Macronix (2337.TW) (PS3) Macronix (2337.TW) (Wii)
<b>Memory (1T-SRAM)</b> MoSys (MOYS) (Wii)
<b>Main Memory (256MB DRAM)</b> SEC (005930.KS) (Wii)
<b>Memory (XDR)</b> SEC (005930.KS) (PS3) Elpida (6665.JP) (PS3)
<b>Memory (GDDR3)</b> SEC (005930.KS) (PS3) SEC (005930.KS) (Xbox 360) IFX (Xbox 360)

### Semiconductors (ctd)

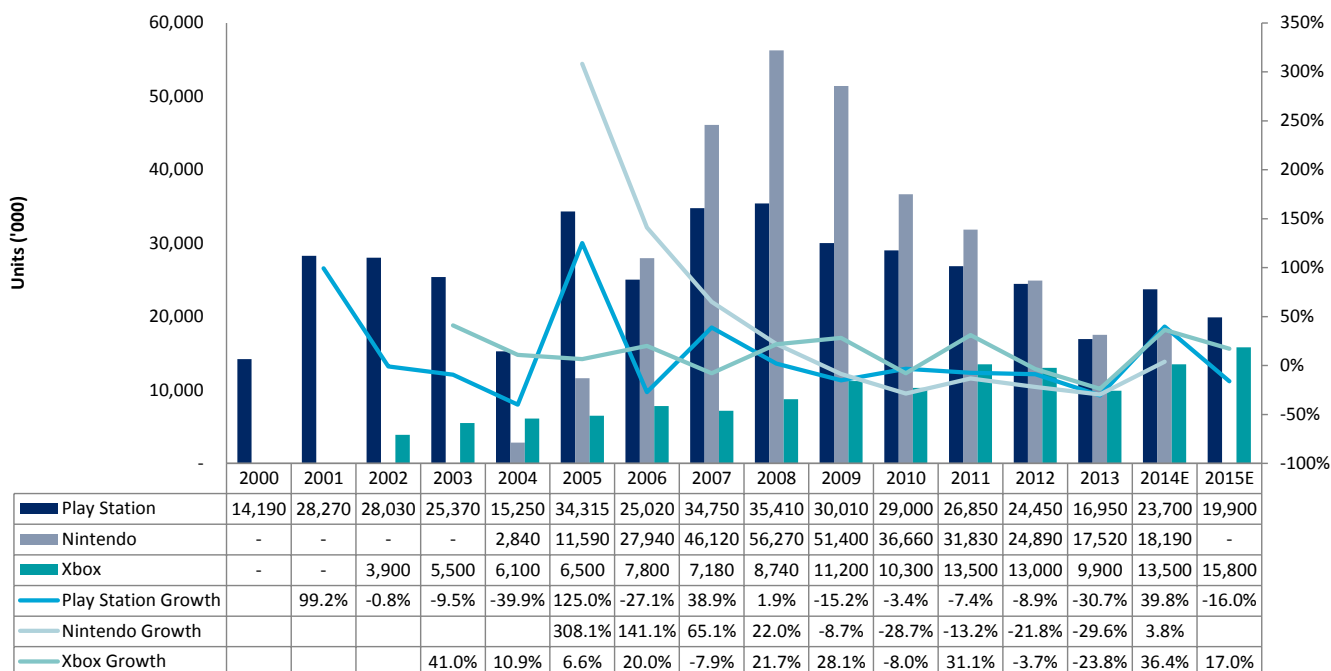
<b>GPU</b> NVDA (PS3) AMD (Xbox 360) Renesas (6723.JP) (Xbox 360) AMD (Wii)
<b>GPU (Foundry)</b> TS semicon (PS3) TSMC (2330.TW) (Xbox 360) Renesas (6723.JP) (Wii)
<b>GPU (Assembly + Test)</b> TS semicon (PS3) ASE (2311.TW) (Xbox 360)
<b>Southbridge</b> Toshiba (6502.JP) (PS3) SIS (2363.TW) (Xbox 360) Renesas (6723.JP) (Wii)
<b>Southbridge (Foundry)</b> UMC (2303.TW) (Xbox 360) TS semicon (PS3)
<b>Southbridge (Assembly + Test)</b> Sony (6758.JP) (PS3)
<b>WLAN</b> BRCM (PS3) ATHR (Xbox 360) (acquired by Qualcomm) IFX (Xbox 360) Askey (2366.TW) (Xbox 360) BRCM (Wii)
<b>Analog</b> ISIL (PMD/PWM) ONNN (AC/DC adaptor) SLAB (Wireless MCU)

### Components

<b>Lens</b> Newmax (3630.TW) Xbox 360-Kinect
<b>Power Supply</b> NJRC (6911.JP) (PS3) Chicony (2385.TW) (Xbox 360) Delta (2308.TW) (PS3) Delta (2308.TW) (Xbox 360) Lite-On Tech (2301.TW) (Xbox 360)
<b>Power Cable</b> I-sheng (6115.TW) (PS3) Ji-Haw (3011.TW) (Xbox 360)
<b>PCB</b> Compeq (2313.TW) (PS3) NYPCB (8046.TW) (PS3) HannStar Board (5469.TW) (Xbox 360) YuFo (6194.TW) (Xbox 360)
<b>Package Substrate</b> Shinko (6967.JP) (PS3) Ibiden (4062.JP) (PS3) Shinko (6967.JP) (Xbox 360) Ibiden (4062.JP) (Xbox 360) PPT (2446.TW) (Xbox 360) NYPCB (8046.TW) (Xbox 360)
<b>Assembly</b> Sony (6758.JP) (PS3) Hon Hai (2317.TW) (PS3) Asustek (2357.TW) (PS3) CLS (Xbox 360) FLEX (Xbox 360) Nintendo (7974.JP) (Wii) Foxconn Tech (2354.TW) (Wii) Hoshiden (6804.JP) (Wii)
<b>Casing</b> FLEX (Xbox 360) Hon Hai (2317.TW) (Xbox 360)
<b>Bluetooth</b> CSR (CSR.LN) (PS3)
<b>End Products</b>
<b>Game Consoles</b> Nintendo (7974.JP) (Wii) IBM (Xbox 360) Sony (6758.JP) (PS3)
<b>Controller</b> Cheng Uei (2392.TW) (PS3) KYE (PS3)

Source: Citi Research

Figure 198. Historical Console Unit Sales by Brand



Source: Citi Research

Note: Play Station including PS1, PS2, PS3, PS4, PSP, & PSV; Nintendo including DS, Wii, & Wii U; Xbox including Xbox 1, Xbox 360, & Xbox One.

Figure 199. Preliminary Xbox One Cost Estimate by Subsystem (in US Dollars)

	Xbox One	PlayStation 4
Components / Hardware Elements	Xbox One Cost Estimates	PS4 Cost Estimates
Retail Pricing	\$ 499.00	\$ 399.00
Total BOM Cost	\$ 457.00	\$ 372.00
Manufacturing Cost	\$ 14.00	\$ 9.00
BOM + Manufacturing	\$ 471.00	\$ 381.00
Major Cost Drivers		
Console		
CPU/GPU	\$ 110.00	\$ 100.00
DRAM	\$ 60.00	\$ 88.00
Internal Power Supply		\$ 20.00
Optical Drive	\$ 32.00	\$ 28.00
Hard Drive	\$ 37.00	\$ 37.00
Mechanical / Electro-Mechanical	\$ 43.00	\$ 35.00
Other (Electronic Content)	\$ 50.00	\$ 40.00
Console Sub Total	\$ 332.00	\$ 348.00
Controller	\$ 15.00	\$ 18.00
Kinect	\$ 75.00	
Power Supply	\$ 25.00	
Other Box Contents	\$ 10.00	\$ 6.00

Source: IHS Technology Teardown Research (November 2013)

Figure 200. Xbox One Key Vendors and Parts (in Descending Order of Surface Area)

Assembly	Location	Qty	MfgName	MfgPartNbr	Preliminary Description
Console Main PCB	Top	1	AMD	X877045-001	CPU / GPU, 8-Core AMD Jaguar, 28nm
Console Main PCB	Top	1	TOSHIBA	X861949-005	I/O Controller
Console Main PCB	Top	1	SK HYNIX INC	H26M42003GMR	Flash, eMMC NAND, 8GB, MLC
Console Main PCB	Top	16	SK HYNIX INC	H5TQ4G63AFR-TEC	SDRAM, DDR3-2133, 4Gb, 1.5V
Console Main PCB	Top	1	REALTEK SEMICONDUCTOR CORP	RTL8151GNM	Ethernet Controller
Console Main PCB	Top	1	ON SEMICONDUCTOR	NCP4204	Regulator, DC-DC Controller
Console Main PCB	Top	1	TEXAS INSTRUMENTS INC	TPS54526PWPR	Regulator, DC-DC Converter, Synchronous Step-Down, 0.76V to 5.5V Output, 5.5A, 650-kHz Switching Frequency
Console Main PCB	Top	1	TEXAS INSTRUMENTS INC	TPS2590RSA	Load Switch, Integrated MOSFET, 5.5A High-Current
Console Main PCB	Top	1	TEXAS INSTRUMENTS INC	TPS54218RTE	Regulator, DC-DC Converter, Synchronous Step-Down, 2A, 200kHz to 2MHz Switching Frequency
Console Main PCB	Top	4	TEXAS INSTRUMENTS INC	TPS53819ARGT	Regulator, DC-DC Controller, Synchronous Step-Down, 0.6V to 5.5V Output, w/ Built-in 5V LDO
Console Main PCB	Top	1	ON SEMICONDUCTOR	NCP5269MNTWG	Regulator, DC-DC Controller, Synchronous Step-Down, 0.65V to 1.5V Output, ±1% System Accuracy, w/ Auto Power Saving Mode & 2-Bit VID Inputs for System Agent
Kinect Main PCB	Top	1	ST MICROELECTRONICS	X871141-001	Video / Image Processor
Kinect Main PCB	Top	1	SAMSUNG SEMICONDUCTOR INC	K4B1G1646G-BYH9	SDRAM, DDR3-1333, 1Gb, 1.5V
Kinect Main PCB	Top	1	TEXAS INSTRUMENTS INC	TPS54225PWP	Regulator, DC-DC Converter, Synchronous Buck, 0.76V to 5.5V Output, 2A
Kinect Main PCB	Top	1	TEXAS INSTRUMENTS INC	TPS54325PWP	Regulator, DC-DC Converter, Synchronous Buck, 0.76V to 5.5V Output, 3A
Kinect Main PCB	Top	1	ON SEMICONDUCTOR	NCP6922CCMTXG	Regulator, DC-DC Converter, Dual, Step-Down, 0.6V to 3.3V Output, 800mA, w/ 2 x 150 mA LDOs
Kinect Main PCB	Top	1	ON SEMICONDUCTOR	NCP6922CBMTXG	Regulator, DC-DC Converter, Dual, Step-Down, 0.6V to 3.3V Output, 800mA, w/ 2 x 150 mA LDOs
Optical Drive Controller PCB	Bottom	1	NUVOTON TECHNOLOGY CORP	ISD9160FI	MCU, 32-bit ARM Cortex-M0, 50MHz, 145KB Flash, 12KB SRAM, UART/SPI/I2C
Combo Module (WiFi/BT)	Top	1	MARVELL SEMICONDUCTOR INC	88W8897M-NMJ2	Bluetooth / NFC / WLAN, SoC, IEEE802.11a/b/g/n/ac, 2x2 MIMO, Bluetooth 4.0+HS
Combo Module (WiFi/BT)	Top	1	MARVELL SEMICONDUCTOR INC	88W8782U-NAP2	WLAN, SoC, IEEE 802.11a/g/b/n, 1x1 SISO

Source: IHS Technology Teardown Research (November 2013)

Figure 201. Sony Play Station 4 Key Vendors and Parts (in Descending Order of Component Value)

Sony PlayStation 4 Key Vendors and Parts (in Descending Order of Component Value)

November 2013					
Assembly	Location	Qty	Manufacturer	Part Number	Preliminary Description
Controller PCB	Top	1	Fujitsu Semiconductor Ltd	MB9BF002	MCU, 32-Bit, ARM Cortex-M3 Core
Controller PCB	Bottom	1	Wolfson Microelectronics Ltd	WM1801G	Audio Codec
Controller PCB	Top	1	Qualcomm Atheros Inc	AR3002-BL3D	Bluetooth, Single Chip, Bluetooth V4.0+HS
Controller PCB	Top	1	Rohm Co Ltd		Power Management IC
Controller PCB	Bottom	1	Bosch Sensortec GmbH	BMI055	Inertial Sensor, 12-Bit 3-Axis Accelerometer plus 16-bit 3-Axis Gyroscope, 6-DoF, Digital Output
Console Main PCB	Bottom	1	Sony Corp (AMD)	CXD90026G	CPU, 8-Core AMD Jaguar, with AMD Radeon GPU, 28nm
Console Main PCB	Bottom	1	Sony Corp (Marvell)	CXD90025G (88EC120-BNS2)	Network Processor - I/O Bridge Controller
Console Main PCB	Bottom	1	TBD	TBD	ASIC
Console Main PCB	Top	8	Samsung Semiconductor Inc	K4G41325FC-HC03	Graphics DRAM, GDDR5, 4Gb
Console Main PCB	Bottom	8	Samsung Semiconductor Inc	K4G41325FC-HC03	Graphics DRAM, GDDR5, 4Gb
Console Main PCB	Top	1	Panasonic Corp	MN86471A	HDMI Transmitter
Console Main PCB	Top	1	Genesys Logic Inc	GL3520	USB Hub Controller, USB 3.0, 4-Port
Console Main PCB	Bottom	1	Samsung Semiconductor Inc	K4B2G1646E-BCK0	SDRAM, DDR3, 2Gb, 1.5V
Console Main PCB	Bottom	1	Macronix International Co Ltd	MX25L25635EM1-100	Flash, NOR, 256Mb, SPI
Console Main PCB	Bottom	1	Marvell Semiconductor Inc	88W8797-BMP2	Bluetooth / FM / WLAN, SoC, IEEE802.11 a/b/g/n, Bluetooth 4.0+HS, FM Radio Receiver and Transmitter
Console Main PCB	Bottom	1	Marvell Semiconductor Inc	88EC060-NN82	Ethernet Controller
Console Main PCB	Top	1	International Rectifier Corp		Regulator
Console Main PCB	Bottom	1	Fujitsu Semiconductor Ltd		MCU
Console Main PCB	Top	1	Winbond Electronics Corp		Flash, NOR, 1Mb, SPI
Console Main PCB	Bottom	2	Skyworks Solutions Inc	SE2614BT	FEM, WLAN 2.4GHz, IEEE802.11 b/g/n, with Integrated PAM, Power Detector and SP3T Switch
Optical Driver Controller PCB	Top	1	Renesas Electronic Corp	R8J32841FP1	ASIC
Optical Driver Controller PCB	Bottom	1	Rohm Co Ltd	BD7763EFV	Motor Driver IC
Optical Driver Controller PCB	Bottom	1	Rohm Co Ltd	BD9685	Regulator, DC-DC Controller
Optical Driver Controller PCB	Bottom	1	STMicroelectronics	STM8ED	MCU, 8-Bit, 130nm

Source: IHS Technology Teardown Research (November 2013)

## Telecommunications Equipment & Networking

Our Communications Equipment coverage spans several subsectors including Data Networking (Cisco, Juniper, F5 Networks, Riverbed Technologies), Optical (Ciena, Infinera, JDSU, Finisar, Oclaro) and Telecommunication Equipment (Ericsson, Alcatel, Arris, Adtran, Polycom, Tellabs).

Data Networking allows the exchange of information through communications protocols between interconnected computers. The overall data networking category is dominated by routers and switches, accounting for nearly 80% of total industry product revenues. After more than two decades, we believe data networking is a mature, pro-cyclical growth industry, highly correlated to overall corporate IT spending. Against this backdrop, we believe growth opportunities still exist in the carrier market given the still incomplete move to IP-based networks and Layer 4-7 switching/routing.

The optical market can be segmented in two broad swaths: legacy SONET/SDH equipment and wave division multiplexing equipment (WDM). The shortcomings of SONET/SDH include high capital costs, difficulty in provisioning new services, the need for redundant fiber pairs, and legacy costs. Wave Division Multiplexing (WDM) was developed in response to the capacity limitations and expense (capital and operating) inherent in SONET/SDH. In a WDM environment, multiple individual lightwaves of different frequencies (colors) are combined into one stream that is sent down a single fiber. This allowed for a significant boost in capacity compared to legacy SONET/SDH networks. The DWDM market can be further explained by segmenting the market into Metro versus Long Haul and by examination of the ROADM (reconfigurable add/drop multiplexer). Metro systems generally transmit over distances of less than 100Km, and do not require amplification devices, while Long Haul systems generally transmit data over distances greater than 100Km, and have at least one amplifier in a span.

Telecommunication Equipment companies provide a wide suite of products and services for both residential and business customers including optical, unified communications, broadband, access and transport products. In our view, telecommunication spending will likely be focused on the move to 100G coherent transport, OTN switching and carrier routing.

Figure 202. Semi-Analysis Telecom Equipment

	LAN Switches		FTTX CPE		Transport Infrastructure		Service Provider Routers and Switches		Enterprise WAN		WLAN Infrastructure		Mobile Infrastructure	
Units (M, 2013)	429.9		36.1		0.6		0.1		6.8		114.5		1.1	
Factory Average Selling Price	\$44.81		\$139.11		\$23,300.28		\$103,530.56		\$1,873.63		\$90.30		\$31,296.00	
	Semiconductor Content	Share of Total Semi-Content Cost	Semiconductor Content	Share of Total Semi-Content Cost	Semiconductor Content	Share of Total Semi-Content Cost	Semiconductor Content	Share of Total Semi-Content Cost	Semiconductor Content	Share of Total Semi-Content Cost	Semiconductor Content	Share of Total Semi-Content Cost	Semiconductor Content	Share of Total Semi-Content Cost
General Purpose	\$2.58	39%	\$17.05	49%	\$1,093.13	38%	\$4,864.21	51%	\$136.70	45%	\$4.49	29%	\$1,394.19	60%
Memory	\$0.54	8%	\$1.47	4%	\$105.72	4%	\$923.12	10%	\$18.20	6%	\$0.35	2%	\$28.67	1%
Microcomponent	\$0.45	7%	\$2.37	7%	\$119.42	4%	\$697.03	7%	\$39.12	13%	\$0.19	1%	\$486.16	21%
Logic IC	\$0.36	5%	\$0.24	1%	\$354.10	12%	\$1,189.95	13%	\$26.09	9%	\$0.09	1%	\$711.48	31%
Analog IC	\$0.69	11%	\$3.56	10%	\$201.41	7%	\$1,019.22	11%	\$25.39	8%	\$3.19	21%	\$107.12	5%
Discrete	\$0.43	7%	\$1.81	5%	\$107.67	4%	\$405.55	4%	\$19.27	6%	\$0.35	2%	\$40.92	2%
Optical	\$0.10	2%	\$7.61	22%	\$204.81	7%	\$629.33	7%	\$8.63	3%	\$0.31	2%	\$19.83	1%
Nonoptical Sensors	\$0.00	0%	\$0.00	0%	\$1.89	0%	\$1.23	0%	\$0.12	0%	\$0.00	0%	\$2.38	0%
Application Specific	\$3.95	61%	\$17.97	51%	\$1,764.05	62%	\$4,606.78	49%	\$165.23	55%	\$10.93	71%	\$929.97	40%
ASIC	\$1.64	25%	\$0.00	0%	\$565.36	20%	\$2,913.52	31%	\$54.65	18%	\$0.26	2%	\$426.35	18%
ASSP	\$2.31	35%	\$17.97	51%	\$1,198.69	42%	\$1,693.27	18%	\$110.58	37%	\$10.67	69%	\$503.62	22%
Total	\$6.53	100%	\$35.02	100%	\$2,859.07	100%	\$9,472.22	100%	\$302.05	100%	\$15.41	100%	\$2,326.54	100%
Total Semi-Content as % of Total	15%		25%		12%		9%		16%		17%		7%	

Source: Gartner (Dec 2013)



**Figure 203. Top 20 Companies Revenue from Shipments of Total Memory - Communications - Wired**

Company Name	2013 Share (%)
Micron Technology	43%
Broadcom	9%
Samsung Electronics	8%
Winbond Electronics	6%
Renesas Electronics	5%
Macronix International	4%
Spansion	4%
Cypress Semiconductor	4%
Toshiba	2%
SK Hynix	2%
GSI Technology	2%
Nanya Technology	2%
GigaDevice Semiconductor	2%
Etron Technology	1%
Atmel	1%
Integrated Silicon Solution	1%
Integrated Device Technology	1%
Elite Semiconductor Memory Technology	1%
Elpida Memory	1%
Others	2%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 204. Top 20 Companies Revenue from Shipments of Total Microcomponents - Communications - Wired**

Company Name	2013 Share (%)
Freescale Semiconductor	23%
Cypress Semiconductor	9%
Cavium Networks	9%
Texas Instruments	8%
CEC Huada Electronic Design	8%
Broadcom	7%
Intel	7%
Microchip Technology	6%
Renesas Electronics	3%
NXP	3%
Atmel	3%
Applied Micro Circuits	3%
Analog Devices	2%
AMD	2%
Silicon Laboratories	2%
Toshiba	1%
Infineon Technologies	1%
Sony	1%
Panasonic	1%
Fujitsu Semiconductor	0%
Others	1%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 205. Top 17 Companies Revenue from Shipments of Total General Purpose Logic - Communications - Wired**

Company Name	2013 Share (%)
Xilinx	44%
Altera	36%
Texas Instruments	10%
Lattice Semiconductor	7%
Fairchild Semiconductor	1%
Maxim Integrated Products	1%
Toshiba	1%
Microsemi	1%
NXP	1%
Integrated Device Technology	0%
Pioneer Micro Technology	0%
Angstrom	0%
Pericom Semiconductor	0%
Atmel	0%
Rohm	0%
STMicroelectronics	0%
Cypress Semiconductor	0%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 206. Top 20 Companies Revenue from Shipments of Total Analog - Communications - Wired**

Company Name	2013 Share (%)
Texas Instruments	37%
Maxim Integrated Products	16%
Linear Technology	7%
Analog Devices	6%
Integrated Device Technology	3%
Monolithic Power Systems	3%
International Rectifier	2%
Richtek Technology	2%
Power Integrations	2%
Diodes	2%
Intersil	2%
Volterra	2%
Pericom Semiconductor	2%
Fairchild Semiconductor	2%
STMicroelectronics	2%
ON Semiconductor	2%
Renesas Electronics	1%
Micrel Semiconductor	1%
O2Micro	1%
Microchip Technology	1%
Others	7%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 207. Top 20 Companies Revenue from Shipments of Total Discrete - Communications - Wired**

<b>Company Name</b>	<b>2013 Share (%)</b>
Toshiba	16%
Fairchild Semiconductor	12%
Vishay	11%
STMicroelectronics	10%
International Rectifier	9%
Rohm	7%
Diodes	7%
ON Semiconductor	6%
Infineon Technologies	2%
M/A-COM Technology Solutions	2%
Jilin Sino-Microelectronics	2%
Microsemi	2%
IXYS	2%
Semtech	2%
Lite-On Semiconductor	2%
Renesas Electronics	1%
Shindengen Electric	1%
NXP	1%
Panasonic	1%
Texas Instruments	1%
Others	3%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 208. Top 17 Companies Revenue from Shipments of Total Optoelectronics - Communications - Wired**

<b>Company Name</b>	<b>2013 Share (%)</b>
Mitsubishi	33%
Sumitomo Electric Device Innovations	21%
Sony	5%
NTT Electronics	4%
Vishay	4%
Rohm	4%
Toshiba	4%
Renesas Electronics	3%
Kodenshi	1%
Fairchild Semiconductor	1%
Hamamatsu Photonics	1%
Nichia	1%
Capella Microsystems	1%
Panasonic	0%
Stanley Electric	0%
ON Semiconductor	0%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 209. Top Company Revenue from Shipments of Nonoptical Sensors - Communications - Wired**

<b>Company Name</b>	<b>2013 Share (%)</b>
Maxim Integrated Products	100%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014



**Figure 210. Communications – Wired ASIC Vendor Market Share By Revenue**

Company	Market Share 2013
IBM Microelectronics	21.9%
HiSilicon Technologies	14.7%
STMicroelectronics	7.4%
LSI	5.8%
Texas Instruments	5.6%
Global Unichip	2.6%
Open-Silicon	1.8%
Fujitsu Semiconductor	1.4%
ON Semiconductor	1.2%
eSilicon	1.1%
Renesas Electronics	1.1%
Toshiba	0.9%
Samsung Electronics	0.8%
Marvell Technology Group	0.8%
IXYS	0.8%
MegaChips	0.8%
Hitachi	0.7%
TriQuint Semiconductor	0.7%
Altera	0.6%
Others	14.2%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, March 2014

**Figure 211. Communications – Wired ASSP Vendor Market Share By Revenue**

Company	Market Share 2013
Broadcom	34.5%
Marvell Technology Group	9.6%
Intel	5.8%
Texas Instruments	5.6%
Lantiq	5.4%
Realtek Semiconductor	3.2%
Semtech	3.1%
LSI	2.6%
Qualcomm	2.3%
Silicon Laboratories	2.2%
Entropic Communications	1.9%
Cortina Systems	1.6%
PMC-Sierra	1.4%
Vitesse Semiconductor	1.4%
Mindspeed Technologies	1.4%
Applied Micro Circuits	1.2%
Ikanos Communications	1.1%
Sigma Designs	1.1%
Conexant Systems	1.1%
MediaTek	1.1%
Others	12.4%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, March 2014

**Figure 212. Communications – Wired ASSP Vendor Market Share By Revenue**

Company	Market Share 2013
Xilinx	50.4%
Altera	41.2%
Lattice Semiconductor	7.6%
Microsemi	0.7%
Atmel	0.1%
Cypress Semiconductor	0.0%
<b>Total Market</b>	<b>100.0%</b>

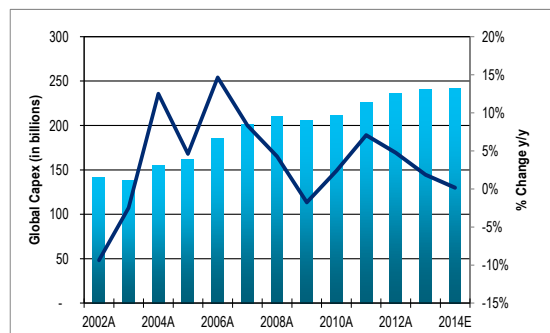
Source: Citi Research, Gartner, March 2014

Figure 213. Comm Equipment End Market Dashboard

2013 - 2017									
Annual Summary	2010A	2011A	2012A	2013E	2014E	2015E	2016E	2017E	CAGR
Carrier Ethernet	6,762	7,638	8,176	8,632	9,083	9,580	10,035	10,418	5%
Routers	3,894	4,683	5,170	5,625	NM	NM	NM	NM	NM
Switches	2,869	2,955	3,006	3,007	NM	NM	NM	NM	NM
Routing	11,873	12,810	12,671	12,937	13,613	14,358	15,040	15,614	5%
Service Provider Core Routing	2,726	2,811	2,529	2,700	2,940	3,180	3,310	3,380	6%
Service Provider Edge Routing	5,853	6,582	6,736	6,740	7,040	7,390	7,800	8,190	5%
High-End Enterprise Routing	531	671	733	744	781	828	878	922	6%
Access Enterprise Routing	2,763	2,745	2,672	2,753	2,852	2,960	3,052	3,122	3%
Switching	20,068	20,058	20,931	22,315	23,819	24,568	24,875	24,874	3%
Fixed Switches	8,439	7,210	6,873	6,614	6,398	6,323	6,306	6,348	-1%
Modular Switches	11,629	12,848	14,058	15,701	17,422	18,245	18,569	18,526	4%
Mobile RAN	30,734	35,250	31,701	32,710	32,875	32,509	32,024	31,548	-1%
GSM	10,504	10,317	6,751	4,884	4,187	3,275	2,402	1,743	-23%
CDMA	4,140	5,430	3,815	2,720	2,051	1,577	1,145	816	-26%
WCDMA	14,712	16,551	14,441	13,604	13,897	13,718	13,217	12,765	-2%
WiMAX	974	706	347	195	156	127	92	62	-25%
LTE Total	404	2,247	6,347	11,306	12,583	13,812	15,169	16,162	9%
Optical	\$12,179	\$13,273	\$12,678	\$12,698	\$13,246	\$13,865	\$14,583	\$15,280	5%
DWDM Long Haul Terrestrial (LH)	\$2,854	\$3,171	\$3,522	\$3,922	\$4,354	\$4,800	\$5,291	\$5,812	10%
WDM Metro	\$3,280	\$4,145	\$4,358	\$4,663	\$5,270	\$5,812	\$6,357	\$6,795	10%
Multiservice Multiplexer	\$5,298	\$5,317	\$4,386	\$3,643	\$3,078	\$2,643	\$2,252	\$1,924	-15%
Optical Switch	\$747	\$641	\$412	\$470	\$544	\$610	\$684	\$749	12%
WLAN	\$5,374	\$6,417	\$7,517	\$8,693	\$9,546	\$10,396	\$11,151	\$11,817	8%
Outdoor	\$130	\$166	\$252	\$322	\$356	\$377	\$401	\$432	8%
Enterprise	\$2,163	\$2,852	\$3,455	\$3,977	\$4,409	\$4,927	\$5,461	\$5,900	10%
SOHO	\$3,080	\$3,399	\$3,809	\$4,395	\$4,781	\$5,092	\$5,289	\$5,485	6%
Access	\$9,632	\$10,342	\$10,449	\$10,511	\$10,668	\$10,687	\$10,714	\$10,737	1%
ADC	1,197	1,407	1,594	1,679	1,850	2,000	2,160	2,315	8%
Physical	1,184	1,365	1,512	1,484	1,556	1,623	1,641	1,558	1%
Virtual	13	42	82	195	294	377	519	757	40%
WAN Optimization	957	1,057	1,081	1,145	1,232	1,333	1,435	1,540	8%
Physical	936	1,032	1,020	1,028	1,021	1,007	985	940	-2%
Virtual	22	25	61	117	211	326	450	600	51%
Security	7,313	7,398	7,787	8,185	8,703	9,267	9,840	10,415	6%
Carrier IP Telephony	8,387	7,936	6,959	6,100	6,115	6,058	6,078	6,201	0%
Storage / SAN Switch	2,501	2,546	2,563	2,617	2,663	2,691	2,712	2,700	1%
Switches	1,816	1,848	1,935	2,000	2,035	2,054	2,075	2,070	1%
Adapters	685	698	628	617	628	637	637	630	1%
Microwave	4,646	4,765	4,196	4,168	4,326	4,460	4,614	4,724	3%
TDM	854	632	315	195	126	83	51	29	-38%
Packet	645	716	626	646	683	744	813	896	9%
Hybrid	3,147	3,417	3,256	3,326	3,517	3,633	3,750	3,799	3%
TOTAL COMM EQUIP MARKET TAM	121,623	130,897	128,301	132,390	137,739	141,772	145,262	148,183	3%

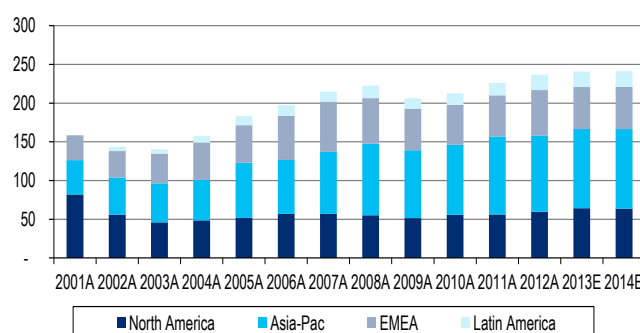
Source: Citi Research

Figure 214. Global Carrier Capex Trend



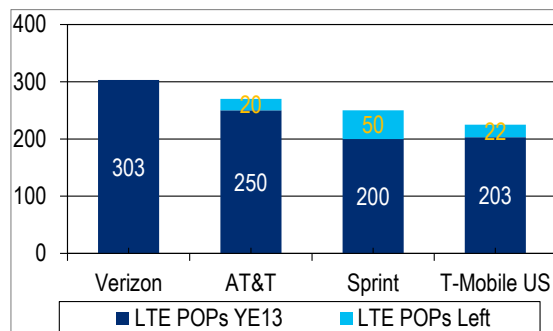
Source: Citi Research

Figure 215. Global Capex Trends by Region



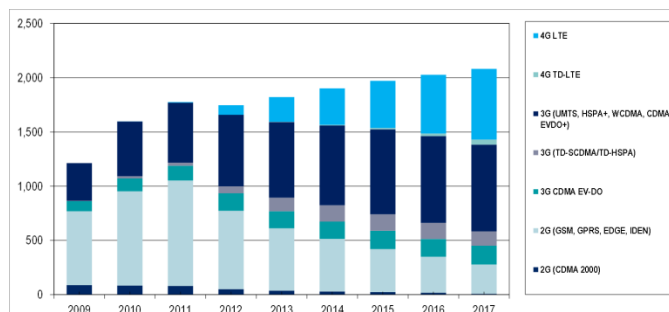
Source: Citi Research

Figure 216. N. America 4G Wireless Deployments



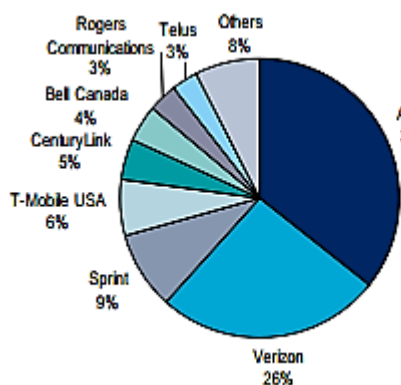
Source: Citi Research

Figure 217. China Wireless Trends



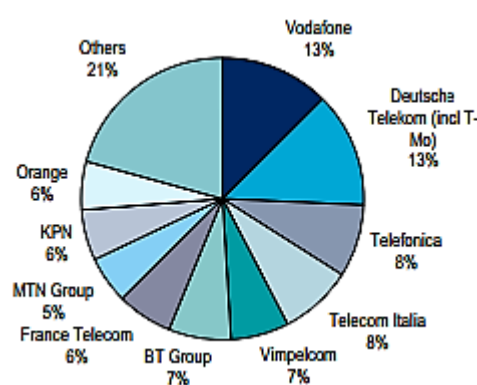
Source: Citi Research

Figure 218. North America Carrier Capex



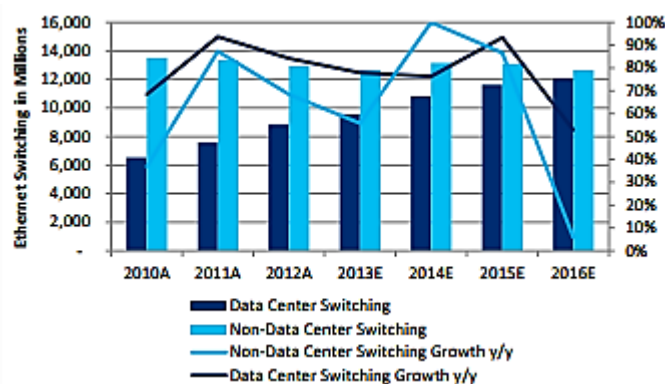
Source: Citi Research, Company Data

Figure 219. Europe Carrier Capex



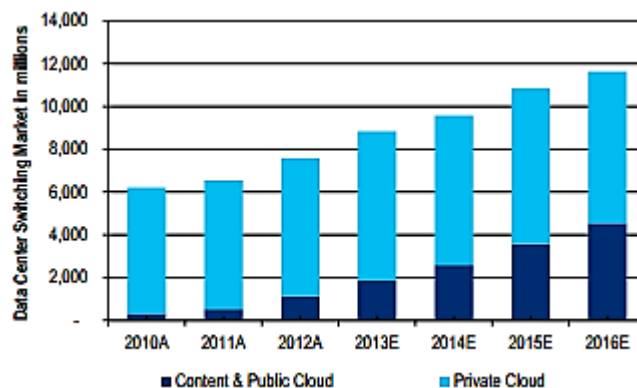
Source: Citi Research, Company Data

Figure 220. Data Center is Fastest Growing Piece of Switching Market



Source: Citi Research

Figure 221. Data Center End Market



Source: Citi Research

## Printing

A printer is a peripheral that is either directly or indirectly connected to a computer workstation via a network. Multi function printers can perform several functions in addition to printing including copying and faxing. Single function printers only print. Printers typically are inkjet or laser. Inkjet printer use either a continuous, controlled flow of ink or a staccato ejection of ink, often referred to as "drop on demand." Ink is typically ejected through a multinozzled head. Laser printers replicate the image of an entire page on an intermediate medium (usually a photosensitive drum) before transferring it to paper. A laser-based device uses a laser as the scanning instrument.

Key printer vendors include Xerox, Canon, Ricoh, Samsung, Hewlett Packard, Lexmark and Brother.

Figure 222. Historical & Forecasted Printer Shipments (2012-2017E)

Shipments (in 000s) and Revenues in \$M							CAGR	
	2012	2013E	2014E	2015E	2016E	2017E	2007-2012	2012-2017E
Units								
Impact	4,305	4,255	3,799	3,449	3,045	2,862	1.5%	-7.8%
Inkjet	70,132	67,864	68,483	68,970	69,089	69,041	-5.2%	-0.3%
- of which MFP	59,161	58,369	59,922	61,057	61,790	62,229	-0.9%	1.0%
Laser	38,935	40,301	42,149	44,318	46,469	48,473	0.8%	4.5%
- of which MFP	18,476	19,966	21,626	23,499	25,370	27,105	9.1%	8.0%
Total Units (000s)	113,372	112,420	114,431	116,737	118,603	120,376	-3.2%	1.2%
- of which MFP	77,637	78,335	81,548	84,556	87,160	89,333	1.0%	2.8%
Revenues								
Impact	1,652	1,566	1,365	1,228	1,105	995	-1.5%	-9.6%
Inkjet	8,763	8,195	8,036	7,953	7,837	7,685	-5.0%	-2.6%
- of which MFP	7,433	7,006	6,985	6,991	6,956	6,873	-2.5%	-1.6%
-of which standalone printers	1,329	1,189	1,051	962	881	812	-14.5%	-9.4%
Laser	47,401	47,240	48,390	49,134	49,293	48,861	0.7%	0.6%
- of which MFP	38,074	38,335	39,519	40,208	40,350	39,954	3.0%	1.0%
- of which standalone printers	9,327	8,906	8,870	8,927	8,943	8,907	-6.3%	-0.9%
Total Revenues (\$M)	57,816	57,001	57,790	58,315	58,235	57,540	-0.4%	-0.1%
- of which MFP	45,507	45,341	46,504	47,199	47,306	46,827	2.0%	0.6%

Source, IDC Nov 2013

Source: IDC

Figure 223. Page Volume Trends

	09-12	12-17
	CAGR	CAGR
WW	1.5%	0.4%
NA	-2.5%	-4.2%
WE	-1.7%	-2.0%
LA	11.9%	3.5%
CEMA	5.9%	2.5%
AP	5.2%	4.4%

2.9 Trillion pages printed in 2013

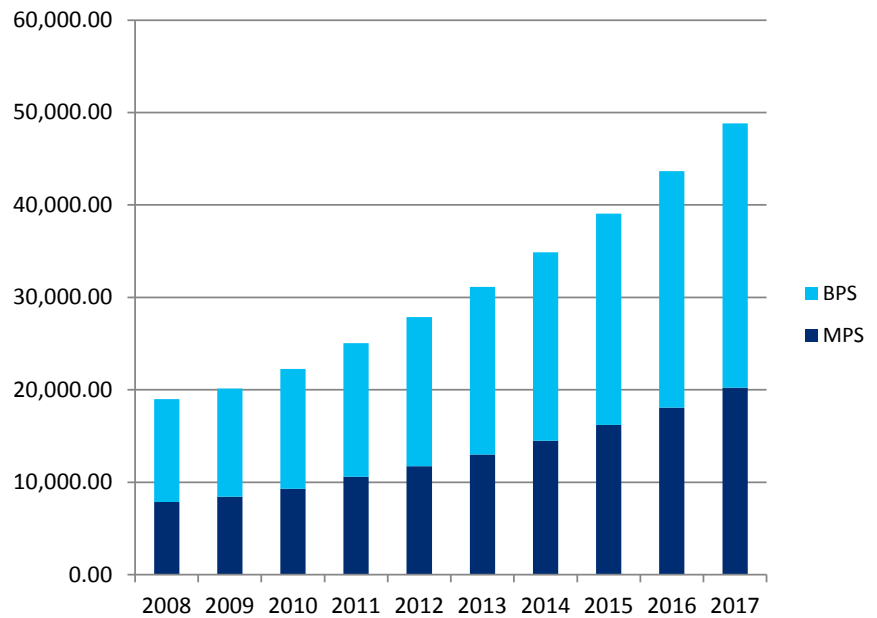
Source: IDC

Figure 224. Color Production Printers (Value of Shipments in \$M)

Color Production (Value)	2012	2013	2014	2015	2016	2017	2012–2017 CAGR (%)
Very light production	300.4	323.1	344.5	362.8	376.9	388.4	5.3
Growth (%)	9.9	7.6	6.6	5.3	3.9	3.1	
Light production	1,574.00	1,597.10	1,712.50	1,821.90	1,938.20	2,057.50	5.5
Growth (%)	5.4	1.5	7.2	6.4	6.4	6.2	
Mid-production	521.3	524.2	526.4	528.5	532.6	539.7	0.7
Growth (%)	-16.5	0.5	0.4	0.4	0.8	1.3	
Full production	1,711.80	1,811.90	1,864.80	1,909.80	1,960.60	1,992.60	3.1
Growth (%)	4.1	5.8	2.9	2.4	2.7	1.6	
Full-production laser	1,169.30	1,186.30	1,198.20	1,202.70	1,212.00	1,216.20	0.8
Growth (%)	-0.5	1.5	1	0.4	0.8	0.3	
Full-production inkjet	542.5	625.5	666.6	707.1	748.6	776.4	7.4
Growth (%)	15.8	15.3	6.6	6.1	5.9	3.7	
<b>Total</b>	<b>4,107.50</b>	<b>4,256.20</b>	<b>4,448.20</b>	<b>4,623.00</b>	<b>4,808.30</b>	<b>4,978.30</b>	<b>3.9</b>
Growth (%)	1.8	3.6	4.5	3.9	4	3.5	

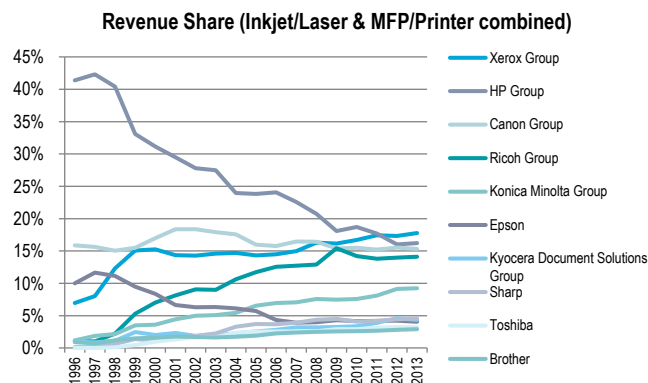
Source: IDC

Figure 225. Basic and Managed Print Services Market (\$M)



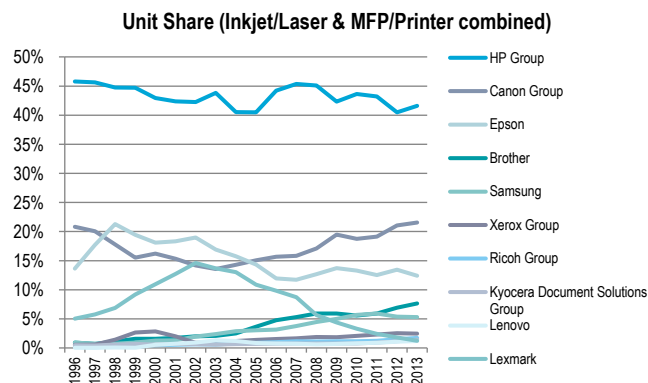
Source: IDC

Figure 226. Market Share For Printers+MFPs (Revenues)



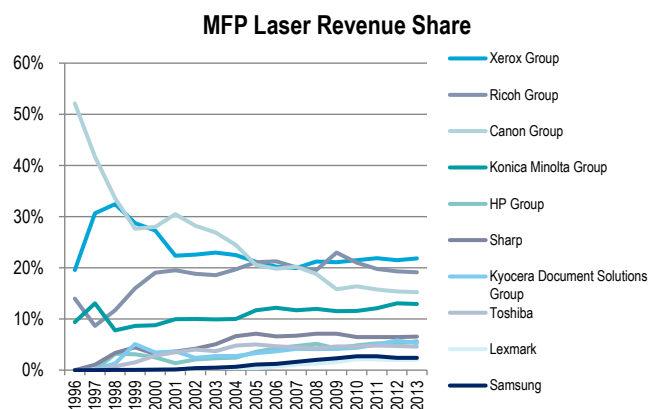
Source: IDC

Figure 227. Unit Market Share for Printers+MFPs



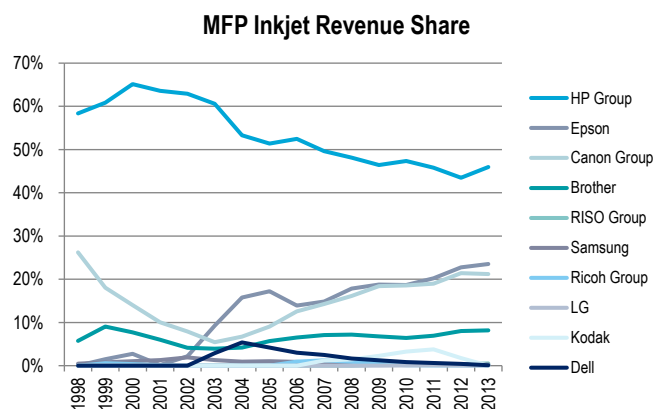
Source: IDC

Figure 228. Market Share for Laser MFPs



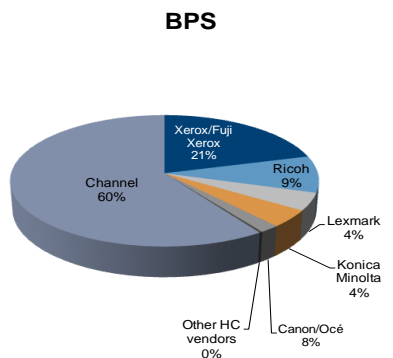
Source: IDC

Figure 229. Market Share for Inkjet MFPs



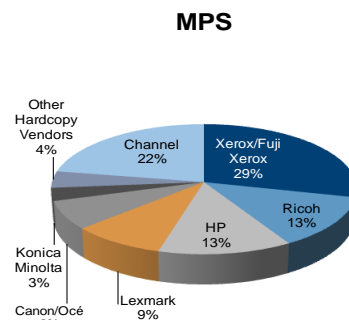
Source: IDC

Figure 230. Basic Print Services (BPS) Market Share



Source: IDC

Figure 231. Managed Print Services (MPS) Market Share



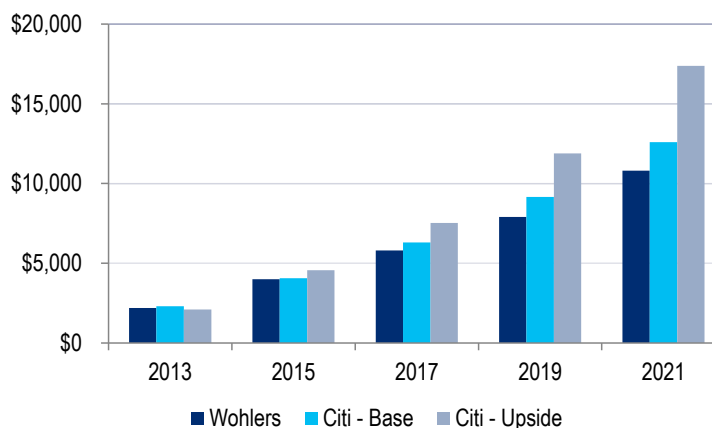
Source: IDC

## 3D Printing

The term 3D printing is defined as the fabrication of a product (such as an intricate jet engine part) through the deposition of a material or binder using a print head, nozzle or other printer technology. We view 3D printing as only one of several emerging additive manufacturing techniques—the terms 3D printing and additive manufacturing are essentially interchangeable. We believe the global market is approaching \$2bn, of which materials are nearly 30%. Wohlers Associates forecasts compound annual growth of over 20% while the Consumer Electronics Association (US) expects the industry to grow to \$5bn by 2017.

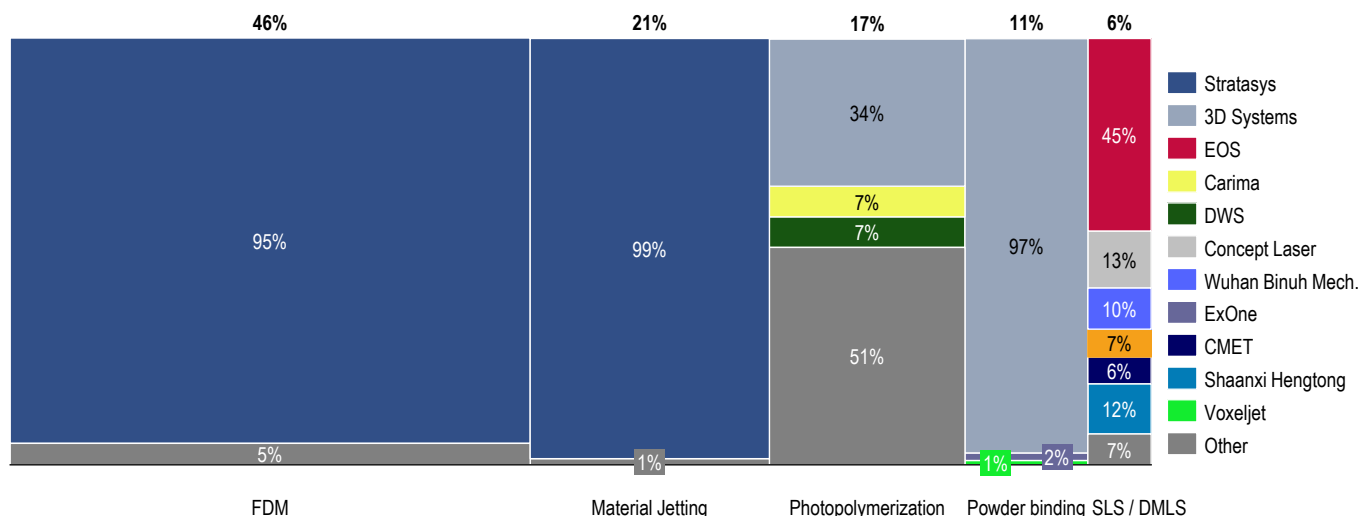
The two largest listed names in the US are 3D Systems (DDD) and Stratasys (SSYS), and are averaging organic growth of 21% with an additional lift from acquisitions. ExOne completed its IPO on Feb 7. We also expect more consolidation in this sector, as evidenced by GE Aviation's acquisition of Morris Technologies and Rapid Quality Manufacturing in November 2012.

Figure 232. 3D Printing Market



Source: Wohlers Associates, Citi Research

























Figure 233. 3D Printing Market Share



Source: Citi Research, Wohler Report 2013



Figure 234. Print Processes Tie to Applications

Print Process	Description	Companies	Materials	Strength	Surface Finish	Speed	Multi-material	Printer Cost	Materials Cost
<b>Fused-deposition modeling (FDM) / Material extrusion</b>	Thermoplastic filament is heated, liquefied and extruded through a nozzle. Process is repeated layer by layer until completion	Stratasys, 3D Systems (Cube), Most consumer desktop printers	ABS, ABSI, PLA, polycarbonate, Ultem					\$	\$
<b>Material Jetting / Multi-jetting</b>	Similar to 2D ink jet printers; Places droplets of photopolymers which are cured by UV light. Multi-material jetting capable	Stratasys (Connex), 3D System (Projet)	Photopolymers with plastic, rubber & wax properties					\$\$	\$\$
<b>Stereolithography (SLA)</b>	Liquid photopolymer is cured by an ultraviolet laser that is directed at the build platform by mirrors to control x-y axis. Requires post production curing.	3D Systems	Thermoplastic, wax, ceramics					\$\$	\$\$\$
<b>Digital Light Processing (DLP)</b>	Liquid photopolymer is cured by a projected image from high powered lamps or LEDs	Formlabs	Thermoplastic, wax, ceramics					\$	\$\$
<b>Powder Binding</b>	Micro powders of sand, plastic or metal is thinly spread out then bonded by jetted liquid adhesive. Significant post production powder removal & curing	3D Systems (ZCorp), Voxeljet, ExOne	Sand, plastic, ceramics, cement, metals					\$\$\$	\$
<b>Selective Laser Sintering (SLS)</b>	Focused laser beam melts and binds powdered plastics, waxes and/or metals	3D Systems, EOS, Arcam	Nylon, plastics, metals, ceramics, glass					\$\$\$	\$\$\$

Source: Citi Research

## Automotive/Aerospace

Automotive product cycles and major platform generally get refreshed every 3-4 years. This should be considered when looking at infotainment (for example GPS, bluetooth, DVD players) and regulatory requirements in the automotive space. Many electronic component companies are seeing an opportunity in Autos as electronic content growth historically reaches 7-10% annually (with Europe having the highest content per vehicle). While infotainment is likely to eventually become commoditized, looking at those companies with exposure to regulatory standard (MPG standards, emissions, sensors) will likely have a longer term opportunity.

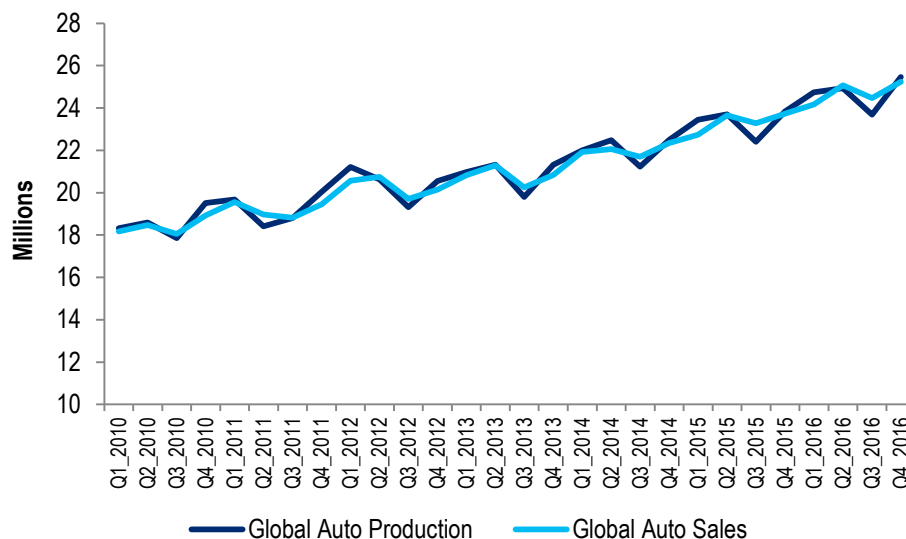
Similar to automotives, we see a transition in aerospace to include more infotainment options for passengers (for example, screens in the headrest and directTV). Additionally there is a much longer term trend to increase the use of electronics to reduce the weight of planes, support more efficient control tower to cockpit interactions, etc.

Figure 235. Citi Global Light Vehicle Registration Forecasts

Citigroup Global LV Forecasts	2010	% Chg	2011	% Chg	2012	% Chg	2013	% Chg	2014	% Chg	2015	% Chg	2016	% Chg
Germany	2,916	-23.4%	3,174	8.8%	3,083	-2.9%	2,973	-3.6%	3,024	1.7%	3,050	0.8%	3,080	1.0%
UK	2,031	1.8%	1,941	-4.4%	2,045	5.3%	2,237	9.4%	2,283	2.1%	2,375	4.0%	2,400	1.1%
France	2,252	-1.8%	2,205	-2.1%	1,899	-13.9%	1,790	-5.7%	1,807	0.9%	1,900	5.2%	2,000	5.3%
Italy	1,960	-9.7%	1,758	-10.3%	1,411	-19.7%	1,305	-7.5%	1,356	3.9%	1,350	-0.4%	1,400	3.7%
Spain	982	3.1%	808	-17.7%	693	-14.3%	725	4.7%	739	2.0%	760	2.8%	800	5.3%
Others	2,835	16.0%	2,931	3.4%	2,632	-10.2%	2,467	-6.3%	2,417	-2.0%	2,315	-4.2%	2,320	0.2%
<b>W Europe (Passenger cars)</b>	<b>12,976</b>	<b>-5.0%</b>	<b>12,816</b>	<b>-1.2%</b>	<b>11,762</b>	<b>-8.2%</b>	<b>11,497</b>	<b>-2.2%</b>	<b>11,626</b>	<b>1.1%</b>	<b>11,750</b>	<b>1.1%</b>	<b>12,000</b>	<b>2.1%</b>
W Europe (LCVs)	1,454	9.6%	1,559	7.3%	1,358	-12.9%	1,307	-3.7%	1,283	-1.9%	1,250	-2.6%	1,300	4.0%
<b>W Europe Total LV</b>	<b>14,430</b>	<b>-3.7%</b>	<b>14,376</b>	<b>-0.4%</b>	<b>13,120</b>	<b>-8.7%</b>	<b>12,805</b>	<b>-2.4%</b>	<b>12,909</b>	<b>0.8%</b>	<b>13,000</b>	<b>0.7%</b>	<b>13,300</b>	<b>2.3%</b>
E Europe ex-Russia Total	1,985	8.2%	2,109	6.2%	2,051	-2.8%	2,138	4.2%	2,213	3.5%	2,350	6.2%	2,400	2.1%
<b>Europe ex-Russia</b>	<b>16,415</b>	<b>-2.4%</b>	<b>16,485</b>	<b>0.4%</b>	<b>15,170</b>	<b>-8.0%</b>	<b>14,942</b>	<b>-1.5%</b>	<b>15,122</b>	<b>1.2%</b>	<b>15,350</b>	<b>1.5%</b>	<b>15,700</b>	<b>2.3%</b>
<b>USA Total</b>	<b>11,570</b>	<b>11.1%</b>	<b>12,742</b>	<b>10.1%</b>	<b>14,472</b>	<b>13.6%</b>	<b>15,612</b>	<b>7.9%</b>	<b>16,400</b>	<b>5.0%</b>	<b>17,000</b>	<b>3.7%</b>	<b>17,500</b>	<b>2.9%</b>
Canada	1,555	6.9%	1,578	1.5%	1,678	6.3%	1,745	4.0%	1,772	1.5%	1,800	1.6%	1,820	1.1%
Mexico	816	8.7%	899	10.2%	981	9.2%	1,056	7.6%	1,129	6.9%	1,200	6.3%	1,250	4.2%
China (Passenger cars)	11,901	36.5%	13,037	9.5%	14,236	9.2%	16,200	13.8%	17,930	10.7%	19,400	8.2%	20,500	5.7%
China (LCV)	5,338	26.0%	4,962	-7.0%	4,977	0.3%	5,131	3.1%	5,570	8.6%	5,800	4.1%	6,000	3.4%
<b>China Total</b>	<b>17,240</b>	<b>33.0%</b>	<b>18,000</b>	<b>4.4%</b>	<b>19,214</b>	<b>6.7%</b>	<b>21,330</b>	<b>11.0%</b>	<b>23,500</b>	<b>10.2%</b>	<b>25,200</b>	<b>7.2%</b>	<b>26,500</b>	<b>5.2%</b>
Japan	4,887	7.4%	4,134	-15.4%	5,269	27.5%	5,222	-0.9%	5,222	0.0%	5,200	-0.4%	5,200	0.0%
Brazil	3,325	8.1%	3,427	3.1%	3,634	6.0%	3,593	-1.1%	3,477	-3.2%	3,500	0.7%	3,550	1.4%
Argentina	633	32.7%	819	29.3%	801	-2.2%	894	11.7%	867	-3.1%	890	2.7%	930	4.5%
Russia	1,879	28.6%	2,646	40.8%	2,966	12.1%	2,762	-6.9%	2,736	-1.0%	2,850	4.2%	3,000	5.3%
Turkey	762		865	13.6%	778	-10.1%	834	7.2%	797	-4.5%	800	0.4%	820	2.5%
India	2,714	31.5%	2,933	8.1%	3,270	11.5%	2,908	-11.1%	2,916	0.3%	3,000	2.9%	3,100	3.3%
South Korea	1,519	7.5%	1,542	1.5%	1,508	-2.2%	1,510	0.1%	1,510	0.0%	1,560	3.3%	1,600	2.6%
Indonesia	682	55.9%	795	16.6%	1,014	27.6%	1,084	6.9%	1,116	3.0%	1,200	7.5%	1,250	4.2%
Other	9,498	18.6%	9,797	3.1%	10,345	5.6%	10,005	-3.3%	8,809	-11.9%	11,450	30.0%	13,780	20.3%
<b>Global LV Total</b>	<b>73,496</b>	<b>15.0%</b>	<b>76,661</b>	<b>4.3%</b>	<b>81,099</b>	<b>5.8%</b>	<b>83,497</b>	<b>3.0%</b>	<b>85,373</b>	<b>2.2%</b>	<b>91,000</b>	<b>6.6%</b>	<b>96,000</b>	<b>5.5%</b>
Global LCVs	11,049	22.3%	11,098	0.4%	11,383	2.6%	11,247	-1.2%	11,677	3.8%	11,500	-1.5%	12,000	4.3%
<b>Global Car Total</b>	<b>62,447</b>	<b>13.9%</b>	<b>65,563</b>	<b>5.0%</b>	<b>69,717</b>	<b>6.3%</b>	<b>72,250</b>	<b>3.6%</b>	<b>73,695</b>	<b>2.0%</b>	<b>79,500</b>	<b>7.9%</b>	<b>84,000</b>	<b>5.7%</b>
Emerging Markets	42,608	25.6%	45,409	6.6%	48,239	6.2%	49,858	3.4%	50,843	2.0%	55,800	9.8%	60,000	7.5%
Mature Markets	30,887	3.1%	31,252	1.2%	32,860	5.1%	33,639	2.4%	34,530	2.6%	35,200	1.9%	36,000	2.3%

Source: ACEA, Autodata, China Association of Automobile Manufacturers and Citi Research estimates

Figure 236. JD Power Units & Sales Outlook



Source: JD Power

Figure 237. Boeing & Airbus Deliver Forecast

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014E	2015E	2016E
737NG	202	212	302	330	290	372	376	372	415	440	476	504	504
747	15	13	14	16	14	8	0	9	31	24	22	18	18
767	9	10	12	12	10	13	12	20	26	21	12	14	24
777	36	40	65	83	61	88	74	73	83	98	100	100	100
787	0	0	0	0	0	0	0	3	46	65	110	127	132
Other	23	15	5	0	0	0	0	0	0	0	0	0	0
<b>Boeing</b>	<b>285</b>	<b>290</b>	<b>398</b>	<b>441</b>	<b>375</b>	<b>481</b>	<b>462</b>	<b>477</b>	<b>601</b>	<b>648</b>	<b>720</b>	<b>763</b>	<b>778</b>
% Y/Y Change	1%	2%	37%	11%	(15%)	28%	(4%)	3%	26%	8%	11%	6%	2%
A320	233	289	339	367	386	402	401	421	455	493	493	493	505
A330/A340	75	80	86	79	85	86	91	87	103	108	108	108	108
A350	0	0	0	0	0	0	0	0	0	0	2	22	55
A380	0	0	0	1	12	10	18	26	30	25	30	30	30
Other	12	9	9	6	0	0	0	0	0	0	0	0	0
<b>Airbus</b>	<b>320</b>	<b>378</b>	<b>434</b>	<b>453</b>	<b>483</b>	<b>498</b>	<b>510</b>	<b>534</b>	<b>588</b>	<b>626</b>	<b>633</b>	<b>653</b>	<b>698</b>
% Y/Y Change	5%	18%	15%	4%	7%	3%	2%	5%	10%	6%	1%	3%	7%
Narrow	458	516	646	697	676	774	777	793	870	933	969	997	1,009
Wide	147	152	186	197	182	205	195	218	319	341	384	419	467
<b>Total</b>	<b>605</b>	<b>668</b>	<b>832</b>	<b>894</b>	<b>858</b>	<b>979</b>	<b>972</b>	<b>1,011</b>	<b>1,189</b>	<b>1,274</b>	<b>1,353</b>	<b>1,416</b>	<b>1,476</b>
% Y/Y Change	3%	10%	25%	7%	(4%)	14%	(1%)	4%	18%	7%	6%	5%	4%
<b>Y/Y Growth</b>													
Narrow	6%	13%	25%	8%	(3%)	14%	0%	2%	10%	7%	4%	3%	1%
Wide	(5%)	3%	22%	6%	(8%)	13%	(5%)	12%	46%	7%	13%	9%	11%
% Y/Y Change	3%	10%	25%	7%	(4%)	14%	(1%)	4%	18%	7%	6%	5%	4%

Source: Citi Research

**Figure 238. Top 20 Companies Revenue from Shipments of Total Memory - Automotive**

Company Name	2013 Share (%)
Micron Technology	30%
Spansion	15%
Integrated Silicon Solution	10%
Samsung Electronics	10%
Toshiba	8%
Seiko Instruments	5%
Nanya Technology	4%
Rohm	3%
SanDisk	3%
Cypress Semiconductor	3%
Macronix International	3%
SK Hynix	3%
STMicroelectronics	2%
Microchip Technology	1%
Atmel	0%
Elpida Memory	0%
Winbond Electronics	0%
ON Semiconductor	0%
Elite Semiconductor Memory Technology	0%
GSI Technology	0%
Ramtron International	0%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 239. Top 20 Companies Revenue from Shipments of Total Microcomponents - Automotive**

Company Name	2013 Share (%)
Renesas Electronics	37%
Freescale Semiconductor	23%
Texas Instruments	8%
STMicroelectronics	7%
Infineon Technologies	6%
Denso	5%
Microchip Technology	4%
Toshiba	2%
Fujitsu Semiconductor	2%
Spansion	2%
Intel	1%
Analog Devices	1%
Panasonic	1%
Atmel	1%
Silicon Laboratories	0%
Rohm	0%
Sony	0%
NXP	0%
Cypress Semiconductor	0%
Micronas	0%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 240. Top 16 Companies Revenue from Shipments of Total General Purpose Logic - Automotive**

Company Name	2013 Share (%)
NXP	20%
Xilinx	16%
Seiko Epson	15%
Texas Instruments	13%
ON Semiconductor	8%
Altera	7%
Samsung Electronics	5%
Himax Technologies	4%
Microsemi	3%
Princeton Technology	3%
Rohm	2%
Lattice Semiconductor	1%
Fairchild Semiconductor	1%
Toshiba	1%
Pioneer Micro Technology	0%
EM Microelectronic	0%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 241. Top 20 Companies Revenue from Shipments of Total Analog - Automotive**

Company Name	2013 Share (%)
Texas Instruments	18%
Analog Devices	18%
Linear Technology	12%
ON Semiconductor	10%
Sanken	9%
Maxim Integrated Products	6%
Renesas Electronics	3%
Toshiba	2%
Rohm	2%
Infineon Technologies	2%
Intersil	2%
Fairchild Semiconductor	2%
NXP	2%
Microchip Technology	1%
Asahi Kasei Microdevices	1%
JSC Sitronics	1%
Fuji Electric	1%
Ricoh	1%
STMicroelectronics	1%
Microsemi	1%
Others	6%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner

**Figure 242. Top 20 Companies Revenue from Shipments of Total Discrete - Automotive**

Company Name	2013 Share (%)
Renesas Electronics	14%
Infineon Technologies	11%
NXP	9%
Rohm	8%
ON Semiconductor	7%
Denso	6%
Toyota	6%
Mitsubishi	5%
Fuji Electric	5%
Vishay	5%
Shindengen Electric	4%
Fairchild Semiconductor	3%
Toshiba	3%
Hitachi	2%
Sanken	2%
International Rectifier	2%
Robert Bosch	2%
STMicroelectronics	2%
Magnachip Semiconductor	0%
Semtech	0%
Others	3%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 243. Top 20 Companies Revenue from Shipments of Total Optoelectronics - Automotive (Millions of \$US)**

Company Name	2013 Share (%)
Osram	16%
Stanley Electric	14%
Aptina	9%
Philips Electronics	9%
Sony	6%
Nichia	6%
Optek Technology	4%
Rohm	3%
Toshiba	3%
Vishay	3%
Seoul Semiconductor	3%
Panasonic	2%
Kingbright	2%
Omnivision	2%
Hamamatsu Photonics	2%
Denso	2%
Toyoda Gosei	2%
Lite-On Technology	1%
Sanan Optoelectronics	1%
Others	5%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 244. Top 20 Companies Revenue from Shipments of Nonoptical Sensors - Automotive**

Company Name	2013 Share (%)
Robert Bosch	20%
Infineon Technologies	15%
Denso	11%
Sanken	10%
Freescale Semiconductor	7%
Mitsubishi	5%
Micronas	5%
Melexis Microelectronic Systems	5%
Analog Devices	4%
Murata Manufacturing	4%
STMicroelectronics	3%
NXP	3%
Fuji Electric	2%
Optek Technology	2%
Honeywell	2%
Elmos Semiconductor	1%
Diodes	0%
Fujikura	0%
Toyota	0%
MEMSIC	0%
Others	1%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, March 2014

**Figure 245. Top 20 Automotive ASIC Vendor Market Share By Revenue**

<b>Company</b>	<b>Market Share 2013</b>
STMicroelectronics	20.0%
Denso	14.7%
Elmos Semiconductor	10.9%
Melexis Microelectronic Systems	8.2%
Fujitsu Semiconductor	8.0%
ON Semiconductor	8.0%
Rohm	5.3%
Infineon Technologies	3.9%
Toyota Industries	3.7%
Toshiba	3.3%
ams	3.2%
Seiko Epson	2.0%
ZMD	1.9%
Dialog Semiconductor	1.4%
iA	1.4%
Panasonic	1.1%
Renesas Electronics	0.7%
Toyota	0.6%
Global Unichip	0.6%
EM Microelectronic	0.4%
Others	0.7%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, Mar 2014

**Figure 246. Top 20 Automotive ASSP Vendor Market Share By Revenue**

<b>Company</b>	<b>Market Share 2013</b>
STMicroelectronics	16.5%
Infineon Technologies	13.5%
NXP Semiconductors	13.0%
Robert Bosch	10.0%
Texas Instruments	9.2%
Renesas Electronics	8.2%
Freescale Semiconductor	5.8%
Panasonic	4.7%
CSR	3.2%
Toshiba	2.7%
Atmel	2.0%
Nvidia	1.5%
u-blox	1.2%
Qualcomm	1.2%
Rohm	1.2%
ON Semiconductor	1.0%
Elmos Semiconductor	0.5%
Fujitsu Semiconductor	0.5%
Microchip Technology	0.5%
Melexis Microelectronic Systems	0.4%
Others	3.1%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, Mar 2014

**Figure 247. Top 20 Automotive ASSP Vendor Market Share By Revenue**

<b>Company</b>	<b>Market Share 2013</b>
Xilinx	58.2%
Altera	26.6%
Microsemi	10.8%
Lattice Semiconductor	4.4%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, Mar 2014

Figure 248. Top 16 Companies Revenue from Shipments of Total Memory – Military/Aero

Company Name	2013 Share (%)
Samsung Electronics	66%
SK Hynix	15%
Toshiba	4%
Microchip Technology	2%
Micron Technology	2%
Cypress Semiconductor	1%
GSI Technology	1%
ON Semiconductor	1%
Integrated Silicon Solution	1%
Spansion	1%
SanDisk	1%
Atmel	1%
Giantec Semiconductor	0%
Integrated Device Technology	0%
Rohm	0%
Elpida Memory	0%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, Mar 2014

Figure 249. Top 10 Companies Revenue from Shipments of Total Microcomponents – Military/Aero

Company Name	2013 Share (%)
Texas Instruments	26%
Shenzhen State Microelectronics	13%
Cypress Semiconductor	10%
Microchip Technology	10%
Renesas Electronics	8%
Sun Microelectronics	6%
Toshiba	6%
ON Semiconductor	3%
Atmel	2%
Panasonic	1%
Fujitsu Semiconductor	0%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, Mar 2014

Figure 250. Top 11 Companies Revenue from Shipments of Total General Purpose Logic – Military/Aero

Company Name	2013 Share (%)
Xilinx	51%
Altera	23%
Microsemi	12%
Texas Instruments	6%
Toshiba	4%
Lattice Semiconductor	3%
Intersil	1%
ON Semiconductor	0%
Seiko Epson	0%
Integrated Device Technology	0%
QuickLogic	0%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, Mar 2014

Figure 251. Top 18 Companies Revenue from Shipments of Total Analog – Military/Aero

Company Name	2013 Share (%)
Linear Technology	20%
Analog Devices	19%
Aeroflex UTM	13%
Maxim Integrated Products	10%
Skyworks Solutions	9%
Integrated Device Technology	8%
Texas Instruments	8%
Intersil	6%
Exar	2%
Microsemi	1%
RF Micro Devices	1%
Sony	1%
Toshiba	1%
Micrel Semiconductor	1%
Microchip Technology	1%
Fujitsu Semiconductor	1%
Spansion	1%
Cypress Semiconductor	0%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, Mar 2014



**Figure 252. Top 20 Companies Revenue from Shipments of Total Discrete – Military/Aero**

Company Name	2013 Share (%)
Microsemi	41%
International Rectifier	18%
Vishay	9%
Mitsubishi	5%
Toshiba	4%
Pan Jit	4%
M/A-COM Technology Solutions	4%
Semicoa Semiconductors	3%
Aeroflex UTM	3%
Renesas Electronics	2%
IXYS	2%
Shindengen Electric	1%
Sumitomo Electric Device Innovations	1%
RF Micro Devices	1%
Panasonic	0%
TriQuint Semiconductor	0%
KEC	0%
Sony	0%
Suzhou Good-Ark Electronics	0%
Fuji Electric	0%
Microchip Technology	0%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, Mar 2014

**Figure 253. Top 11 Companies Revenue from Shipments of Total Optoelectronics – Military/Aero**

Company Name	2013 Share (%)
e2v	17%
Sony	15%
ams	7%
Toshiba	4%
Aptina	4%
Vishay	3%
Sumitomo Electric Device Innovations	2%
ON Semiconductor	1%
Panasonic	1%
Nichia	0%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, Mar 2014

**Figure 254. Top 20 Companies Revenue from Shipments of Total Nonoptical – Military/Aero**

Company Name	2013 Share (%)
Murata Manufacturing	87%
MEMSIC	13%
Others	0%
<b>Total Market</b>	<b>100%</b>

Source: Citi Research, Gartner, Mar 2014

**Figure 255. Top 20 Military/Aerospace ASSP Vendor Market Share By Revenue**

<b>Company</b>	<b>Market Share 2013</b>
Texas Instruments	18.8%
Aeroflex	10.0%
Tongfang Guoxin Electronics	9.1%
Atmel	8.8%
ON Semiconductor	6.1%
Microsemi	4.6%
Shenzhen State Microelectronics	3.6%
M/A-COM Technology Solutions	2.9%
Fujitsu Semiconductor	2.7%
IBM Microelectronics	2.7%
TriQuint Semiconductor	2.7%
Samsung Electronics	2.0%
Honeywell	1.5%
Angstrom	1.1%
RF Micro Devices	0.9%
Altera	0.9%
Global Unichip	0.6%
Peregrine Semiconductor	0.5%
Rohm	0.2%
GigOptix	0.0%
Others — OEM/Foundry Direct	20.2%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, Mar 2014

**Figure 256. Top 5 Military/Aerospace FPGA/PLD Vendor Market Share By Revenue**

<b>Company</b>	<b>Market Share 2013</b>
Xilinx	57.6%
Altera	26.4%
Microsemi	13.0%
Lattice Semiconductor	2.8%
QuickLogic	0.2%
<b>Total Market</b>	<b>100.0%</b>

Source: Citi Research, Gartner, Mar 2014

## Solar

Solar power fits into the tech supply chain as semiconductors are primarily used in making photovoltaic cells used to generate power. Solar companies are generally considered in two categories, “upstream” and “downstream.” Upstream companies engage in product manufacturing, R&D, and distribution while downstream companies distribute the product directly to consumers, install solar systems, etc. Examples of upstream players in solar are Yingli Green & Trina Solar and while downstream (the project developers) are First Solar & SunEdison Inc.

Figure 257. Solar Systems Food Chain

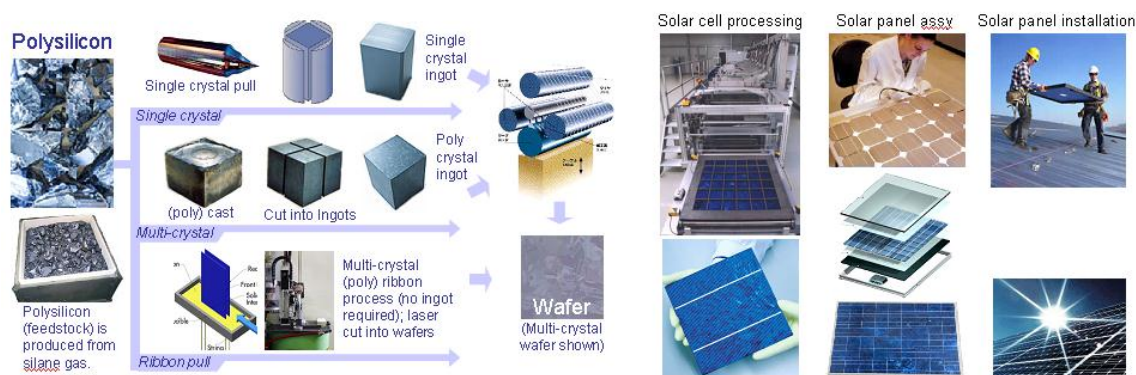
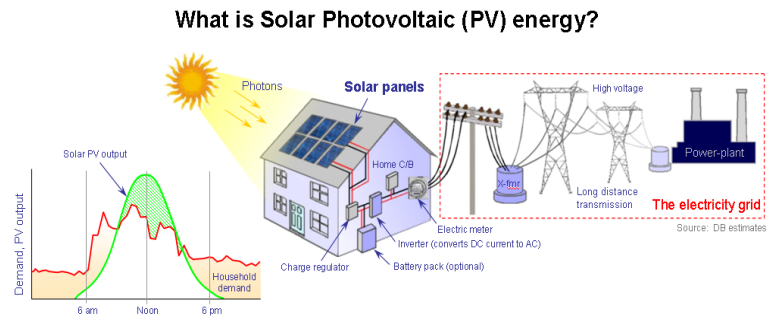


Figure 24: PV System—How it works



Source: Citi Research

Figure 258. Explanation of PV Energy, System, Net Metering



- **PV energy:** photons from the sun are converted to electricity via solar PV (cells) panels (i.e. the photovoltaic effect – Albert Einstein won a Nobel prize for this.)
- **PV system:** electricity generated by the solar panels goes through a charge regulator, then an inverter (converting DC current to AC current) before connecting to a home circuit breaker (C/B). This constitutes an independent, self-contained electricity generation system.
- **Output:** electricity generated by the solar PV panels is first consumed by the home, with excess power routed to the "grid" (conventional electricity generation system) for credit (net metering)

Source: Citi Research

Figure 259. Solar PV Demand Forecast (2012-2020)

Annual Demand (MW)

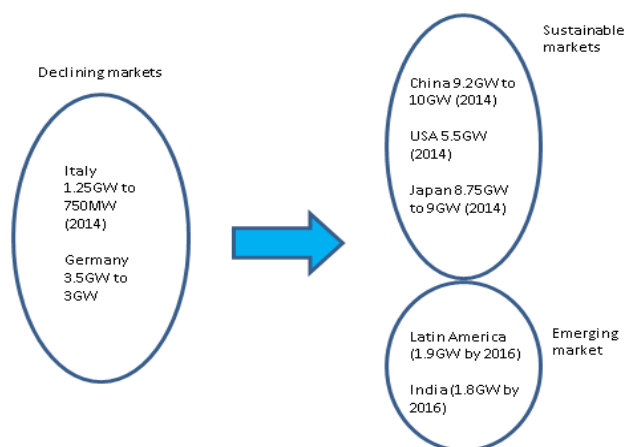
	2007A	2008A	2009A	2010A	2011A	2012A	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E
Italy	70	338	719	2,321	9,446	3,564	1,250	750	1,000	1,000	1,000	1,000	1,000	1,000
Germany	1,400	1,600	4,500	7,392	7,485	7,600	3,500	3,000	3,000	3,300	3,600	3,600	1,000	1,000
Spain	600	2,500	100	275	372	275	50	150	165	182	327	359	395	448
France	50	100	100	707	1,671	1,022	800	1,000	1,050	1,103	1,158	1,216	1,276	1,340
UK	0	0	0	115	784	725	1,000	1,000	1,050	1,103	1,158	1,216	1,276	1,340
ROE	242	297	1,344	1,204	1,720	2,050	2,500	2,700	2,781	2,864	2,950	3,039	3,130	3,224
USA	200	350	350	984	1,712	3,300	4,000	5,500	7,000	9,000	9,500	10,000	10,500	11,000
Canada	0	0	50	145	249	268	335	402	469	536	603	670	704	737
Latin America	10	10	10	30	140	100	200	1,000	1,250	1,875	2,500	3,000	3,300	3,300
Japan	300	300	500	900	1,155	2,000	7,000	9,000	10,500	11,025	11,576	12,155	12,763	13,401
China	40	30	200	450	3,240	5,000	8,000	10,000	11,500	12,650	13,915	14,611	15,341	16,108
India	0	0	20	95	300	980	1,069	1,247	1,158	1,782	2,673	3,118	3,118	3,118
Australia	20	20	100	387	774	1,115	1,000	1,000	1,100	1,265	1,455	1,673	1,924	2,212
Korea	50	300	100	148	157	252	252	315	378	441	504	567	630	630
SE Asia	0	0	20	360	420	600	960	1,371	1,577	1,814	2,116	2,267	2,418	2,588
Africa	20	20	20	140	225	550	800	1,000	1,200	1,500	1,875	2,344	2,813	3,281
ROW	100	100	150	1,942	2,606	2,200	2,530	2,910	3,055	3,208	3,368	3,537	3,713	3,899
<b>Total</b>	<b>3,102</b>	<b>5,965</b>	<b>8,283</b>	<b>17,595</b>	<b>32,456</b>	<b>31,601</b>	<b>35,246</b>	<b>42,282</b>	<b>48,170</b>	<b>54,583</b>	<b>60,214</b>	<b>64,308</b>	<b>65,239</b>	<b>68,627</b>
<b>Growth</b>		<b>92%</b>	<b>39%</b>	<b>112%</b>	<b>84%</b>	<b>-3%</b>	<b>12%</b>	<b>20%</b>	<b>14%</b>	<b>13%</b>	<b>10%</b>	<b>7%</b>	<b>1%</b>	<b>5%</b>

Cumulative installations (MW)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Italy	93	431	1,150	3,471	12,917	16,481	17,731	18,481	19,481	20,481	21,481	22,481	23,481	24,481
Germany	4,170	5,770	10,270	17,662	25,147	32,747	36,247	39,247	42,247	45,247	49,147	52,747	53,747	54,747
Spain	690	3,190	3,290	3,565	3,937	4,212	4,262	4,412	4,577	4,759	5,085	5,445	5,840	6,288
France	26	126	226	933	2,604	3,626	4,426	5,426	6,476	7,579	8,736	9,952	11,228	12,568
UK	16	16	16	131	915	1,640	2,640	3,640	4,690	5,793	6,950	8,166	9,442	10,782
ROE	262	559	1,903	3,107	4,827	6,877	9,377	12,077	14,858	17,722	20,673	23,712	26,842	30,066
USA	831	1,181	1,531	2,515	4,227	7,527	11,527	17,027	24,027	33,027	42,527	52,527	63,027	74,027
Canada	26	26	76	221	470	738	1,073	1,475	1,944	2,480	3,083	3,753	4,457	5,194
Latin America	0	10	20	50	190	290	490	1,490	2,740	4,615	7,115	10,115	13,415	16,715
Japan	1,917	2,217	2,717	3,617	4,772	6,772	13,772	22,772	33,272	44,297	55,873	68,028	80,791	94,192
China	100	130	330	780	4,020	9,020	17,020	27,020	38,520	51,170	65,085	79,696	95,037	111,145
India	31	31	51	146	446	1,426	2,495	3,742	4,901	6,682	9,355	12,473	15,591	18,710
Australia	46	66	166	553	1,327	2,442	3,442	4,442	5,542	6,807	8,262	9,935	11,859	14,071
Korea	81	381	481	629	786	1,038	1,290	1,542	1,857	2,235	2,676	3,180	3,747	4,377
SE Asia	4	4	24	384	804	1,404	2,364	3,735	5,313	7,126	9,242	11,509	13,928	16,515
Africa	0	20	40	180	405	955	1,755	2,755	3,955	5,455	7,330	9,674	12,486	15,768
ROW	1,150	1,250	1,400	3,342	5,948	8,148	10,678	13,588	16,642	19,850	23,218	26,755	30,468	34,367
<b>Total</b>	<b>9,443</b>	<b>15,408</b>	<b>23,691</b>	<b>41,286</b>	<b>73,742</b>	<b>105,343</b>	<b>140,589</b>	<b>182,871</b>	<b>231,042</b>	<b>285,625</b>	<b>345,839</b>	<b>410,147</b>	<b>475,385</b>	<b>544,012</b>

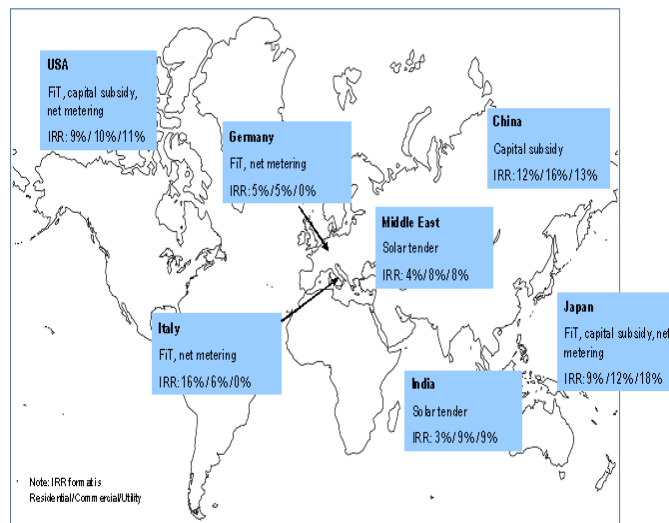
Source: Citi Research

Figure 260. Summary of demand market shift



Source: Citi Research

Figure 261. IRR Summary



Source: Citi Research

Figure 262. US Solar Competitive Positioning

Company	Ticker	Module Pricing	Manufacturing Cost	Gross Margins (Module + Systems)	Channel Strength	Balance Sheet	Bankability	Technology	Near Term Access To Capital	Average Score	Key Takeaways
SunPower	SPWR	1	4	2	1	2	1	1	2	1.8	Margins lifted by downstream business. Key player in the residential market. Good history with panel reliability. Backed by Total Sa (66% owned by Total). Good balance sheet though not as strong as FSLR. JV with Toshiba and Sharp helps with Japan market penetration.
First Solar	FSLR	4	3	1	2	1	1	4	1	2.1	Margins lifted by downstream business. Most successful player in utility scale projects despite having some module reliability issues. Strongest balance sheet in the sector. May become technology agnostic down the road.
Advanced Energy Industries (Solar Energy - Inverters)	AEIS	NA	NA	NA	NA	1	2	1	2	1.5	Does get slightly higher prices on inverters. Strong balance sheet with ample cash. Margins healthy - driven by being selective with client projects versus just chasing market share like some inverter peers. Satcon bankruptcy should help gain market share.
SunEdison	SUNE	NM	NM	1	3	2	1	NA	2	1.8	Becoming mostly a project developer - tech agnostic. Sound balance sheet though not as strong as FSLR. High margins driven by project development at Commercial and utility scale. Minimal debt - mostly project financed debt.
Trina Solar	TSL	4	1	4	3	3	3	3	1	2.8	Margins will remain weak over the intermediate term. Balance sheet strength improving - albeit still weak. Looking to get further in the downstream market - success in strategy remains uncertain. The Chinese government is expected to continue to lend despite massive debt balances but this will not continue into perpetuity.
Yingli Green Energy Holdings	YGE	4	1	4	2	4	3	3	1	2.8	Margins will remain weak over the intermediate term. Balance sheet strength an issue with significant short term debt outstanding. The Chinese government is expected to continue to lend despite massive debt balances but this will not continue into perpetuity.

Scale 1-5 Positioning Strength  
1 = Strong  
5 = Weak

Source: Citi Research

Figure 263. US Solar Competitive Positioning

Company	Ticker	Upstream Manufacturing				Downstream Services					Other Segments - Non Solar	Key Takeaways
		Poly/silicon	Wafer/Ingot	Cell	Module	Systems	Development	EPC	Financing/Leasing	System Inverters		
SunPower	SPWR											Residential leasing in several states. Solar systems business more geared for residential rooftop given that they are higher priced but also higher efficiency. Very large dealer network.
First Solar	FSLR											Thin Film module business becoming much smaller contributor - panels mainly for internal project business. Emphasis on downstream will continue to grow. Business more geared for utility scale projects. May one day become technology agnostic.
Advanced Energy Industries	AEIS											Has a non solar segment that produces wafers for semiconductor sector. Solar inverters primarily for utility scale projects. More contribution from the Solar Inverter segment expected versus the non solar segment (i.e. Power Conversion products for multiple industries including Semiconductor).
SunEdison	SUNE											Cut Poly production materially - now Poly production mainly serves Semi Wafers. Wafers are produced for semiconductor industry and internally for solar project consumption at SunEdison - 3rd party Solar Wafer sales largely eliminated - only strategic sales where demand exists. Solar downstream segment through SunEdison will continue to become a more material segment for SUNE - main focus is Commercial and Utility segment.
Trina Solar	TSL											Has a systems lease program mainly for residential customers. Has made a strategic pledge to shift more of the business further downstream given the state of the module business.
Yingli Green Energy Holdings	YGE											Has vendor financing in US. Downstream business goals not in the immediate forefront - unlike TSL.

Source: Citi Research

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## Selected Companies

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## 3D Systems Corp

Citi Analyst: Ken Wong, CFA

3D Systems is the leading provider of print systems and materials based stereolithography (SLA) technology as well as laser sintering systems and FDM technology.

The company's core product line is based on SLA, a process which selectively cures photopolymer resins with a UV laser until a final end product is created. 3D Systems' laser sintering technology focuses a laser beam on a finely spread layer of powdered plastics, waxes and metals bonding the materials before repeating the process until a finished product is produced.

The company's acquisition of Z Corporation at the start of 2012 gave it the capability to offer printers based on multi-jetting which jets a bonding liquid from an inkjet onto a bed of powder materials in the shape of the object design.

3D Systems is headquartered in Rockhill, South Carolina and as of December 2012 had 1,010 full-time employees.

Figure 264. 3D Systems (DDD) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	112.8	159.9	230.4	353.6	513.4	709.5	702.5	941.6	908.6
- <i>y/y growth</i>	-18.8%	41.7%	44.1%	53.5%	45.2%	38.2%	36.8%	32.7%	29.3%
<b>Gross Margins</b>	44.1%	46.3%	47.3%	51.2%	52.1%	53.7%		55.9%	
<b>Operating Margins</b>	3.8%	14.0%	20.0%	23.3%	23.8%	19.9%		24.3%	
<b>EPS</b>	0.05	0.45	0.80	1.25	0.85	0.81	0.82	1.22	1.21
- <i>y/y growth</i>	148.8%	767.5%	79.9%	54.9%	-31.7%	-4.6%	-4.2%	49.9%	49.0%
<b>Cash</b>	24.9	37.3	179.1	155.9	306.3	361.6		478.7	
<b>Debt</b>	8.5	8.3	138.9	88.1	18.9	18.9		18.9	
<b>Net Cash/Shr</b>	0.4	0.6	0.8	1.2	2.9	3.1		3.8	
<b>Tangible Book Value/Shr</b>	1.1	1.2	1.8	2.1	4.0	4.5		5.3	

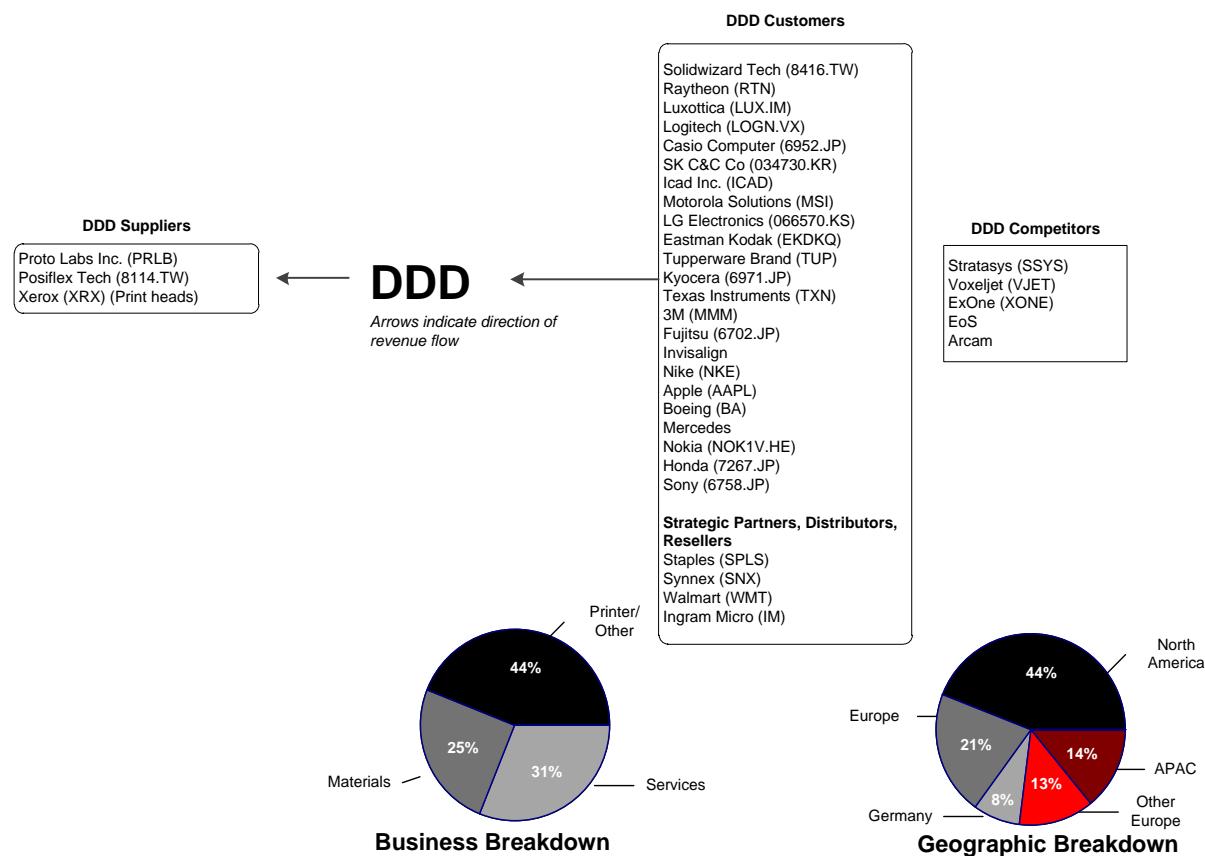
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 265. 3D Systems Corp (DDD)

Sector: 3D Printing

## 3D Systems Corp. (DDD)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Acer

Citi Analyst: Wei Chen

Starting in 1976 as a developer of microprocessor-based products, Acer has grown into one of the top global PC brands and manufacturers.

Figure 266. Acer (2353.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	573982.5	629059.0	475258.1	429510.9	357402.1	326466.7	329455.2	335307.8	338652.5
- y/y growth	5.1%	9.6%	-24.4%	-9.6%	-16.8%	-8.7%	-7.8%	2.7%	2.8%
<b>Gross Margins</b>	10.2%	10.3%	8.1%	10.1%	7.7%	8.5%		8.7%	
<b>Operating Margins</b>	2.7%	2.9%	-1.4%	0.2%	-2.7%	-0.4%		-0.2%	
<b>EPS</b>	4.26	5.62	-2.44	-1.03	-6.57	-0.40	-0.83	-0.22	0.05
- y/y growth	-9.5%	31.7%	-143.5%	57.9%	-538.6%	93.9%	87.4%	45.9%	106.3%
<b>Cash</b>	55272.3	68809.4	59312.7	50999.5	44655.1	43625.0		43578.6	
<b>Debt</b>	12919.9	27077.5	23423.1	18344.4	24042.1	24042.1		24042.1	
<b>Net Cash/Shr</b>	16.1	18.4	13.4	16.6	9.1	8.7		8.7	
<b>Tangible Book Value/Shr</b>	34.7	34.8	28.0	26.5	20.4	20.0		19.8	

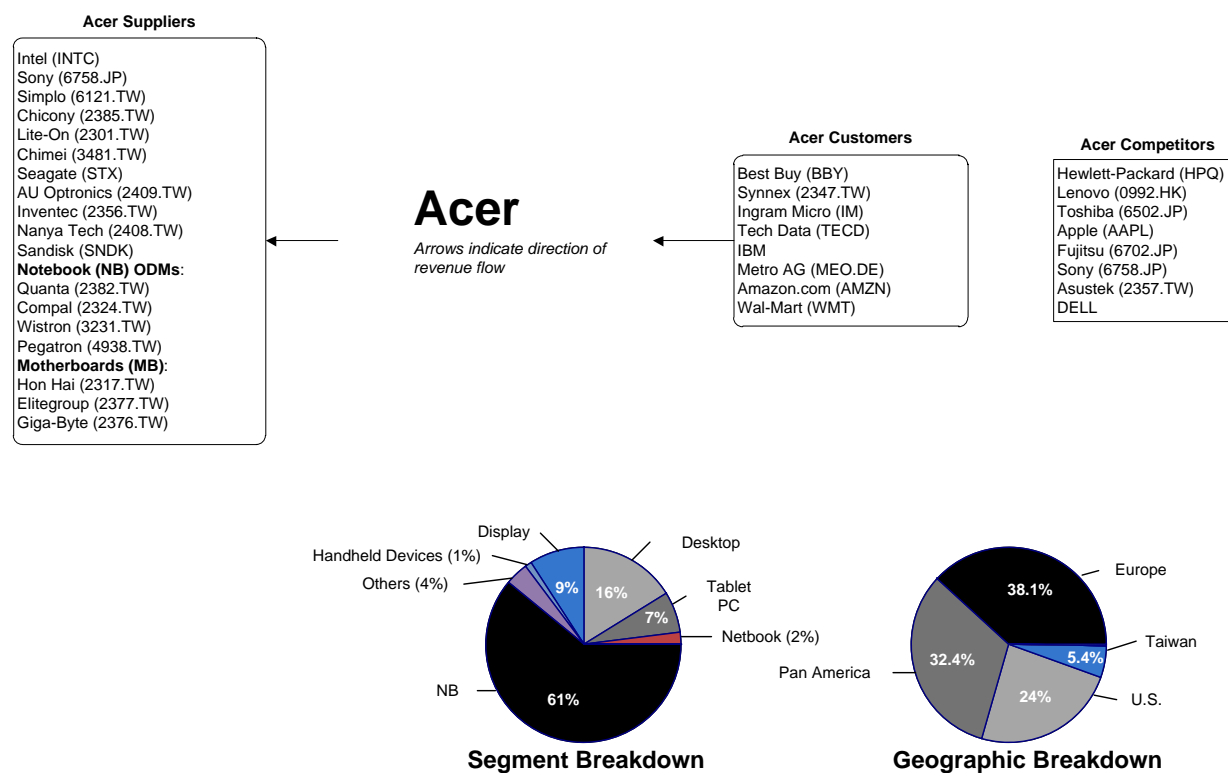
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 267. Acer (2353.TW)

Sector: PC & Enterprise Hardware

Acer (2353.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Advanced Energy Industries Inc.

Citi Analyst: **Shahriar Pourreza, CFA**

Advanced Energy Industries operates under two key business segments: Thin Films and Solar Energy. The latter segment has become a greater contributor to consolidated results with the rapid growth of North America inverter sales.

Advanced Energy is a leading provider of components and subsystems to a variety of industries utilizing high-technology manufacturing processes. The firm's suite of products in power conversion are critical to the production of semiconductors, flat panel displays, data storage products, solar PV, architectural glass, and other advanced product applications.

Targeting both OEMs and end users, Advanced Energy's operations reach around the globe with regional centers in North America, Asia, and Europe, in addition to its growing manufacturing base in China.

Advanced Energy continues to enter new markets vis-à-vis strategic acquisitions and partnerships, as well as through internally developed proprietary, process-focused technologies - all key elements that further strengthen the company's position in process-critical, scalable, highly-patented technologies. Recently, more focus has been turned to the inverter segment (Solar Energy) which now comprises 50%-plus of consolidated results.

Founded in 1981, the company is headquartered in Fort Collins, Colorado and has 1,500 employees.

Figure 268. Advanced Energy Industries Inc. (AEIS) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	186.4	471.3	516.8	451.9	547.0	726.3	619.8	793.0	670.2
- <i>y/y growth</i>	-43.3%	152.8%	9.7%	-12.6%	21.0%	32.8%	13.3%	9.2%	8.1%
<b>Gross Margins</b>	29.2%	43.5%	40.2%	37.7%	38.9%	38.3%		38.0%	
<b>Operating Margins</b>	-15.6%	16.1%	13.4%	9.4%	15.1%	16.6%		15.8%	
<b>EPS</b>	-0.83	1.32	0.95	0.60	1.82	2.12	1.91	2.28	2.03
- <i>y/y growth</i>	-280.3%	257.9%	-28.1%	-36.1%	201.0%	16.4%	4.9%	7.7%	6.3%
<b>Cash</b>	177.5	140.6	143.2	172.2	173.7	208.0		275.7	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	4.2	3.2	3.3	4.4	4.3	5.0		6.7	
<b>Tangible Book Value/Shr</b>	6.5	6.4	7.2	7.1	7.2	9.4		12.0	

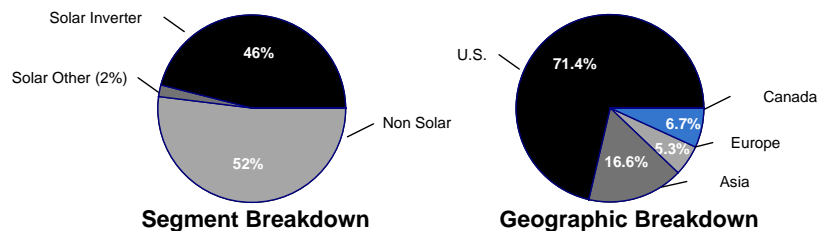
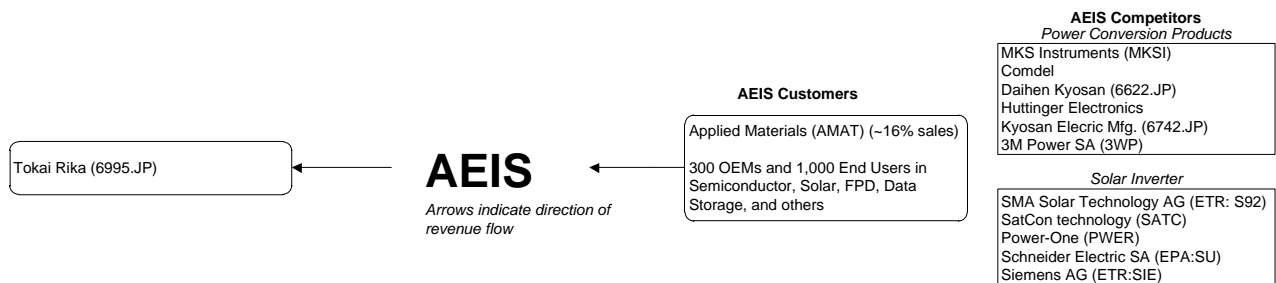
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 269. Advanced Energy Industries Inc. (AEIS)

Sector: Semiconductor Components

## Advanced Energy Industries Inc. (AEIS)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Advanced Micro Devices

Citi Analyst: Glen Yeung

Advanced Micro Devices Inc (AMD) is the world's second-largest producer of microprocessors, with ~20% global PC CPU market share.

The company generates revenue from the PC end-market from sales of its microprocessors, graphics processors and PC chipsets.

Advanced Micro is a fabless company utilizing Global Foundries and Taiwan Semiconductor Manufacturing Company to manufacture its chips.

Figure 270. Advanced Micro Devices (AMD) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	5403.0	6494.0	6568.0	5422.0	5299.0	5868.5	5749.0	6410.5	5879.0
- <i>y/y growth</i>	-7.0%	20.2%	1.1%	-17.4%	-2.3%	10.7%	8.5%	9.2%	2.3%
<b>Gross Margins</b>	42.1%	45.6%	44.8%	22.8%	37.3%	35.6%		36.7%	
<b>Operating Margins</b>	-9.5%	8.7%	5.6%	-19.5%	1.9%	5.6%		8.0%	
<b>EPS</b>	0.45	0.64	0.66	-1.60	-0.11	0.18	0.13	0.44	0.15
- <i>y/y growth</i>	111.3%	41.7%	3.5%	-340.2%	93.1%	262.4%	213.8%	147.4%	20.8%
<b>Cash</b>	2676.0	1789.0	1765.0	1002.0	1097.0	1083.4		1442.8	
<b>Debt</b>	4560.0	2192.0	2016.0	2042.0	2058.0	2058.0		2058.0	
<b>Net Cash/Shr</b>	-2.3	-0.5	0.3	-1.4	-1.2	-1.2		-0.7	
<b>Tangible Book Value/Shr</b>	0.3	0.9	1.8	-0.2	-0.1	0.2		0.8	

(Revenues, Cash and Debt in Millions in Local Currency)

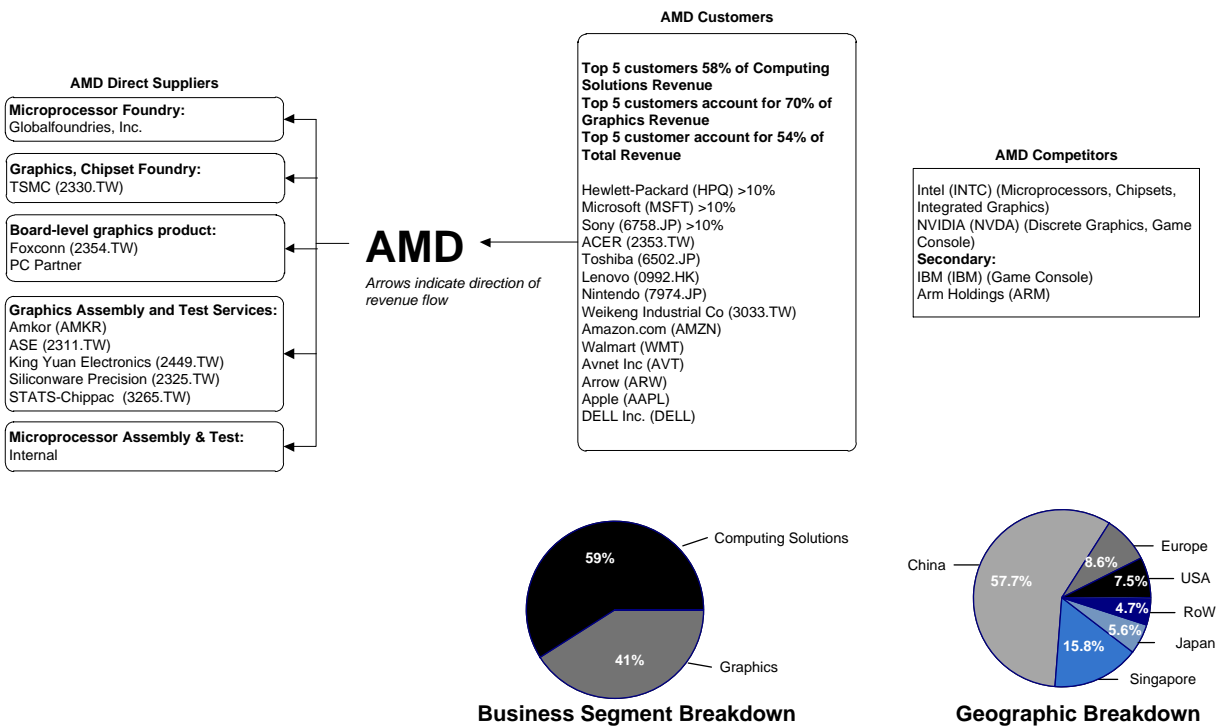
Source: Citi Research, Company Reports, FirstCall



Figure 271. Advanced Micro Devices, Inc. (AMD)

Sector: Semiconductors

Advanced Micro Devices, Inc. (AMD)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Alcatel-Lucent

Citi Analyst: Ehud Gelblum, Ph.D

Alcatel-Lucent is 3rd largest provider of communications equipment globally and is the product of the 2006 merger of Alcatel, the then largest French supplier of telecommunication equipment and Lucent, AT&T's former equipment division which was spun off in a 1996 IPO.

The company's product portfolio is divided into two main operating segments: Core Networking (43% 2012 revenue), which includes IP routing, optical networking, and IP platforms such as IMS and other network applications; and Access (51% 2012 revenue) which includes wireless access, fixed access, licensing, and managed services.

Alcatel-Lucent holds leading market share positions in carrier routing (20%), optical networking (12%), and wireless access (13%), and fixed access (21%) all per Dell'Oro as of 2012. In aggregate, Alcatel-Lucent holds an 18% market share globally, also per Dell'Oro.

The company has undergone successive rounds of restructuring since its 2006 merger due to significant exposure to declining legacy technologies including circuit-switch voice, 2G and 3G wireless, and SONET-based optical equipment. Michel Combes became the company's 4th CEO in February 2013, and in June 2013 launched The Shift Plan, a restructuring strategy intended to transform the company from a telecom equipment generalist to an IP networking and Ultra broadband specialist, while cutting €1B of fixed costs through 2015.

Figure 272. Alcatel-Lucent (ALU.PA) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	15157.0	15658.0	15327.0	14449.0	14436.0	14986.8	14610.3	15255.8	14789.7
- y/y growth	-10.8%	3.3%	-2.1%	-5.7%	-0.1%	3.8%	1.2%	1.8%	1.2%
<b>Gross Margins</b>	33.7%	33.9%	35.0%	30.1%	32.2%	32.0%		33.6%	
<b>Operating Margins</b>	-2.8%	-0.6%	2.5%	-8.5%	-4.6%	1.8%		5.1%	
<b>EPS</b>	-0.16	-0.07	0.33	-1.07	-0.54	-0.03	0.07	0.11	0.20
- y/y growth	77.6%	55.6%	566.2%	-426.5%	49.3%	94.6%	113.6%	467.9%	167.6%
<b>Cash</b>	5570.0	5689.0	4482.0	4930.0	6355.0	5375.9		5496.2	
<b>Debt</b>	4755.0	5378.0	4619.0	4805.0	6162.0	5187.0		5187.0	
<b>Net Cash/Shr</b>	0.6	0.7	0.1	0.4	0.6	0.4		0.5	
<b>Tangible Book Value/Shr</b>	-1.2	-1.3	-1.0	-1.3	-0.5	-0.9		-1.0	

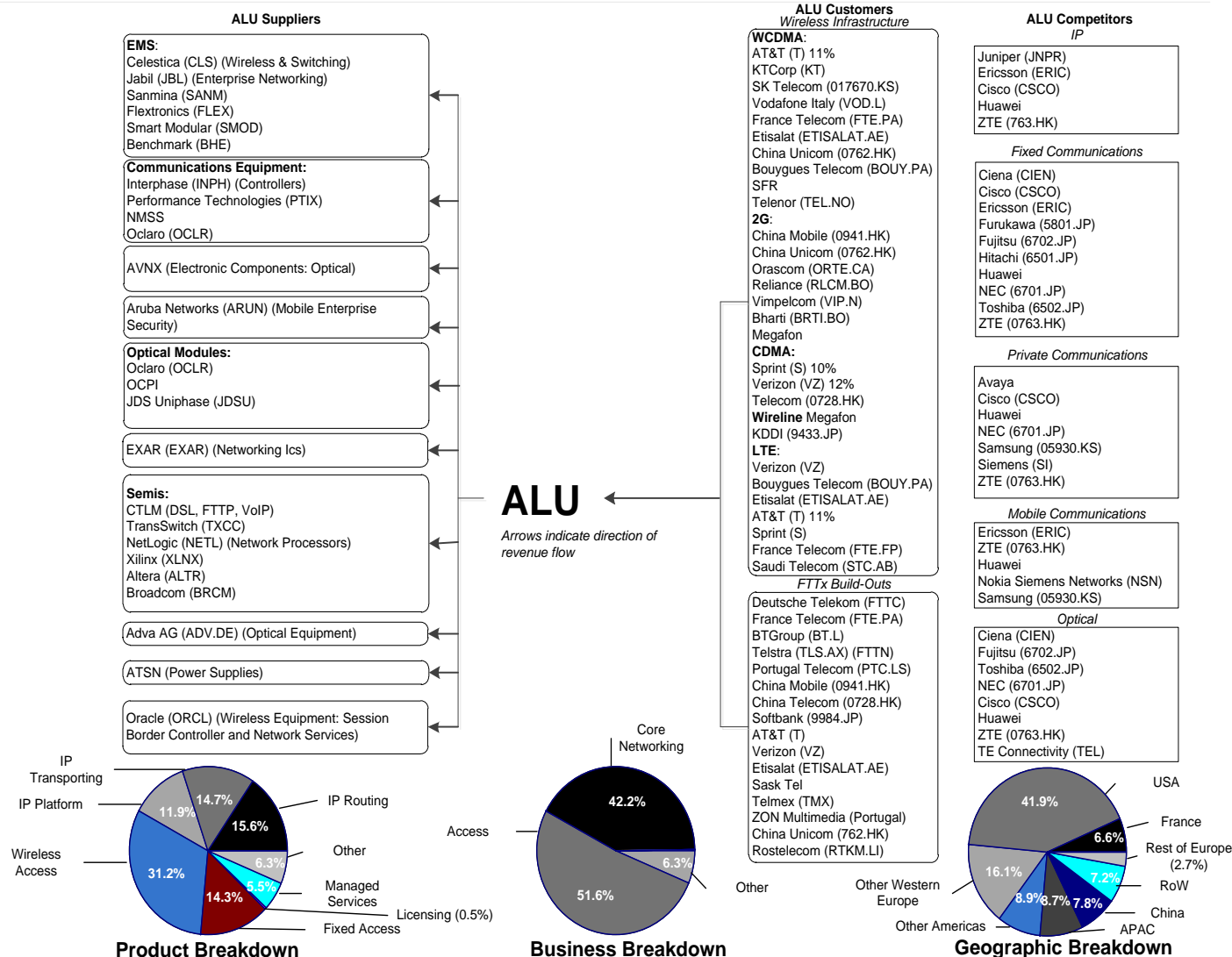
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 273. Alcatel-Lucent (ALU.PA)

Sector: Communications Equipment

# Alcatel-Lucent (ALU.PA; ALU)



Source: Company reports, CIRA estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Alps Electric

Citi Analyst: Yuta Fukasawa

Alps Electric is a maker of electronic equipment, developing and manufacturing electronic components and audio equipment. It is comprised of three segments: electronic components, audio equipment, and logistics/others.

The electronic components business is run by Alps itself, while in audio equipment, car electronics operations are mainly handled by Alpine, and the logistics/other business by Alps Logistics.

Alps Electric's electronic component business can be broadly divided into automotive and consumer electronic/other applications. In automotive, the mainstays are now products related to human-machine interfaces and sensors. In consumer electronics/other components, parts for smartphones are the growth driver and formerly touchscreen operations were the focus of investor attention.

Now, however, with smartphone cameras growing increasingly sophisticated, lens actuators (VCMs) are becoming the growth driver. Smartphone cameras are increasingly coming equipped with anti-shake functionality (OIS) and we expect Alps to benefit from the increasingly high performance of VCMs.

Figure 274. Alps Electric (6770.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	538995.0	493639.0	550668.0	526500.0	546423.0	678307.0	671763.0	703800.0	699088.0
- <i>y/y growth</i>	-22.2%	-8.4%	11.6%	-4.4%	3.8%	24.1%	22.9%	3.8%	4.1%
<b>Gross Margins</b>	10.2%	15.9%	19.8%	17.8%	16.1%	18.5%		18.5%	
<b>Operating Margins</b>	-4.9%	1.0%	5.2%	2.9%	1.3%	4.2%		4.5%	
<b>EPS</b>	-390.93	2.75	62.15	23.30	-39.45	73.45	73.07	80.34	94.22
- <i>y/y growth</i>	-1849.9%	100.7%	2160.4%	-62.5%	-269.3%	286.2%	285.2%	9.4%	28.9%
<b>Cash</b>	68372.0	89286.0	99031.0	85588.0	76687.0	112990.6		126485.3	
<b>Debt</b>	70727.0	102188.0	100888.0	60889.0	113985.0	135501.0		135501.0	
<b>Net Cash/Shr</b>	227.3	110.0	166.8	330.3	59.0	144.5		219.8	
<b>Tangible Book Value/Shr</b>	534.4	556.3	581.6	584.1	578.3	690.9		755.4	

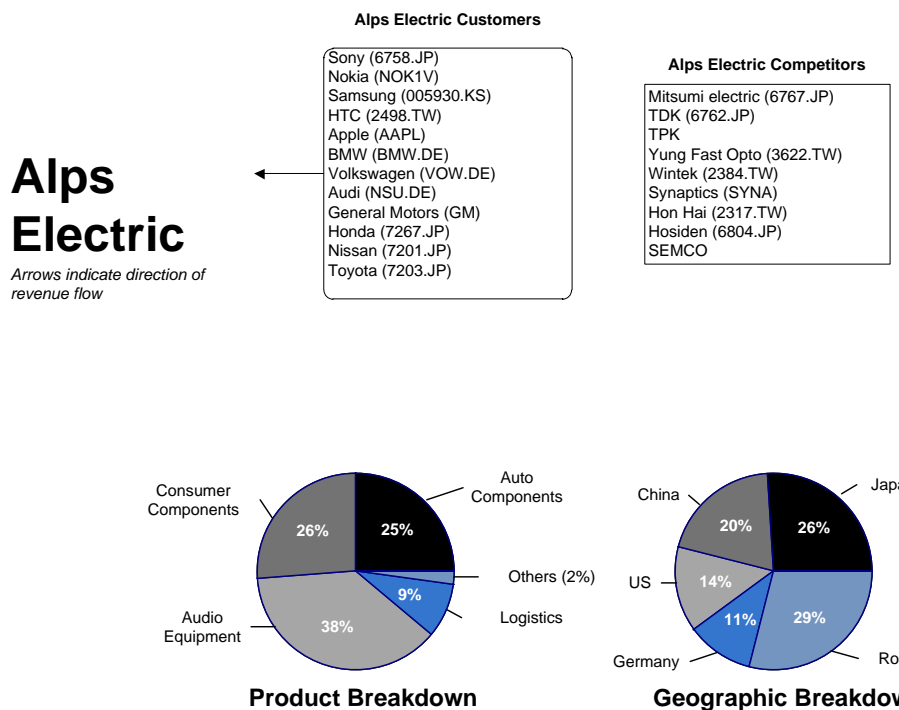
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 275. Alps Electric (6770.JP)

Sector: Electronic Components

## Alps Electric (6770.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research, Company Reports

## Altera Corp.

Citi Analyst: Glen Yeung

Altera Corporation (ALTR) designs and manufactures programmable logic devices (PLDs) and HardCopy application-specific integrated circuit (ASIC) devices, IP cores, and development tools.

Altera's market share in FPGA's is has grown to over a third, with most of the company's revenues from PLD sales (FPGA and CPLD). Major product families include Stratix, Cyclone, Arria, MAX, and HardCopy. By vertical market, Telecom and Wireless accounts for a majority of sales, followed by Industrial automation, Military, and Automotive; Networking, Computer and Storage; and Other (Broadcast, Consumer, Medical, Test & Measurement).

Figure 276. Altera Corp. (ALTR) Results & Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1195.4	1954.4	2064.5	1783.0	1732.6	1887.8	1871.8	2004.7	2060.4
- <i>y/y growth</i>	-12.6%	63.5%	5.6%	-13.6%	-2.8%	9.0%	8.0%	6.2%	10.1%
<b>Gross Margins</b>	66.8%	71.0%	70.4%	69.6%	68.4%	68.7%		69.0%	
<b>Operating Margins</b>	25.5%	44.4%	41.1%	33.2%	27.5%	28.5%		30.7%	
<b>EPS</b>	0.85	2.49	2.35	1.72	1.36	1.43	1.45	1.64	1.76
- <i>y/y growth</i>	-28.4%	194.4%	-5.7%	-27.1%	-20.6%	4.9%	6.7%	14.7%	21.0%
<b>Cash</b>	1546.7	2765.2	3437.2	3017.6	3010.6	2864.0		2777.7	
<b>Debt</b>	500.0	500.0	500.0	500.0	1491.5	1491.5		1491.5	
<b>Net Cash/Shr</b>	3.5	7.2	9.0	7.8	4.7	4.3		4.0	
<b>Tangible Book Value/Shr</b>	3.5	7.4	9.2	10.3	10.9	10.3		9.9	

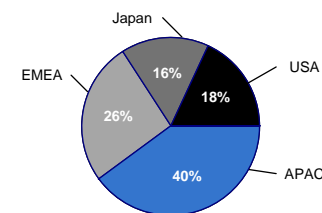
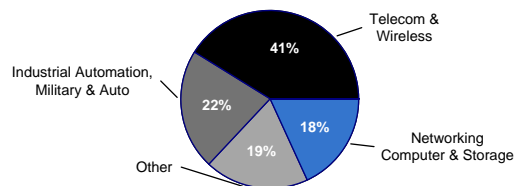
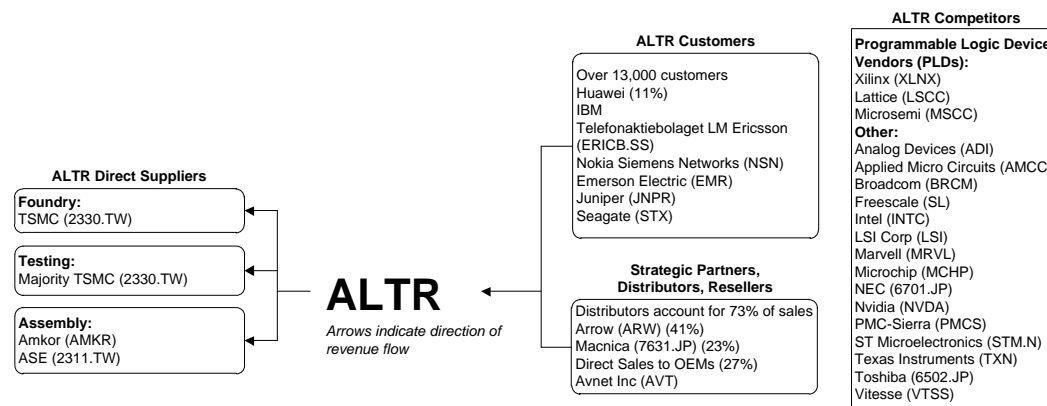
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 277. Altera Corp (ALTR)

Sector: Semiconductors

## Altera Corp. (ALTR)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Amkor Technology Inc.

Citi Analyst: Terence Whalen

Amkor is a leading provider of packaging and test services to the global semiconductor industry headquartered in Chandler, Arizona. Amkor has over 300 customers and +1,000 different package types/sizes, from traditional leadframe packages to advanced chip-scale (CSP), ball-grid array (BGA), and flip chip packages.

The company has balanced revenue streams in terms of end-market applications with communications 59%, consumer 14%, computing 9%, networking 10%, and industrial 8% of total sales. The company maintains more than 5 million square feet of manufacturing floor space in the U.S., Korea, Japan, China, Taiwan, Singapore, and the Philippines.

Figure 278. Amkor (AMKR) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	2179.1	2939.5	2776.4	2759.8	2956.5	3072.9	3076.9	3311.1	3283.2
- <i>y/y growth</i>	-18.0%	34.9%	-5.5%	-0.6%	7.1%	3.9%	4.1%	7.8%	6.7%
<b>Gross Margins</b>	22.0%	22.6%	17.7%	16.1%	18.4%	19.7%		20.9%	
<b>Operating Margins</b>	10.3%	12.7%	7.0%	6.3%	7.9%	9.3%		10.7%	
<b>EPS</b>	0.67	0.90	0.39	0.33	0.49	0.64	0.64	0.86	0.80
- <i>y/y growth</i>	127.4%	33.7%	-56.0%	-15.5%	48.4%	30.2%	29.2%	34.0%	25.0%
<b>Cash</b>	398.1	422.8	437.3	415.7	613.1	674.3		656.4	
<b>Debt</b>	1434.2	1364.3	1346.7	1545.0	1652.7	1652.7		1552.7	
<b>Net Cash/Shr</b>	-3.6	-2.8	-3.1	-5.1	-4.2	-3.9		-3.5	
<b>Tangible Book Value/Shr</b>	2.0	3.4	4.1	4.2	5.9	6.9		8.1	

(Revenues, Cash and Debt in Millions in Local Currency)

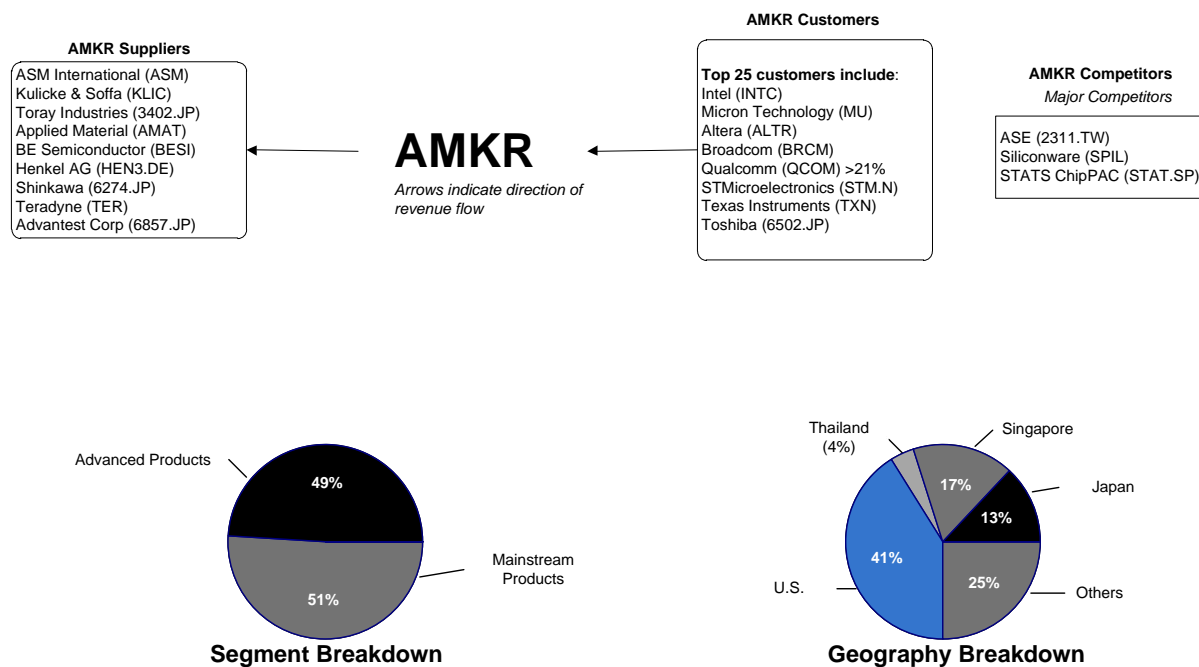
Source: Citi Research, Company Reports, FirstCall



Figure 279. Amkor (AMKR)

Sector: Semiconductors: Assembly and Test

Amkor (AMKR)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Amphenol Corp.

Citi Analyst: Jim Suva, CPA

Amphenol is a leading manufacturer of electronic and electrical interconnect products and assemblies and fiber optics. In 2010, Amphenol was the second-largest global connector company and the second-largest producer of coaxial cable for the cable TV market.

Amphenol had \$2.8B in annual sales in 2009, \$3.6B (+26% Y/Y) in 2010, \$3.9B (+11% Y/Y) in 2011, \$4.3Bn (+9%) in 2012 and \$4.6Bn in 2013 (+7.5%). It sells products to over 10,000 customer locations with no single customer accounting for more than 7% of total sales. Customers include: Samsung, Cisco, Dell, IBM, HP, Motorola, Lucent, Nortel, Maxtor, Bosch, Comcast, Verizon, Nokia, Delphi, Rockwell, Airbus, and Lockheed Martin. Sales by end market include: wireless/telecom/datacom 48%, broadband 8%, military/aerospace 18%, industrial 14% and auto 12%.

Based in Wallingford, Connecticut, it has ~20,000 employees and 128 facilities worldwide with <30% of its operations in the U.S. and >70% internationally.

Figure 280. Amphenol (APH) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	2820.1	3554.1	3939.8	4292.1	4614.7	5058.4	5113.3	5421.2	5461.3
- <i>y/y growth</i>	-12.9%	26.0%	10.9%	8.9%	7.5%	9.6%	10.8%	7.2%	6.8%
<b>Gross Margins</b>	31.4%	32.6%	31.6%	31.3%	31.4%	31.4%		31.9%	
<b>Operating Margins</b>	17.3%	19.7%	19.2%	19.3%	19.6%	19.5%		19.7%	
<b>EPS</b>	1.85	2.71	3.05	3.47	3.86	4.22	4.26	4.61	4.72
- <i>y/y growth</i>	-21.2%	46.9%	12.4%	13.7%	11.2%	9.5%	10.4%	9.2%	10.8%
<b>Cash</b>	422.4	624.2	648.9	942.5	1192.2	1588.4		1748.2	
<b>Debt</b>	753.4	800.0	1377.1	1706.5	2132.9	2092.9		2052.9	
<b>Net Cash/Shr</b>	-1.9	-1.0	-4.2	-4.0	-1.5	1.2		2.5	
<b>Tangible Book Value/Shr</b>	2.3	4.7	2.6	3.2	3.5	7.0		9.1	

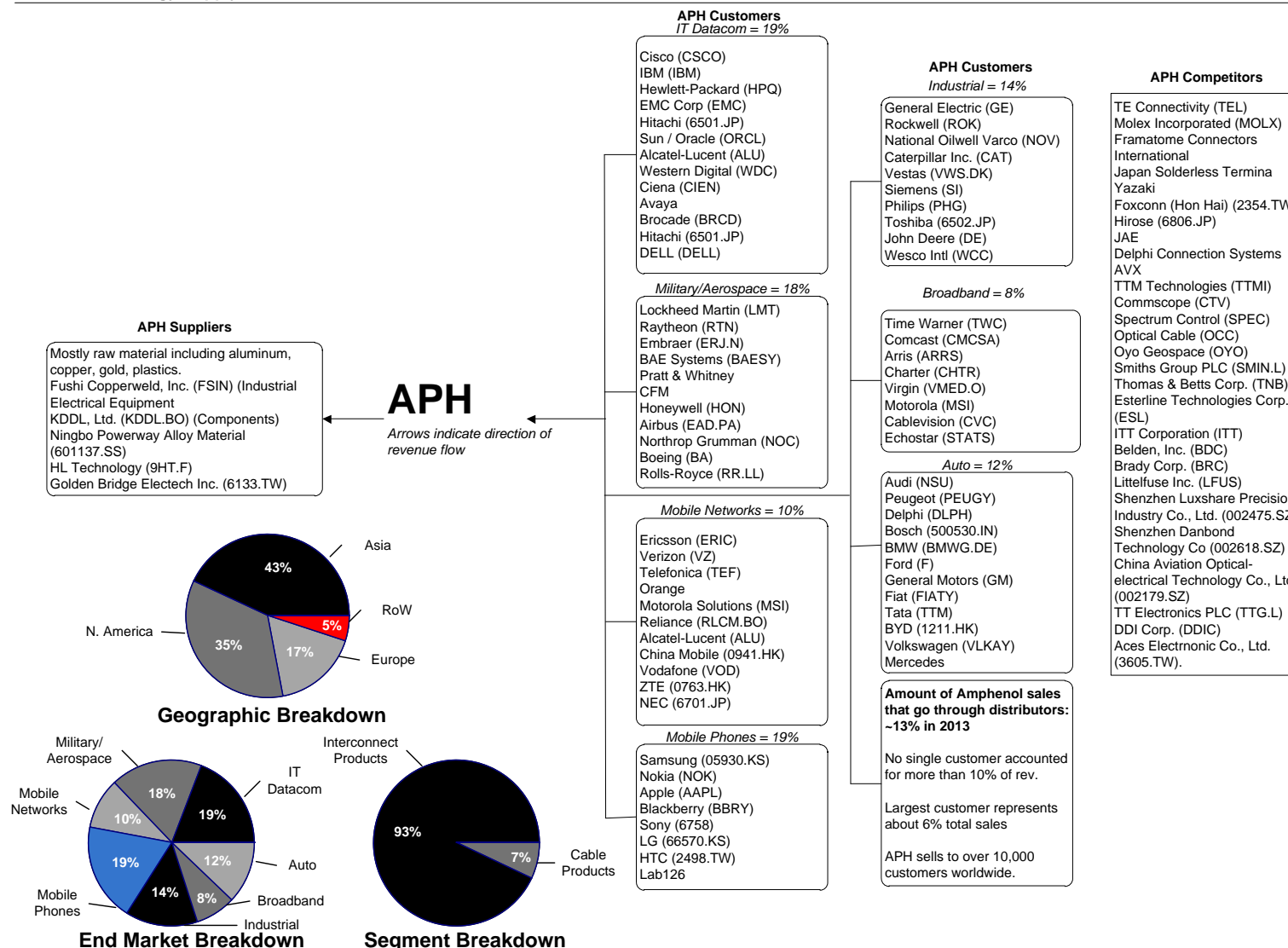
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 281. Amphenol (APH)

Sector: Technology Supply Chain - Connectors

# Amphenol Corp. (APH)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Analog Devices, Inc.

Citi Analyst: Terence Whalen

Analog Devices (NYSE: ADI) sells data converters, signal amplifiers, and digital signal processors. ADI's converter and amplifier focus position it in markets with significant design barriers to entry, high-margin competitors, and sticky design-ins.

Texas Instruments is ADI's primary converter competitor while Texas Instruments and National Semi are amplifier competitors. Other competitors are Broadcom, Cirrus Logic, Infineon, Intersil, Linear, Maxim, Microchip, National, NXP, STMicroelectronics and Silicon Labs.

ADI has low customer concentration (no account >4% sales) partly because of its industrial market leverage. Application exposure conveys the horizontal nature of its business: industrial (44%), communications (20% sales), consumer (20%), and automotive (16%).

ADI demonstrated strategic foresight by exiting less attractive markets of DSL, handset baseband, and PC power in 2006-2008, sidestepping what would have been punishing declines for these segments in 2008/2009. ADI has consolidated two manufacturing facilities and is in the process of realizing ~350bps of gross margin benefits.

ADI operates a fab-lite manufacturing model with 55% output produced internally and 45% sourced externally mainly with TSMC. ADI derives 54% of sales from third party distributors recognizing revenue to the distributor only after the distributor sells through to its end customer. ADI's fiscal year ends in October.

Figure 282. Analog Devices (ADI) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	2014.9	2761.5	2993.3	2701.1	2633.7	2705.8	2701.0	2871.5	2899.1
- y/y growth	N/A		8.4%	-9.8%	-2.5%	2.7%	2.6%	6.1%	7.3%
<b>Gross Margins</b>	55.5%	65.2%	66.4%	64.5%	64.3%	66.2%		67.1%	
<b>Operating Margins</b>	16.8%	33.2%	35.9%	30.8%	30.0%	31.9%		34.2%	
<b>EPS</b>	0.97	2.36	2.71	2.14	2.16	2.31	2.29	2.61	2.62
- y/y growth	N/A		14.5%	-20.9%	0.8%	7.1%	5.9%	13.1%	14.5%
<b>Cash</b>	1816.0	2687.8	3592.5	3900.4	4682.9	5069.3		5482.2	
<b>Debt</b>	379.6	400.6	886.4	821.6	872.2	872.4		872.4	
<b>Net Cash/Shr</b>	4.9	7.5	8.8	10.1	12.1	13.1		14.3	
<b>Tangible Book Value/Shr</b>	7.8	10.0	11.9	13.0	14.8	16.2		17.6	

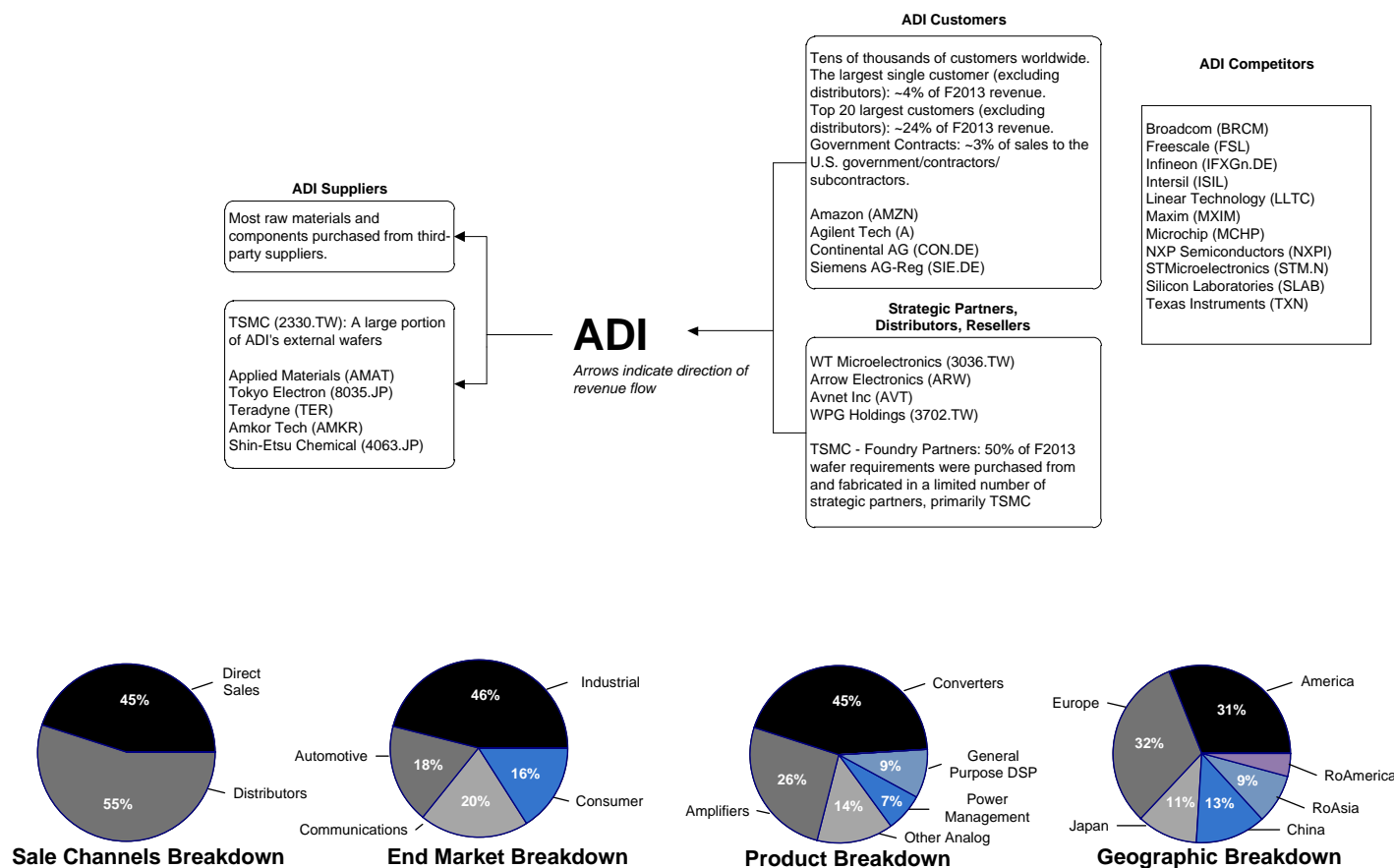
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 283. Analog Devices (ADI)

Sector: Semiconductors

## Analog Devices, Inc. (ADI)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Apple Inc.

Citi Analyst: Glen Yeung, Walter  
Pitchard, & Jim Suva, CPA

Apple, Inc. (AAPL), is a leading vendor in "eco-system" based mobile hardware devices globally and one of the largest companies in the world by market capitalization.

With the iMac in 1998, iPod in 2001, iPhone in 2007, and iPad in 2010, Apple set itself apart with innovative hardware and has increasingly extended this differentiation into chip design, software (operating system), and applications throughout its entire product offering.

Apple derives ~51% of its revenues from iPhone, ~21% from iPad, and ~15% from PC sales. iPod sales account for ~9% of revenues and the rest is ~4%.

The company was founded in 1976 by Steve Jobs and Steve Wozniak, and is headquartered in Cupertino, CA. Apple employs approximately 72,800 on a full-time basis and has an additional 3,300 temporary employees and contractors.

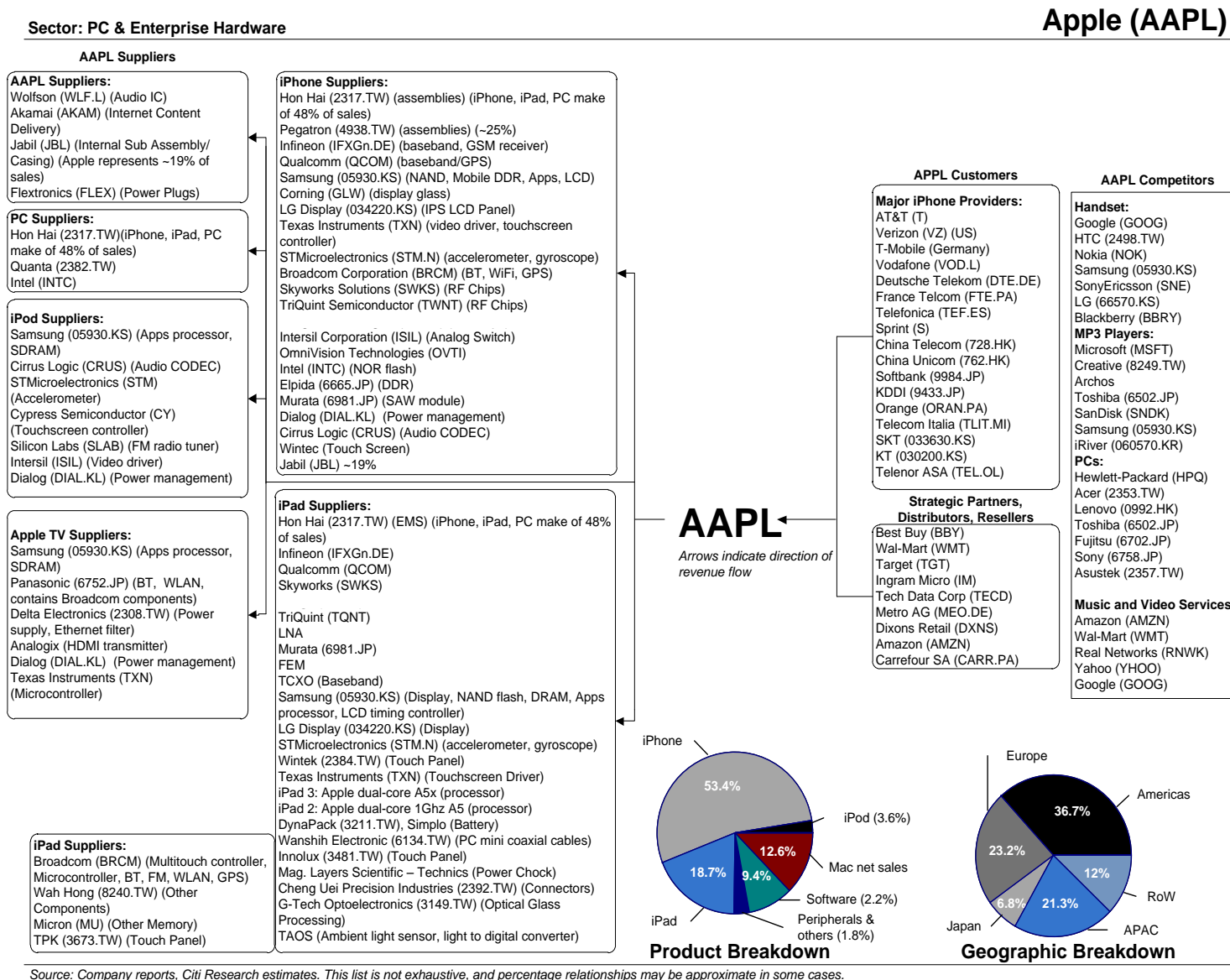
Figure 284. Apple (AAPL) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	42905.0	65225.0	108249.1	156508.0	170910.0	175739.5	181025.4	177466.7	191812.8
- <i>y/y growth</i>	14.4%	52.0%	66.0%	44.6%	9.2%	2.8%	5.9%	1.0%	6.0%
<b>Gross Margins</b>	40.1%	39.4%	40.5%	43.9%	37.6%	37.3%		37.4%	
<b>Operating Margins</b>	27.4%	28.2%	31.2%	35.3%	28.7%	27.9%		27.8%	
<b>EPS</b>	9.08	15.15	27.68	44.15	39.75	41.39	42.82	43.25	46.47
- <i>y/y growth</i>	33.9%	66.9%	82.6%	59.5%	-9.9%	4.1%	7.7%	4.5%	8.5%
<b>Cash</b>	23464.0	25620.0	25952.0	29129.0	40546.0	44585.4		57829.2	
<b>Debt</b>	0.0	0.0	0.0	0.0	16960.0	16961.0		16961.0	
<b>Net Cash/Shr</b>	25.9	27.7	27.7	30.8	25.3	31.0		47.5	
<b>Tangible Book Value/Shr</b>	34.9	51.4	78.1	120.7	127.3	141.6		155.6	

(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 285. Apple (AAPL)



Source: Citi Research

Figure 286. Apple's Supplier List

Apple's Supplier list - 2014				
3M	Cowell Optic Electronics	Interflex	NXP Semiconductor	Sony
AAC Technologies	COXON Precise	Intersil	OmniVision	Stanley Engineering Fastening
AcBel Polytech Inc	Cymmetrik Shenzhen Printing	Intramedia	Omron	STMicroelectronics
Advanced Micro Devices	Dai-Ichi Seiko	Inventec Appliances	Osram Opto Semiconductors	Styron
ACON Group	Darfon Electronic	Jabil Circuit	Panasonic	Sumida Electric
Advance Tech	Delta Electronics	Japan Aviation Electronics	Parade Technologies	Sumitomo Chemical
Advanced Semiconductor Engi	Dialog Semiconductor	Japan Display	PCH International	Sumitomo Electric
AKM Semiconductor	Diodes	Kailly Packaging	Pegatron	SUNREX Tech
Alcoa	Dou Yee Tech	KEMET	Philips Lumileds Lighting	Suyin Corp
Alps Electric	Dover	Kyocera	Pioneer Material Precision	Suzhou Anjie Tech
Amphenol	DSM	Laird Technologies	Plastron Precision	Suzhou Panel Electronic
Analog Devices	Dynacast International	Largan Precision	Prent	Taishan City Kam Kiu Aluminium Extrusion
Arvato Digital	Dynapack International	Lateral Solutions	Primax Electronics	Taiyo Yuden
Asahi Glass	E-Litecom	Lens One Tech	Quanta Computer	Taylor Corp
Asia Vital Components	Eaton	LG Chem	Qualcomm	TDK Corp
AT&S AG	Ellington Electronics	LG Display	Radiant Opto Electronics	TE Connectivity
AU Optronics	Elpida Memory	LG Innotek	Renesas	Teikoku Printing
Audience	Emerson Electric	Lite-On Tech	RF Micro Devices	Texas Instruments
Austria Microsystems	Fairchild Semiconductor	Longwell	ROHM	Tian Jin Lishen Batter Join-Stock Co.
	FLEXium Interconnect	Luen Fung Group	R.R. Donnelley & Sons	Toshiba
Biel Crystal Manufactory	Flextronics	Luxshare-Ict	SABIC Innovative Plastics	Toyo Rikagaku Kenkyusho
Brilliant International Group	Fortune Grand Enterprise	Macronix International	Salcomp	Toyoda Gosei
Broadcom	Foster Electric	Marian	Samsung Electro-Mechancis	TPK Holding Co
Broadway Industrial Group	Fujikura	Maxim Integrated Products	Samsung Electronics	Tripod Tech
Bum Chun Precision	Genius Electronic Optical	Merry Electronics	SDI Corp	TriQuint
BYD Company	GoerTek	Micron	Sandisk	Triumph Lead Electronic
Career Technology	Hama Naka Shoukin Industry	Minebea	Santak	TTM Tech
Catcher Technology	Hanson Metal Factory	Mitsumi Electric	Seagate	TXC Corp
Cathay Tat Ming Precision	Heesung Electronics	Molex	Seiko Epson	UACJ Corp
Cheng Loong Corporation	Henkel Ag & Co.	Multi-Fineline Electronix	Semiconductor Components Industries	UniBright Chemical
Cheng Uei Precision	Heptagon Advanced Micro-Optics	Murata Manufacturing	Sharp	Unimicron
Cirrus Logic	Hi-P International	Nan Ya PCB	Shenzhen Desay Battery Tech	Unisteel Technology
China Circuit Technology	Hon Hai Precsion	NEC TOKIN	Shenzhen Yuto Printing	Vishay Interconnect
CN Innovations	Hony Glass Technology	Nichia Corp.	Shicoh	Voilex
Coilcraft	Hydro Aluminium Extrusion	Nidec	Shin Zu Shing	Western Digital
Compeq Manufacturing	Hynix Semiconductor	Nippon Mektron	Silicon Works	Wintek
Consolidated Graphics	Ibiden	Nissha Printing	Simplo Tech	Zeniya Aluminum Engineering
Coretronic	Infineon	Nisshin Steel	Skyworks Solutions	Zhen Ding Technology
Corning	Innolux	Nitto Denko Corp	SMK Corp	
Cosmosupplylab	Intel	NVIDIA	Solvay Specialty Polymers	

Source: Citi Research, Company Reports



Figure 287. Apple's Old vs. New Suppliers to the List this year

Suppliers not on the List This Year	Suppliers New to The List This Year
Advanced-Connectek Inc.	ACON Group
Amperex Technology	Advance Tech
Anjie Insulating Material Co.	Advanced Semiconductor Engineering
Auras Technology	Bum Chun Precision
Avnet	Cathay Tat Ming Precision
Best Ever Industries	China Circuit Technology
Bluecom	CN Innovations
Cypress Semiconductor	Cosmosupplylab
Daikin Industries	COXON Precise
Daishinku	Dou Yee Tech
Deufol Sunman	Eaton
Dynamic Electronics	Ellington Electronics
Gold Circuit Electronics	Heesung Electronics
Hirose Electric	Hydro Aluminium Extrusion
Hitachi-LG Data Storage	Kaily Packaging
Infastech Fastening Systems	KEMET
International Peper	Luen Fung Group
International Rectifier Corp.	Merry Electronics
Linear Technology	NEC TOKIN
Magnachip Semiconductor	Nissha Printing
Marvell Technology	Plastron Precision
Mega Precision Tech	Santak
Meiko Electronics	Semiconductor Components Industries
Multi Packaging Solutions	Shenzhen Desay Battery Tech
New Ocean Precision Component	Stanley Engineering Fastening
ON Semiconductor	Sumida Electric
Oriental Printed Circuits	Suzhou Anjie Tech
Pulse Electronics	Suzhou Panel Electronic
Semtech	Taishan City Kam Kiu Aluminium Extrusion
Shenzhen Panel Lighting	Taylor Corp
Shimano	TTM Tech
Sumitomo Light Metals	UACJ Corp
Taiyi Precision	UniBright Chemical
Universal Scientific Industrial	

Source: Citi Research, Company Reports

## Applied Materials Inc.

Citi Analyst: Terence Whalen

Applied Materials is the largest supplier of wafer fab equipment and supplied roughly 18% equipment to the approximately \$30 billion market in 2012.

Applied Materials Inc. (AMAT) also participates in non-semi display and solar equipment which comprises ~8% of its overall sales.

Figure 288. Applied Materials (AMAT) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	5013.6	9548.7	10517.0	8719.0	7509.0	9248.2	9230.9	10326.5	10067.7
- <i>y/y growth</i>	-38.3%	90.5%	10.1%	-17.1%	-13.9%	23.2%	22.9%	11.7%	9.1%
<b>Gross Margins</b>	28.5%	38.9%	41.5%	38.0%	39.8%	42.6%		43.5%	
<b>Operating Margins</b>	-2.8%	18.1%	22.8%	15.8%	13.7%	19.1%		22.1%	
<b>EPS</b>	-0.05	0.88	1.29	0.75	0.59	1.12	1.07	1.52	1.36
- <i>y/y growth</i>	-106.5%	1809.9%	47.1%	-41.6%	-21.1%	88.7%	80.7%	35.5%	26.7%
<b>Cash</b>	2214.7	2584.6	6243.0	1937.0	1891.0	2968.9		4504.4	
<b>Debt</b>	201.9	205.5	1947.0	1946.0	1946.0	1946.0		1946.0	
<b>Net Cash/Shr</b>	1.5	1.8	3.2	0.0	0.0	0.8		2.2	
<b>Tangible Book Value/Shr</b>	4.2	4.4	5.5	1.9	2.2	3.1		4.6	

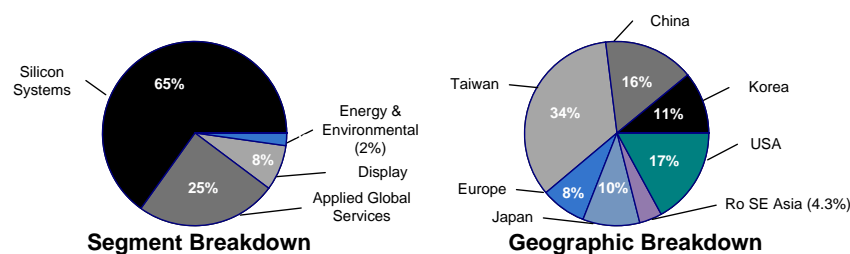
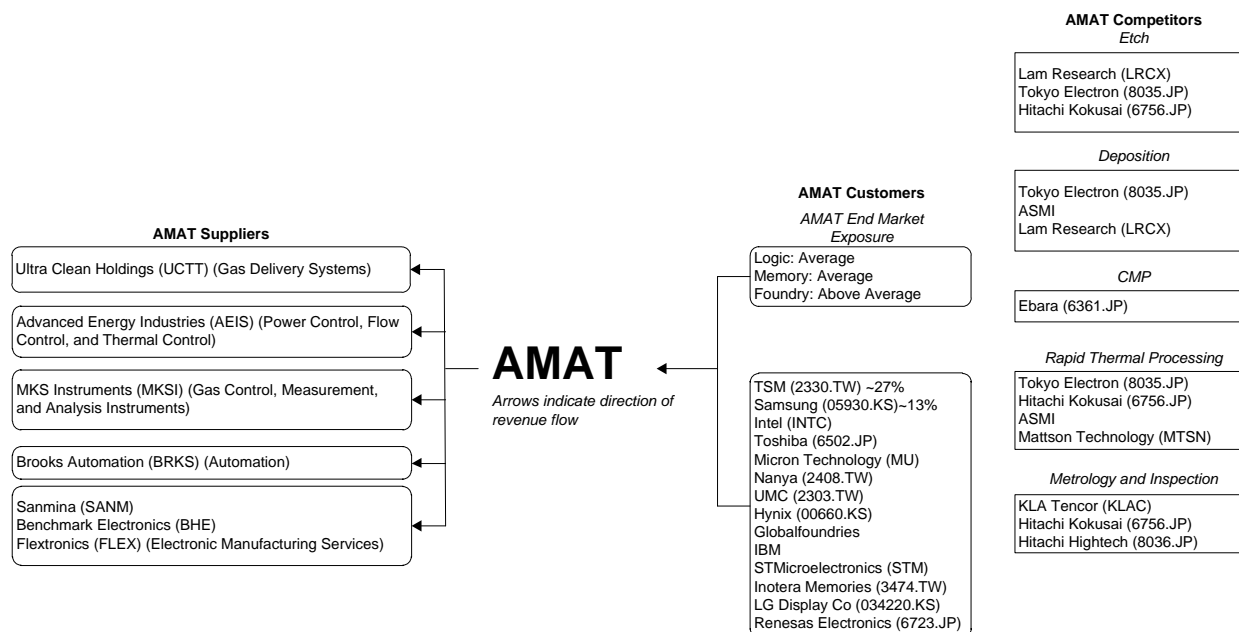
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 289. Applied Materials (AMAT)

Sector: Semiconductor Equipment: Front End

## Applied Materials (AMAT)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## ARM Holdings PLC

Citi Analyst: Amit Harchandani

ARM is a semiconductor intellectual property (IP) company. It designs building blocks (cores and peripherals) that aid engineers in their design and manufacture of integrated circuits (ICs). Semiconductor manufacturers license the designs and incorporate them into their own chips

**Most Relevant Relationships:** Apple, Samsung, TSMC

Figure 290. ARM Holdings PLC (ARM.L) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	305.0	406.6	491.8	576.8	714.6	786.1	799.0	912.6	926.7
- <i>y/y growth</i>	2.0%	33.3%	20.9%	17.3%	23.9%	10.0%	11.8%	16.1%	16.0%
<b>Gross Margins</b>	91.6%	93.6%	94.4%	94.6%	94.5%	94.8%		95.1%	
<b>Operating Margins</b>	31.2%	40.4%	45.1%	45.6%	57.4%	50.1%		53.8%	
<b>EPS</b>	0.05	0.09	0.12	0.15	0.21	0.24	0.24	0.30	0.30
- <i>y/y growth</i>	-4.4%	74.1%	33.0%	18.2%	40.0%	14.8%	17.4%	25.7%	22.3%
<b>Cash</b>	141.8	275.1	345.9	386.3	587.9	691.7		845.5	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	0.1	0.2	0.3	0.3	0.4	0.5		0.6	
<b>Tangible Book Value/Shr</b>	0.2	0.3	0.4	0.5	0.5	0.6		0.8	

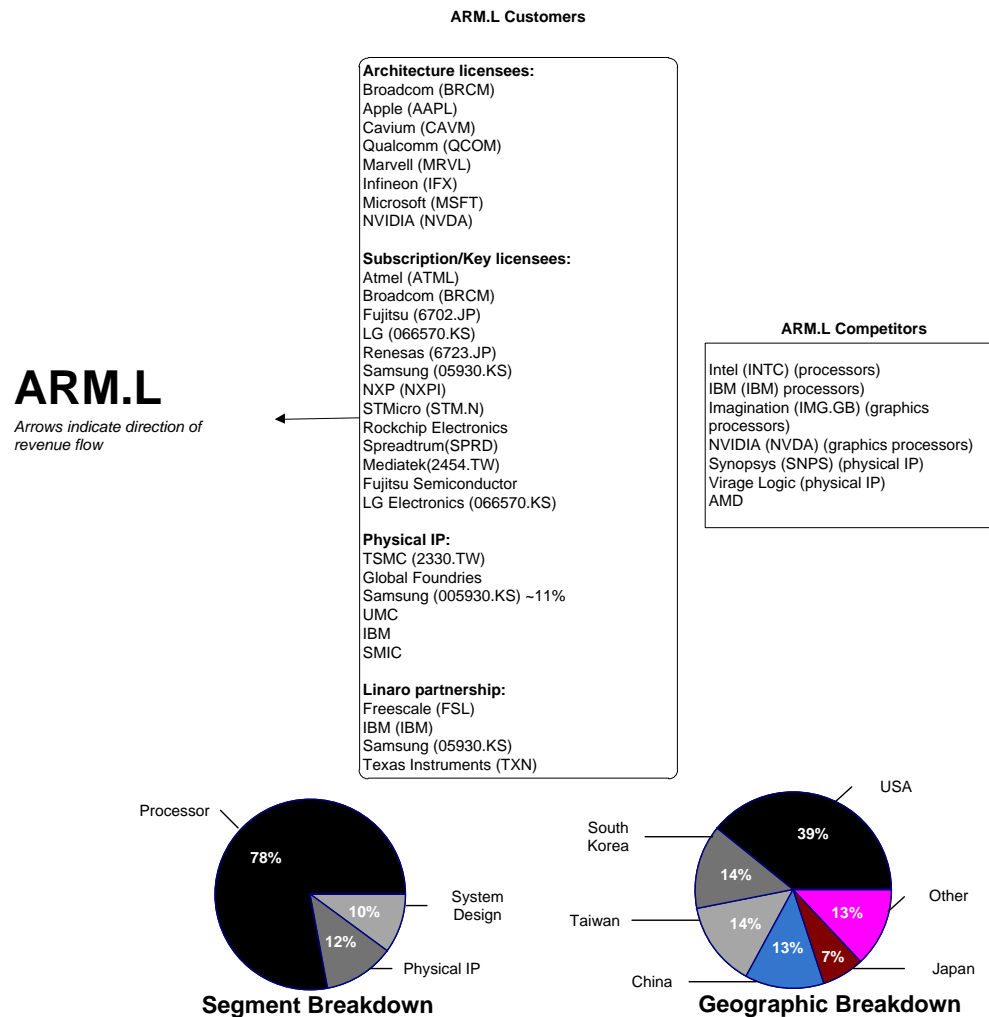
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 291. ARM Holdings PLC (ARM.L)

Sector: Semiconductor Intellectual Property

## ARM Holdings PLC (ARM.L)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Arrow Electronics

Citi Analyst: Jim Suva, CPA

Arrow Electronics, Inc (ARW) is a leading global distributor of electronics components and computer products. In 2011 was the second-largest global distributor of such products in terms of revenue.

Arrow serves as a supply channel partner for more than 100,000 original equipment manufacturers, contract manufacturers, and commercial customers through a global network of more than 470 locations in 55 countries.

No single customer representing more than 10% of sales. Sales by geography are: 52% Americas, 29% Europe/EMEASA, and 19% Asia/Pacific. Arrow has two business segments: Electronics Components (EC) at 64% of sales and Computer Products (CP) at 36% of sales.

Arrow is headquartered in Englewood, Colorado, and has about 11,000 employees in more than 340 global locations.

Figure 292. Arrow (ARW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	14684.1	18744.7	21390.3	20405.1	21357.3	22691.1	22807.5	23607.8	23844.3
- <i>y/y growth</i>	-12.4%	27.7%	14.1%	-4.6%	4.7%	6.2%	6.8%	4.0%	4.5%
<b>Gross Margins</b>	11.5%	12.5%	13.3%	12.8%	12.5%	12.9%		12.9%	
<b>Operating Margins</b>	2.6%	4.2%	4.5%	3.8%	3.8%	4.1%		4.3%	
<b>EPS</b>	1.68	4.14	5.19	4.40	4.88	5.74	5.67	6.49	6.17
- <i>y/y growth</i>	-42.7%	147.2%	25.3%	-15.2%	10.9%	17.6%	16.0%	12.9%	8.9%
<b>Cash</b>	1137.0	926.3	396.9	409.7	390.6	871.2		1342.5	
<b>Debt</b>	1399.2	1822.4	1961.7	1951.8	2250.0	2250.0		2250.0	
<b>Net Cash/Shr</b>	-1.1	-7.1	-13.4	-10.9	-18.0	-13.2		-8.6	
<b>Tangible Book Value/Shr</b>	16.6	16.1	19.7	21.4	37.4	42.6		48.5	

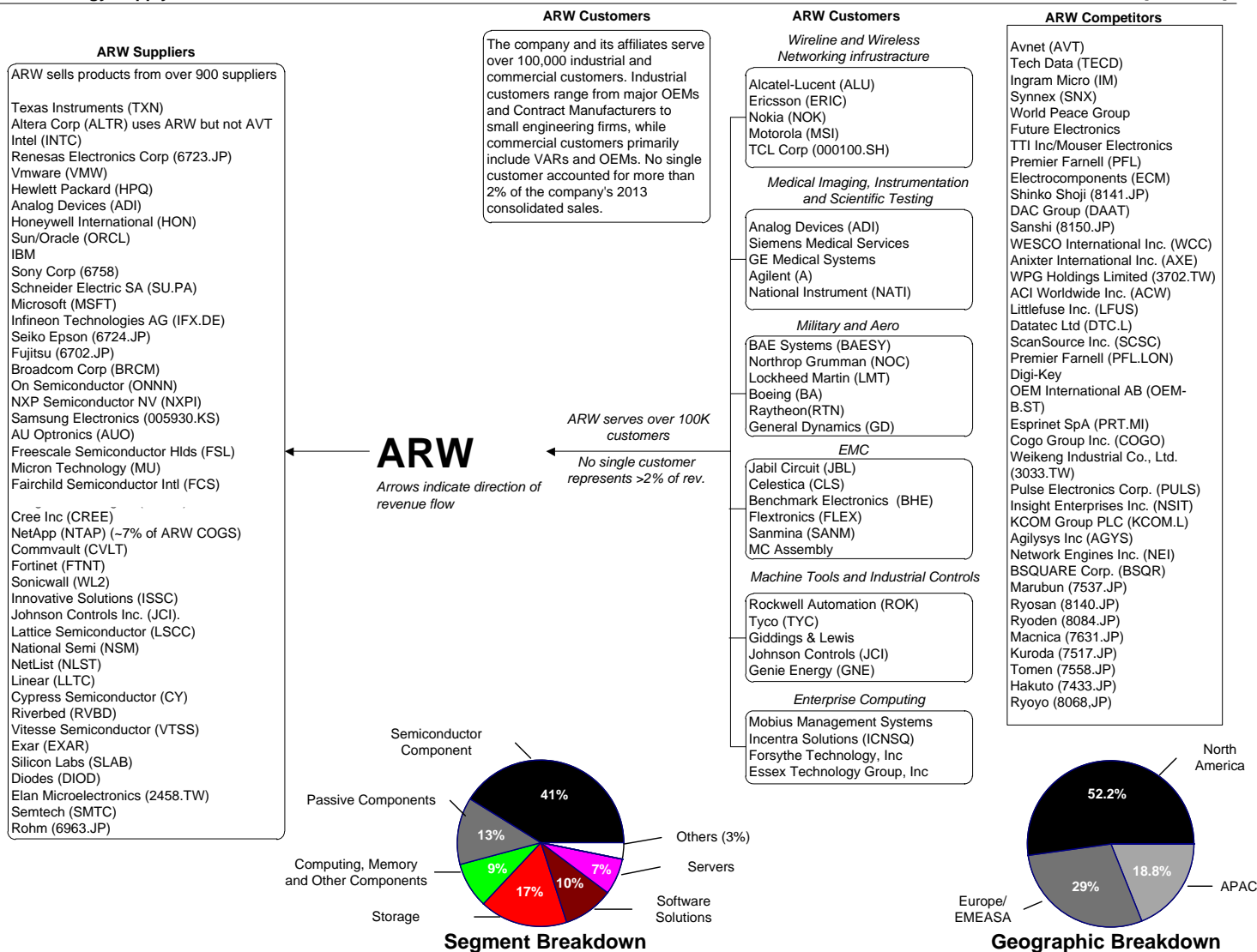
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 293. Arrow Electronics (ARW)

Sector: Technology Supply Chain - Distributors

# Arrow Electronics (ARW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Asahi Glass

Citi Analyst: Atsushi Ikeda

Asahi Glass ranks with Nippon Electric Glass and Saint Gobain among the world's largest flat glass manufacturers and has the top global market share.

The company has a particularly strong auto glass customer base, centering on Japanese makers, thanks to its ability to supply high-quality products on a uniform basis worldwide; Asahi has the top global maker share at around 25%. The company is expanding its market share for solar cell glass, mainly to Japanese makers.

Asahi Glass has the second largest global market share for TFT-LCD glass (we estimate it at 23%) behind Corning and the top share (70%) for PDP glass. The FPD glass business is currently the major source of profit. A feature of the business is the use of the float production method for all products. Asahi Glass plans to make cover glass a future pillar of earnings.

Figure 294. Asahi Glass (5201.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1148198.0	1288947.0	1214672.0	1189952.0	1320006.0	1337900.0	1363014.0	1343400.0	1391465.0
- y/y growth	-20.5%	12.3%	-5.8%	-2.0%	10.9%	1.4%	3.3%	0.4%	2.1%
<b>Gross Margins</b>	28.0%	35.0%	32.2%	28.9%	26.4%	26.4%		26.4%	
<b>Operating Margins</b>	7.5%	17.8%	13.6%	8.6%	6.1%	4.9%		4.4%	
<b>EPS</b>	17.12	105.56	82.44	41.91	13.97	14.97	21.93	24.83	31.31
- y/y growth	-49.0%	516.6%	-21.9%	-49.2%	-66.7%	7.2%	57.0%	65.9%	42.8%
<b>Cash</b>	103953.0	159497.0	123789.0	133818.0	132649.0	136812.7		144105.9	
<b>Debt</b>	594179.0	472643.0	387420.0	538599.0	575013.0	580000.0		560000.0	
<b>Net Cash/Shr</b>	-363.7	-210.0	-175.4	-260.9	-224.7	-227.7		-221.4	
<b>Tangible Book Value/Shr</b>	637.0	682.2	699.9	786.0	940.7	954.9		961.6	

(Revenues, Cash and Debt in Millions in Local Currency)

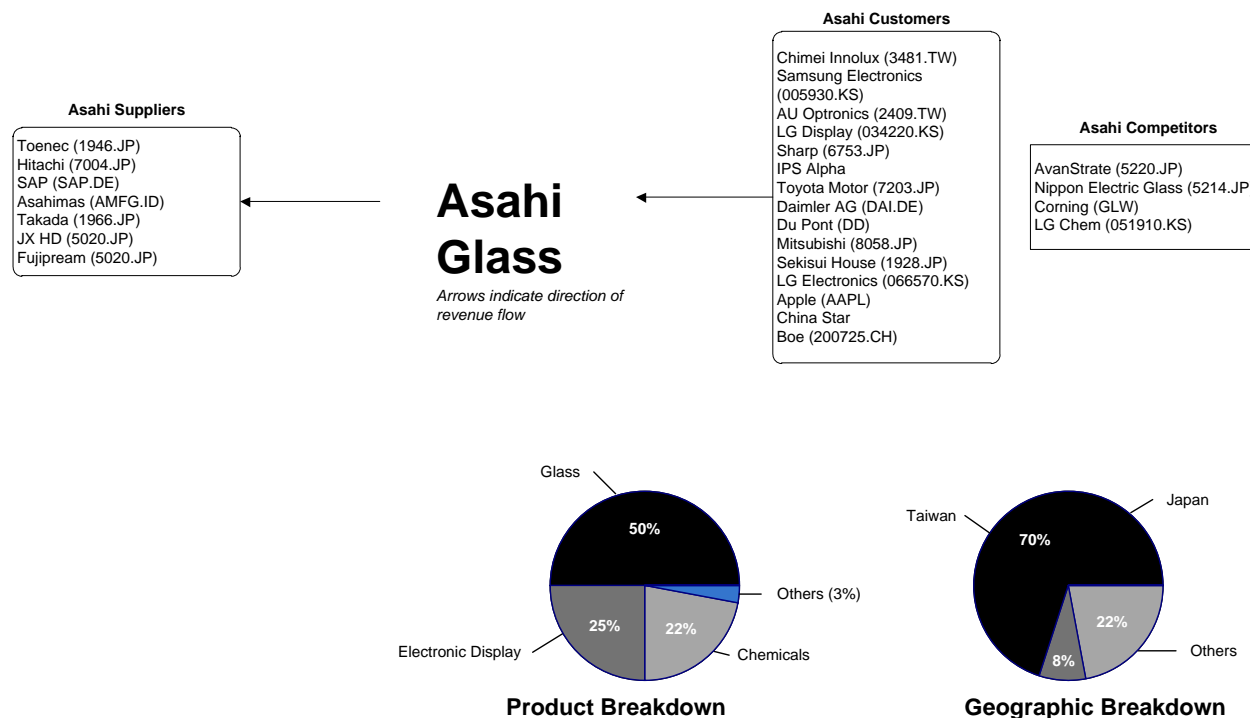
Source: Citi Research



Figure 295. Asahi Glass (5201.JP)

Sector: Technology General

## Asahi Glass (5201.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## ASE

Citi Analyst: Roland Shu

ASE Group is the world's largest provider of independent semiconductor manufacturing services in assembly and test.

The group develops and offers a wide portfolio of technology and solutions, including IC test program design, front-end engineering test, wafer probe, wafer bump, substrate design and supply, wafer level package, flip chip, system-in-package, final test and design manufacturing services (DMS, ODM/EMS) through Universal Scientific Industrial Co, which was acquired by ASE in 2010.

Figure 296. ASE (2311.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	85775.3	188742.8	185347.2	193972.4	219862.0	243918.5	244612.3	268399.0	271442.0
- y/y growth	-9.2%	120.0%	-1.8%	4.7%	13.3%	10.9%	11.3%	10.0%	11.0%
<b>Gross Margins</b>	21.2%	21.5%	18.9%	18.9%	19.5%	19.9%		20.1%	
<b>Operating Margins</b>	10.5%	12.8%	9.1%	9.2%	10.0%	10.5%		10.6%	
<b>EPS</b>	0.93	2.44	1.79	1.73	2.11	2.50	2.38	2.81	2.70
- y/y growth	13.6%	161.2%	-26.6%	-3.6%	22.2%	18.5%	12.5%	12.3%	13.8%
<b>Cash</b>	27577.7	25094.6	25268.2	24435.9	50167.0	64403.9		81715.6	
<b>Debt</b>	63040.7	69548.0	76793.0	84690.4	100801.0	100363.6		99103.5	
<b>Net Cash/Shr</b>	-3.0	-3.6	-3.3	-2.7	0.0	1.8		4.0	
<b>Tangible Book Value/Shr</b>	9.9	11.5	13.1	14.4	15.5	17.1		18.8	

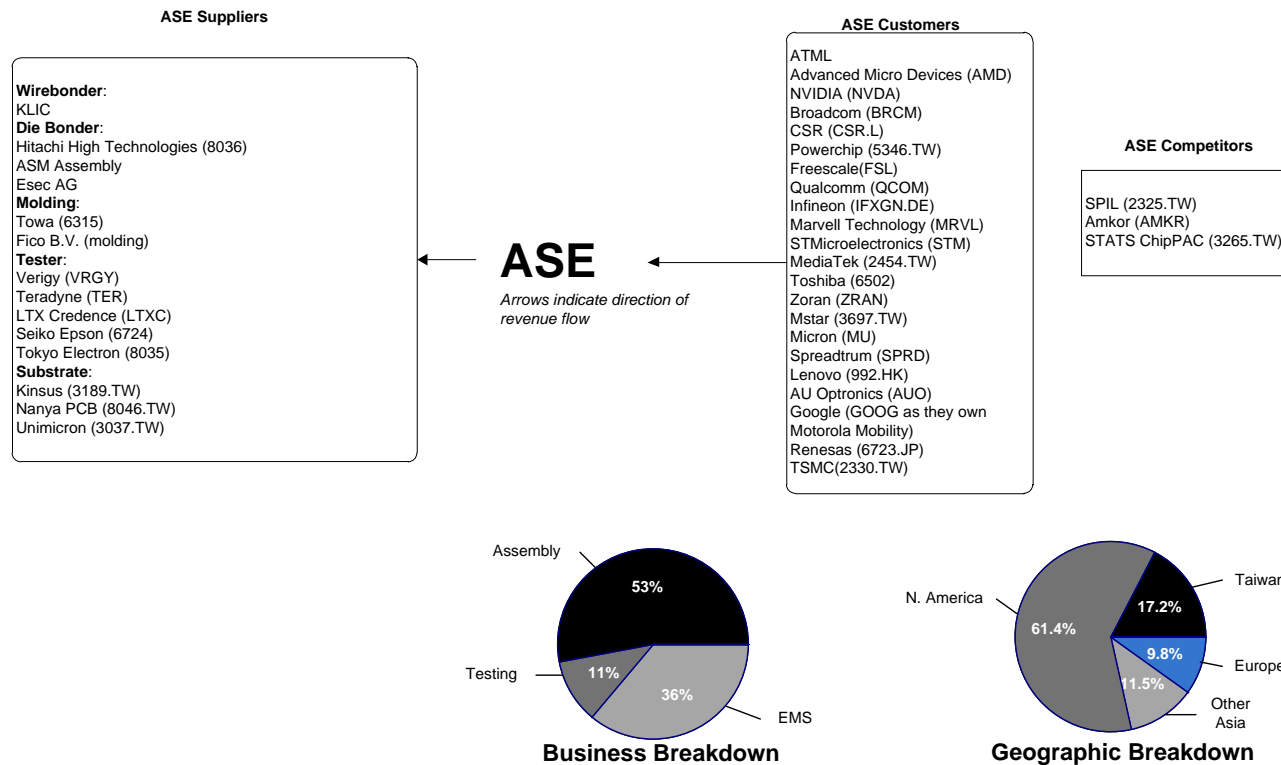
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 297. ASE (2311.TW)

Sector: Semiconductors

ASE (2311.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## ASML Holding NV

Citi Analyst: Amit Harchandani

ASML develops, manufactures and markets photolithography projection systems used in integrated circuit semiconductor manufacturing.

Since it was founded in 1984, ASML has grown rapidly to become the world's top 3 semiconductor equipment company and the largest manufacturer of photolithography scanner systems.

**Most Relevant Relationships:** Intel, Samsung, TSMC

Figure 298. ASM Lithography (ASML.AS) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1596.1	4507.9	5651.0	4731.5	5245.3	6646.0	6560.8	6894.8	7291.4
<b>- y/y growth</b>	-46.0%	182.4%	25.4%	-16.3%	10.9%	26.7%	25.1%	3.7%	11.1%
<b>Gross Margins</b>	28.7%	43.4%	43.3%	42.4%	41.2%	42.9%		44.1%	
<b>Operating Margins</b>	-10.3%	27.7%	29.0%	24.4%	19.6%	23.7%		26.4%	
<b>EPS</b>	-0.35	2.33	3.42	2.69	2.25	3.28	3.16	3.88	4.21
<b>- y/y growth</b>	-147.0%	767.2%	46.9%	-21.3%	-16.4%	45.8%	40.4%	18.2%	33.1%
<b>Cash</b>	1037.1	1949.8	2731.8	2697.6	3010.6	2700.6		2812.1	
<b>Debt</b>	663.1	710.1	733.8	755.9	1070.2	1070.2		1070.2	
<b>Net Cash/Shr</b>	0.9	2.8	4.7	4.6	4.4	3.7		4.0	
<b>Tangible Book Value/Shr</b>	3.8	6.0	7.7	9.2	9.6	11.1		13.2	

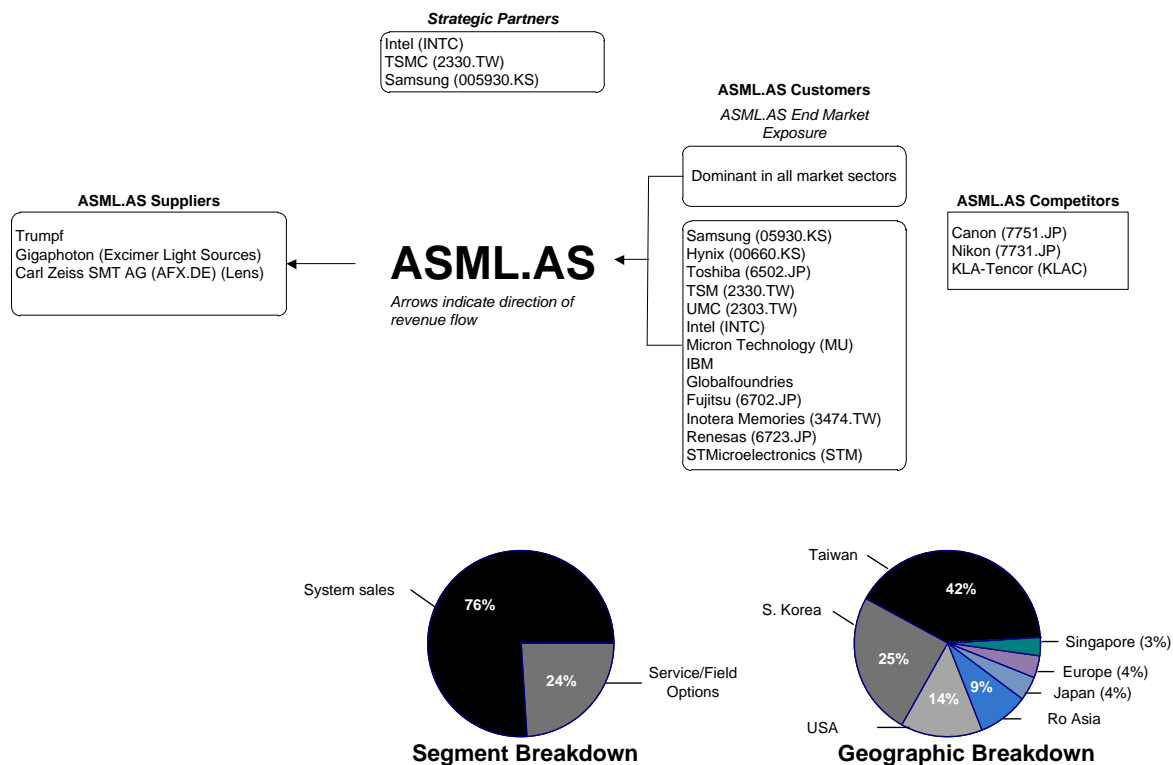
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 299. ASM Lithography (ASML.AS)

Sector: Semiconductor Equipment

## ASM Lithography (ASML.AS; ASML)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## ASUSTek Computer

Citi Analyst: Wei Chen

Established in 1990, ASUSTek Computer (Asus) has built its reputation in motherboards and tapped the notebook arena in 1997.

Asus enjoys a leading position in the global motherboard market. After the spin-off of its manufacturing arm Pegatron, Asus has become a pure brand company. Besides motherboards and NB, Asus also markets hand-held devices, graphic cards, and other consumer electronics.

Figure 300. Asustek (2357.TW) Results and Forecasts

	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	429721.2	384112.3	448684.6	463302.4	459462.4	470197.6	431874.2	495307.3
- <i>y/y growth</i>	-29.6%	-10.6%	16.8%	3.3%	-0.8%	1.5%	-6.0%	5.3%
<b>Gross Margins</b>	12.1%	13.6%	13.6%	12.9%	12.9%		13.4%	
<b>Operating Margins</b>	4.4%	4.7%	4.9%	4.3%	4.0%		4.5%	
<b>EPS</b>	21.55	21.93	29.79	28.59	24.17	27.25	26.13	28.31
- <i>y/y growth</i>	34.4%	1.8%	35.8%	-4.0%	-15.4%	-4.7%	8.1%	3.9%
<b>Cash</b>	52911.3	54496.1	59339.0	52448.7	62101.1		63093.7	
<b>Debt</b>	8020.5	4639.3	5569.2	6620.6	6620.6		6620.6	
<b>Net Cash/Shr</b>	67.3	71.0	77.5	68.3	82.0		83.3	
<b>Tangible Book Value/Shr</b>	138.6	152.1	167.5	177.2	184.5		195.0	

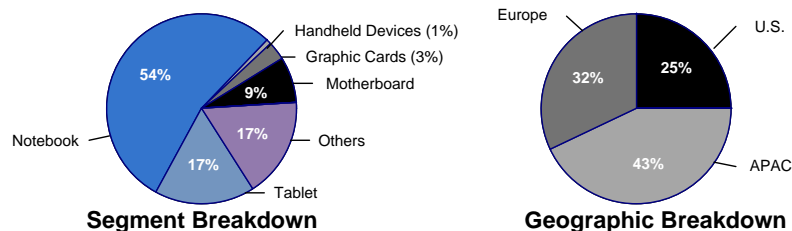
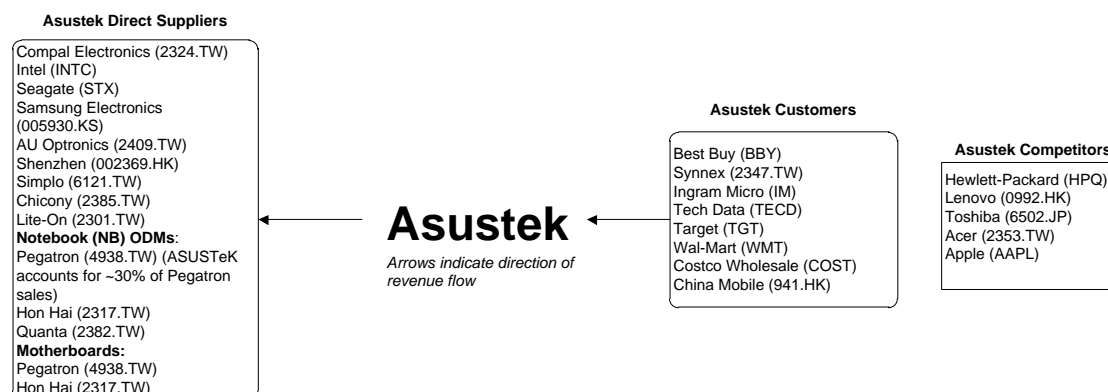
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 301. Asustek (2357.TW)

Sector: PC & Enterprise Hardware

Asustek (2357.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## AU Optronics

Citi Analyst: Winnie Hong, CFA

AUO was established in 1996 and now ranks as the fourth-largest display panel company after Samsung Electronics, LG Display, and Innolux.

Figure 302. AU Optronics (2409.TW) Results and Forecasts

	2009	2010	2011	2012	2013	Street 2014E	Street 2015E
<b>Revenues</b>	359331.3	467158.0	379711.9	378470.9	416362.8	402151.5	405277.3
- <i>y/y growth</i>	-15.2%	30.0%	-18.7%	-0.3%	10.0%	-3.4%	0.8%
<b>Gross Margins</b>	2.0%	7.8%	-7.4%	-2.3%	8.2%		
<b>Operating Margins</b>	-4.2%	2.2%	-15.2%	-10.0%	2.0%		
<b>EPS</b>	-3.05	0.76	-6.94	-6.19	0.45	0.41	0.57
- <i>y/y growth</i>	-223.7%	124.9%	-1015.4%	10.9%	107.3%	-9.8%	40.7%
<b>Cash</b>	85831.4	89925.8	90922.3	77449.3	76312.0		
<b>Debt</b>	183480.5	183515.9	232711.5	224208.7	184708.0		
<b>Net Cash/Shr</b>	-5.6	-6.4	-9.9	-10.5	-4.6		
<b>Tangible Book Value/Shr</b>	29.7	30.4	23.3	16.9	17.1		

(Revenues, Cash and Debt in Millions in Local Currency)

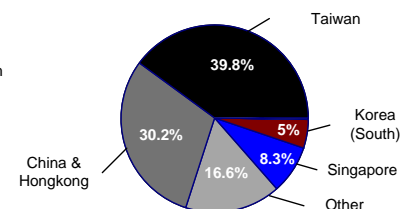
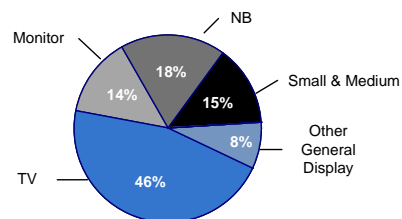
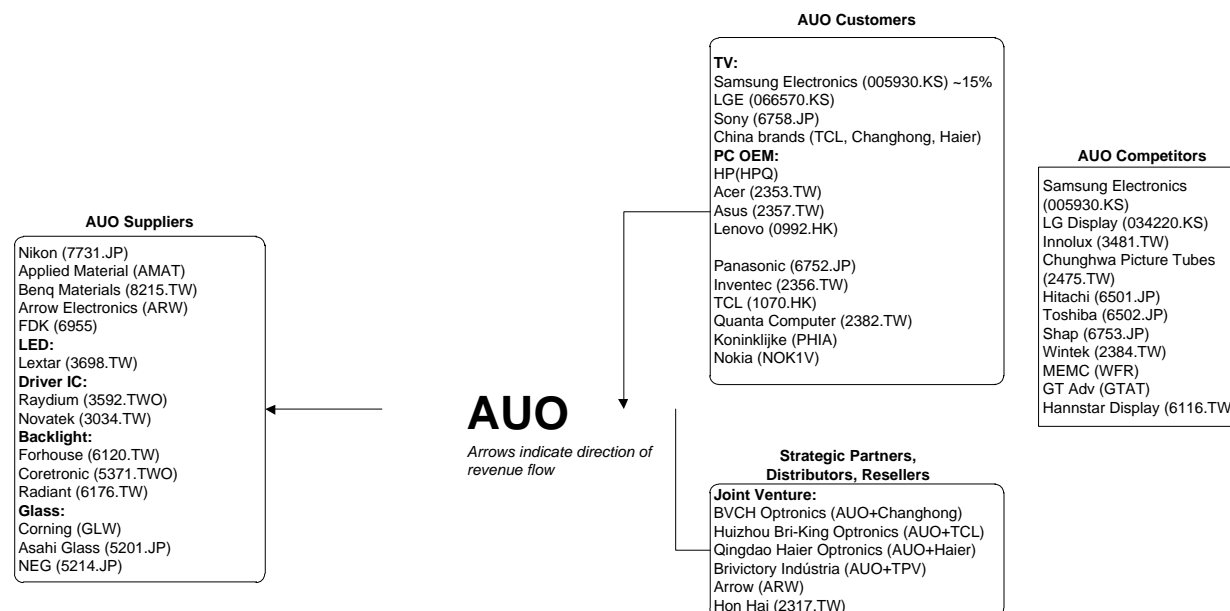
Source: Citi Research, Company Reports, FirstCall



Figure 303. AU Optronics (2409.TW)

Sector: Semiconductors and Components

## AU Optronics (2409.TW; AUO)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Avnet

Citi Analyst: Jim Suva, CPA

Avnet Inc (AVT) is a leading global distributor of electronics components and computer products and was ranked #1 by revenues in 2011.

Avnet has two business segments: Electronics Marketing (EM) representing 59% of total sales and Technology Solutions (TS) representing 41% of total sales over the last 12 months. Avnet has ~300 suppliers and >100,000 customers. Sales by geography are: ~45% Americas, 27% Europe/EMEASA, and 28% Asia/Pacific.

**Most Relevant Relationships:** IBM's products accounted for 12% of Company's consolidated sales in 2013

Avnet is headquartered in Phoenix, AZ and has ~19,100 employees in over 275 global locations.

Figure 304. Avnet (AVT) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	16229.9	19160.1	26534.4	25707.5	25459.0	27853.0	27832.1	29031.6	29004.1
- <i>y/y growth</i>	-9.6%	18.1%	38.5%	-3.1%	-1.0%	9.4%	9.3%	4.2%	4.2%
<b>Gross Margins</b>	12.5%	11.9%	11.7%	11.9%	11.7%	11.7%		11.7%	
<b>Operating Margins</b>	3.0%	3.4%	3.8%	3.7%	3.0%	3.4%		3.5%	
<b>EPS</b>	1.91	2.77	4.32	4.06	3.47	4.26	4.36	4.49	4.72
- <i>y/y growth</i>	-39.8%	44.9%	55.8%	-5.9%	-14.7%	23.0%	25.7%	5.3%	8.4%
<b>Cash</b>	943.9	1092.1	675.3	1006.9	1009.3	1137.6		1748.5	
<b>Debt</b>	969.9	1280.2	1516.6	2144.4	2045.2	2196.3		2196.3	
<b>Net Cash/Shr</b>	0.0	-1.0	-3.9	-1.8	-1.4	-0.6		3.7	
<b>Tangible Book Value/Shr</b>	14.7	16.1	20.8	19.0	21.9	25.7		29.6	

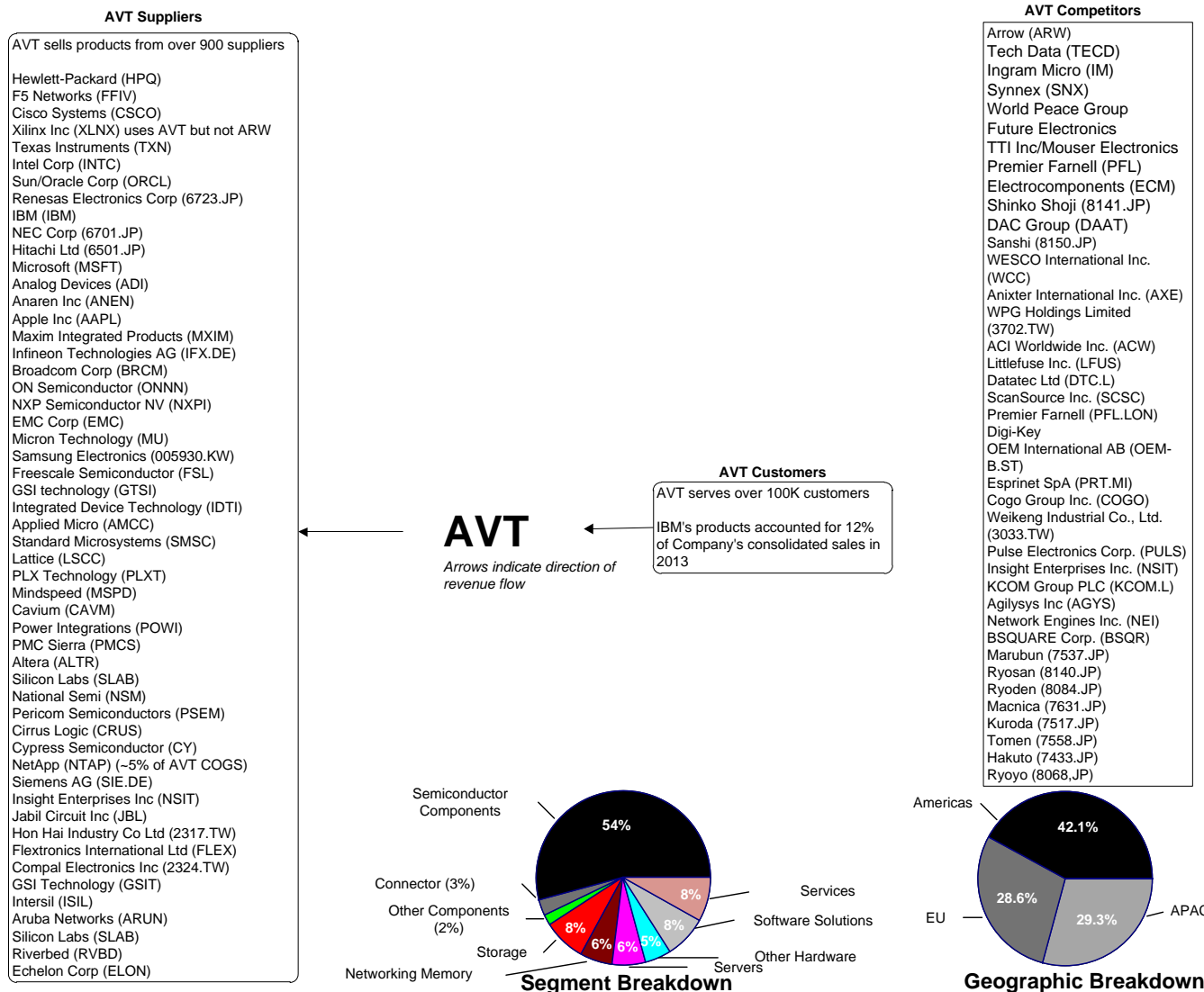
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 305. Avnet (AVT)

Sector: Technology Supply Chain - Distributors

Avnet (AVT)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## AVX Corporation

Citi Analyst: Jim Suva, CPA

AVX Corp. manufactures and sells passive electronic components around the world with products that include ceramic and tantalum capacitors, film and power capacitors, and resistors.

The company is controlled by Kyocera (Japanese conglomerate of electronic components and electronic goods) that owns 70% of the company.

AVX sales are approximately: 68% AVX Passive Components, 17% Kyocera Electronic Devices Resale, and 15% AVX Connectors. AVX distributes some of Kyocera's products as well as small amount connectors both of which help the company with a broader offering of products.

It has 20 manufacturing facilities in 12 countries. Its end markets are computers 14%, consumer 9%, wireless 13%, telecom 14%, industrial 13%, auto 21%, military 4%, medical 8%, and other 4%.

Headquartered South Carolina, AVX was founded in 1972, joined the Kyocera group in 1990, and became a publicly traded company in 1995.

Figure 306. AVX (AVX) Results and Forecasts

	2010	2011	2012	2013	2014	CIR 2015E	Street 2015E	CIR 2016E	Street 2016E
<b>Revenues</b>	1305.0	1653.1	1545.3	1414.4	1445.1	1533.5	1505.4	1694.7	NA
- y/y growth	-6.1%	26.7%	-6.5%	-8.5%	2.2%	6.1%	4.2%	10.5%	
<b>Gross Margins</b>	21.3%	27.7%	25.4%	18.6%	19.0%	19.2%		19.6%	
<b>Operating Margins</b>	12.9%	20.0%	17.8%	10.4%	10.6%	11.2%		12.3%	
<b>EPS</b>	0.84	1.46	1.20	0.60	0.68	0.74	0.74	0.89	0.89
- y/y growth	36.3%	74.2%	-18.1%	-49.6%	12.6%	8.8%	8.9%	20.1%	20.3%
<b>Cash</b>	688.5	781.0	813.4	1047.1	913.0	788.5		664.3	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	4.0	4.6	4.8	6.2	5.4	4.7		4.0	
<b>Tangible Book Value/Shr</b>	9.1	10.6	11.4	10.0	10.3	10.0		9.7	

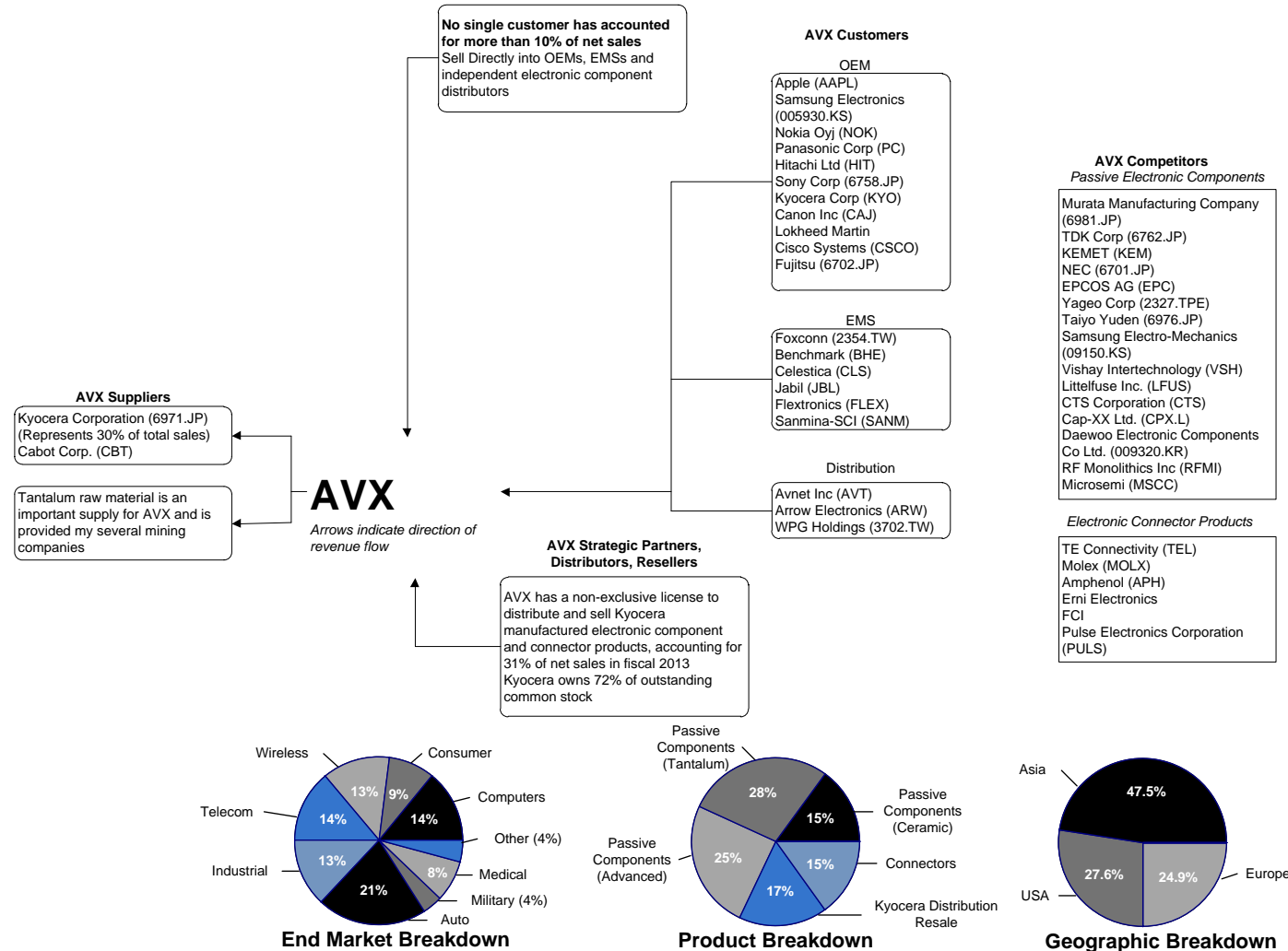
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 307. AVX Corp. (AVX)

Sector: Technology Supply Chain - Passives

## AVX Corporation (AVX)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Benchmark Electronics

Citi Analyst: Jim Suva, CPA

Benchmark Electronics is a leading provider of electronics manufacturing services to the enterprise computer, telecommunications, medical device, industrial control, and testing and instrumentation markets.

Benchmark's customers rely on Benchmark to manufacture technologically complex products, including telecommunications equipment, high-capacity computer storage devices, and fault-tolerant computer servers.

Sales by end markets include: 31% high-end computing, 10% medical, 27% industrial, 26% telecom, and 7% test and instrumentation. The company's largest customers are IBM (>10% of sales), EMC (~8-9%), Medtronic and AMAT.

Benchmark is a global manufacturer with facilities located in North America, South America, Europe, and Asia.

Figure 308. Benchmark (BHE) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	2089.3	2402.1	2253.0	2468.2	2506.5	2705.8	2742.1	2808.8	2876.8
- y/y growth	-19.3%	15.0%	-6.2%	9.5%	1.6%	8.0%	9.4%	3.8%	4.9%
<b>Gross Margins</b>	7.0%	7.9%	6.2%	7.2%	7.4%	7.7%		7.6%	
<b>Operating Margins</b>	2.9%	4.0%	2.2%	3.5%	3.5%	3.8%		3.8%	
<b>EPS</b>	0.91	1.38	1.01	1.21	1.27	1.45	1.48	1.56	1.63
- y/y growth	-27.4%	51.4%	-27.1%	19.8%	5.0%	14.2%	16.6%	7.6%	10.1%
<b>Cash</b>	421.2	346.3	283.9	384.6	345.6	455.7		531.0	
<b>Debt</b>	11.7	11.4	11.0	10.6	10.1	10.1		10.1	
<b>Net Cash/Shr</b>	6.3	5.4	4.6	6.6	6.1	8.3		9.7	
<b>Tangible Book Value/Shr</b>	16.4	17.1	18.2	19.5	20.4	22.0		23.6	

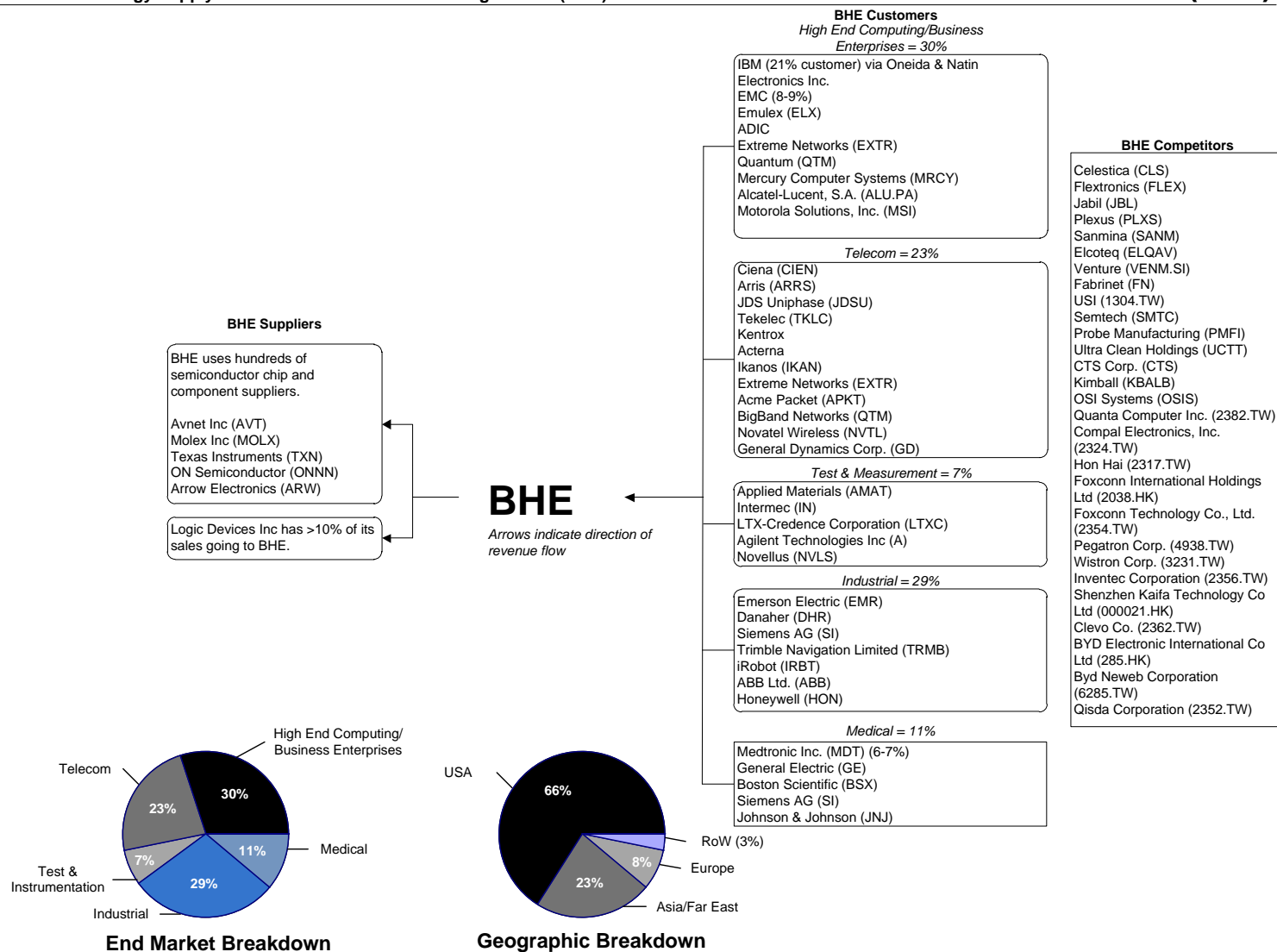
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 309. Benchmark Electronics (BHE)

Sector: Technology Supply Chain – Electronic Manufacturing Service (EMS)

## Benchmark Electronics (BHE)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Blackberry

Citi Analyst: Ehud Gelblum, Ph.D

BlackBerry develops hardware and software solutions for mobile communications.

Through the development of integrated hardware, software, and services, which support multiple wireless network standards, the company provides platforms and solutions. These solutions provide access to information, including e-mail, voice, instant messaging, short message services, the Internet, and intranet-based applications and browsing.

The company's technology also enables third party developers and manufacturers to enhance their products and services through software development kits, wireless connectivity to data, and other support programs.

BBRY has seen its market share erode in recent quarters as a result of heightened competition from Apple and Android devices. As of C2012, its market share of smartphones stood at 5%, down from 11% a year ago.

The company was founded by Mike Lazaridis, Douglas Fregin, and Jim Balsillie on March 7, 1984 and is headquartered in Waterloo, Canada.

Figure 310. Blackberry (BBRY) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	11065.2	14953.2	19907.2	18489.0	11092.0	6923.5	12851.0	3524.0	4208.1
- y/y growth	84.1%	35.1%	33.1%	-7.1%	-40.0%	-37.6%	15.9%	-49.1%	-67.3%
<b>Gross Margins</b>	46.1%	44.0%	44.3%	40.0%	31.9%	34.5%		33.8%	
<b>Operating Margins</b>	24.6%	23.4%	23.3%	15.0%	-6.2%	-19.3%		-16.7%	
<b>EPS</b>	3.44	4.37	6.34	4.19	-0.63	-2.31	0.12	-1.33	-1.35
- y/y growth	52.2%	27.2%	44.9%	-33.8%	-115.0%	-266.9%	119.1%	42.1%	-1228.3%
<b>Cash</b>	1518.2	1911.5	2121.0	1763.0	2654.0	2800.9		1799.0	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	994.0		994.0	
<b>Net Cash/Shr</b>	2.6	3.4	3.9	3.4	5.1	3.4		1.5	
<b>Tangible Book Value/Shr</b>	8.3	10.9	12.4	12.5	11.5	4.6		4.0	

(Revenues, Cash and Debt in Millions in Local Currency)

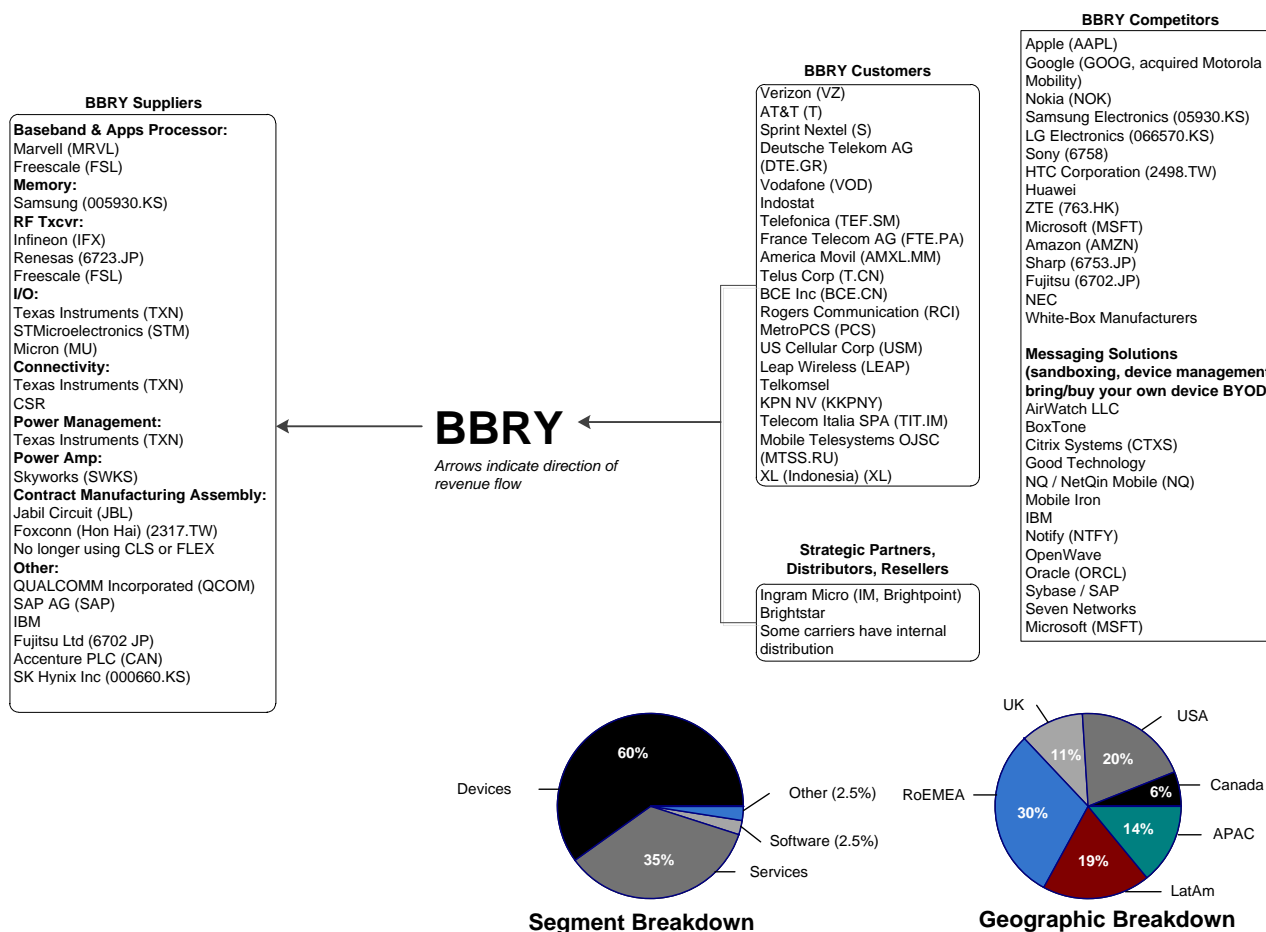
Source: Citi Research, Company Reports, FirstCall



Figure 311. Blackberry (BBRY)

Sector: Handheld Devices

## Blackberry (BBRY)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Broadcom

Citi Analyst: Glen Yeung

Broadcom is a fabless semiconductor company that designs and develops semiconductors for wired and wireless communications.

Broadcom provides a broad portfolio of system-on-chip (SoC) solutions for manufacturers of broadband access, computing and networking equipment, mobile devices, and consumer electronics.

Applications for Broadcom's SoC solutions include digital cable, satellite and IP set-top boxes, HDTV, cable and DSL modems, residential gateways, transmission and switching for networking, server solutions, broadband network and security processors, handsets, GPS, VoIP gateway and telephony systems. However, in the fast-growing fabless semiconductor market, Broadcom is the 2nd largest behind Qualcomm.

Figure 312. Broadcom (BRCM) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	4490.3	6818.3	7389.0	8006.0	8305.0	8295.6	8541.2	8707.4	9134.6
- y/y growth	-3.6%	51.8%	8.4%	8.4%	3.7%	-0.1%	2.8%	5.0%	6.9%
<b>Gross Margins</b>	50.8%	51.8%	50.9%	49.7%	50.8%	49.8%		50.1%	
<b>Operating Margins</b>	1.2%	15.9%	12.9%	8.4%	5.7%	8.7%		10.6%	
<b>EPS</b>	0.13	1.99	1.65	1.25	0.73	1.13	2.46	1.43	2.74
- y/y growth	-68.9%	1455.8%	-17.1%	-24.2%	-41.5%	55.2%	236.7%	26.0%	11.5%
<b>Cash</b>	1929.4	2657.7	4529.0	2374.0	2432.0	2855.5		3469.4	
<b>Debt</b>	0.0	697.0	1196.0	1693.0	1394.0	1394.0		1394.0	
<b>Net Cash/Shr</b>	3.8	3.6	5.9	1.7	1.8	2.5		3.4	
<b>Tangible Book Value/Shr</b>	4.9	7.6	8.7	4.7	6.9	7.9		9.2	

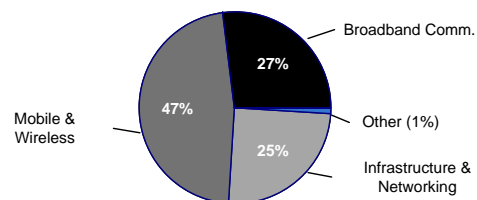
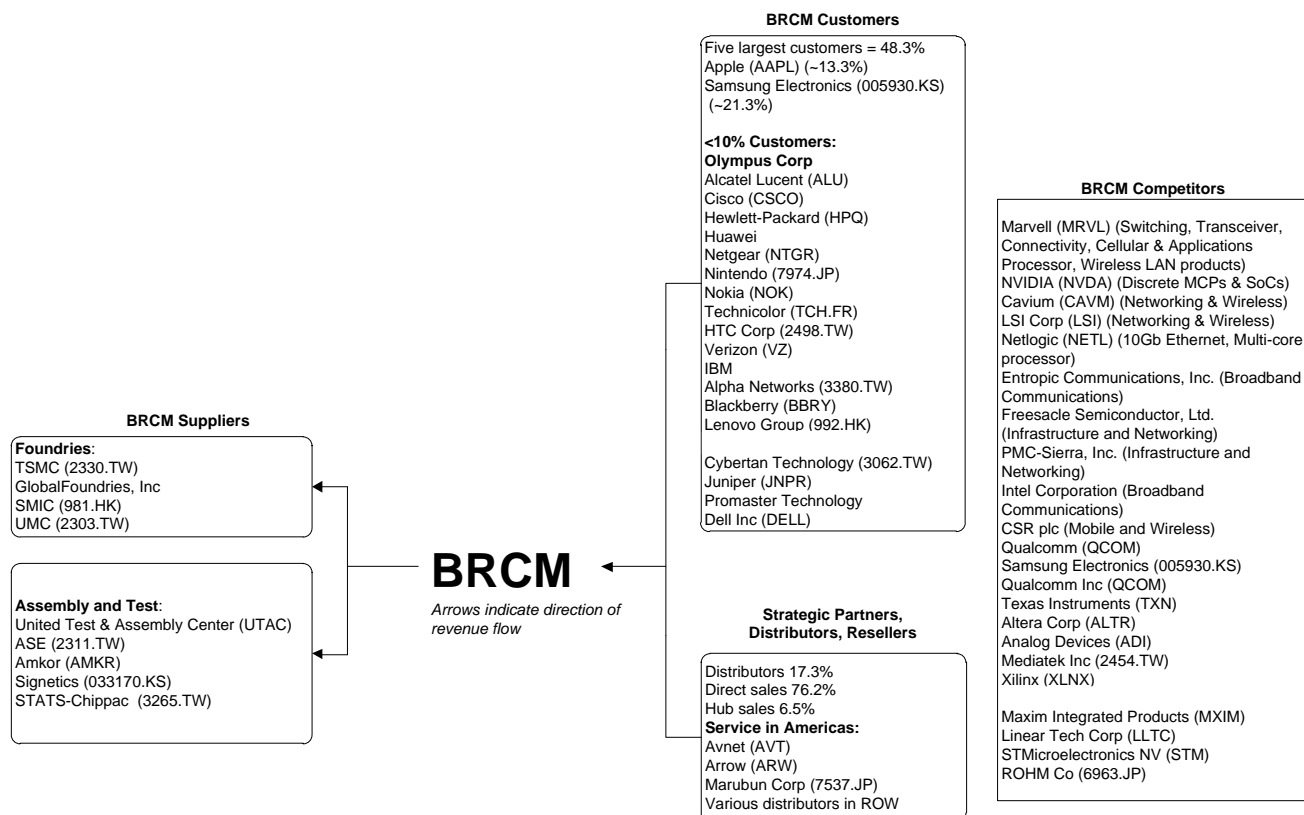
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

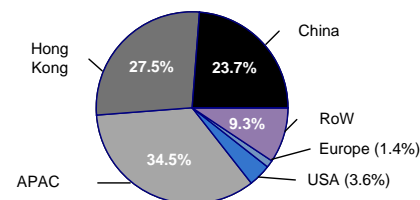
Figure 313. Broadcom (BRCM)

Sector: Semiconductors

## Broadcom (BRCM)



Business Segment Breakdown



Geographic Breakdown

Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

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Source: Citi Research

## Brocade Communications

Citi Analyst: Kimberly Watkins, CFA

Brocade is a supplier of fiber channel SAN switching and IP networking equipment to enterprise and service provider customers.

The company began life as a supplier of fiber channel switches, a market in which it holds 75-80% share per Dell'Oro and still comprises 70% of company revenue, and has OEM agreements with EMC, IBM, HP, and others which account for ~85% of its SAN switching revenue.

Brocade acquired Foundry Networks in 2008 expanding into the Ethernet switching and service provider routing markets, which comprises the remaining 30% of revenue.

The company was founded in 1995, went public in 1999, and is based in San Jose, CA. Brocade has 4,169 employees as of October 2013.

Figure 314. Brocade Communications (BRCD) Results and Forecasts

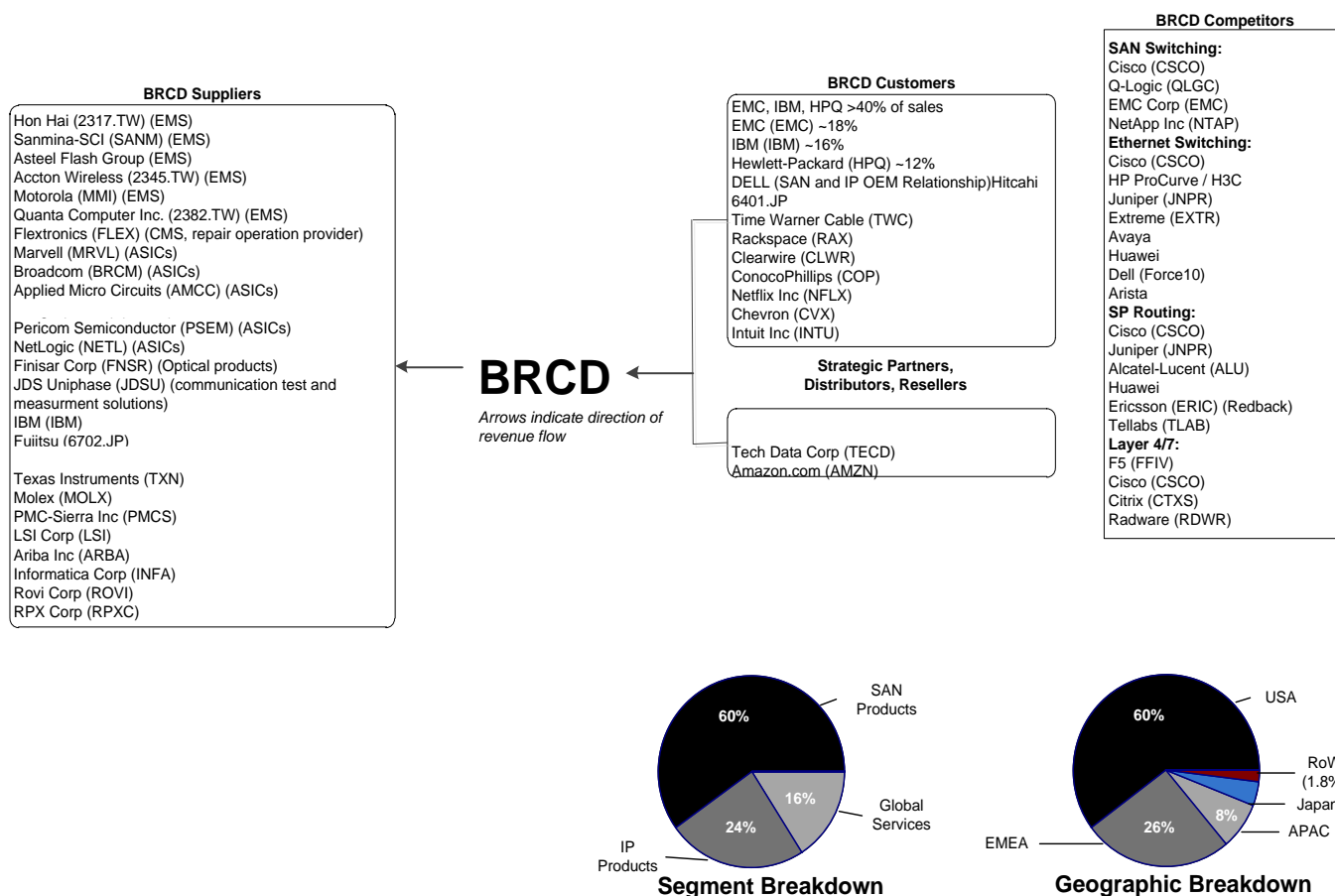
	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1953.0	2094.3	2147.5	2237.9	2223.0	2142.4	2197.1	2091.4	2240.3
- y/y growth	33.1%	7.2%	2.5%	4.2%	-0.7%	-3.6%	-1.2%	-2.4%	2.0%
<b>Gross Margins</b>	58.4%	62.6%	62.5%	64.6%	66.0%	66.7%		66.1%	
<b>Operating Margins</b>	21.8%	21.2%	17.6%	20.6%	22.7%	24.7%		23.6%	
<b>EPS</b>	0.53	0.60	0.50	0.66	0.80	0.81	0.83	0.77	0.87
- y/y growth	-20.2%	12.9%	-16.5%	32.6%	22.2%	0.1%	3.7%	-4.3%	4.6%
<b>Cash</b>	351.4	336.0	415.0	713.2	987.0	1101.2		1314.8	
<b>Debt</b>	1084.8	921.3	789.4	601.2	599.2	598.7		598.7	
<b>Net Cash/Shr</b>	-1.1	-1.2	-0.7	0.2	0.8	1.1		1.7	
<b>Tangible Book Value/Shr</b>	-0.8	0.1	0.4	1.1	1.5	1.8		2.2	

Source: Citi Research, Company Reports, FirstCall

Figure 315. Brocade Communications (BRCD)

Sector: Storage

## Brocade Communications (BRCD)



Source: Company reports, CIRA estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Brooks Automation Inc.

Citi Analyst: Terence Whalen

Brooks Automation is a leading supplier of automation solutions to the global semiconductor industry and other related industries, including flat panel display manufacturing and data storage. BRKS serves the semiconductor automation market, being the share leader in tool and factory hardware.

The company was founded in 1978 and became publicly traded in 1995. Partly through acquisitions such as PRI-Automation in May 2002, BRKS has transformed itself from a niche player in the tool automation market to the largest automation player in the semiconductor industry.

Figure 316. Brooks Automation (BRKS) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	218.7	593.0	688.1	519.5	451.0	521.8	521.1	549.7	568.8
- <i>y/y growth</i>	-58.5%	171.1%	16.0%	-24.5%	-13.2%	15.7%	15.6%	5.4%	9.2%
<b>Gross Margins</b>	-2.7%	28.0%	32.4%	33.4%	32.4%	36.6%		37.0%	
<b>Operating Margins</b>	-42.5%	7.7%	12.7%	5.0%	1.0%	6.9%		8.7%	
<b>EPS</b>	-1.47	0.84	1.39	0.48	0.17	0.40	0.44	0.53	0.73
- <i>y/y growth</i>		157.2%	65.3%	-65.9%	-63.9%	132.0%	155.2%	32.8%	66.2%
<b>Cash</b>	88.0	108.8	125.8	141.0	129.0	137.3		171.0	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	1.4	1.7	1.9	2.1	1.9	2.1		2.6	
<b>Tangible Book Value/Shr</b>	4.1	5.2	6.0	8.0	6.8	6.9		7.2	

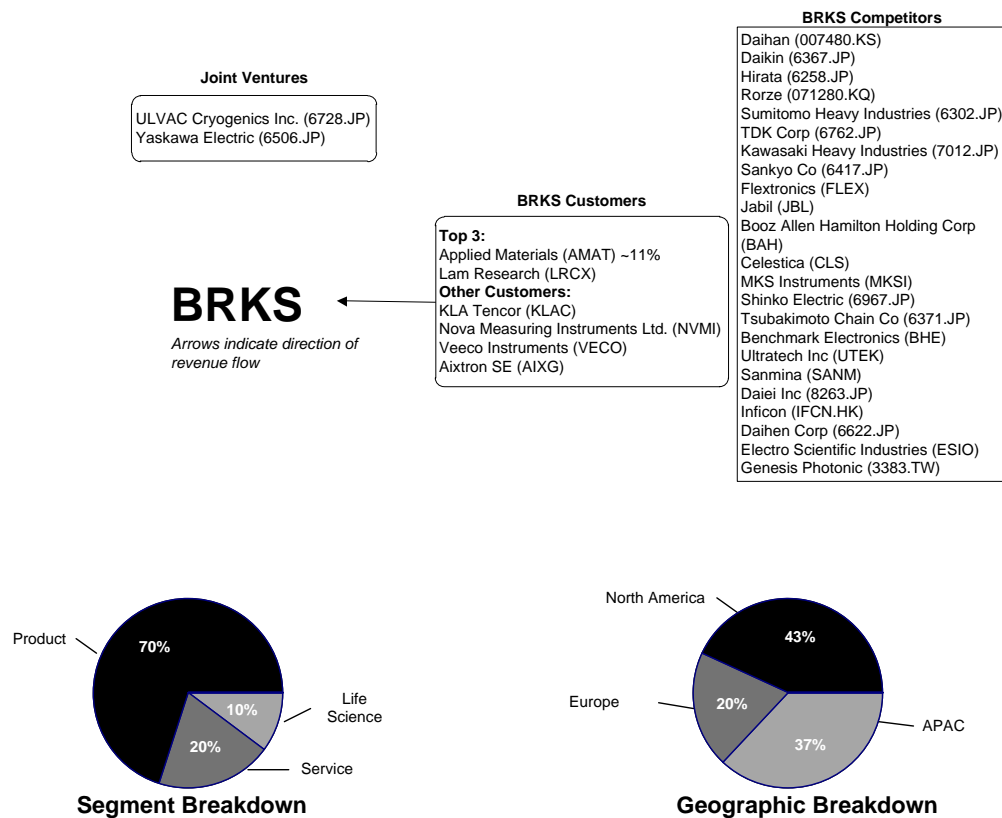
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 317. Brooks Automation (BRKS)

Sector: Semiconductor Equipment

## Brooks Automation (BRKS)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Brother Industries

Citi Analyst: Masahiro Shibano

Brother Industries, Ltd. engages in the manufacture and sale of communication, printing, and electronic products and instruments.

The company operates through the following segments: Printing and Solutions Business, Personal and Home Business, Machinery and Solution Business, Network and Contents Business, and Other.

- The Printing and Solutions Business segment offers all-in-ones, printers, fax machines, electronic stationeries, and typewriters.
- The Personal and Home Business segment composes of sewing products, which include home sewing and embroidery machines.
- The Machinery and Solution Business segment supplies industrial sewing machines and machine tools.
- The Network and Contents Business segment provides online karaoke, content-delivery systems, and content services.
- The Other segment provides real estate services.

The company was founded by Kanekichi Yasui in April 1908 and is headquartered in Nagoya, Japan.

Figure 318. Brother Industries (6448.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	482204.0	446269.0	502830.0	497390.0	516066.0	613600.0	613086.0	645600.0	640471.0
– <i>y/y growth</i>	-14.9%	-7.5%	12.7%	-1.1%	3.8%	18.9%	18.8%	5.2%	4.5%
<b>Gross Margins</b>	41.9%	44.6%	43.0%	43.6%	41.9%	37.8%		37.7%	
<b>Operating Margins</b>	4.1%	6.0%	7.2%	6.9%	5.8%	6.4%		7.0%	
<b>EPS</b>	56.21	73.34	98.03	72.95	66.74	55.89	60.08	129.78	119.13
– <i>y/y growth</i>	-42.9%	30.5%	33.7%	-25.6%	-8.5%	-16.3%	-10.0%	132.2%	98.3%
<b>Cash</b>	45970.0	49829.0	67239.0	59536.0	52320.0	74999.0		76999.0	
<b>Debt</b>	30401.0	26942.0	24386.0	19966.0	19224.0	18000.0		18000.0	
<b>Net Cash/Shr</b>	93.8	128.0	194.2	220.6	148.3	236.3		243.8	
<b>Tangible Book Value/Shr</b>	735.3	793.0	822.4	863.1	985.9	1091.5		1091.5	

(Revenues, Cash and Debt in Millions in Local Currency)

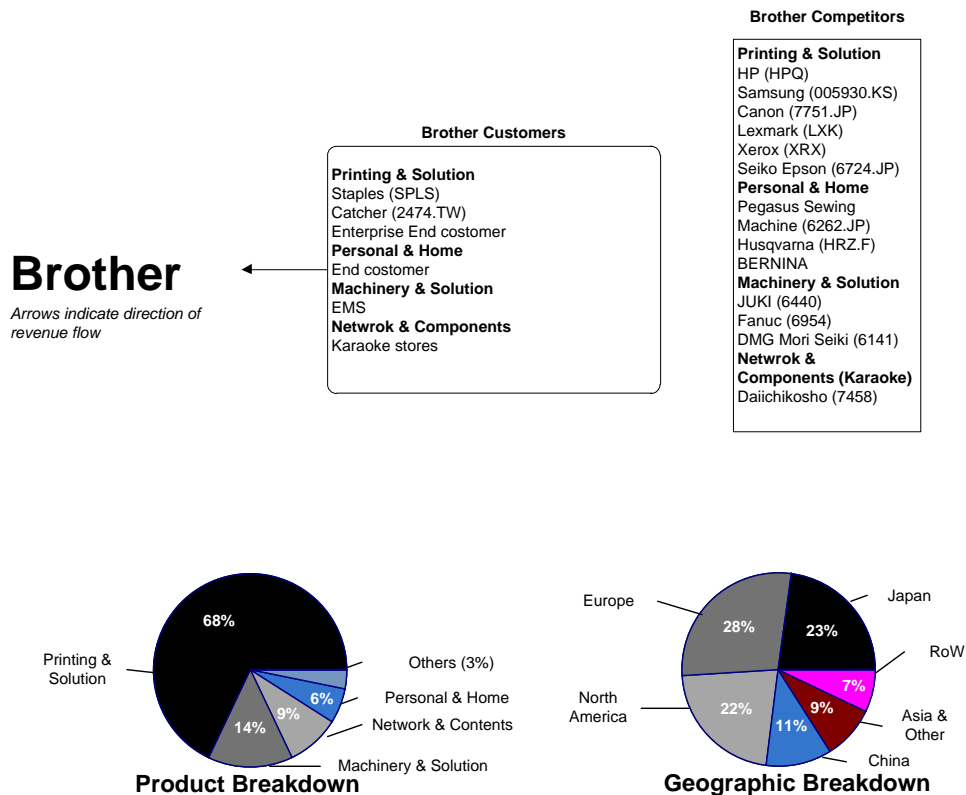
Source: Citi Research, Company Reports, FirstCall



Figure 319. Brother Industries (6448.JP)

Sector: Imaging

## Brother Industries (6448.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Canon

Citi Analyst: Masahiro Shibano

Canon, Inc. is engaged in the development, manufacture and sale of office multifunction devices (MFDs), copying machines, printers, cameras, and lithography equipment.

The company operates through the following segments: Office Business Unit, Imaging System Business Unit, and Industry and Others Business Unit.

- The Office Business Unit segment offers office MFDs, printers, and other equipment featuring high image quality, high resolution, and high speed.
- The Imaging System Business Unit segment includes interchangeable-lens and compact digital cameras, digital camcorders, digital cinema cameras, interchangeable lenses, inkjet printers, large-format inkjet printers, commercial photo printers, image scanners, broadcast equipment, and calculators.
- The Industry and Others Business Unit segment offers semiconductor and flat panel display lithography equipment, digital radiography systems, ophthalmic equipment, vacuum thin-film deposition equipment, organic light-emitting diode panel manufacturing equipment, micromotors, computers, handy terminals, and document scanners.

The company was founded on August 10, 1937 and is headquartered in Tokyo, Japan.

Figure 320. Canon (7751.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	3209201.0	3706901.0	3557433.0	3479788.0	3731380.0	3811249.0	3825733.0	3928849.0	3897465.0
– <i>y/y growth</i>	-21.6%	15.5%	-4.0%	-2.2%	7.2%	2.1%	2.5%	3.1%	1.9%
<b>Gross Margins</b>	44.5%	48.1%	48.8%	47.4%	48.2%	49.9%		50.2%	
<b>Operating Margins</b>	6.8%	10.5%	10.6%	9.3%	9.0%	10.2%		10.9%	
<b>EPS</b>	106.64	200.25	204.63	190.77	201.31	235.71	218.63	260.33	240.81
– <i>y/y growth</i>	-57.0%	87.8%	2.2%	-6.8%	5.5%	17.1%	8.6%	10.4%	10.1%
<b>Cash</b>	795034.0	840579.0	773227.0	666678.0	788909.0	945724.0		1074525.0	
<b>Debt</b>	9781.0	11331.0	11711.0	3983.0	2747.0	3799.0		3600.0	
<b>Net Cash/Shr</b>	640.0	679.2	633.6	564.5	687.8	829.6		942.9	
<b>Tangible Book Value/Shr</b>	2015.4	1983.7	1912.7	2253.7	2559.6	2633.4		2763.5	

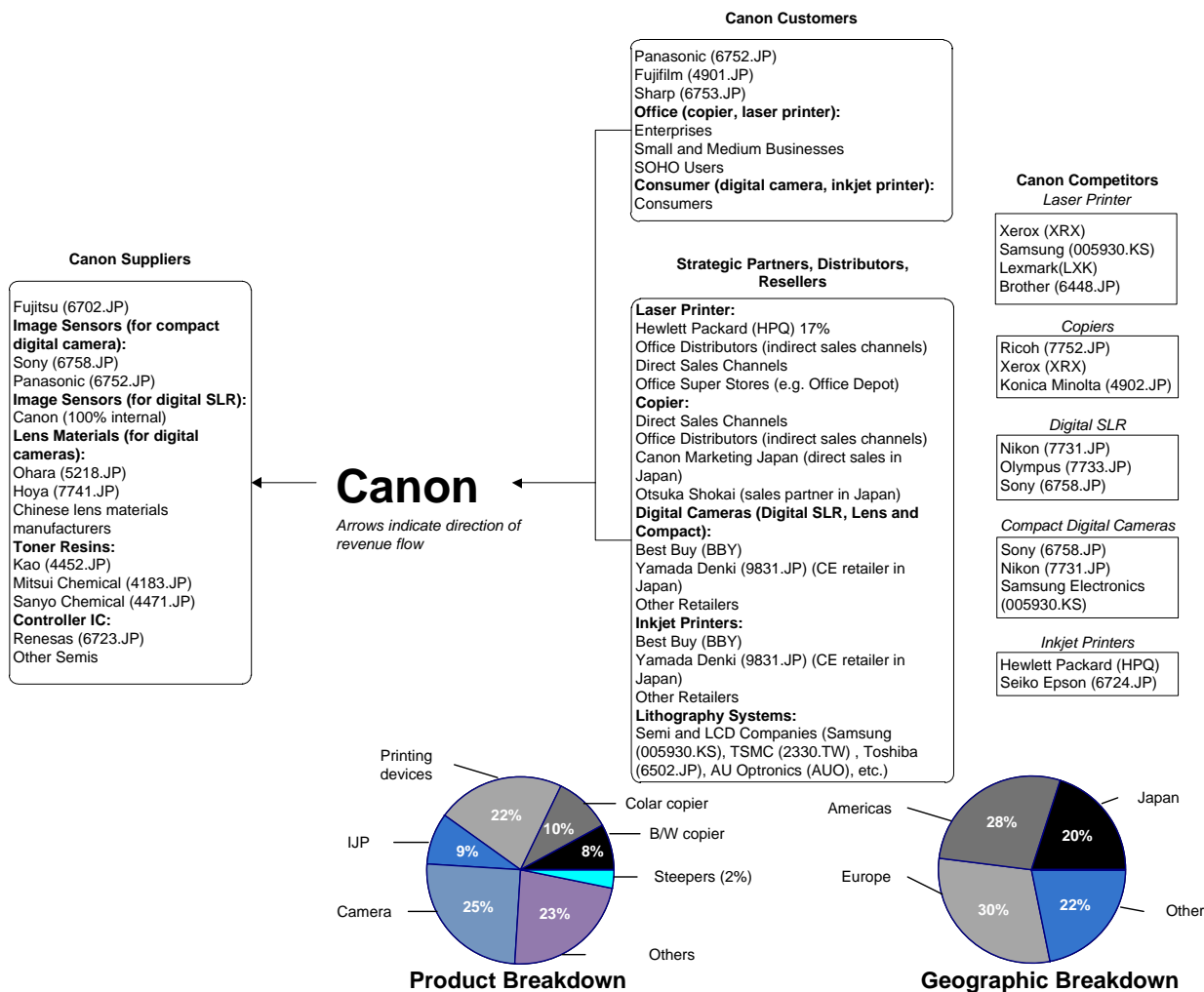
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 321. Canon (7751.JP)

Sector: Imaging

## Canon (7751.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Casio

Citi Analyst: Kota Ezawa

Casio Computer is a mid-sized consumer electronics maker. In addition to lucrative core businesses including calculators, electronic stationery, electronic dictionaries, musical instruments, and watches the company has been aggressively pursuing businesses such as digital cameras and mobile phones.

New businesses such as mobile handsets, digital cameras, and LCD suffered in the wake of the 2008 financial crisis. The company is selling off or forming tie-ups in mobile handset and LCD businesses, and removing them from consolidation. The spotlight is now on potential improvement in the remaining loss-making business, digital cameras.

Casio Computer was established in Tokyo in 1946 by Tadao Kashio. Hit products such as the Casio Mini personal calculator (1972) and G-Shock impact-resistant watches (1983) established the company's reputation for distinctive technologies.

Figure 322. Casio Computer (6952.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	518036.0	427925.0	341678.0	301660.0	297763.0	322900.0	319854.0	343300.0	335401.0
- y/y growth	-16.9%	-17.4%	-20.2%	-11.7%	-1.3%	8.4%	7.4%	6.3%	4.9%
<b>Gross Margins</b>	25.2%	22.8%	33.3%	35.2%	39.1%	41.2%		41.9%	
<b>Operating Margins</b>	0.8%	-6.8%	3.5%	3.0%	6.7%	8.7%		9.5%	
<b>EPS</b>	-81.54	-71.88	19.10	8.68	41.19	53.42	55.27	62.09	68.68
- y/y growth	-284.7%	11.8%	126.6%	-54.6%	374.6%	29.7%	34.2%	16.2%	24.3%
<b>Cash</b>	98812.0	106184.0	125490.0	102989.0	113168.0	124800.0		121000.0	
<b>Debt</b>	97584.0	104296.0	137800.0	112234.0	113828.0	112000.0		102000.0	
<b>Net Cash/Shr</b>	99.9	62.3	42.0	-18.4	134.4	148.5		170.0	
<b>Tangible Book Value/Shr</b>	484.6	432.8	474.5	491.0	587.0	661.7		707.4	

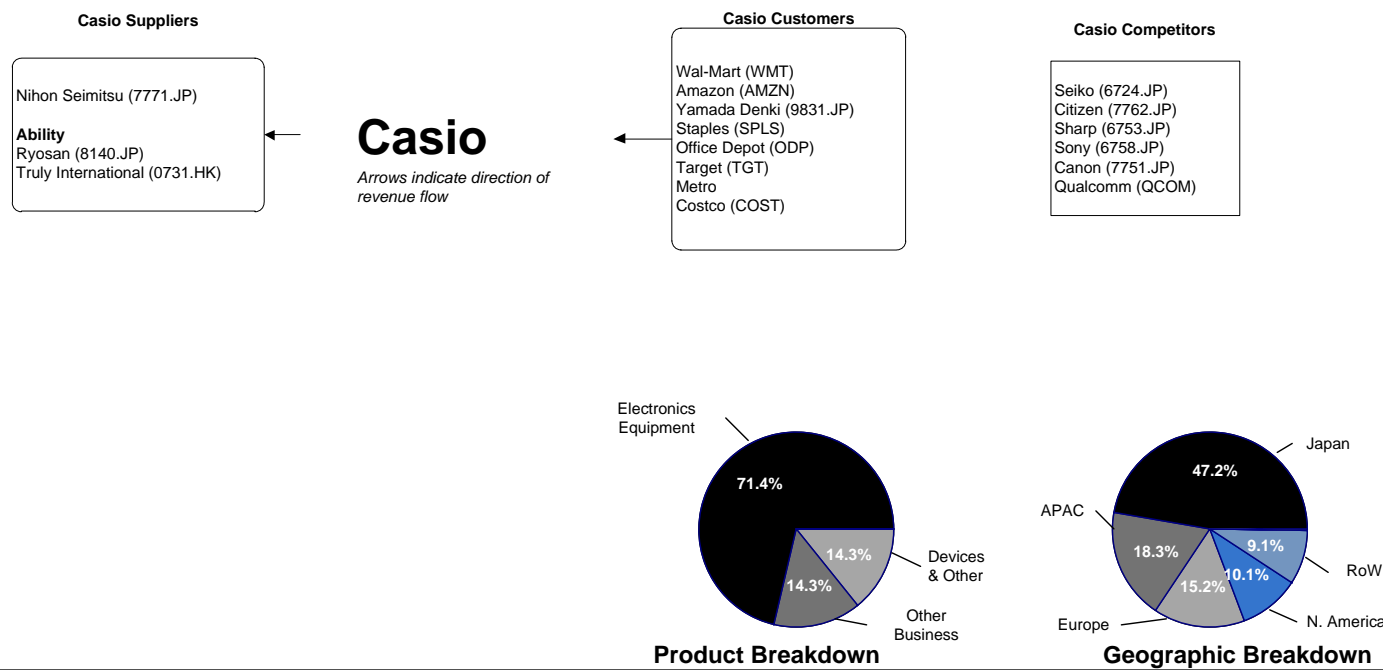
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 323. Casio Computer (6952.JP)

Sector: Consumer Electronics

## Casio Computer (6952.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Catcher Technology

Citi Analyst: Wei Chen

Catcher Technology is one of the largest manufacturers of light metal casing (aluminum alloy and magnesium alloy) in the world.

Product segments include casings for notebook, smartphone, tablet, and MP3 devices. NB accounted for 40-45% of total revenue in 2013 and smartphone + tablet for 45%. We expect higher adoption of Unibody casing in NBs.

Catcher's major customers include Apple, Dell, and HTC.

Figure 324. Catcher Technology Co. Ltd (2474.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	16988.0	21844.6	35913.8	37028.8	43245.6	52934.5	52002.5	67870.2	60313.7
- <i>y/y growth</i>	-10.8%	28.6%	64.4%	3.1%	16.8%	22.4%	20.2%	28.2%	16.0%
<b>Gross Margins</b>	35.3%	35.5%	47.0%	43.3%	42.4%	43.6%		44.2%	
<b>Operating Margins</b>	21.0%	23.3%	36.8%	32.8%	32.2%	33.5%		33.7%	
<b>EPS</b>	5.00	6.21	14.44	14.18	18.00	18.28	18.53	24.36	21.30
- <i>y/y growth</i>	-24.6%	24.2%	132.5%	-1.8%	27.0%	1.6%	2.9%	33.2%	14.9%
<b>Cash</b>	13723.7	17247.1	40197.8	45725.6	39378.0	36559.8		46087.1	
<b>Debt</b>	18135.8	19580.2	25406.0	31630.0	17400.8	17400.8		17400.8	
<b>Net Cash/Shr</b>	8.3	15.7	44.3	55.8	51.4	47.7		60.1	
<b>Tangible Book Value/Shr</b>	48.1	49.1	74.4	81.3	97.9	109.2		126.7	

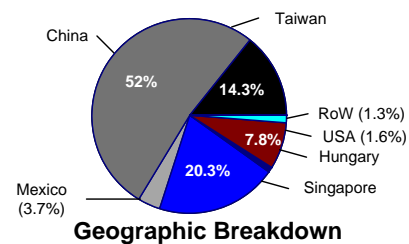
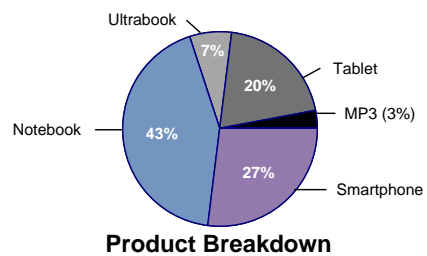
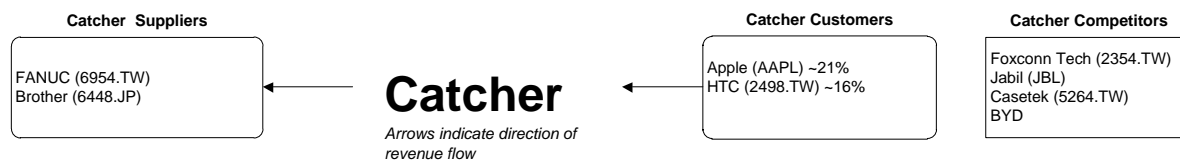
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 325. Catcher Technology Co. Ltd (2474.TW)

Sector: PC & Enterprise Hardware

## Catcher Technology Co. Ltd. (2474.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Celestica

Citi Analyst: Jim Suva, CPA

Celestica is the fourth-largest EMS company in the world in terms of calendar 2012 revenue.

The company provides OEMs with complex printed circuit board assembly, full system assembly and integration, test, material management, logistics, and distribution. It also provides advanced design, engineering and supply chain management services, and it manufactures memory and power products.

Top customers include CSCO, IBM, HPQ, ALU, Oracle and Juniper. Celestica has been winding down its Research In Motion (Blackberry) business which in 2012 was a 12% customer and currently has minimal impact to sales.

Sales by end-market: 40% communications, 7% Consumer, 24% Diversified, 16% Servers and 13% Storage.

Originally an IBM manufacturing unit, Celestica was carved out in October 1996 and purchased by an investor group that included Celestica's management. It went public in June 1998 and grew rapidly, but it was slow to begin restructuring after the tech boom.

Figure 326. Celestica (CLS)

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	6092.2	6526.0	7213.0	6507.2	5796.1	5677.5	5853.5	5986.7	6117.9
- y/y growth	-20.7%	7.1%	10.5%	-9.8%	-10.9%	-2.0%	1.0%	5.4%	4.5%
<b>Gross Margins</b>	7.3%	7.0%	7.0%	6.8%	6.9%	7.1%		7.1%	
<b>Operating Margins</b>	3.5%	3.4%	3.6%	3.3%	3.0%	3.5%		3.5%	
<b>EPS</b>	0.64	0.86	1.05	0.98	0.83	0.97	0.94	1.05	1.05
- y/y growth	-13.7%	34.4%	22.3%	-7.3%	-14.7%	16.2%	13.3%	7.9%	10.7%
<b>Cash</b>	937.7	632.8	658.9	550.5	544.3	542.3		589.8	
<b>Debt</b>	222.8	0.0	0.0	55.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	4.1	2.7	3.0	2.6	2.9	3.0		3.4	
<b>Tangible Book Value/Shr</b>	6.3	6.0	6.4	5.8	7.1	7.7		8.5	

(Revenues, Cash and Debt in Millions in Local Currency)

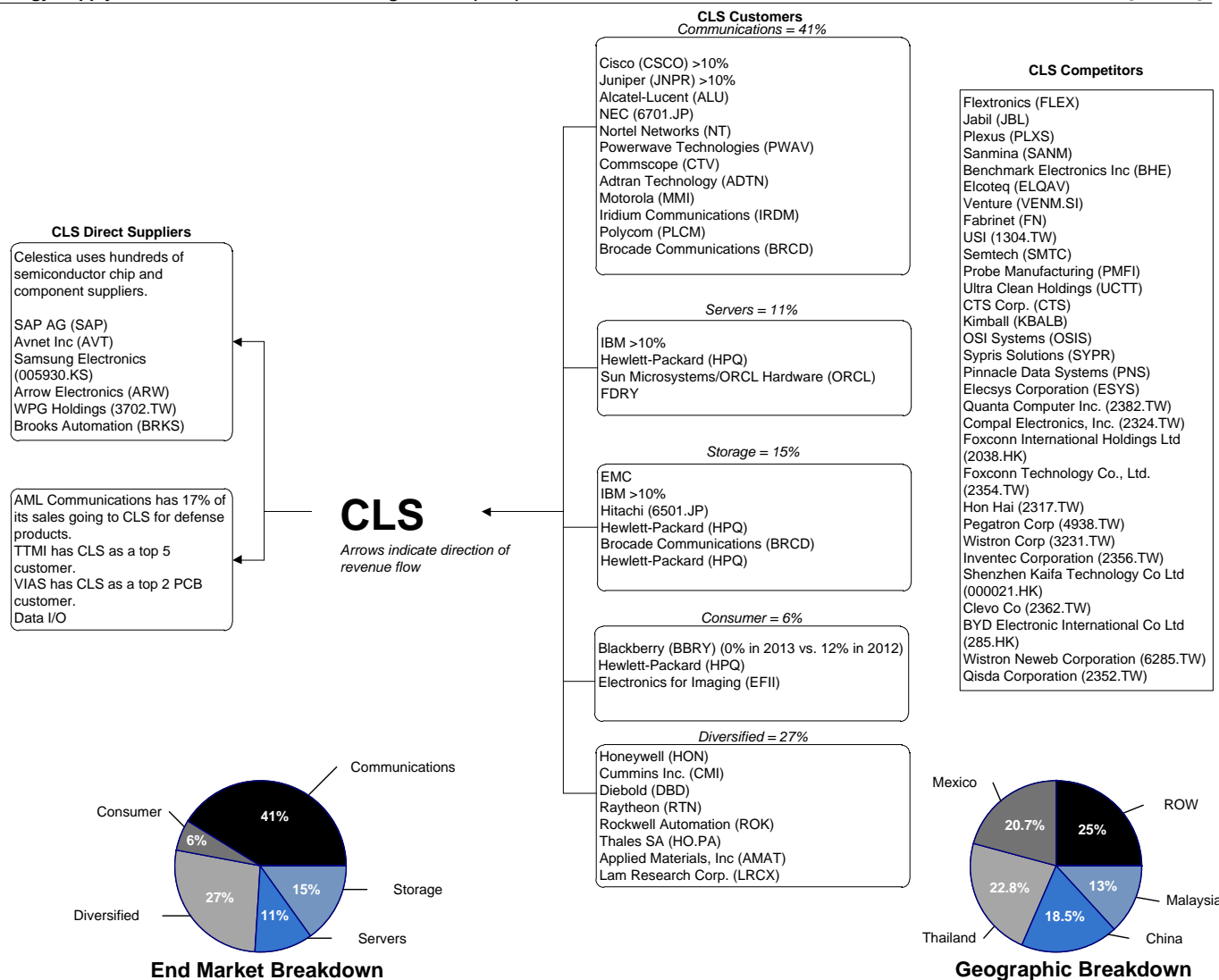
Source: Citi Research, Company Reports, FirstCall



Figure 327. Celestica (CLS)

Sector: Technology Supply Chain – Electronic Manufacturing Service (EMS)

Celestica (CLS)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.  
Note: Business segments as per latest quarterly results

Source: Citi Research

## Cheil Industries

Citi Analyst: Henry Kim, CFA

Cheil Industries engages in the manufacture of electronic chemical materials (ECM) used in semiconductor, display, polarizer and OLED, along with chemical products such as acrylonitrile butadiene styrene (ABS), polystyrene (PS), and expanded polystyrene resins (EPS).

Figure 328. Cheil Industries (001300.KS) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	4261744.0	5113000.0	5581200.0	6009921.0	4411100.0	4902945.5	4942655.0	5671818.6	5426437.0
- y/y growth	14.3%	20.0%	9.2%	7.7%	-26.6%	11.2%	12.1%	15.7%	9.8%
<b>Gross Margins</b>	29.2%	29.6%	28.4%	30.9%	29.9%	31.7%		33.4%	
<b>Operating Margins</b>	6.2%	6.5%	4.0%	5.4%	4.4%	6.2%		7.9%	
<b>EPS</b>	2397.26	5456.94	5079.28	3981.11	4862.92	4405.90	4645.59	6483.24	5778.10
- y/y growth	-23.9%	127.6%	-6.9%	-21.6%	22.1%	-9.4%	-4.5%	47.1%	24.4%
<b>Cash</b>	79501.9	33388.0	96432.0	113459.0	919200.0	923057.9		982863.9	
<b>Debt</b>	494421.2	327232.0	852704.0	1269452.0	1120800.0	1120800.0		1020800.0	
<b>Net Cash/Shr</b>	-6049.5	-1413.3	-9503.1	-15222.2	143.5	217.1		3264.6	
<b>Tangible Book Value/Shr</b>	38168.1	54410.7	53098.9	53233.3	50055.6	55211.5		62444.7	

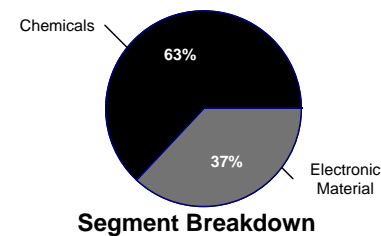
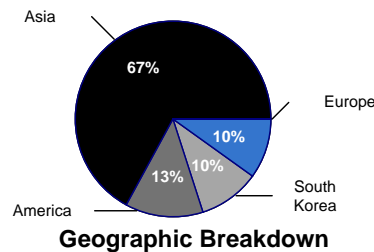
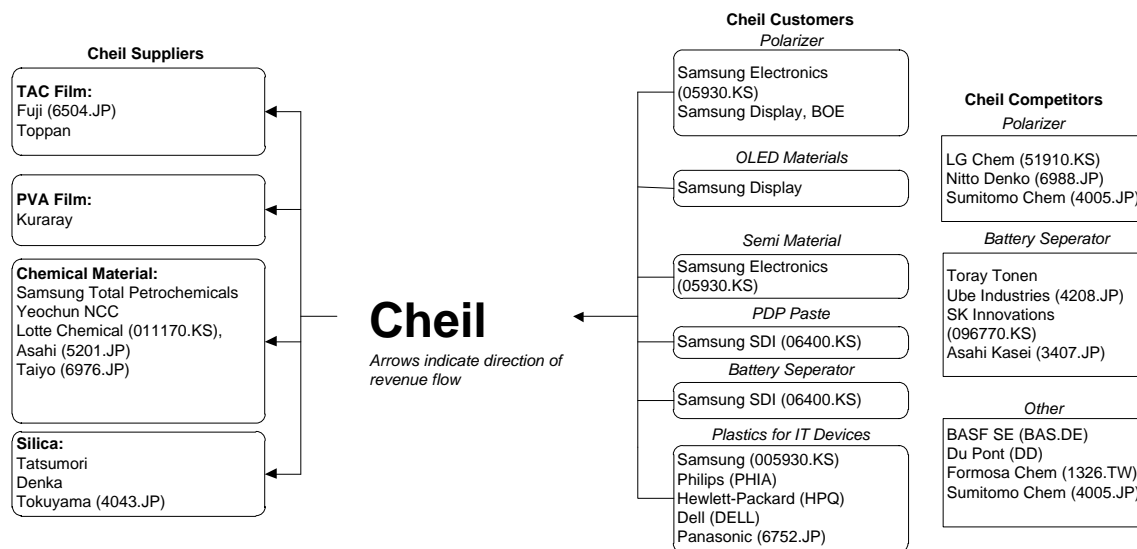
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 329. Cheil Industries (001300.KS)

Sector: Diversified

## Cheil Industries (001300.KS)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Chicony Electronics

Citi Analyst: Wei Chen

Founded in 1983, Chicony is one of the world's largest PC peripheral makers with a leading market share in keyboards, PC webcams, NB camera modules, and NB adapters.

With manufacturing sites in DongGuan and Suzhou, China, alongside an extensive global logistics network, the company cooperates closely with PC OEM/ODMs such as HP, Dell, Acer, and Toshiba, retailers such as Carrefour, and peripheral brand names such as Microsoft.

Figure 330. Chicony Electronics (2385.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	53947.9	60437.3	60686.0	67509.7	74539.0	81967.3	83139.6	94026.8	88117.7
- <i>y/y growth</i>	11.4%	12.0%	0.4%	11.2%	10.4%	10.0%	11.5%	14.7%	6.0%
<b>Gross Margins</b>	18.2%	14.7%	14.8%	15.8%	15.3%	15.5%		15.7%	
<b>Operating Margins</b>	7.5%	5.2%	3.5%	6.0%	5.7%	5.7%		6.0%	
<b>EPS</b>	5.41	5.85	6.53	6.02	5.83	6.74	6.51	7.89	7.03
- <i>y/y growth</i>	6.5%	8.0%	11.7%	-7.9%	-3.1%	15.5%	11.5%	17.1%	8.1%
<b>Cash</b>	3747.1	4811.1	6272.2	5418.8	8066.3	11687.7		19330.5	
<b>Debt</b>	5593.2	7030.5	8616.8	6548.2	7090.3	7090.3		12090.3	
<b>Net Cash/Shr</b>	0.2	1.1	6.5	0.9	10.6	16.1		20.2	
<b>Tangible Book Value/Shr</b>	19.0	21.8	25.9	25.6	30.6	32.5		35.1	

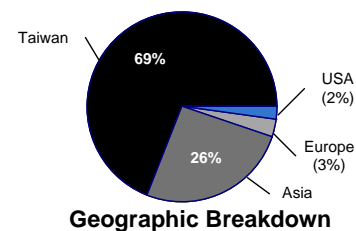
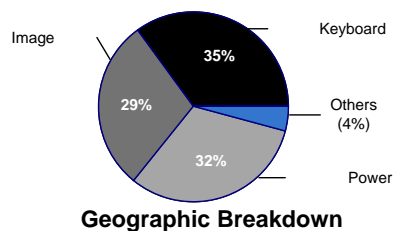
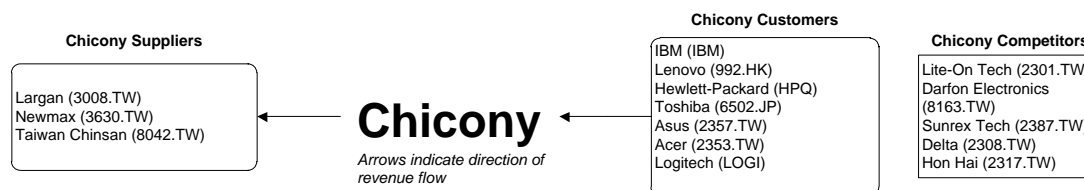
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 331. Chicony Electronics (2385.TW)

Sector: PC & Enterprise Hardware

## Chicony Electronics Co. Ltd. (2385.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Chipbond Technology

Citi Analyst: Roland Shu

Chipbond was established in 1997 to provide turnkey services for back-end assembly processing of LCD driver ICs from wafer bumping to packaging.

The acquisition of International Semiconductor Technology (IST) in 2010 has made Chipbond the largest LCD driver IC back-end supplier.

Figure 332. Chipbond Technology (6147.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	5210.9	12595.7	13226.0	15012.8	15811.2	17320.3	18466.5	17814.7	21548.5
<b>- y/y growth</b>	-1.0%	141.7%	5.0%	13.5%	5.3%	9.5%	16.8%	2.9%	16.7%
<b>Gross Margins</b>	15.5%	28.6%	23.4%	28.6%	25.3%	24.6%		24.4%	
<b>Operating Margins</b>	7.9%	23.2%	16.7%	21.5%	18.4%	16.9%		16.8%	
<b>EPS</b>	1.11	4.56	2.99	4.31	4.33	3.92	4.07	4.04	5.08
<b>- y/y growth</b>	355.8%	309.9%	-34.5%	44.2%	0.5%	-9.4%	-5.9%	2.9%	24.6%
<b>Cash</b>	2204.9	2767.0	5449.8	4931.2	7498.5	8211.4		9560.4	
<b>Debt</b>	4174.7	5355.6	8131.9	6110.0	9040.2	9016.5		8691.4	
<b>Net Cash/Shr</b>	-1.1	-1.3	1.3	3.1	8.1	9.3		11.7	
<b>Tangible Book Value/Shr</b>	19.2	26.7	27.3	29.6	31.6	32.5		33.8	

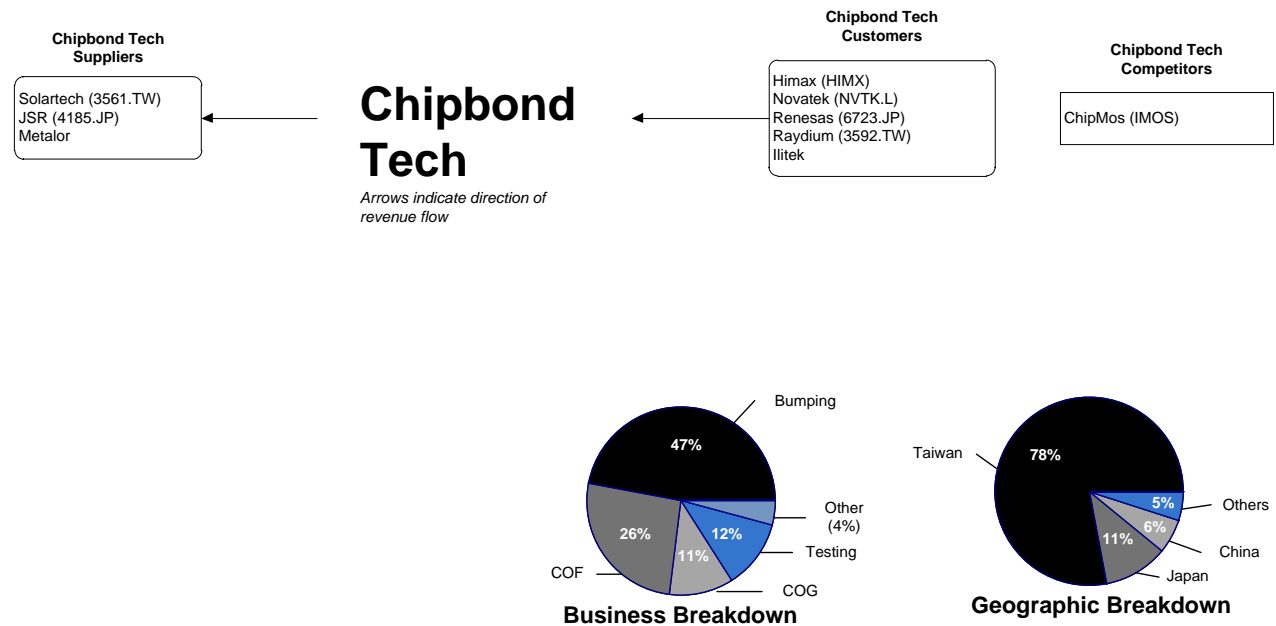
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 333. Chipbond Technology (6147.TW)

Sector: Semiconductors

Chipbond Technology (6147.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Ciena Corp.

Citi Analyst: Ehud Gelblum, Ph.D

Ciena is a provider of networking equipment primarily deployed in optical telecom networks.

Ciena's customers are mainly service providers, cable operators, governments, enterprises, and academic institutions.

In 2010, Ciena acquired Nortel's Metro Ethernet Networks business, which sizably expanded Ciena's Metro and Long-Haul optical businesses globally that now account nearly 60% of total revenue; about 20% comes from packet-optical and Carrier Ethernet products and another 20% comes from software and services. The company currently derives over 30% of revenue from its top two service provider customers in North America.

Founded in 1992, Ciena is headquartered in Linthicum, MD and has 4,700 employees globally and generated approximately 47% of FY2012 sales internationally.

Figure 334. Ciena Corp. (CIEN) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	652.6	1236.6	1742.0	1833.9	2082.5	2290.4	2299.0	2495.7	2515.3
- <i>y/y growth</i>	-27.7%	89.5%	40.9%	5.3%	13.6%	10.0%	10.4%	9.0%	9.4%
<b>Gross Margins</b>	44.6%	45.7%	42.6%	40.9%	42.8%	43.1%		43.1%	
<b>Operating Margins</b>	-7.6%	-2.3%	1.0%	1.9%	5.6%	7.2%		8.8%	
<b>EPS</b>	-0.51	-0.52	-0.25	-0.24	0.57	0.96	0.89	1.33	1.32
- <i>y/y growth</i>	-136.1%	-1.9%	52.5%	3.8%	340.0%	69.6%	55.6%	37.5%	48.7%
<b>Cash</b>	1048.9	688.7	541.9	692.5	471.6	385.6		314.1	
<b>Debt</b>	798.0	1442.7	1442.4	1225.8	1212.0	1025.4		1025.4	
<b>Net Cash/Shr</b>	2.8	-8.1	-9.2	-5.4	-6.1	-4.6		-4.4	
<b>Tangible Book Value/Shr</b>	4.3	-2.9	-3.3	-3.4	-2.6	-1.5		0.1	

(Revenues, Cash and Debt in Millions in Local Currency)

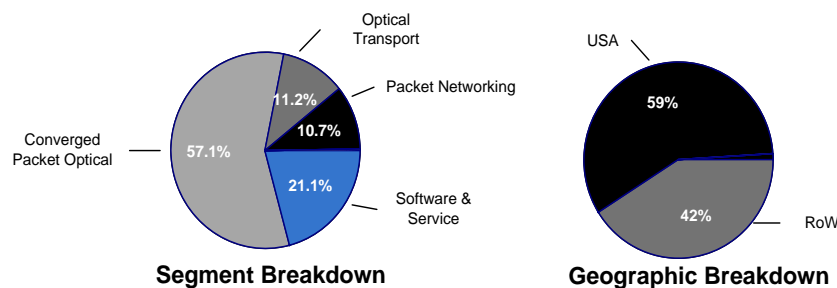
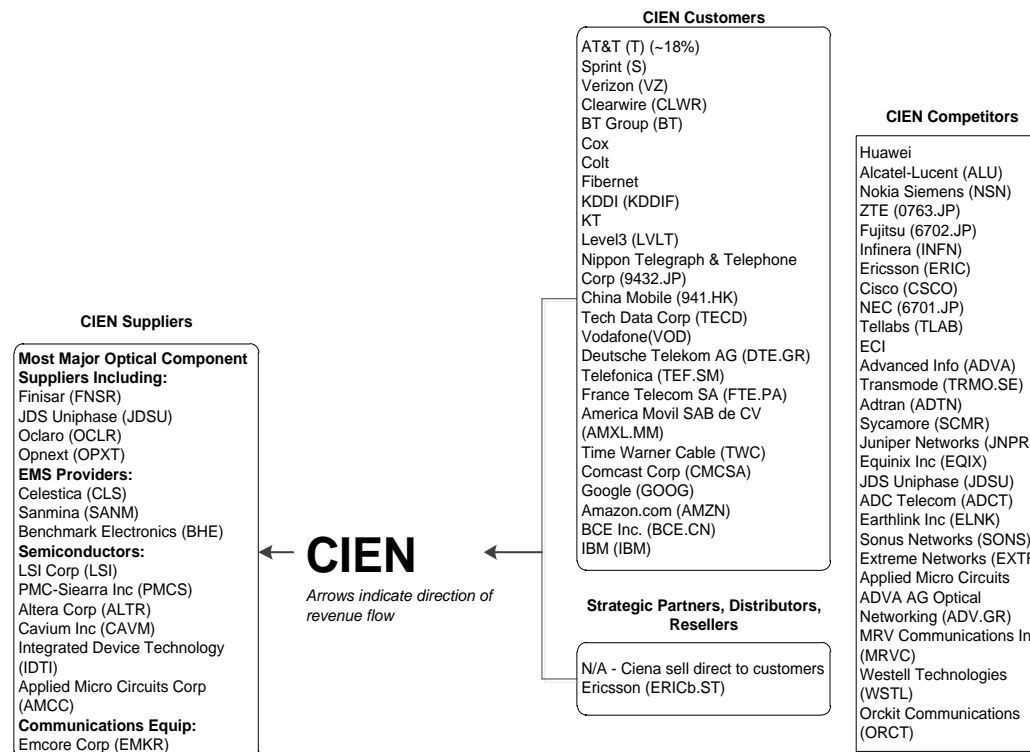
Source: Citi Research, Company Reports, FirstCall



Figure 335. Ciena Corp. (CIEN)

Sector: Communications Equipment

## Ciena Corp. (CIEN)



Source: Company reports, CIRA estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Cisco Systems, Inc

Citi Analyst: Ehud Gelblum, Ph.D

Cisco Systems, Inc. is the world's largest provider of networking equipment including routers, switches, and servers, and set-top boxes, which it sells to both enterprise (~70% of revenue) and service provider (~30% of revenue) customers.

Cisco began developing enterprise routers to connect computers on networks utilizing disparate networking protocols, and quickly expanded via acquisition to add Ethernet switching which remains its largest product line (30% of FY13 revenue). Cisco augments internal development with acquisitions, and has completed over 150 acquisitions since 1993, including 3 of the company's largest: Scientific-Atlanta in 2006, adding service provider video equipment including set-top boxes and other video transmission equipment; Tandberg in 2010, adding room-based video conferencing equipment; and NDS in 2012, augmenting its service provider video offering with a software-based solution.

Cisco holds dominant share positions in several markets in which it participates, with a stated goal to achieve #1 or #2 market share. Switching is Cisco's largest business at 30% of FY13 (July) revenue where Cisco holds nearly 70% share, followed by routing at 17% of FY13 revenue and 50% share, both per Dell'Oro.

Other key product categories include Service Provider Video (10% FY13 revenue), Collaboration (8% FY13 revenue), Wireless (5% FY13 revenue), Data Center (4% FY13 revenue) Security (3% FY13 revenue), and Services (22% FY13 revenue). Cisco's data center segment houses the Unified Computing System, Cisco's entry into the server market, introduced in 2009.

Cisco was founded in 1984 by computer support staff at Stanford University and went public in 1990. The company is based in San Jose, CA and has 75,049 employees as of July 2013.

Figure 336. Cisco (CSCO) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	36117.0	40040.0	43218.0	46061.0	48607.0	46392.6	46434.2	47766.9	48158.1
- y/y growth	-8.7%	10.9%	7.9%	6.6%	5.5%	-4.6%	-4.5%	3.0%	3.7%
<b>Gross Margins</b>	65.0%	65.2%	63.3%	62.4%	62.5%	61.7%		61.0%	
<b>Operating Margins</b>	27.1%	29.2%	26.2%	27.7%	28.1%	27.8%		27.1%	
<b>EPS</b>	1.36	1.61	1.62	1.85	2.02	1.97	1.99	2.02	2.10
- y/y growth	-11.2%	18.8%	0.6%	14.2%	9.0%	-2.3%	-1.5%	2.5%	5.6%
<b>Cash</b>	35001.0	39861.0	44585.0	48716.0	50610.0	47651.0		50473.7	
<b>Debt</b>	10295.0	15284.0	16822.0	16328.0	16211.0	17147.0		17147.0	
<b>Net Cash/Shr</b>	4.2	4.7	5.1	6.0	7.0	5.8		6.4	
<b>Tangible Book Value/Shr</b>	4.2	4.3	5.1	6.1	6.3	5.7		6.2	

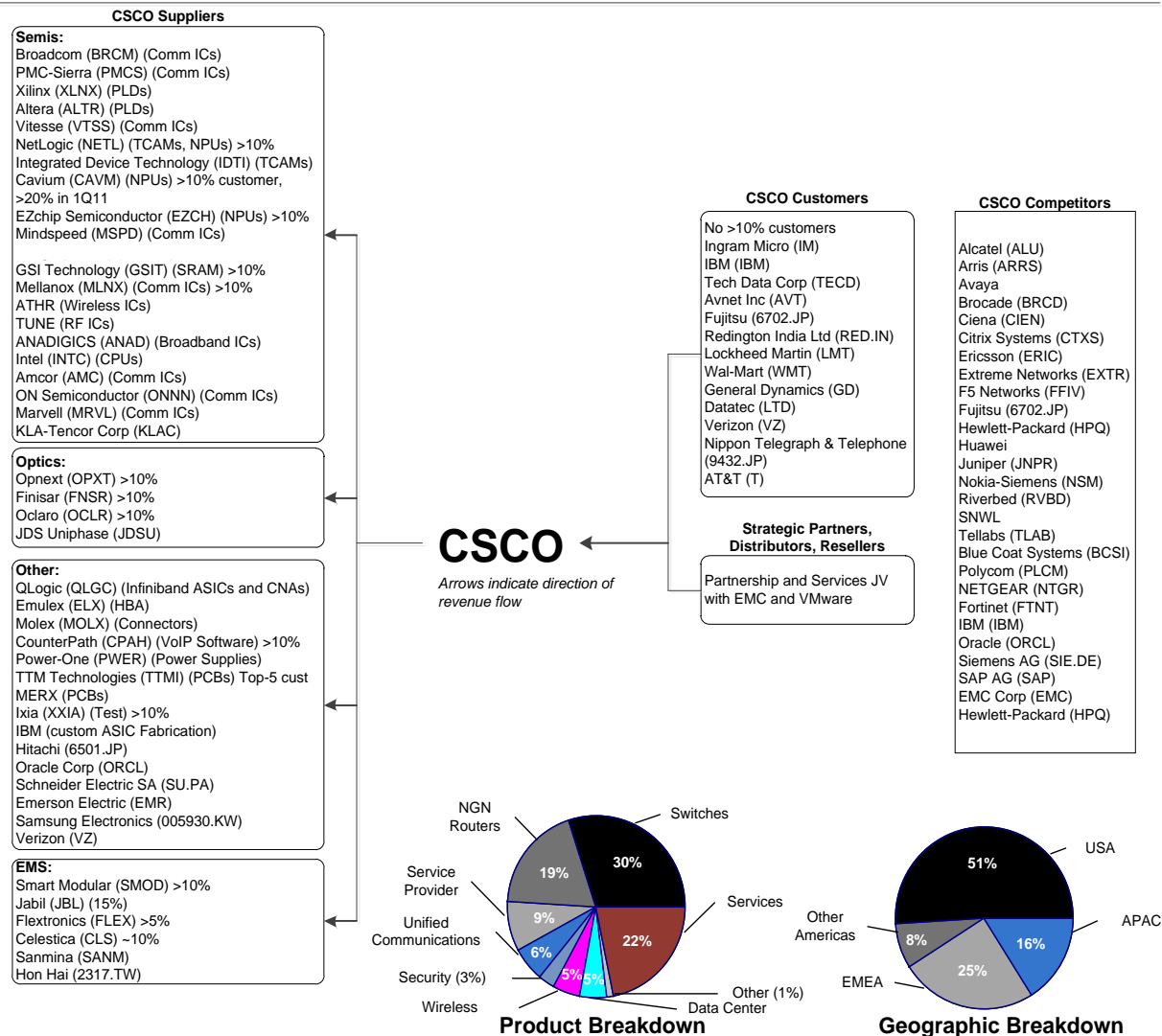
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 337. Cisco (CSCO)

Sector: Telecom Equipment

Cisco (CSCO)



Source: Company reports, CIRA estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Compal Electronics

Citi Analyst: Wei Chen

Established in 1984, Compal Electronics is a Taiwanese original design manufacturer (ODM) of notebook (NB) PCs for various NB brands including Acer, Dell, Toshiba, HPQ, and Lenovo. It is the world's second-largest NB ODM in terms of shipments (1H13 data) next to Quanta Computer.

Figure 338. Compal Electronics (2324.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	675305.2	887004.1	693126.6	682891.4	692704.5	775695.5	755083.7	905495.1	805179.2
- y/y growth	41.1%	31.3%	-21.9%	-1.5%	1.4%	12.0%	9.0%	16.7%	6.6%
<b>Gross Margins</b>	6.1%	5.1%	4.8%	4.4%	4.2%	4.4%		4.7%	
<b>Operating Margins</b>	3.3%	2.7%	1.9%	1.5%	1.4%	1.5%		1.8%	
<b>EPS</b>	4.79	5.37	2.49	1.45	0.53	2.22	2.10	3.05	2.24
- y/y growth	52.3%	12.0%	-53.6%	-41.6%	-63.9%	322.1%	300.2%	37.5%	6.7%
<b>Cash</b>	47672.9	63870.1	52630.9	44345.8	61565.0	60323.4		64693.4	
<b>Debt</b>	31651.2	39176.9	15014.4	37131.8	48688.8	48688.8		48688.8	
<b>Net Cash/Shr</b>	11.9	14.7	11.9	9.9	13.4	13.1		14.1	
<b>Tangible Book Value/Shr</b>	23.7	25.6	24.1	24.2	25.1	26.8		28.8	

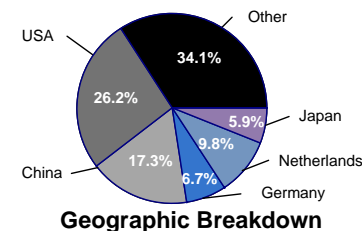
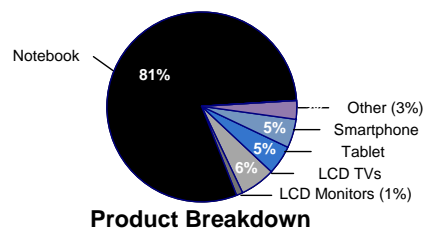
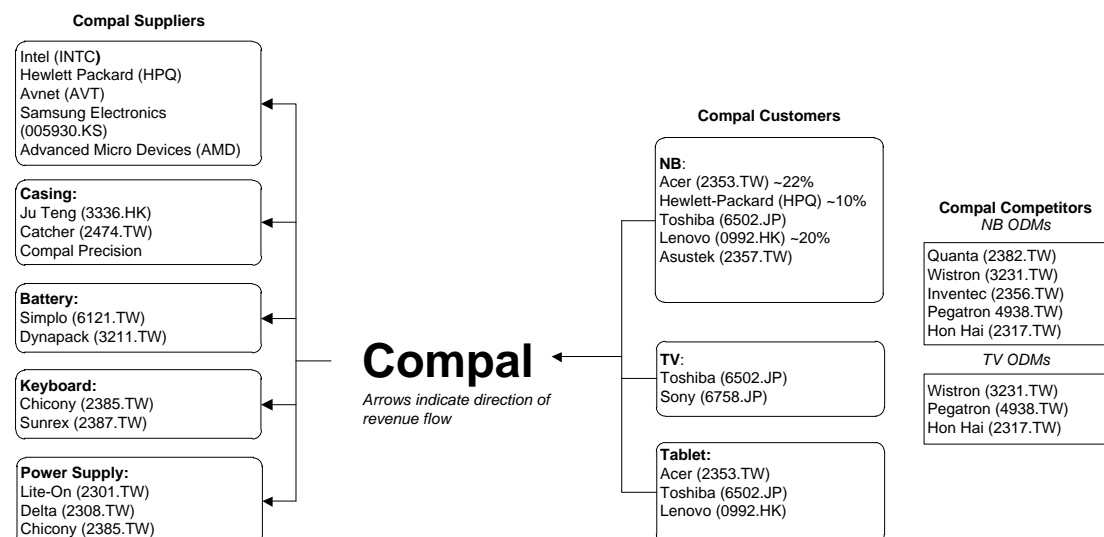
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 339. Compal Electronics (2324.TW)

Sector: PC & Enterprise Hardware

## Compal Electronics (2324.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Corning Incorporated

Citi Analyst: Ehud Gelblum, Ph.D

Corning is a world leader in specialty glass and ceramics. The company has over 160 years of experience developing keystone components in order to enable high-technology systems.

Today, Corning operates in five businesses (Display Technologies, Optical Communications, Specialty Materials, Environmental Technologies, and Life Sciences) and has a 50% equity interest in Dow Corning.

Corning manufactures and processes products at approximately 70 plants in 13 countries.

Figure 340. Corning Incorporated (GLW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	5395.0	6632.0	7890.0	8012.0	7819.0	9322.3	10041.8	9456.0	10523.5
- <i>y/y growth</i>	-9.3%	22.9%	19.0%	1.5%	-2.4%	19.2%	28.4%	1.4%	4.8%
<b>Gross Margins</b>	38.8%	46.0%	45.2%	41.4%	42.5%	46.4%		46.1%	
<b>Operating Margins</b>	7.2%	27.2%	21.5%	16.3%	19.7%	25.4%		25.0%	
<b>EPS</b>	1.28	2.25	1.49	1.06	1.23	1.32	1.45	1.36	1.63
- <i>y/y growth</i>	-61.4%	75.7%	-34.0%	-28.7%	16.1%	7.5%	17.5%	2.7%	12.9%
<b>Cash</b>	3583.0	6350.0	5825.0	6144.0	5235.0	4841.3		5894.6	
<b>Debt</b>	2004.0	2319.0	2391.0	3458.0	3293.0	3193.0		3193.0	
<b>Net Cash/Shr</b>	1.1	2.6	2.2	1.8	1.3	1.2		1.9	
<b>Tangible Book Value/Shr</b>	9.6	12.0	13.3	13.6	14.0	13.7		14.4	

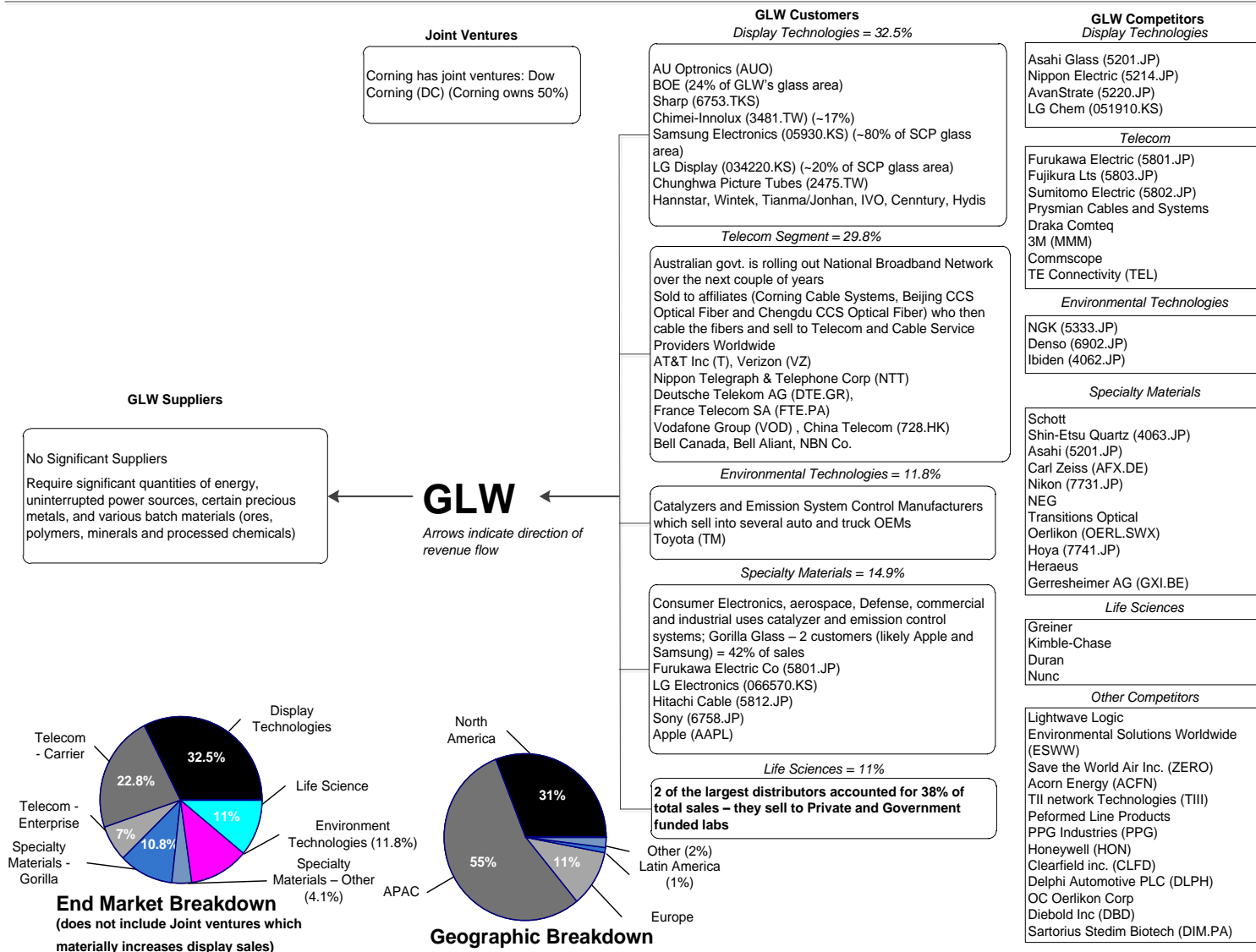
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 341. Corning Incorporated (GLW)

Sector: Technology Supply Chain

# Corning Incorporated (GLW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## CSR Plc

Citi Analyst: Amit Harchandani

CSR plc is a provider of Bluetooth, location, FM, Wi-Fi, audio, video, and camera technologies. CSR operates a fabless business model.

The company was formed in 1999 and floated on the London Stock Exchange in 2004. It is headquartered in Cambridge, UK, and has more than 3,000 employees working in over 35 offices worldwide.

Figure 342. CSR Plc (CSR.L) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	385.2	518.3	527.2	647.1	613.1	543.9	521.2	NA	534.8
- y/y growth	N/A		1.7%	22.7%	-5.2%	-11.3%	-15.0%	NA	2.6%
<b>Gross Margins</b>	44.6%	47.7%	49.8%	50.8%	52.1%	54.7%		NA	
<b>Operating Margins</b>	2.4%	9.9%	5.8%	7.2%	10.6%	10.9%		NA	
<b>EPS</b>	0.13	0.27	0.13	0.17	0.28	0.29	0.31	NA	0.38
- y/y growth	N/A		-51.2%	28.5%	65.2%	0.5%	9.9%	NA	22.4%
<b>Cash</b>	255.2	282.1	178.8	205.0	179.4	222.6		NA	
<b>Debt</b>	0.2	0.0	0.0	0.0	0.0	0.0		NA	
<b>Net Cash/Shr</b>	1.6	1.6	1.0	1.0	1.0	1.3		NA	
<b>Tangible Book Value/Shr</b>	2.0	1.8	1.6	1.2	1.5	1.8		NA	

(Revenues, Cash and Debt in Millions in Local Currency)

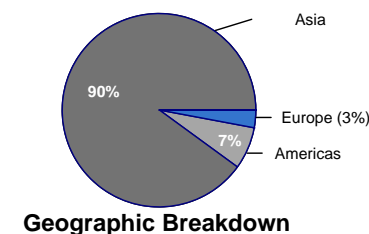
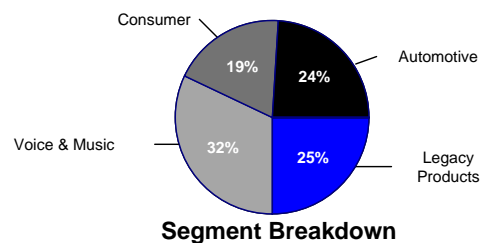
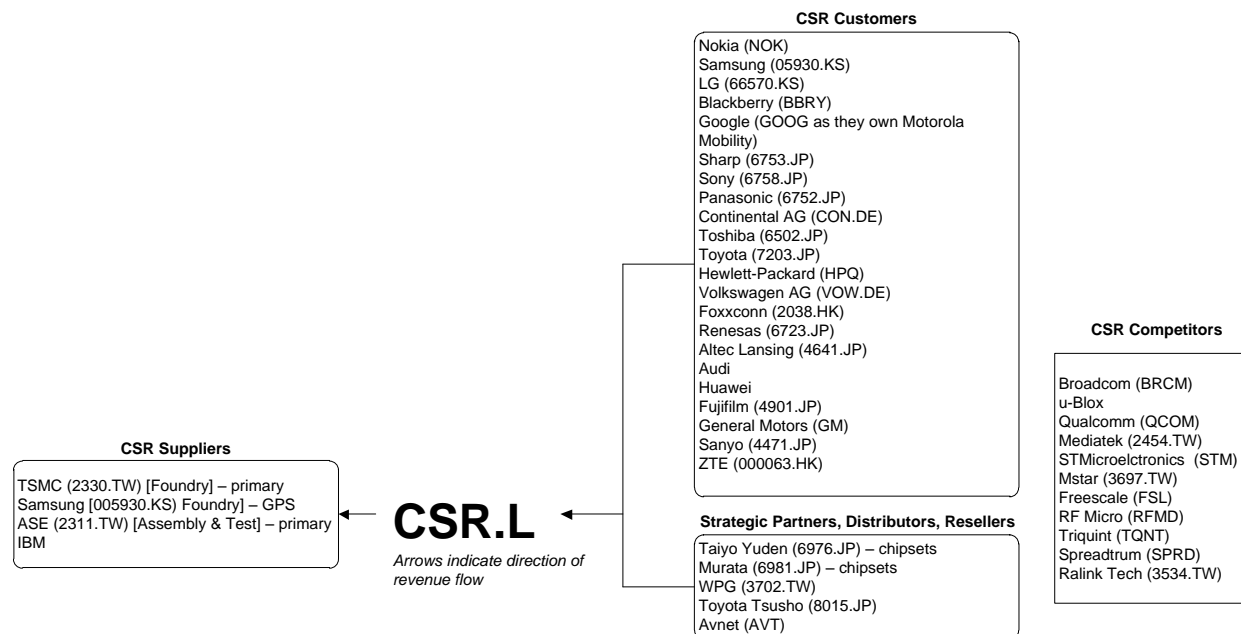
Source: Citi Research, Company Reports, FirstCall



Figure 343. CSR Plc (CSR.L)

Sector: Semiconductors

## CSR Plc (CSR.L)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Cypress Semiconductor

Citi Analyst: Glen Yeung

Cypress Semiconductor designs and manufactures a range of semiconductor solutions, including its proprietary programmable system-on-a-chip (PSoC) platform (which has been successful in touchscreen controllers), static random access memory (SRAM), and data communication devices (USB & West Bridge controllers).

The company has aligned its businesses along the following end-markets: 1) Programmable Systems, which includes touch controllers; 2) Memory Products (SRAM, FRAM); and 3) Data Communications (USB).

Founded in 1982, Cypress is headquartered in San Jose, California, and operates a “fab-lite” strategy with a fab in Minnesota that manufactures ~50% of Cypress’s output.

Figure 344. Cypress (CY) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	667.8	877.5	995.2	769.7	722.7	723.1	737.2	773.7	791.8
- <i>y/y growth</i>	-62.9%	31.4%	13.4%	-22.7%	-6.1%	0.1%	2.0%	7.0%	7.4%
<b>Gross Margins</b>	47.1%	58.4%	57.3%	55.4%	52.2%	52.7%		53.3%	
<b>Operating Margins</b>	1.9%	21.8%	23.7%	12.6%	10.0%	11.7%		14.1%	
<b>EPS</b>	0.07	0.95	1.25	0.57	0.39	0.44	0.51	0.57	0.67
- <i>y/y growth</i>	-90.0%	1213.5%	32.1%	-54.5%	-30.6%	10.9%	28.9%	31.3%	30.8%
<b>Cash</b>	299.6	434.3	166.3	117.2	104.5	133.1		139.9	
<b>Debt</b>	0.0	0.0	0.0	232.0	227.0	227.0		227.0	
<b>Net Cash/Shr</b>	2.1	2.2	0.9	-0.7	-0.8	-0.6		-0.5	
<b>Tangible Book Value/Shr</b>	4.0	4.1	2.2	0.5	0.5	0.5		0.6	

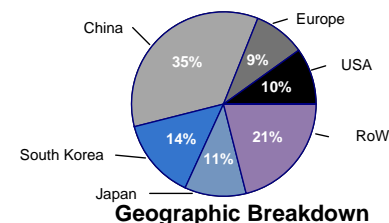
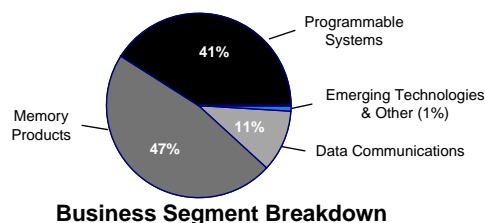
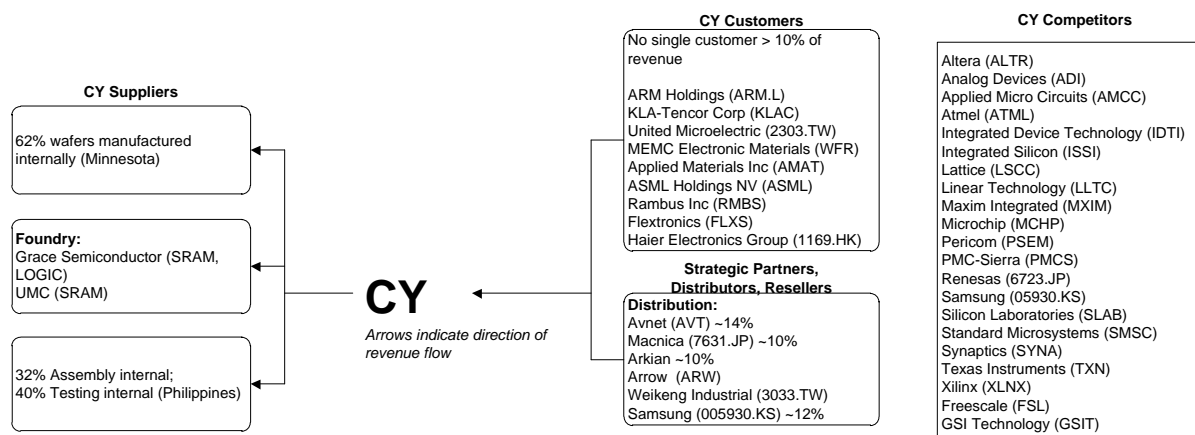
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 345. Cypress Semiconductor Corp. (CY)

Sector: Semiconductors

## Cypress Semiconductor Corp. (CY)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Dainippon Screen

Citi Analyst: Masahiro Shibano

Dainippon Screen Mfg. Co., Ltd. engages in the manufacture and sale of semiconductors and printing equipment.

The company operates through the following segments: Semiconductor Equipment (SE), Flat Panel Display Equipment (FE), Media and Precision Technology (MP), and Other.

- The SE segment provides single wafer and batch-type cleaning tools; spin scrubbers; coaters and developers; and annealing, wafer surface inspection and measurement systems.
- The FE segment offers coaters and developers, wet etchers, resist strippers, and exposure and measurement systems for thin film devices.
- The MP segment handles systems for pattern inspection, automatic optical inspection, plotters, exposure, and pattern measurement.
- The Other segment administers the development of product software, and planning and production of printed materials.

The company was founded on October 11, 1943 and is headquartered in Kyoto, Japan.

Figure 346. Dainippon Screen (7735.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	219049.0	164128.0	254952.0	250089.0	189923.0	231100.0	229231.0	243700.0	246914.0
– <i>y/y growth</i>	-21.7%	-25.1%	55.3%	-1.9%	-24.1%	21.7%	20.7%	5.5%	7.7%
<b>Gross Margins</b>	22.7%	16.0%	28.2%	25.1%	21.0%	23.7%		25.2%	
<b>Operating Margins</b>	-2.1%	-8.6%	10.5%	5.4%	-3.7%	3.8%		5.9%	
<b>EPS</b>	-160.84	-33.71	108.21	19.53	-56.81	23.80	24.32	40.66	40.63
– <i>y/y growth</i>	-948.0%	79.0%	421.0%	-81.9%	-390.8%	141.9%	142.8%	70.8%	67.1%
<b>Cash</b>	25899.0	31253.0	39985.0	37662.0	40420.0	49695.0		59094.0	
<b>Debt</b>	94883.0	67966.0	48693.0	42686.0	66774.0	47000.0		50000.0	
<b>Net Cash/Shr</b>	-29.8	-71.4	123.6	49.2	45.4	116.7		122.6	
<b>Tangible Book Value/Shr</b>	284.8	266.4	362.0	370.4	328.6	401.5		442.1	

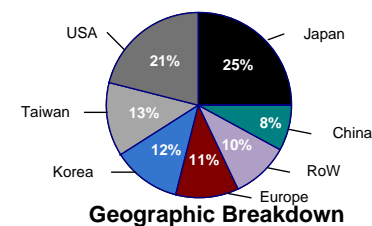
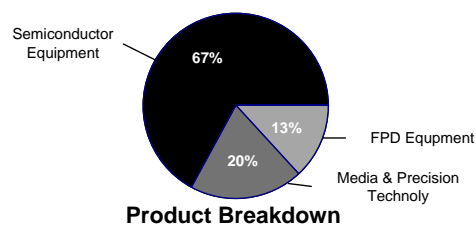
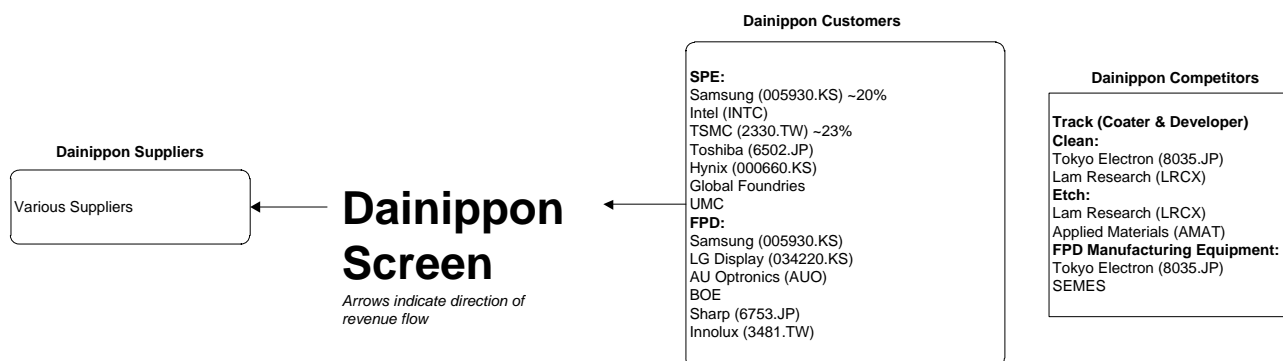
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 347. Dainippon Screen (7735.JP)

Sector: Semiconductor Equipment

## Dainippon Screen (7735.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Delta Electronics

Citi Analyst: Wei Chen

Delta was established in 1975 and is the world's leading computer switching power supply manufacturer.

The company's business is divided into 1) Power Electronics (62% of 2012 revenue), including switching power supply, components, fan and thermal; 2) Energy Management (17% of revenue), including wind power, telecom power, UPS, Industrial Automation, Auto Electronics; and 3) Smart Green Life (18% of revenue), including display, LED, E-paper, voice, cloud computing, and networking.

Figure 348. Delta Electronics (2308.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	125510.8	171302.5	172056.3	171759.9	177053.1	201157.5	193444.0	221294.4	212832.8
- <i>y/y growth</i>	-12.0%	36.5%	0.4%	-0.2%	3.1%	13.6%	9.3%	10.0%	10.0%
<b>Gross Margins</b>	21.0%	21.4%	19.1%	24.5%	25.4%	26.0%		27.0%	
<b>Operating Margins</b>	9.4%	10.1%	6.0%	10.1%	11.0%	12.2%		13.2%	
<b>EPS</b>	5.22	6.70	4.58	6.14	7.33	9.02	8.67	10.62	10.19
- <i>y/y growth</i>	9.8%	28.4%	-31.6%	34.0%	19.4%	23.1%	18.4%	17.8%	17.6%
<b>Cash</b>	58453.2	61408.3	68423.6	52469.7	59806.5	67141.5		77553.0	
<b>Debt</b>	14747.2	19528.5	43319.6	21601.7	23389.4	18389.4		18389.4	
<b>Net Cash/Shr</b>	24.8	22.0	18.1	14.9	16.9	21.9		26.1	
<b>Tangible Book Value/Shr</b>	28.0	31.7	32.4	34.6	38.8	42.5		46.6	

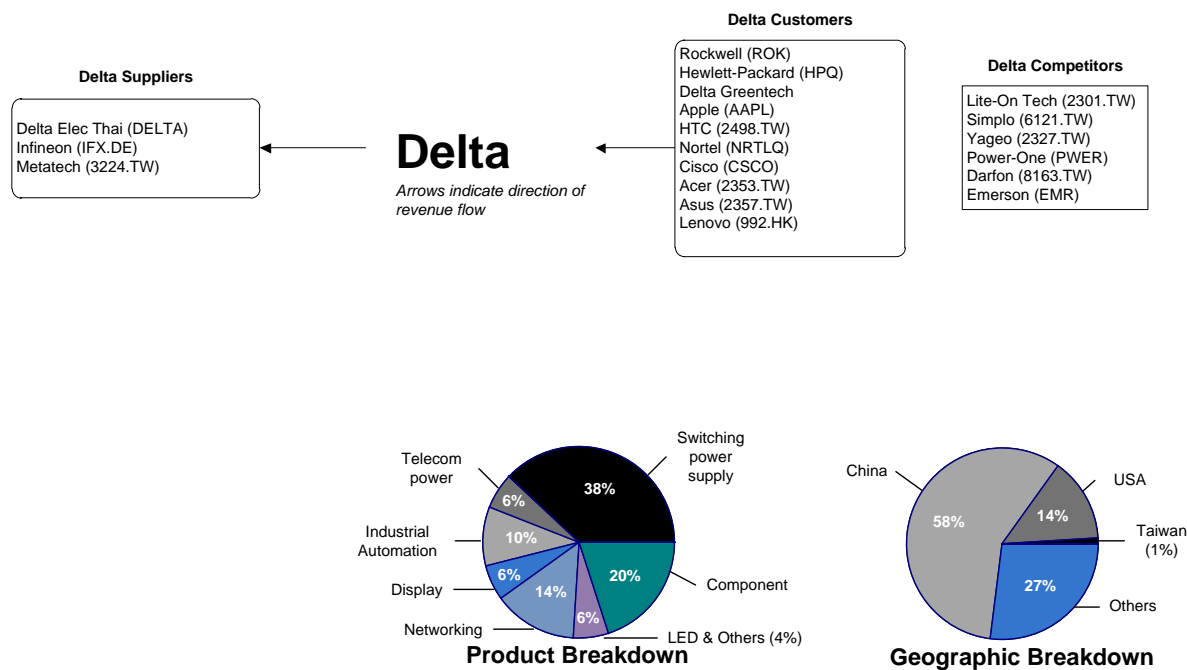
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 349. Delta Electronics (2308.TW)

Sector: PC & Enterprise Hardware

## Delta Electronics (2308.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Electronics for Imaging Inc.

Citi Analyst: Jim Suva, CPA

Electronics for Imaging, Inc. is focused on the transformation of the printing, packaging, and decorative industries from the use of traditional analog based presses to digital on-demand printing.

The company's products include industrial super-wide and wide format, label and packaging, and ceramic tile decoration digital inkjet printers that utilize its digital ink; print production workflow, web-to-print, cross-media marketing, and business process automation solutions; and color digital print controllers creating an on-demand digital printing ecosystem. It operates through three segments: Industrial Inkjet, Productivity Software, and Fiery.

- The Industrial Inkjet segment products (49% of sales) consist of VUTEk super-wide and EFI wide format industrial digital inkjet printers, Jetrion label and packaging digital inkjet printing systems, Cretaprint digital inkjet printers for ceramic tile decoration, and related ink, parts, and services.
- The Productivity Software segment (16% of sales) engages in the business of process automation software, including Monarch, PSI, Logic, PrintSmith, and PrintFlow, Radius, PrintStream, Prism, Metrics, Technique, and Alphagraph.
- The Fiery segment brand (35% of sales) consists of print servers, controllers, and DFEs, which transform digital copiers and printers into high performance networked printing devices for the office and commercial printing market.

Electronics for Imaging was founded in 1988 in the San Francisco Bay Area, CA. It employs approximately 2,400 employees.

**Most Relevant Relationships:** Xerox = 12% of 2013 revenues

Figure 350. Electronics for Imaging Inc. (EFII) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	401.1	504.0	591.6	652.1	727.7	788.3	777.9	853.0	842.2
– <i>y/y growth</i>	-28.4%	25.7%	17.4%	10.2%	11.6%	8.3%	6.9%	8.2%	8.3%
<b>Gross Margins</b>	53.0%	53.8%	56.2%	54.6%	54.6%	54.5%		54.5%	
<b>Operating Margins</b>	-4.5%	7.1%	11.7%	12.1%	13.6%	14.2%		15.1%	
<b>EPS</b>	-0.22	0.59	1.12	1.29	1.58	1.91	1.79	2.19	2.10
– <i>y/y growth</i>	-130.3%	373.1%	88.9%	15.6%	22.7%	20.5%	13.1%	14.8%	17.2%
<b>Cash</b>	204.2	229.7	219.2	365.0	355.0	408.2		475.6	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	4.1	4.9	4.6	7.7	7.3	8.4		9.8	
<b>Tangible Book Value/Shr</b>	7.6	7.8	7.6	7.7	10.0	11.3		12.9	

(Revenues, Cash and Debt in Millions in Local Currency)

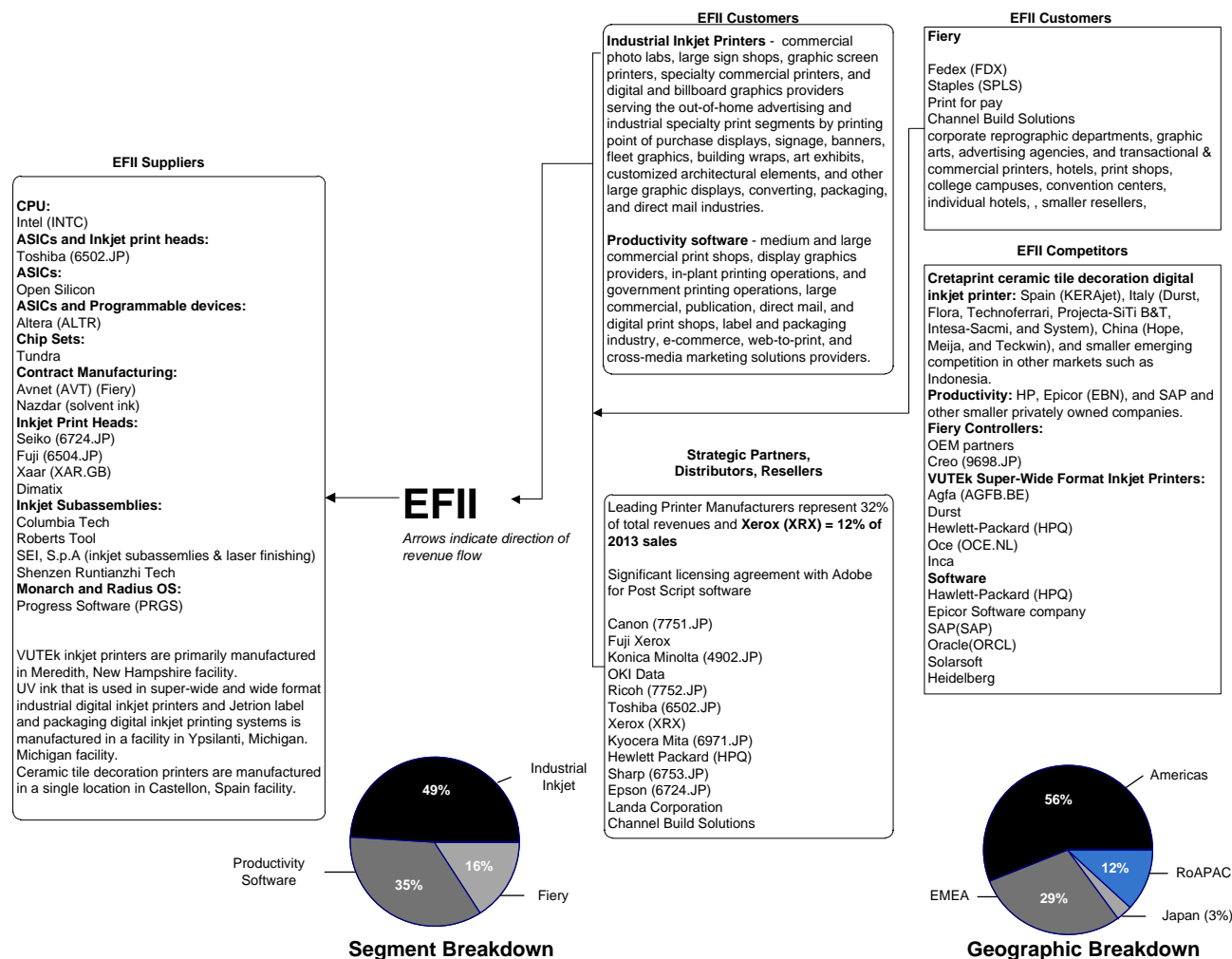
Source: Citi Research, Company Reports, FirstCall



Figure 351. Electronics for Imaging Inc. (EFII)

Sector: Imaging

## Electronics for Imaging Inc. (EFII)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## EMC Corp

Citi Analyst: Jim Suva, CPA

EMC Corporation (EMC) has grown from providing memory boards into the early computer market to the world's leading provider of intelligent enterprise infrastructure, with products spanning most every layer of the IT architecture. In addition to being the world's largest storage supplier, EMC is well positioned in such high growth markets as server virtualization, security, content management and network monitoring. The company maintains a controlling interest (~80%) in virtualization software-leader VMware. Based in Hopkinton, MA and founded in 1979, EMC has approximately 60,000 employees globally.

EMC conducts its business through two categories: EMC Information Infrastructure (80% of total sales in 2011) & VMware Virtual Infrastructure (20% of total sales). The company's EMC Information Infrastructure provides a foundation for organizations to store, manage, protect, analyze and secure their vast and ever-increasing quantities of information, improve business agility, lower cost of ownership and enhance their competitive advantage within traditional data centers, virtual data centers and cloud-based IT infrastructures. It operates through three segments: Information Storage, Information Intelligence Group and RSA Information Security. The Information Storage segment offers a portfolio of enterprise storage systems and software-scaling from entry-level to datacenter class systems supporting organizations' information storage, back-up and recovery, and management strategies. The Information Intelligence Group segment provides software and services for enterprise capture, information access, customer communications, case management and governance to help organizations get maximum leverage from their information. The RSA Information Security segment delivers products, packaged solutions and services designed to safeguard the integrity and confidentiality of information throughout its lifecycle. It offers solutions in identity assurance and access control, data loss prevention, encryption and key management, enterprise governance, risk and compliance, security information management and fraud protection. These technologies enable organizations to discover, classify and place appropriate controls around their data, secure access to the data both inside and outside the network as well as across physical, virtual or cloud infrastructures, and monitor and enforce these measures to prove compliance with security policies and regulations. The VMware Virtual Infrastructure business category provides virtualization and cloud infrastructure software solutions. Its solutions enable organizations to aggregate multiple servers, storage infrastructure and networks.

Figure 352. EMC Corp (EMC) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	14025.9	17015.1	20007.6	21713.9	23222.4	24520.4	24507.2	26277.2	26207.2
- y/y growth	-5.7%	21.3%	17.6%	8.5%	6.9%	5.6%	5.5%	7.2%	6.9%
<b>Gross Margins</b>	57.0%	60.4%	62.6%	64.5%	64.0%	66.8%		67.6%	
<b>Operating Margins</b>	17.4%	22.0%	23.9%	24.9%	24.7%	24.1%		25.0%	
<b>EPS</b>	0.90	1.26	1.52	1.71	1.79	1.95	1.94	2.19	2.17
- y/y growth	-13.1%	39.8%	20.0%	12.6%	4.9%	8.7%	8.1%	12.5%	11.9%
<b>Cash</b>	6695.3	5375.3	6318.0	6167.1	10664.0	10312.7		12857.1	
<b>Debt</b>	3100.3	3450.0	3424.3	1710.1	7159.0	5494.0		5494.0	
<b>Net Cash/Shr</b>	1.7	2.4	2.8	2.8	2.4	2.3		3.6	
<b>Tangible Book Value/Shr</b>	2.5	1.9	2.5	3.1	3.0	4.1		5.5	

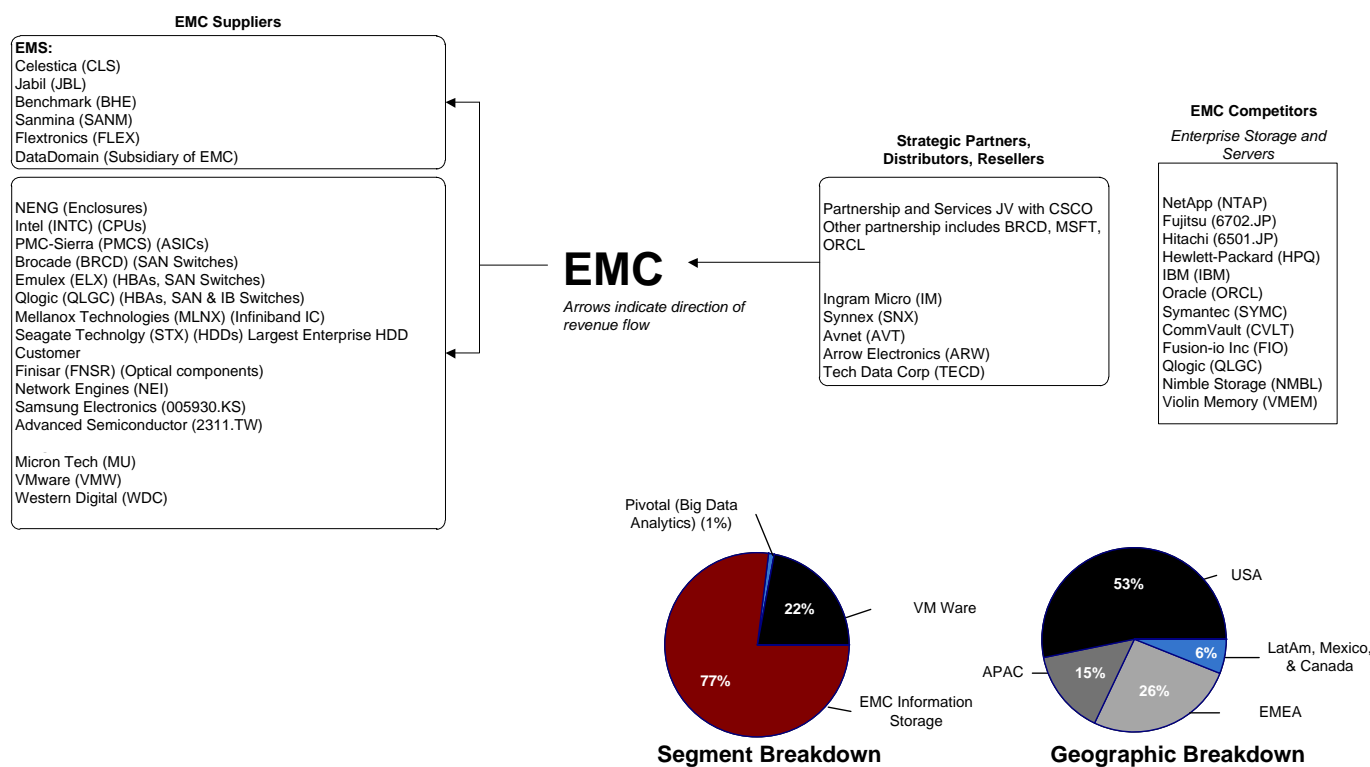
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 353. EMC (EMC)

Sector: Storage

## EMC (EMC)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Entegris Inc.

Citi Analyst: Terence Whalen

Entegris is the leading provider of purification and materials handling solutions to the global semiconductor and related industries.

Approximately two-thirds of ENTG's sales are generated from sales of consumables products, with the remaining third coming from gas and liquid delivery, pressure measurement, and other systems related to materials handling.

The company's global customer base includes chipmakers as well as equipment OEMs.

The company is headquartered in Chaska, Minnesota and has manufacturing sites in nine countries across North America, Europe, and Asia.

Figure 354. Entegris Inc. (ENTG) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	398.6	688.4	749.3	715.9	680.7	747.8	731.3	773.1	789.7
- y/y growth	-28.1%	72.7%	8.8%	-4.5%	-4.9%	9.9%	7.4%	3.4%	8.0%
<b>Gross Margins</b>	34.6%	45.1%	43.5%	42.9%	42.4%	43.5%		43.9%	
<b>Operating Margins</b>	-2.4%	17.4%	18.2%	15.2%	14.8%	16.5%		17.3%	
<b>EPS</b>	-0.18	0.72	0.80	0.58	0.56	0.61	0.62	0.65	0.72
- y/y growth	-525.8%	497.6%	11.4%	-28.0%	-2.2%	7.3%	10.5%	6.7%	14.9%
<b>Cash</b>	68.7	134.0	273.6	350.4	362.8	445.8		550.0	
<b>Debt</b>	71.8	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	0.1	1.0	2.0	2.5	2.6	3.1		3.8	
<b>Tangible Book Value/Shr</b>	2.3	3.0	4.1	4.7	5.1	5.7		6.2	

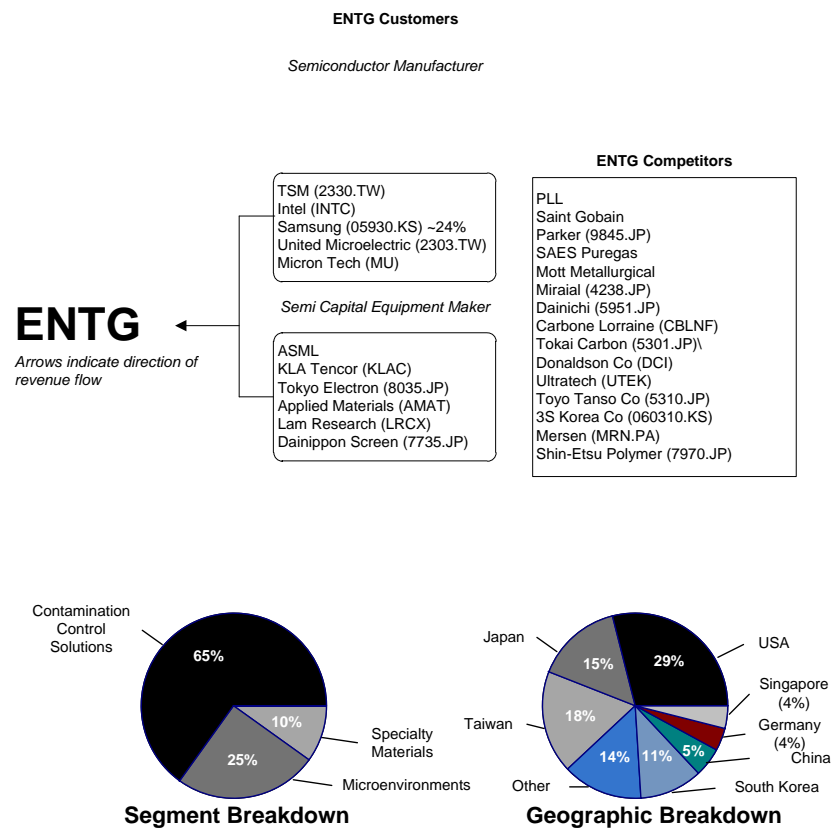
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 355. Entegris Inc. (ENTG)

Sector: Semiconductor Equipment

## Entegris Inc. (ENTG)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Epistar

Citi Analyst: Winnie Hong, CFA

Epistar was founded in 1996 and is now one of the leading LED chip makers in the world specializing in a full spectrum of high brightness LED. It ranks no.1 in 4-element (red/yellow light) chips and top 3 in InGaN (blue light) chips worldwide.

The company's products can be widely applied in consumer electronics, LCD backlight, general lighting, automotive, and outdoor displays.

Key customers include Lumens, Everlight and Lite-On.

Figure 356. Epistar (2448.TW) Results and Forecasts

	2009	2010	2011	2012	2013	Street 2014E	Street 2015E
<b>Revenues</b>	12848.9	20888.1	21963.6	19931.4	22251.2	26544.1	30536.4
- <i>y/y growth</i>	24.5%	62.6%	5.1%	-9.3%	11.6%	19.3%	15.0%
<b>Gross Margins</b>	25.2%	37.6%	12.3%	7.4%	13.3%		
<b>Operating Margins</b>	13.9%	26.4%	0.1%	-6.0%	2.0%		
<b>EPS</b>	2.59	7.26	0.56	-1.30	0.04	1.94	3.42
- <i>y/y growth</i>	3745.4%	180.0%	-92.3%	-330.9%	103.2%	4618.8%	76.1%
<b>Cash</b>	22247.0	23269.7	17725.3	12142.9	15604.5		
<b>Debt</b>	6167.9	10755.8	14615.0	12348.9	18908.1		
<b>Net Cash/Shr</b>	33.3	23.7	7.2	2.8	8.0		
<b>Tangible Book Value/Shr</b>	46.4	54.8	51.8	49.0	49.0		

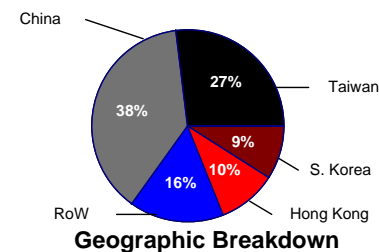
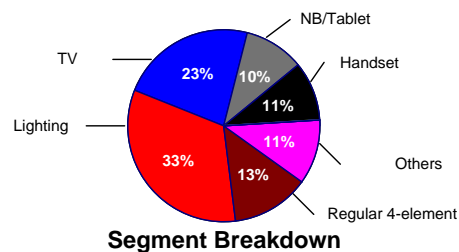
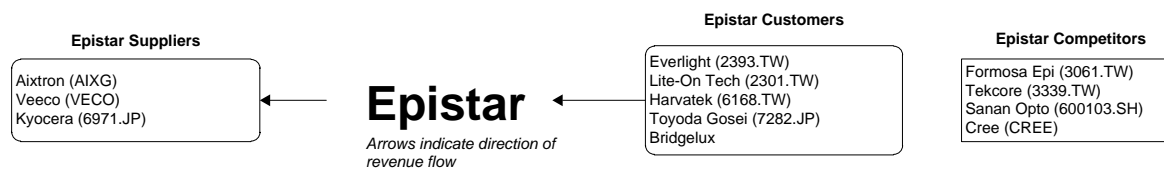
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 357. Epistar (2448.TW)

Sector: Electronic Components

Epistar (2448.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Ericsson LM

Citi Analyst: Ehud Gelblum, Ph.D

Ericsson is a leader in telecommunications technologies, serving approximately 400 customers, mostly service providers. Ericsson has four main businesses:

- The “Networks” division (52% of consolidated revenue and 58% of consolidated operating income in 2013) sells network infrastructure products built on three main platforms: the RBS 6000 multi-standard platform for Radio Base Stations (RBS); the Ericsson Blade System platform for handling of network control functionality in fixed and mobile core networks; and the SSR 8000 family of Smart Services Routers (SSR), a high-capacity router platform with multi-application capabilities. Ericsson is the largest supplier of mobile systems in the world having earned a 40% share of the global installed base of radio base stations.
- The “Global Services” division (43% of consolidated revenue and 35% of consolidated operating income in 2013) manages complex multi-vendor, multi-technology networks with approximately 1 billion subscribers in more than 100 countries. We believe Ericsson has over 300 managed services contracts globally which typically last five to seven years. Professional Services and Network Rollout sales are also included in the “Global Services” division.
- The “Support Solutions” division (5% of consolidated revenue and 7% of consolidated operating income in 2013) includes Ericsson’s OSS (Operational Support Systems), BSS (Business Support Systems), media management and IPTV businesses.
- The “Modem” division has been consolidated into Ericsson as of October 1, 2013, following the split-up of the former ST-Ericsson Joint Venture. Revenue is scheduled to ramp with the launch of the M7450 LTE baseband in Q2’14; Ericsson aims to be a top 3 supplier of thin LTE modems by 2015.

Mobile broadband solutions accounted for 58% of Ericsson sales across all divisions in 2012, essentially making Ericsson a play on the growth of mobile data traffic.

Figure 358. Ericsson (ERICb.ST) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	206477.0	203348.0	226921.0	227779.0	227376.0	222207.3	229976.4	229126.6	237823.1
<b>- y/y growth</b>	-1.2%	-1.5%	11.6%	0.4%	-0.2%	-2.3%	1.1%	3.1%	3.4%
<b>Gross Margins</b>	34.0%	36.5%	35.1%	31.6%	33.6%	34.6%		36.1%	
<b>Operating Margins</b>	11.9%	12.0%	11.0%	11.3%	9.9%	8.5%		10.4%	
<b>EPS</b>	0.00	0.00	5.54	3.55	5.60	4.62	5.05	5.34	5.96
<b>- y/y growth</b>	#DIV/0!	#DIV/0!	#DIV/0!	-35.9%	57.7%	-17.4%	-9.9%	15.4%	18.1%
<b>Cash</b>	76724.0	87150.0	80542.0	76708.0	77089.0	89704.7		96465.0	
<b>Debt</b>	32120.0	30763.0	31021.0	28667.0	29455.0	29455.0		29455.0	
<b>Net Cash/Shr</b>	14.6	18.7	17.7	16.3	16.9	20.7		22.7	
<b>Tangible Book Value/Shr</b>	29.4	31.7	31.9	28.3	29.7	31.1		33.1	

(Revenues, Cash and Debt in Millions in Local Currency)

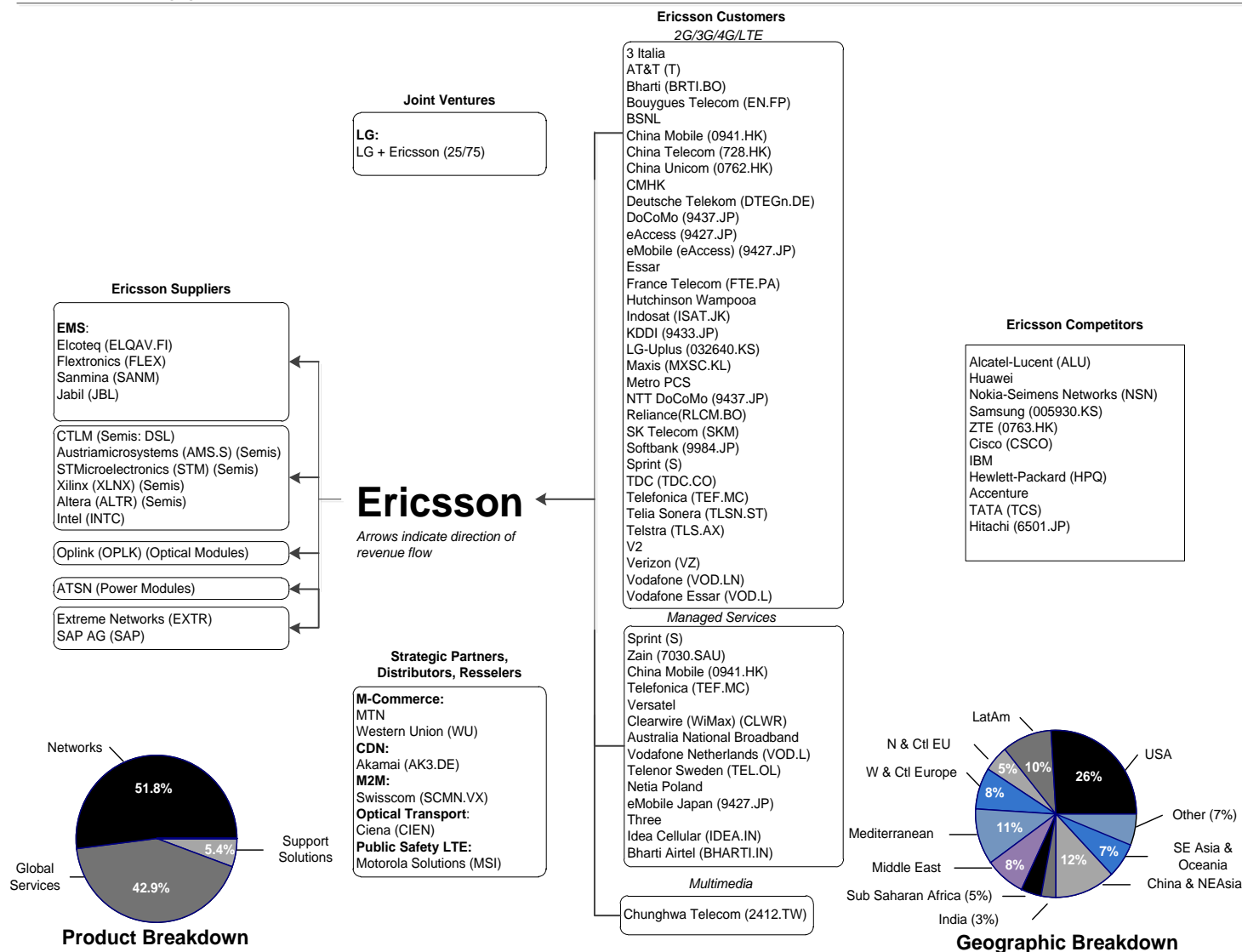
Source: Citi Research, Company Reports, FirstCall



Figure 359. Ericsson (ERICB.ST)

Sector: Telecom Equipment

## Ericsson (ERICB.ST; ERIC)



Source: Company reports, CIRA estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Everlight

Citi Analyst: Winnie Hong, CFA

Everlight, founded in 1983; is the largest LED packager in Taiwan and is one of the top 10 LED packagers worldwide.

To secure chip supply, Everlight has solid relationships with major chip suppliers in Taiwan through direct investments – it holds 10% in Teckore and 4% in Epistar. Its major products include SMD, lamp, display, and infrared.

In terms of application, handset and backlight currently account for 60-70% of total revenues, infrared is 20%, and lighting is ~10% as of 2012.

Figure 360. Everlight Corp. (2393.TW) Results and Forecasts

	2009	2010	2011	2012	2013	Street 2014E	Street 2015E
<b>Revenues</b>	11405.0	17470.8	18642.3	19068.2	24732.4	29107.4	31719.8
- <i>y/y growth</i>	0.7%	53.2%	6.7%	2.3%	29.7%	17.7%	9.0%
<b>Gross Margins</b>	34.9%	29.9%	24.7%	23.3%	24.4%		
<b>Operating Margins</b>	14.7%	12.8%	8.0%	5.7%	8.5%		
<b>EPS</b>	4.84	5.54	3.14	1.30	3.62	4.33	4.77
- <i>y/y growth</i>	28.7%	14.4%	-43.3%	-58.5%	177.9%	19.7%	10.2%
<b>Cash</b>	7992.7	6574.0	6360.1	4690.0	6468.6		
<b>Debt</b>	6711.4	7121.7	8888.6	7085.7	7609.4		
<b>Net Cash/Shr</b>	15.5	10.5	15.1	1.7	6.0		
<b>Tangible Book Value/Shr</b>	35.4	36.1	36.4	33.3	35.5		

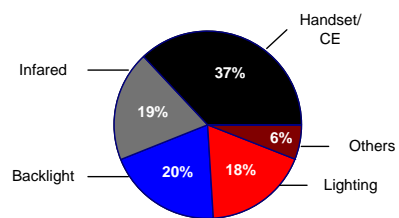
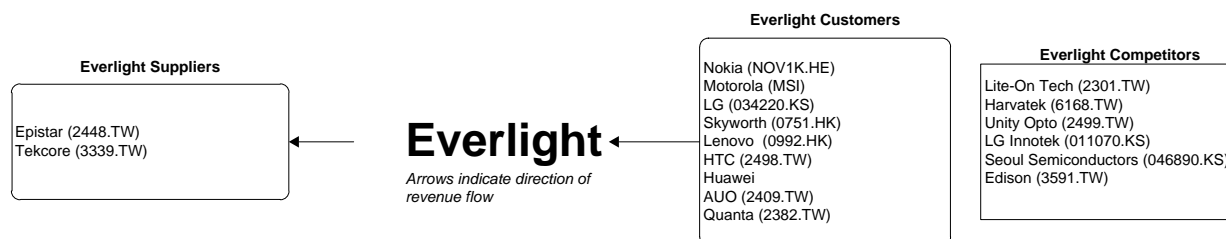
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

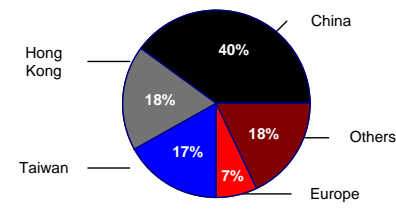
Figure 361. Everlight Corp. (2393.TW)

Sector: Semiconductors & Components

## Everlight Corp. (2393.TW)



**Business Breakdown**



**Geographic Breakdown**

Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## F5 Networks

Citi Analyst: Ehud Gelblum, Ph.D

F5 is an application delivery networking and security provider based in Seattle, WA.

The company leads the \$1.6B Application Delivery Controller market with over 40% share and specializes in products that improve performance, availability, and security of enterprise and telco applications.

Application Delivery Controllers have matured since being introduced simply as "load balancers" a decade ago and have evolved into more sophisticated networking devices and software handling security offload and server processing of policy monitoring and enforcement.

The company's main product line is BIG-IP, a series of hardware solutions and standalone-software solutions that use F5's Traffic Management Operating System (TMOS) and its full-proxy inspection engine to establish strategic points of control within networks and enables users to connect to applications quickly and securely. F5 further augments its core load balancing technology with software modules to improve application delivery and performance such as SSL encryption and custom scripting functionality via its iRules language.

Founded in 1996, F5 employs more than 3,000 globally, largely in sales and engineering.

Figure 362. F5 Networks (FFIV) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	653.1	882.0	1151.8	1377.2	1481.3	1701.9	1699.1	1908.9	1903.9
- y/y growth	0.4%	35.0%	30.6%	19.6%	7.6%	14.9%	14.7%	12.2%	12.1%
<b>Gross Margins</b>	79.1%	81.3%	82.8%	84.0%	83.9%	83.4%		83.1%	
<b>Operating Margins</b>	19.5%	26.1%	30.4%	31.4%	29.5%	30.4%		31.3%	
<b>EPS</b>	1.68	2.52	3.78	4.38	4.60	5.24	5.23	6.09	6.05
- y/y growth	14.2%	50.0%	50.1%	15.8%	4.8%	14.1%	13.9%	16.1%	15.6%
<b>Cash</b>	317.1	428.5	542.6	532.2	542.1	763.6		1112.7	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	4.0	5.3	6.7	6.7	6.9	9.9		14.8	
<b>Tangible Book Value/Shr</b>	7.2	9.6	11.0	12.4	13.0	14.4		18.5	

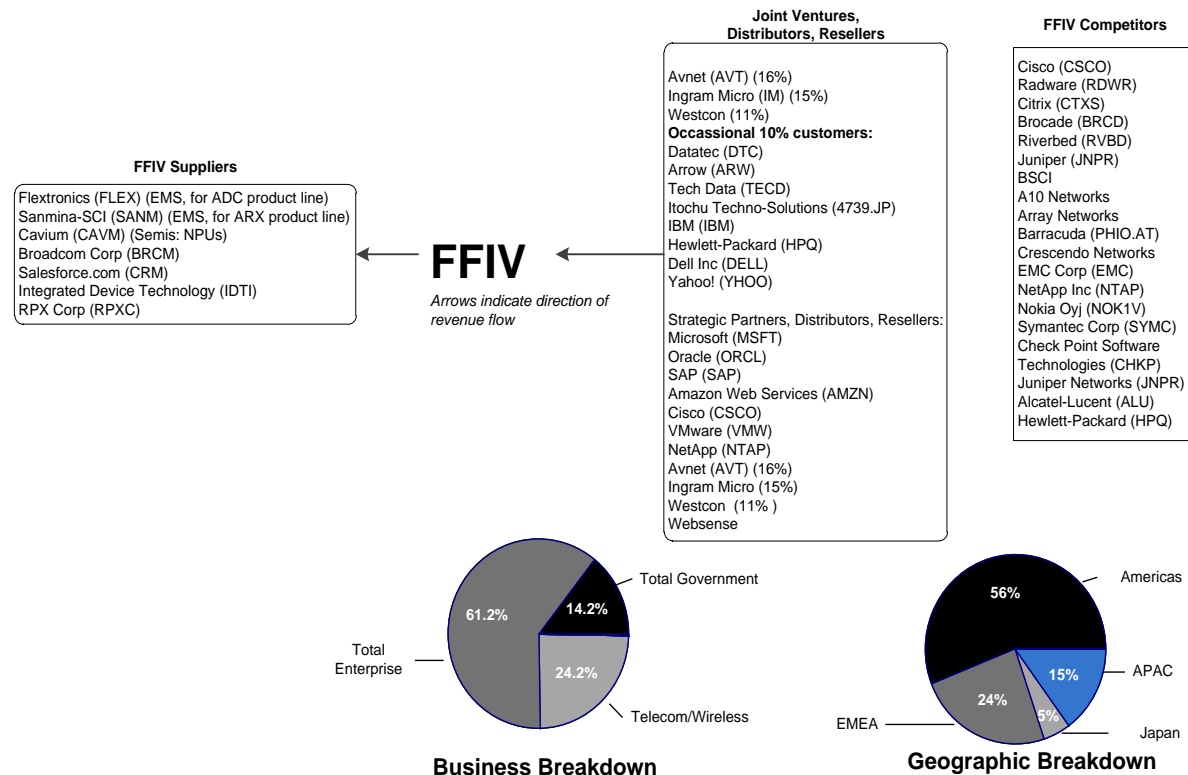
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 363. F5 Networks (FFIV)

Sector: Software Services

## F5 Networks (FFIV)



Source: Company reports, CIRA estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Fairchild Semiconductor International

Citi Analyst: Terence Whalen

Fairchild Semiconductor is a leading supplier of power discrete components, optoelectronics, interface, logic ICs, and has a small but growing analog power management integrated circuit (IC) portfolio.

The company has three reportable business segments: Power Conversion, Industrial, and Auto (PCIA - 49% 2012 sales), Mobile, Computing, Consumer, and Communications (MCCC - 41%) and Standard Products (SPG - 10%).

FCS derives 62% of sales from third party distributors recognizing the distributor revenue using a sell-in basis both domestically and internationally. Its revenue is consequently susceptible to quarter-to-quarter changes resulting from distributor inventory stocking or destocking.

Fairchild's gross margins are low by analog standards, though the company has one of the leanest operating expense profiles. FCS is vertically integrated and manufactures 95%+ of products internally. Manufacturing facilities are located in West Jordan, UT, South Portland, ME, Mountaintop, PA, Bucheon, Korea, Singapore, and Malaysia.

Competitors include International Rectifier, Intersil, ON Semi, Renesas, ST Microelectronics, and Texas Instruments.

Fairchild's fiscal year ends in December.

Figure 364. Fairchild Semiconductor International (FCS) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1187.5	1599.7	1588.8	1405.9	1405.4	1475.1	1457.2	1569.0	1539.3
<b>- y/y growth</b>	-24.6%	34.7%	-0.7%	-11.5%	0.0%	5.0%	3.7%	6.4%	5.6%
<b>Gross Margins</b>	24.4%	35.2%	35.2%	31.4%	29.6%	31.4%		35.2%	
<b>Operating Margins</b>	-0.2%	12.7%	10.8%	4.3%	2.3%	5.1%		11.0%	
<b>EPS</b>	0.01	1.47	1.25	0.55	0.27	0.57	0.55	1.19	0.97
<b>- y/y growth</b>	-98.4%	12929.5%	-15.0%	-56.1%	-51.0%	112.4%	102.8%	107.5%	77.7%
<b>Cash</b>	415.9	404.7	423.5	406.0	417.9	522.8		716.7	
<b>Debt</b>	472.2	320.7	300.1	250.1	200.1	200.1		200.1	
<b>Net Cash/Shr</b>	-0.4	0.7	0.9	1.2	1.7	2.5		3.9	
<b>Tangible Book Value/Shr</b>	6.2	7.4	8.5	9.1	9.1	9.6		10.7	

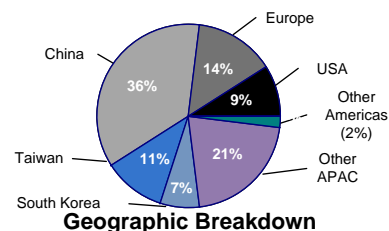
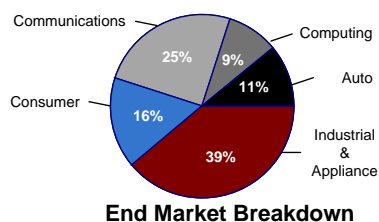
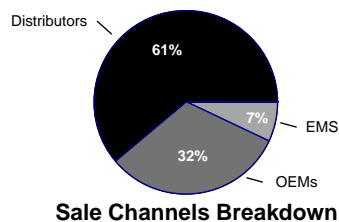
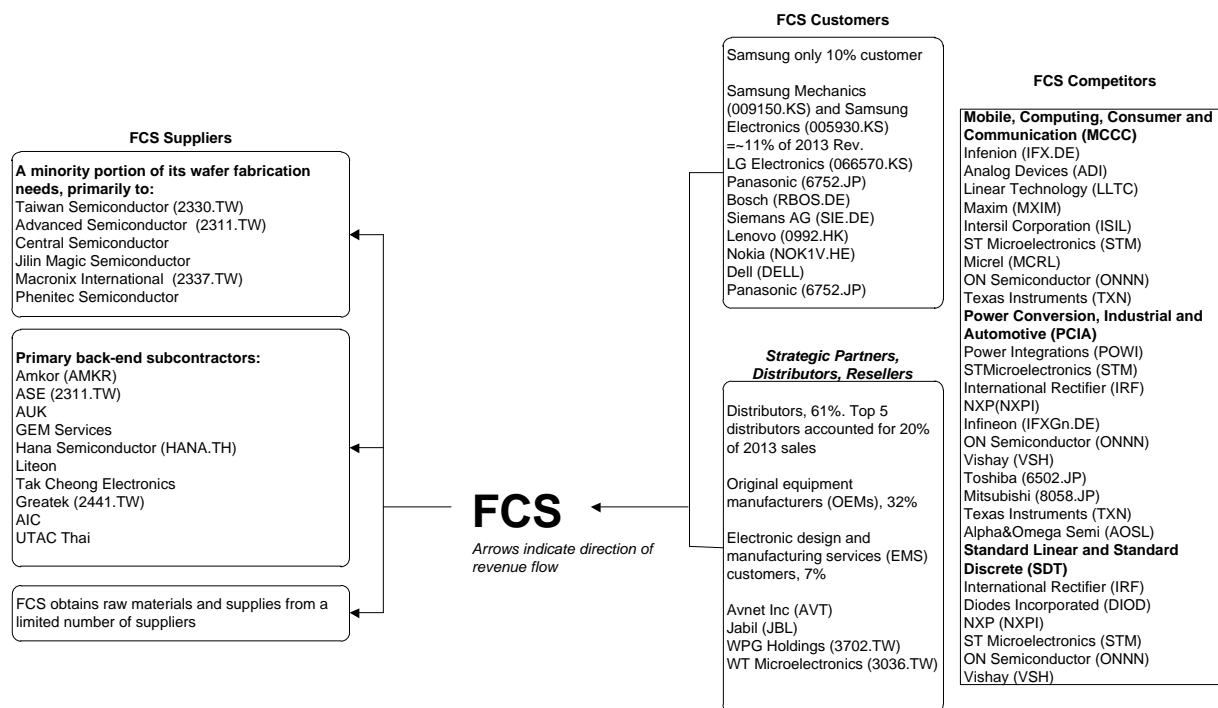
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 365. Fairchild Semiconductor International (FCS)

Sector: Semiconductors

## Fairchild Semiconductor International, Inc. (FCS)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## First Solar

Citi Analyst: **Shahriar Pourreza, CFA**

First Solar is a leading manufacturer of solar modules based on thin film technology.

By leveraging a proprietary process centered on the semiconductor material cadmium telluride, the company has been able to achieve a significant manufacturing cost advantage relative to its silicon-based peers in the solar photovoltaic market – although this benefit has contracted with the drop in Poly prices.

Headquartered in Arizona, the company boasts a global manufacturing base with sites in North America and Asia. First Solar's copy-exact manufacturing strategy, combined with its minimal need for polysilicon, continues to drive capacity expansion that has fueled better growth than many of its solar PV peers in the utility scale market.

Moving forward, First Solar should increasingly become known as a project developer versus a module manufacturer.

Figure 366. First Solar, Inc. (FSLR) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	2066.2	2563.5	2766.2	3368.5	3812.8	3496.2	3714.4	4030.3	4239.4
- y/y growth	65.8%	24.1%	7.9%	21.8%	13.2%	-8.3%	-2.6%	15.3%	14.1%
<b>Gross Margins</b>	51.4%	47.0%	40.7%	41.2%	25.1%	24.3%		25.7%	
<b>Operating Margins</b>	37.8%	33.9%	25.2%	29.9%	13.8%	12.5%		15.3%	
<b>EPS</b>	7.37	7.68	6.00	4.88	4.31	3.37	3.23	4.97	3.68
- y/y growth	73.7%	4.2%	-21.9%	-18.6%	-11.8%	-21.8%	-25.0%	47.7%	13.9%
<b>Cash</b>	784.7	933.6	671.8	1003.9	1333.7	1609.7		1961.9	
<b>Debt</b>	175.0	237.4	663.6	562.6	255.8	255.8		255.8	
<b>Net Cash/Shr</b>	7.5	8.4	0.6	5.7	12.5	15.2		18.5	
<b>Tangible Book Value/Shr</b>	28.3	35.6	41.6	40.3	49.7	53.8		59.9	

(Revenues, Cash and Debt in Millions in Local Currency)

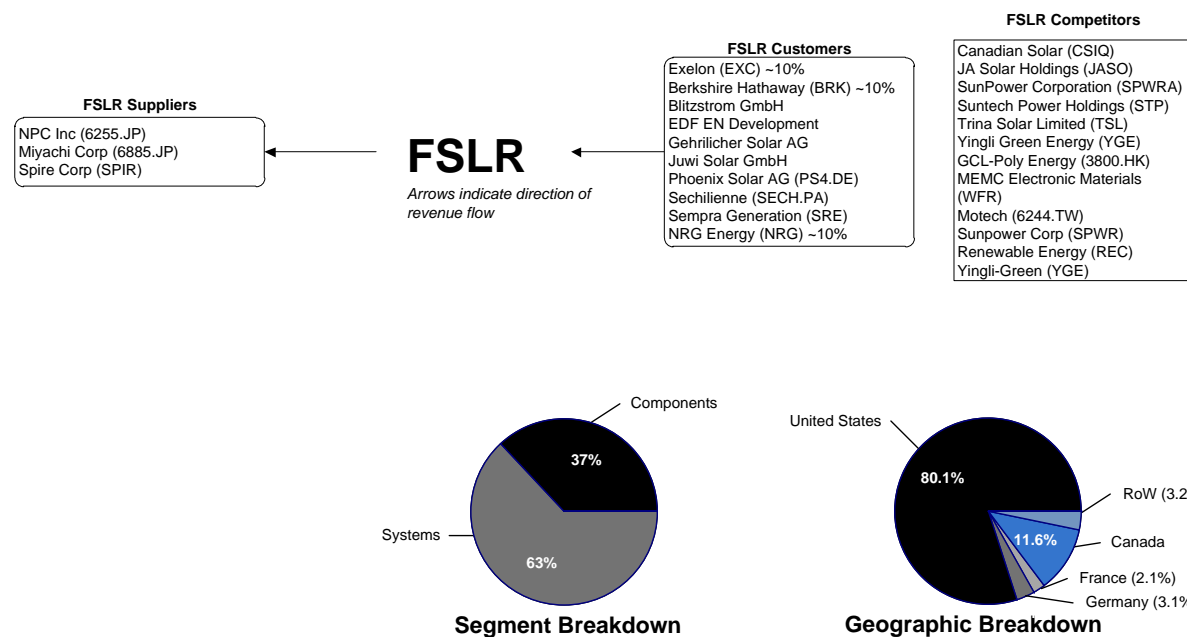
Source: Citi Research, Company Reports, FirstCall



Figure 367. First Solar, Inc. (FSLR)

Sector: Alternative Energy

## First Solar, Inc. (FSLR)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Flexium Interconnect

Citi Analyst: Roland Shu

Flexium is one of the world's key flexible PCB makers, with an estimated 3% global market share (2012). Flexium has manufacturing sites in Kaohsiung Taiwan and Kunshan China. Flexium's revenue exposure to smartphone application surpassed 40% in 2012.

Flexium was founded in 1997 and is headquartered in Kaohsiung, Taiwan,

Figure 368. Flexium Interconnect (6269.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	3088.0	4552.5	7563.5	11079.0	13605.2	16591.5	16040.4	19015.0	18054.0
- <i>y/y growth</i>	9.6%	47.4%	66.1%	46.5%	22.8%	21.9%	17.9%	14.6%	12.6%
<b>Gross Margins</b>	25.0%	22.4%	27.9%	27.1%	23.7%	23.3%		23.0%	
<b>Operating Margins</b>	14.8%	14.0%	17.1%	18.1%	15.1%	16.1%		16.1%	
<b>EPS</b>	2.41	3.47	6.17	8.45	8.54	9.43	9.58	10.74	10.22
- <i>y/y growth</i>	60.9%	43.8%	77.8%	36.9%	1.1%	10.5%	12.2%	13.9%	6.7%
<b>Cash</b>	957.8	981.4	2384.0	3505.0	5507.4	6642.8		8317.9	
<b>Debt</b>	364.7	463.0	632.3	2299.7	4933.3	5259.5		5457.5	
<b>Net Cash/Shr</b>	5.0	5.2	11.9	10.6	12.4	16.4		23.4	
<b>Tangible Book Value/Shr</b>	12.1	13.4	24.4	32.1	38.3	47.6		58.2	

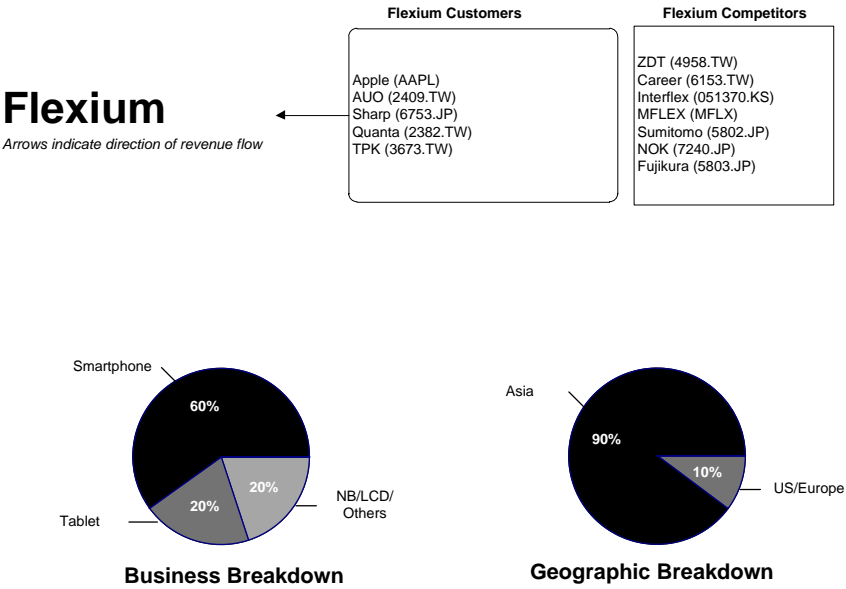
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 369. Flexium Interconnect (6269.TW)

Sector: Electronic Components

Flexium Interconnect (6269.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Flextronics

Citi Analyst: Jim Suva, CPA

Flextronics is the world's second largest EMS company and we believe it is one of the lowest-cost producers in the industry, primarily due to its dominant presence in newly industrialized nations, such as China, Hungary, Mexico, and Poland.

Leading customers include Hewlett Packard (~9%), Cisco, Lenovo, Ericsson, Huawei, Oracle (Sun), Xerox, Alcatel-Lucent, Dell, Sony-Ericsson, Microsoft, and Motorola.

Flextronics services encompass virtually every aspect of the manufacturing process, including product design and other front-end engineering services; printed circuit board fabrication and assembly; enclosure fabrication and plastic injection molding; materials procurement; inventory management; and final system assembly, testing, and end-customer fulfillment.

Sales by end markets include 46% Integrated Network Solutions, 17% Industrial & Emerging Industries, 11% High Reliability Solutions and 26% High Velocity Solutions.

Figure 370. Flextronics (FLEX) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	30948.6	24111.7	28679.9	29387.7	23583.0	25562.4	25487.6	26846.3	26266.4
- <i>y/y growth</i>	12.3%	-22.1%	18.9%	2.5%	-19.8%	8.4%	8.1%	5.0%	3.1%
<b>Gross Margins</b>	5.4%	5.3%	5.6%	5.2%	5.9%	5.8%		5.7%	
<b>Operating Margins</b>	2.6%	2.5%	2.9%	2.3%	2.6%	2.5%		2.7%	
<b>EPS</b>	0.74	0.53	0.87	0.84	0.84	0.84	0.86	1.00	1.03
- <i>y/y growth</i>	-28.4%	-28.0%	64.0%	-3.0%	-0.5%	0.4%	2.4%	18.5%	19.9%
<b>Cash</b>	1821.9	1927.6	1748.5	1518.3	1587.1	1692.3		1437.6	
<b>Debt</b>	2948.1	2256.8	2601.6	2200.3	2067.6	2055.6		2055.6	
<b>Net Cash/Shr</b>	-1.1	-0.1	-0.6	-0.7	-0.1	-0.5		-1.0	
<b>Tangible Book Value/Shr</b>	1.9	2.1	2.7	3.0	2.9	3.1		3.1	

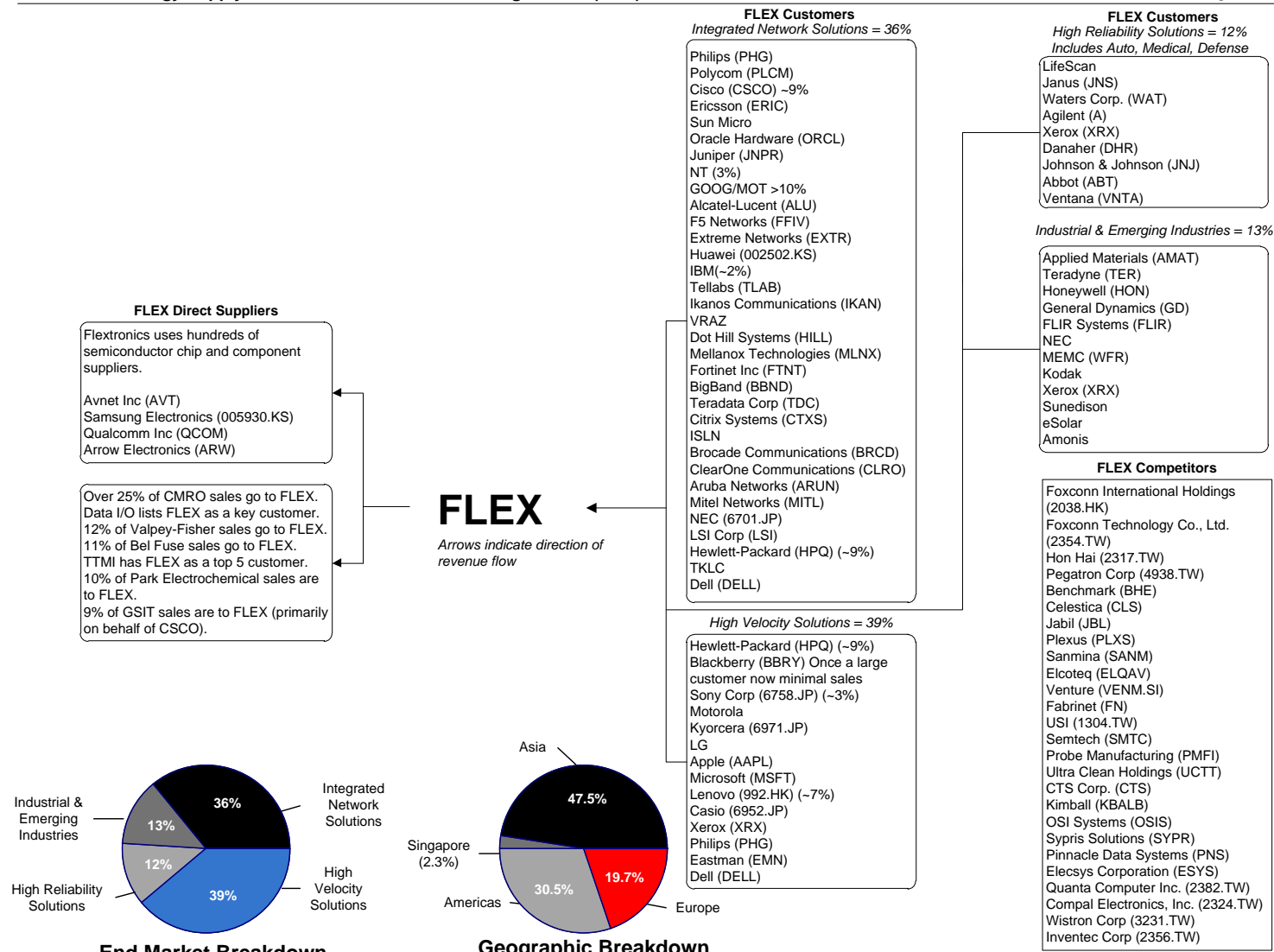
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 371. Flextronics (FLEX)

Sector: Technology Supply Chain – Electronic Manufacturing Service (EMS)

## Flextronics (FLEX)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.  
Note: 1) Business segments as per latest quarterly results, 2) Potential Rev. share change for Lenovo, Google, and IBM due to consolidation

Source: Citi Research

## FormFactor Inc.

Citi Analyst: Terence Whalen

FormFactor, Inc. is a leading manufacturer of advanced semiconductor wafer probe cards used in testing integrated circuits during the chip manufacturing process.

The company's innovative probe card technology leverages a broad-based intellectual property portfolio, including its patented MicroSpring technology, and is based on highly advanced lithographic, or MEMS-based, manufacturing processes like those used in semiconductor manufacturing.

FormFactor is the biggest supplier of advanced probe cards to the DRAM market - which has historically accounted for the majority of the company's revenue - and is aggressively expanding into the Flash and logic markets via new product rollouts and the MicroProbe acquisition in 2012.

FormFactor is headquartered in Livermore, CA.

Figure 372. FormFactor Inc (FORM) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	135.3	188.6	169.3	178.5	231.0	271.5	257.0	N/A	301.3
- <i>y/y growth</i>	-35.6%	39.3%	-10.2%	5.4%	29.4%	17.5%	11.3%	N/A	17.2%
<b>Gross Margins</b>	-0.3%	-1.2%	12.4%	14.2%	19.2%	29.7%		N/A	
<b>Operating Margins</b>	-100.8%	-66.2%	-40.9%	-35.9%	-21.0%	1.4%		N/A	
<b>EPS</b>	-2.08	-2.31	-1.33	-0.92	-0.43	0.07	0.08	N/A	0.54
- <i>y/y growth</i>	-44.8%	-11.0%	42.2%	31.1%	53.3%	115.7%	119.3%	N/A	544.6%
<b>Cash</b>	449.2	347.6	296.7	165.8	141.9	163.4		N/A	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		N/A	
<b>Net Cash/Shr</b>	9.1	6.9	5.9	3.3	2.6	3.0		N/A	
<b>Tangible Book Value/Shr</b>	11.7	8.2	6.9	5.2	4.4	4.7		N/A	

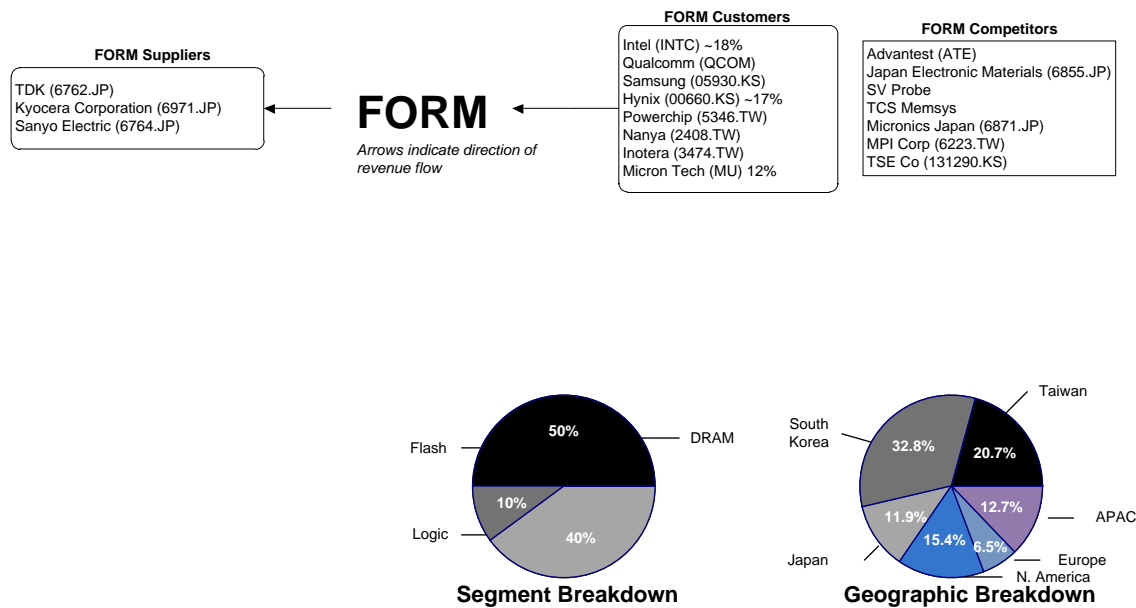
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 373. FormFactor Inc (FORM)

Sector: Semiconductor Production Equipment

## FormFactor, Inc. (FORM)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Foxconn Technology

Citi Analyst: Wei Chen

Foxconn Technology, 31% held by Hon Hai, is a component supplier within the Hon Hai group.

The company's main products include thermal modules, light metal casing, and consumer-electronics assembly (game consoles such as Nintendo Wii and DS).

Its key customers include Nintendo, Apple, and NB/handset brands.

Figure 374. Foxconn Technology Co. Ltd (2354.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	155058.9	136723.6	131497.9	133616.6	118750.5	118798.9	102084.8	118766.4	101180.5
- <i>y/y growth</i>	-3.0%	-11.8%	-3.8%	1.6%	-11.1%	0.0%	-14.0%	0.0%	-0.9%
<b>Gross Margins</b>	8.3%	10.8%	9.0%	10.5%	10.1%	10.0%		10.5%	
<b>Operating Margins</b>	5.1%	6.9%	5.4%	6.8%	6.5%	6.4%		6.7%	
<b>EPS</b>	5.14	6.22	6.52	6.79	5.47	5.19	5.55	5.49	5.48
- <i>y/y growth</i>	-0.4%	20.9%	4.8%	4.2%	-19.5%	-5.1%	1.4%	5.9%	-1.1%
<b>Cash</b>	22561.2	18291.5	25593.7	33473.5	62488.7	62879.3		71981.6	
<b>Debt</b>	17798.9	7144.5	9364.2	6092.5	5177.5	5177.5		5177.5	
<b>Net Cash/Shr</b>	17.5	13.3	20.8	27.1	48.0	48.1		55.1	
<b>Tangible Book Value/Shr</b>	39.1	41.0	44.2	49.4	53.0	57.4		62.9	

(Revenues, Cash and Debt in Millions in Local Currency)

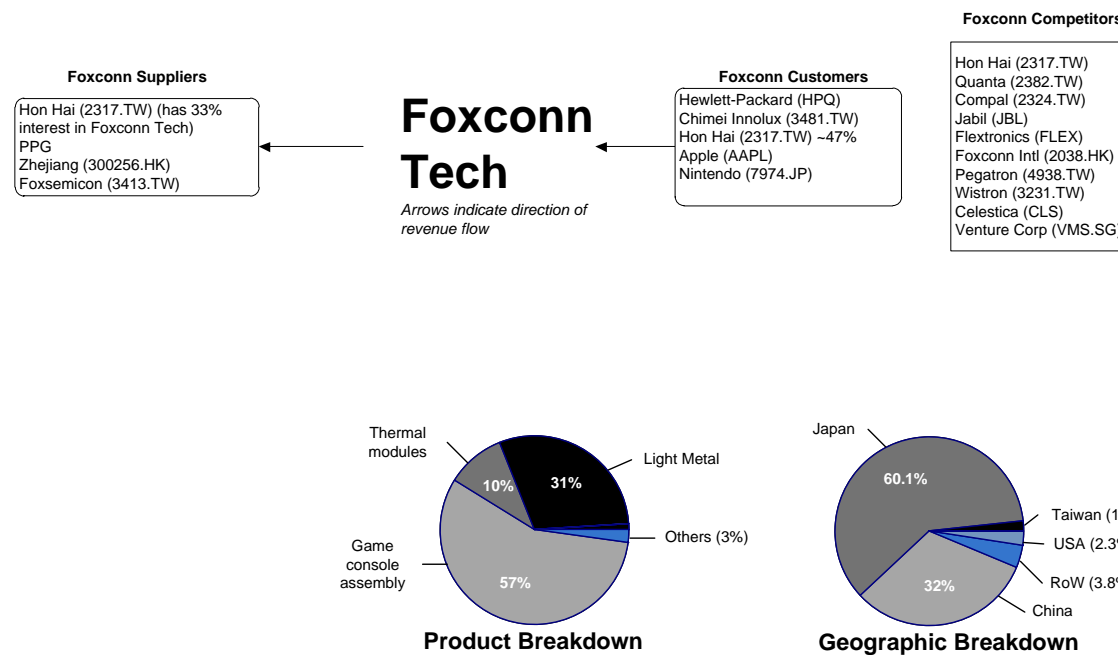
Source: Citi Research, Company Reports, FirstCall



Figure 375. Foxconn Technology Co. Ltd (2354.TW)

Sector: PC & Enterprise Hardware

## Foxconn Technology Co. Ltd. (2354.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Freescall Semiconductor Ltd

Citi Analyst: Glen Yeung

Originally part of Motorola's internal chip division, Freescall is a long-standing player in the global chip industry (50+ years).

Now in their second iteration as a public company (the first was 2004-2006), Freescall has evolved into the #1 vendor of embedded processors (microcontrollers, microprocessors, application processors and digital signal processors) in the world (45% share).

Freescall groups their offerings into 3 core operating groups: microcontrollers (35% of sales), networking & multimedia (26%), and RF & Analog (26-27%). These 3 business units address 4 main end-markets: automotive (39%), networking (27%), industrial (14%), consumer (10%), and other the remaining (10%).

Freescall serves a diverse customer base (18,000), holds 6100 patent families, and employs 19,000 personnel (5500 in R&D).

The company is headquartered in Austin, TX.

Figure 376. Freescall (FSL) Results and Forecasts

	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	4572.0	3945.0	4186.0	4493.2	4517.4	4621.9	4721.6
- y/y growth		-13.7%	6.1%	7.3%	7.9%	2.9%	4.5%
<b>Gross Margins</b>	41.4%	41.6%	42.7%	45.7%		47.2%	
<b>Operating Margins</b>	6.0%	11.7%	12.7%	17.0%		18.5%	
<b>EPS</b>	-1.81	-0.41	-0.81	1.33	1.37	1.64	1.85
- y/y growth		77.5%	-98.4%	264.3%	269.3%	23.5%	35.4%
<b>Cash</b>	772.0	711.0	747.0	1092.5		1593.4	
<b>Debt</b>	6591.0	6381.0	6479.0	5919.0		5919.0	
<b>Net Cash/Shr</b>	-25.6	-22.6	-21.9	-16.5		-14.5	
<b>Tangible Book Value/Shr</b>	-20.3	-18.5	-18.0	-12.6		-10.7	

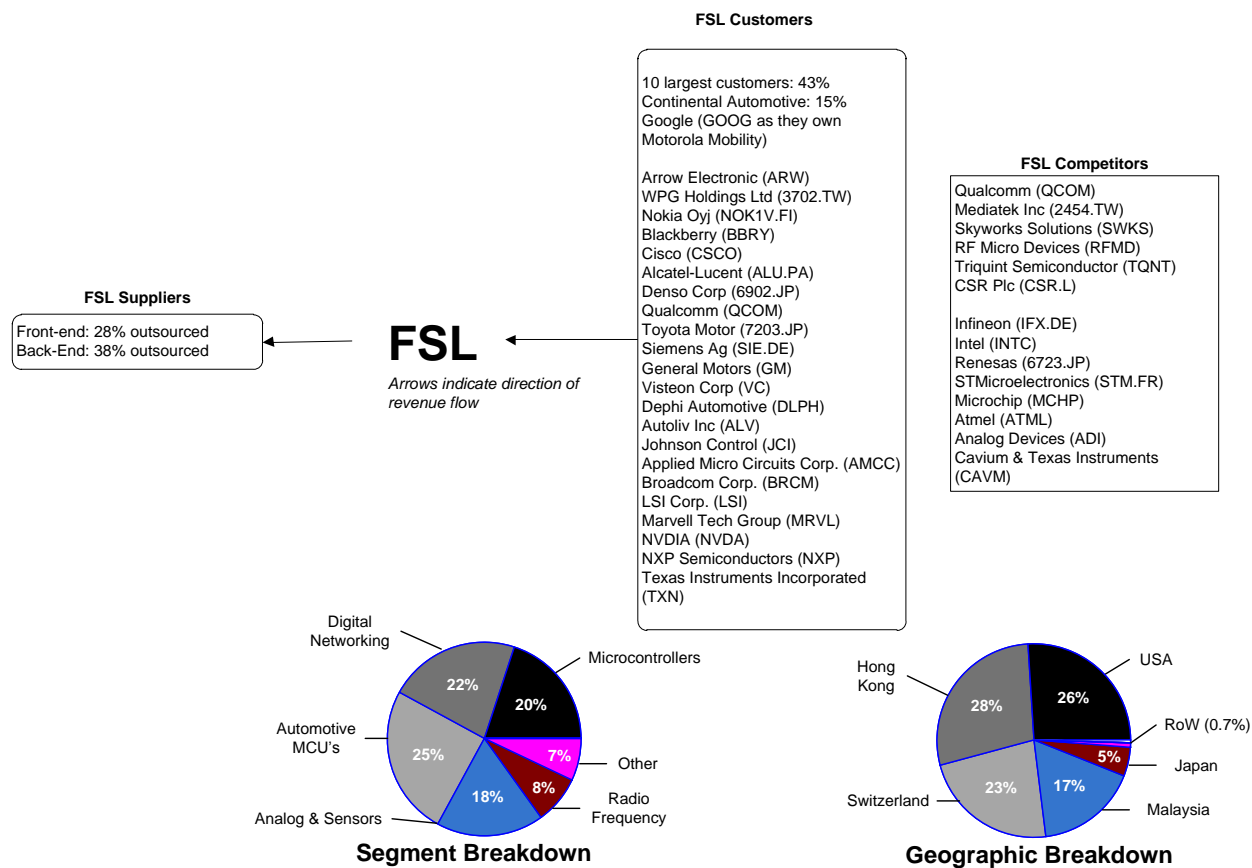
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 377. Freescale Semiconductor Holdings I, Ltd (FSL)

Sector: Semiconductors

## Freescale Semiconductor Holdings I, Ltd. (FSL)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Fujifilm Holdings

Citi Analyst: Masahiro Shibano

FUJIFILM Holdings, Inc. engages in the development, production, sales, and provision of imaging, information, and document solutions.

The company operates through the following segments: Imaging Solutions, Information Solutions, and Document Solutions.

- The Imaging Solutions segment handles color films color paper and chemicals, photofinishing equipment, laboratories, film developing and image services, and electronic imaging.
- The Information Solutions segment deals with medical systems and life sciences, graphic arts, and recording media.
- The Document Solutions segment provides office products, printers, and document outsourcing and production services.

The company was founded on January 20, 1934 and is headquartered in Tokyo, Japan.

Figure 378. Fujifilm Holding Corp (4901.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	2434344.0	2181693.0	2217084.0	2195293.0	2214696.0	2431380.0	2389913.0	2463320.0	2460658.0
- y/y growth	-14.5%	-10.4%	1.6%	-1.0%	0.9%	9.8%	7.9%	1.3%	3.0%
<b>Gross Margins</b>	37.9%	39.6%	40.8%	39.5%	38.4%	38.1%		38.6%	
<b>Operating Margins</b>	1.5%	-1.9%	6.2%	5.1%	5.2%	6.0%		7.3%	
<b>EPS</b>	19.22	-70.29	118.35	83.76	106.63	169.53	163.75	203.33	183.64
- y/y growth	-90.3%	-465.7%	268.4%	-29.2%	27.3%	59.0%	53.6%	19.9%	12.1%
<b>Cash</b>	270094.0	406177.0	313070.0	235104.0	445394.0	613612.0		625450.0	
<b>Debt</b>	321546.0	295648.0	189657.0	198870.0	358272.0	370000.0		295000.0	
<b>Net Cash/Shr</b>	29.4	486.2	359.1	411.1	251.1	612.8		779.0	
<b>Tangible Book Value/Shr</b>	3482.0	3573.7	3576.0	3574.3	3878.5	4308.1		4571.4	

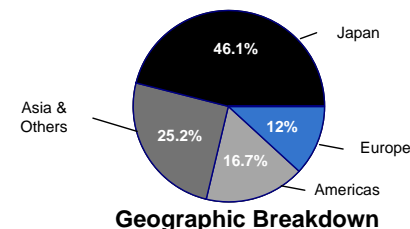
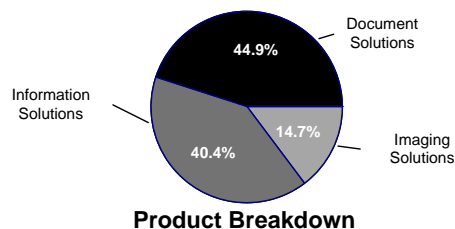
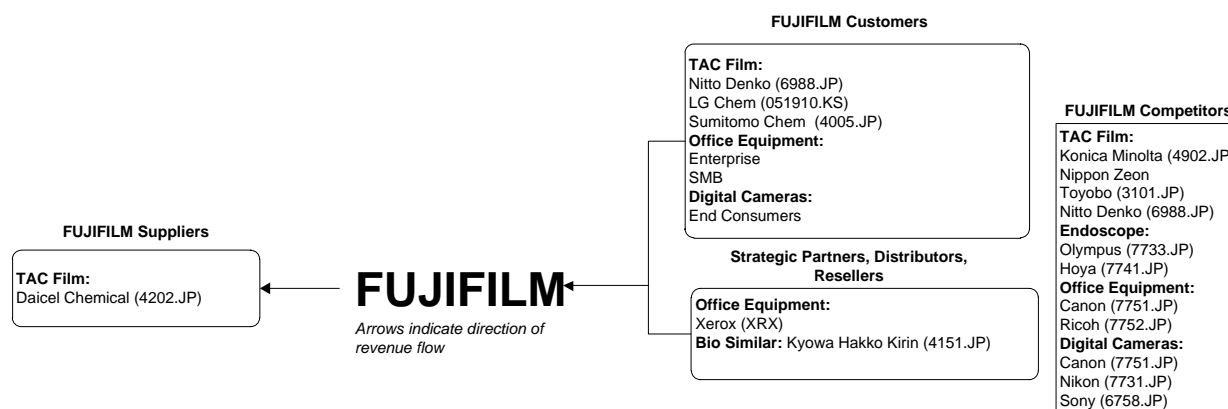
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 379. Fujifilm Holding Corp (4901.JP)

Sector: Imaging

## FUJIFILM Holding Corp. (4901.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Fujitsu

Citi Analyst: Kota Ezawa

Fujitsu is an integrated information communications company with a diverse portfolio (IT services, hardware, middleware, telecom equipment, etc.)

The company has the top share of the domestic IT services market and has actively expanded its IT services business overseas, acquiring ICL (UK) and Amdahl (US) in the 1990s and making Fujitsu Siemens a wholly-owned subsidiary in 2009. Market share is notable in the UK (3.6%, fifth largest) and Australia (third largest).

Fujitsu has reduced earnings volatility by rationalizing non-core businesses; HDDs sold to Toshiba in October 2009, HD media sold to Showa Denko in July 2009, semiconductors converted into a fab-lite operation. The company is clearly focused on core IT services and on globalization in particular.

Near term, earnings will be affected by a slow domestic IT market recovery and UK budget cuts. But management policy is rational and we expect growth over the longer term.

Figure 380. Fujitsu (6702.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	4692991.0	4679519.0	4528405.0	4467574.0	4381728.0	4681000.0	4667592.0	4670000.0	4692454.0
- y/y growth	-12.0%	-0.3%	-3.2%	-1.3%	-1.9%	6.8%	6.5%	-0.2%	0.5%
<b>Gross Margins</b>	25.6%	26.6%	27.8%	27.7%	27.5%	27.8%		27.9%	
<b>Operating Margins</b>	1.5%	2.0%	2.9%	2.4%	2.2%	3.0%		3.6%	
<b>EPS</b>	-49.36	40.70	25.07	20.55	-35.08	19.33	24.57	43.16	42.69
- y/y growth	-332.8%	182.5%	-38.4%	-18.0%	-270.7%	155.1%	170.0%	123.3%	73.7%
<b>Cash</b>	488636.0	322733.0	353892.0	213499.0	202502.0	379000.0		419000.0	
<b>Debt</b>	883480.0	577443.0	470823.0	381148.0	812002.0	1025000.0		1012000.0	
<b>Net Cash/Shr</b>	14.1	-15.0	49.4	-18.6	-20.6	-19.8		-0.5	
<b>Tangible Book Value/Shr</b>	260.0	251.6	275.1	295.2	287.1	170.6		203.5	

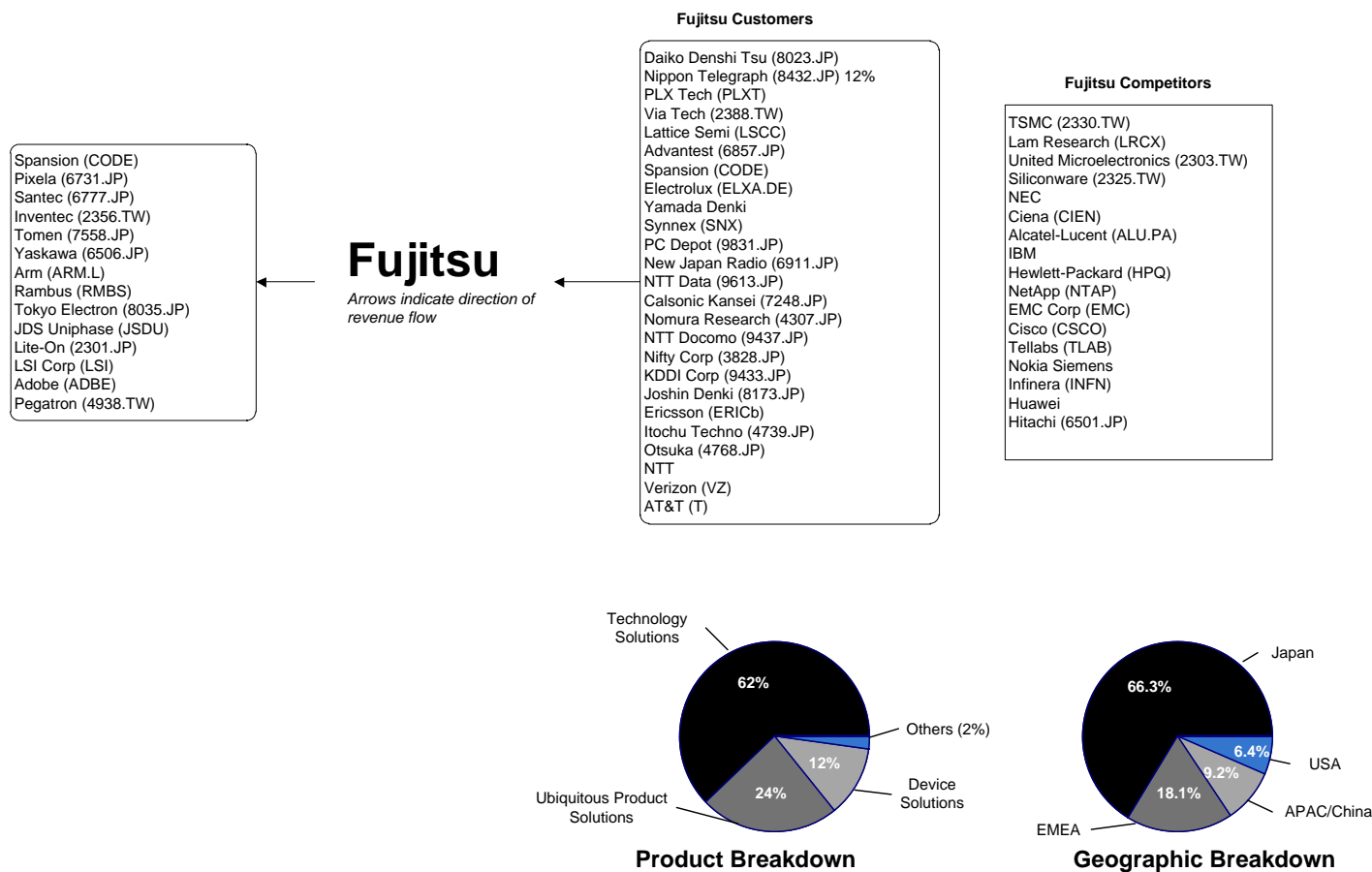
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 381. Fujitsu (6702.JP)

Sector: Technology - General

## Fujitsu (6702.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Funai

Citi Analyst: Kota Ezawa

Funai Electric is a mid-size consumer electronics maker, with operations centering on LCD TVs, DVDs, and printers. Subsidiary DX Antenna is a major maker of domestic antennas.

Funai has production bases overseas (China, Thailand, etc.) and is developing its business in the mainstay North American market. Funai is one of the few Japanese electronics makers that are strong in OEM. Production lines can be adapted to produce large volumes of needed products at low cost.

Funai is developing its own LCD TV brand and steadily establishing a solid presence in the LCD TV space. In September 2008 it acquired Philips' North American LCD TV business and is increasing its North American market share. Expansion in other overseas markets is viewed as key to future earnings growth.

The company was founded in Osaka in 1961 by Tetsuro Funai.

Figure 382. Funai Electric (6839.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	302777.0	314911.0	295923.0	246147.0	192007.0	229000.0	227066.0	236100.0	224609.0
- y/y growth	9.2%	4.0%	-6.0%	-16.8%	-22.0%	19.3%	18.3%	3.1%	-1.1%
<b>Gross Margins</b>	14.7%	18.2%	13.6%	15.2%	17.1%	16.5%		16.7%	
<b>Operating Margins</b>	0.5%	3.5%	0.3%	0.2%	-2.7%	-0.2%		1.0%	
<b>EPS</b>	-509.34	302.99	-34.29	-135.73	-250.33	23.45	-149.05	38.10	9.31
- y/y growth	-223.0%	159.5%	-111.3%	-295.9%	-84.4%	109.4%	40.5%	62.5%	106.2%
<b>Cash</b>	96503.0	86045.0	70076.0	72646.0	67813.0	54400.0		59700.0	
<b>Debt</b>	13882.0	7291.0	10497.0	4583.0	12981.0	8000.0		8000.0	
<b>Net Cash/Shr</b>	2802.9	2495.9	2043.7	2129.5	1987.5	1565.1		1720.4	
<b>Tangible Book Value/Shr</b>	3964.2	4023.7	3706.9	3461.0	3520.1	3716.4		3719.3	

(Revenues, Cash and Debt in Millions in Local Currency)

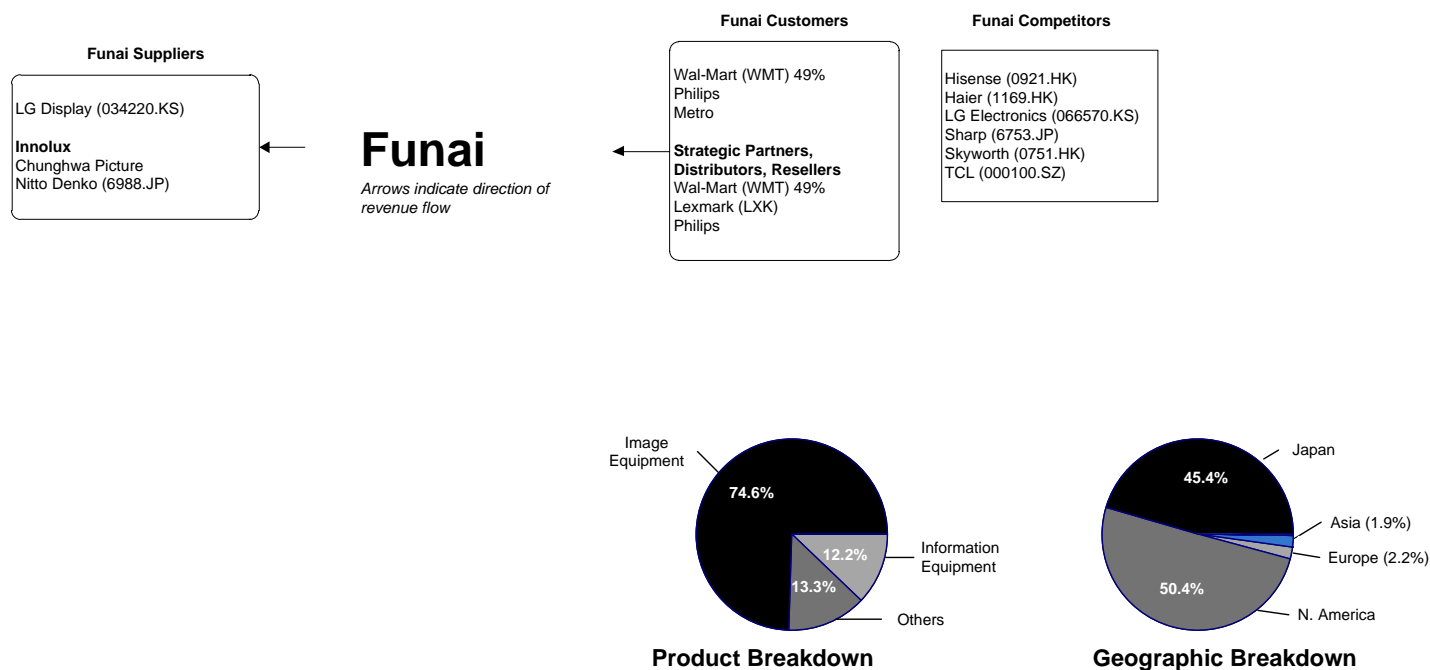
Source: Citi Research, Company Reports, FirstCall



Figure 383. Funai Electric (6839.JP)

Sector: Consumer Electronics

## Funai Electric (6839.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Garmin, Ltd

Citi Analyst: Jeremy David, CFA

Garmin is a leading provider of navigation and communication products enabled by Global Positioning System (GPS) technology.

The company, which controls its own manufacturing and distribution activities, serves five main markets: personal navigation devices, outdoor handheld GPS devices, GPS-enabled fitness, avionics and marine electronics.

The company pays a \$1.92 annual dividend, has over \$2.8B of cash on its balance sheet, and no debt.

Garmin was founded in 1990, is incorporated in Schaffhausen, Switzerland, and as of December 28, 2013, had 10,086 employees.

Figure 384. Garmin (GRMN) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	2946.4	2689.9	2758.6	2715.7	2631.9	2630.8	2637.5	2603.1	2684.7
- y/y growth	-15.7%	-8.7%	2.6%	-1.6%	-3.1%	0.0%	0.2%	-1.1%	1.8%
<b>Gross Margins</b>	49.0%	50.1%	48.5%	53.0%	53.5%	54.3%		54.9%	
<b>Operating Margins</b>	26.7%	23.7%	20.1%	22.2%	21.8%	21.0%		21.7%	
<b>EPS</b>	3.53	2.75	2.72	2.85	2.62	2.54	2.61	2.63	2.80
- y/y growth	2.9%	-22.0%	-1.0%	4.8%	-8.1%	-3.1%	-0.7%	3.4%	7.3%
<b>Cash</b>	1111.2	1285.4	1398.3	1384.3	1329.0	1409.8		1519.6	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	5.5	6.5	7.2	7.1	6.8	7.3		7.9	
<b>Tangible Book Value/Shr</b>	13.1	14.7	15.5	16.9	17.6	17.6		18.4	

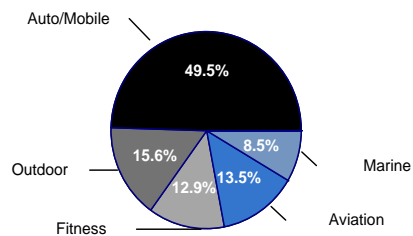
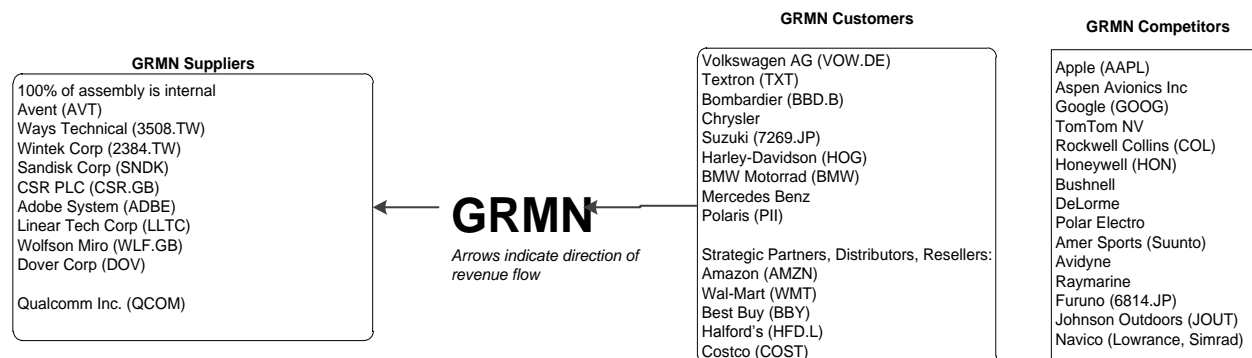
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

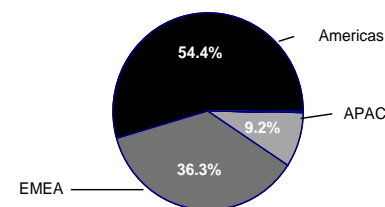
Figure 385. Garmin (GRMN)

Sector: Consumer Electronics

## Garmin Ltd. (GRMN)



Business Breakdown



Geographic Breakdown

Source: Company reports, CIRA estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Hewlett-Packard Co.

Citi Analyst: Jim Suva, CPA

Hewlett-Packard is a leading vendor of IT hardware, imaging solutions, and services worldwide.

As of FY13 HP has five major business segments:

- 1) Imaging & Printing Group (IPG; ~21% of total revs; 16% op margin) provides laser and inkjet printers, supplies, multifunction and photo printers, wide/large-format printers, digital cameras and accessories, online photo services (through Snapfish), and imaging & software solutions and related professional & consulting services.
- 2) Personal Systems Group (PSG; ~29% of total revs; 3% op margin) provides computing systems for the enterprise, SMB and consumers, including PCs & workstations, digital entertainment systems, calculators, and software & related services.
- 3) Enterprise Group (EG; ~25% of total revs; 15% op margin).
- 4) Software (~3% of total revs; 22% op margin) which includes enterprise software to manage data centers and the Mercury Interactive acquisition.
- 5) Services (~21% of total revs; 3% op margin) include consulting, integration, managed services, as well as the EDS acquisition.

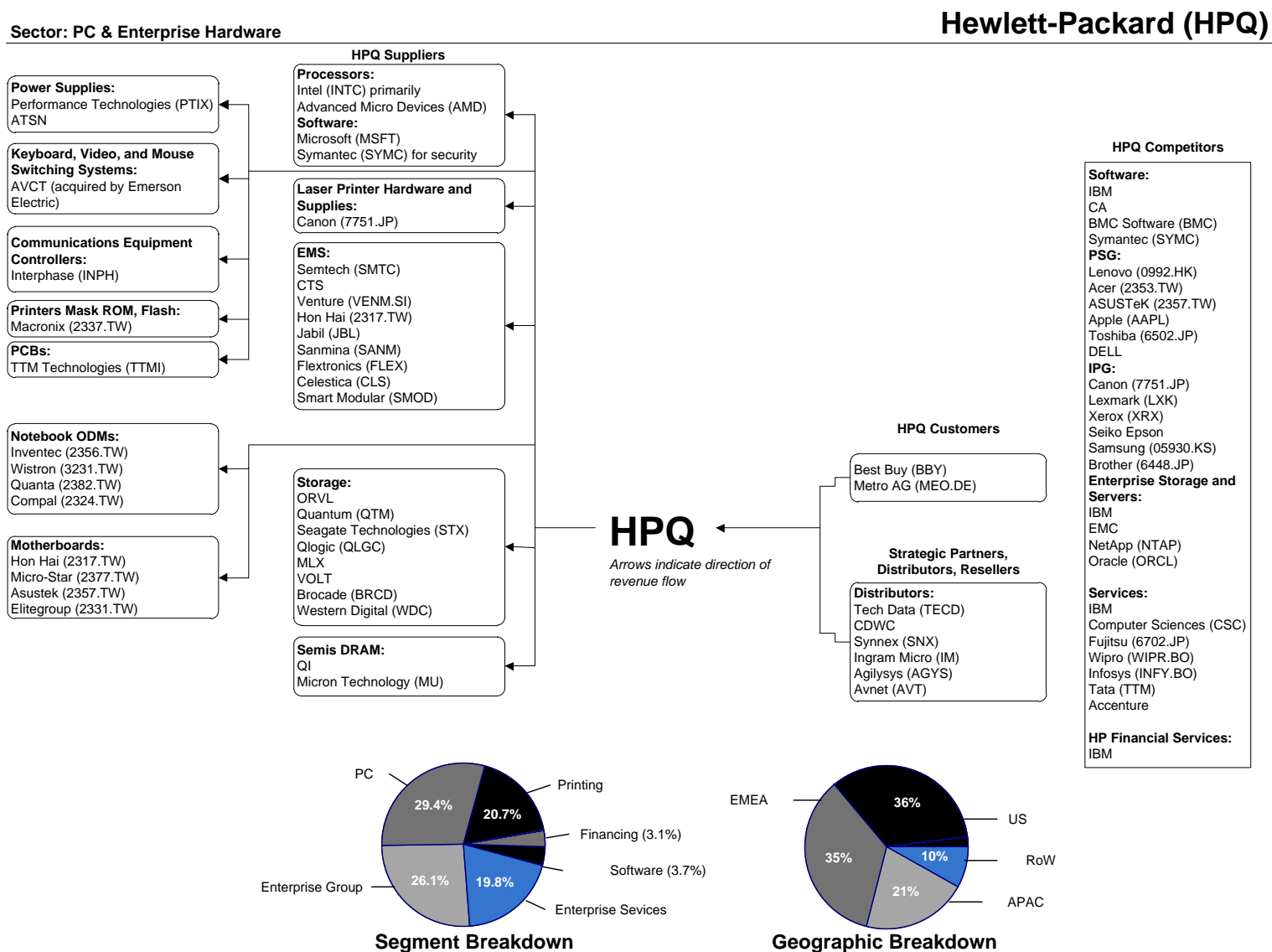
Figure 386. Hewlett-Packard (HPQ) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	114552.0	126033.0	127387.0	120357.0	112298.0	112827.2	111122.2	114251.0	110462.9
- y/y growth	-3.2%	10.0%	1.1%	-5.5%	-6.7%	0.5%	-1.0%	1.3%	-0.6%
<b>Gross Margins</b>	23.6%	23.9%	23.9%	23.3%	23.1%	23.0%		23.2%	
<b>Operating Margins</b>	11.0%	11.4%	10.8%	9.3%	8.5%	8.8%		9.0%	
<b>EPS</b>	3.85	4.60	4.89	4.06	3.56	3.80	3.71	4.00	3.84
- y/y growth	6.2%	19.6%	6.2%	-16.9%	-12.3%	6.6%	4.1%	5.4%	3.5%
<b>Cash</b>	13334.0	10934.0	8043.0	11301.0	12163.0	17520.0		21414.4	
<b>Debt</b>	15830.0	22304.0	30634.0	28436.0	22587.0	24592.0		24592.0	
<b>Net Cash/Shr</b>	-0.3	-1.8	-6.8	-5.3	-2.3	-0.2		1.8	
<b>Tangible Book Value/Shr</b>	0.3	-2.4	-8.3	-6.5	-3.4	-1.3		1.1	

(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research

Figure 387. Hewlett-Packard (HPQ)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Hirose Electric

Citi Analyst: Yuta Fukasawa

Hirose is an electronic components maker specializing in development and manufacturing of connectors.

The company's connector business boasts the highest margin among Japan peers. Hirose is able to secure high margins because of its focus on developing highly profitable new products (which account for 35% of sales), leveraging its impressive product development capabilities, and ensuring stable supply to the market.

Earnings were firm in the 2000s due to strong mobile phone demand, but then Hirose saw its earnings growth decline as the competitive environment in the mobile phone market changed and its share among major customers declined precipitously. However, with smartphones expanding, particularly in Asia, Hirose has been able to reestablish its presence as a supplier of connectors to Asian smartphone makers, and earnings have improved significantly over the past year.

In addition to smartphone products, Hirose focuses on the automotive market, where electronics are getting more sophisticated, as well as the industrial equipment market (routers, factory automation equipment, medical equipment), where added value is high.

Backed by a solid net cash position on its balance sheet Hirose is aggressive about shareholders' return (boosting dividends, share buybacks).

Figure 388. Hirose (6806.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	89872.0	84468.0	92440.0	94790.0	95938.0	127634.0	124321.0	142100.0	130151.0
- y/y growth	-23.9%	-6.0%	9.4%	2.5%	1.2%	33.0%	29.6%	11.3%	4.7%
<b>Gross Margins</b>	40.9%	43.3%	43.1%	40.7%	42.2%	45.4%		48.1%	
<b>Operating Margins</b>	21.3%	24.2%	23.8%	20.6%	21.9%	27.0%		28.1%	
<b>EPS</b>	356.67	363.18	330.26	366.17	390.54	661.09	636.05	757.60	688.19
- y/y growth	-39.3%	1.8%	-9.1%	10.9%	6.7%	69.3%	62.9%	14.6%	8.2%
<b>Cash</b>	137713.0	129616.0	131833.0	135438.0	143464.0	152511.5		167527.7	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	3690.6	3548.2	3716.5	3866.6	4146.8	4408.4		4842.4	
<b>Tangible Book Value/Shr</b>	5691.4	5705.0	5821.9	5875.8	6255.4	6714.2		7188.4	

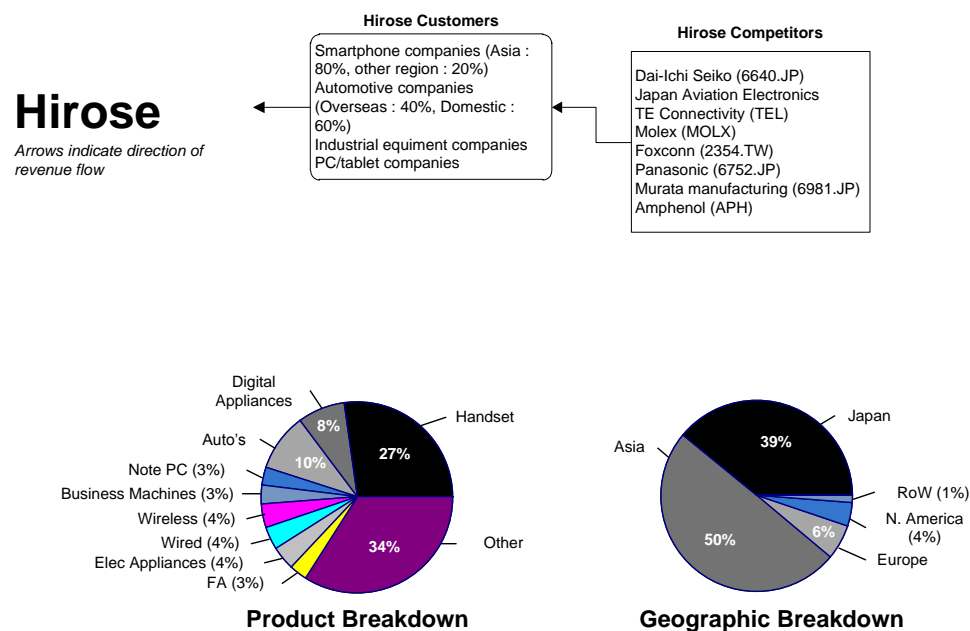
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 389. Hirose (6806.JP)

Sector: Electronic Components

## Hirose Electric (6806.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Hitachi

Citi Analyst: Kota Ezawa

Hitachi, which celebrated its 100th anniversary in 2010, is Japan's largest industrial electronics firm.

The company operates in 11 segments with businesses ranging from social infrastructure (including electric power systems, social and industrial systems, and IT and telecom systems) to auto parts, electronic devices, distribution, and finance.

Through FY3/10 it posted four consecutive years of net losses, totaling almost ¥1trn, but earnings have recovered significantly since as Hitachi has restructured problem businesses (HDDs, TVs, automotive) and is undertaking streamlining measures. Hitachi is aiming for stable growth centered on its "social innovation" businesses and has set to work on improving its business portfolio.

In 2009, it decided to make five listed subsidiaries wholly owned, sold off HGST, and completed the de-consolidation of Hitachi Displays. Currently it is introducing streamlining measures under the Smart Transformation Project initiative and is aiming to raise the operating margin 5% in FY3/16. The key issue is nurturing growth business.

Figure 390. Hitachi (6501.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	10000369.0	8968546.0	9315807.0	9665883.0	9041071.0	9361000.0	9373954.0	9261000.0	9377597.0
- y/y growth	-10.9%	-10.3%	3.9%	3.8%	-6.5%	3.5%	3.7%	-1.1%	0.0%
<b>Gross Margins</b>	21.8%	23.6%	25.2%	24.7%	25.4%	27.1%		27.2%	
<b>Operating Margins</b>	1.3%	2.3%	4.8%	4.3%	4.7%	5.6%		6.5%	
<b>EPS</b>	-236.86	-22.33	49.43	70.20	35.45	50.72	51.04	63.61	63.86
- y/y growth	-1254.8%	90.6%	321.3%	42.0%	-49.5%	43.1%	44.0%	25.4%	25.1%
<b>Cash</b>	807926.0	577584.0	554810.0	619577.0	538076.0	658000.0		679000.0	
<b>Debt</b>	2806389.0	2350878.0	2100490.0	2154341.0	2240782.0	2400000.0		2350000.0	
<b>Net Cash/Shr</b>	-144.9	-216.0	-154.3	-127.2	-155.4	-153.6		-138.9	
<b>Tangible Book Value/Shr</b>	-60.4	6.3	-26.6	61.6	113.4	102.1		116.0	

(Revenues, Cash and Debt in Millions in Local Currency)

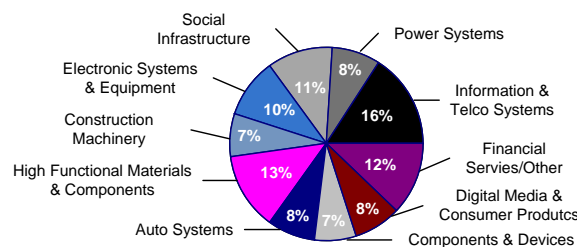
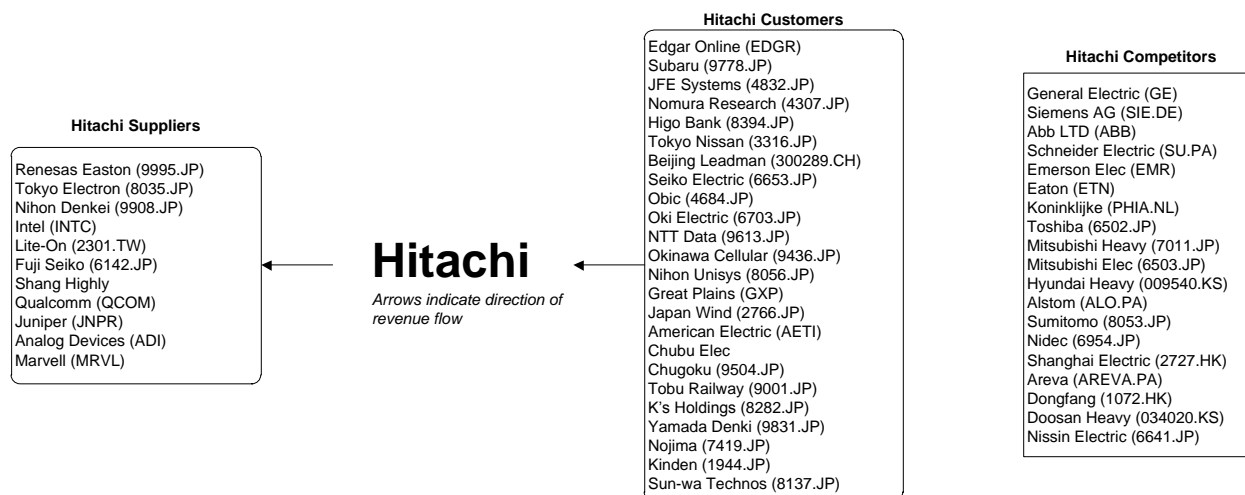
Source: Citi Research, Company Reports, FirstCall



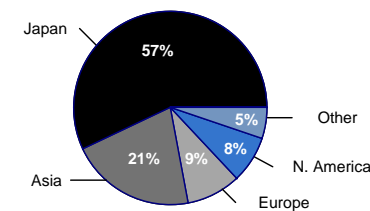
Figure 391. Hitachi (6501.JP)

Sector: Technology - General

## Hitachi (6501.JP)



Geographic Breakdown



Geographic Breakdown

Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Hon Hai Precision

Citi Analyst: Wei Chen

Established in 1974, Hon Hai has become the largest EMS player in the world in terms of sales.

Through its vertical integration model or "eCMMS" (e-enabled Components, Modules, Moves and Services), it provides components, modules and system assembly products to many global OEMs in the PC, communication and consumer sectors.

Figure 392. Hon Hai (2317.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1959182.4	2997205.3	3452681.3	3905395.3	3953669.8	4238710.0	4155085.5	4813414.4	4374602.5
- y/y growth	0.4%	53.0%	15.2%	13.1%	1.2%	7.2%	5.1%	13.6%	5.3%
<b>Gross Margins</b>	9.5%	8.1%	7.7%	8.4%	6.5%	6.9%		7.4%	
<b>Operating Margins</b>	4.3%	2.9%	2.4%	2.8%	2.9%	3.1%		3.2%	
<b>EPS</b>	5.94	6.02	6.34	7.31	8.41	9.29	8.52	10.26	9.15
- y/y growth	34.4%	1.4%	5.2%	15.3%	15.1%	10.4%	1.3%	10.4%	7.3%
<b>Cash</b>	179143.0	255296.0	330538.2	506444.6	637617.0	743477.7		859358.3	
<b>Debt</b>	148893.8	318409.8	387490.9	461478.9	511867.9	511867.9		511867.9	
<b>Net Cash/Shr</b>	9.1	13.1	16.7	30.9	39.1	46.9		55.7	
<b>Tangible Book Value/Shr</b>	34.4	37.4	44.7	49.7	59.4	67.0		75.4	

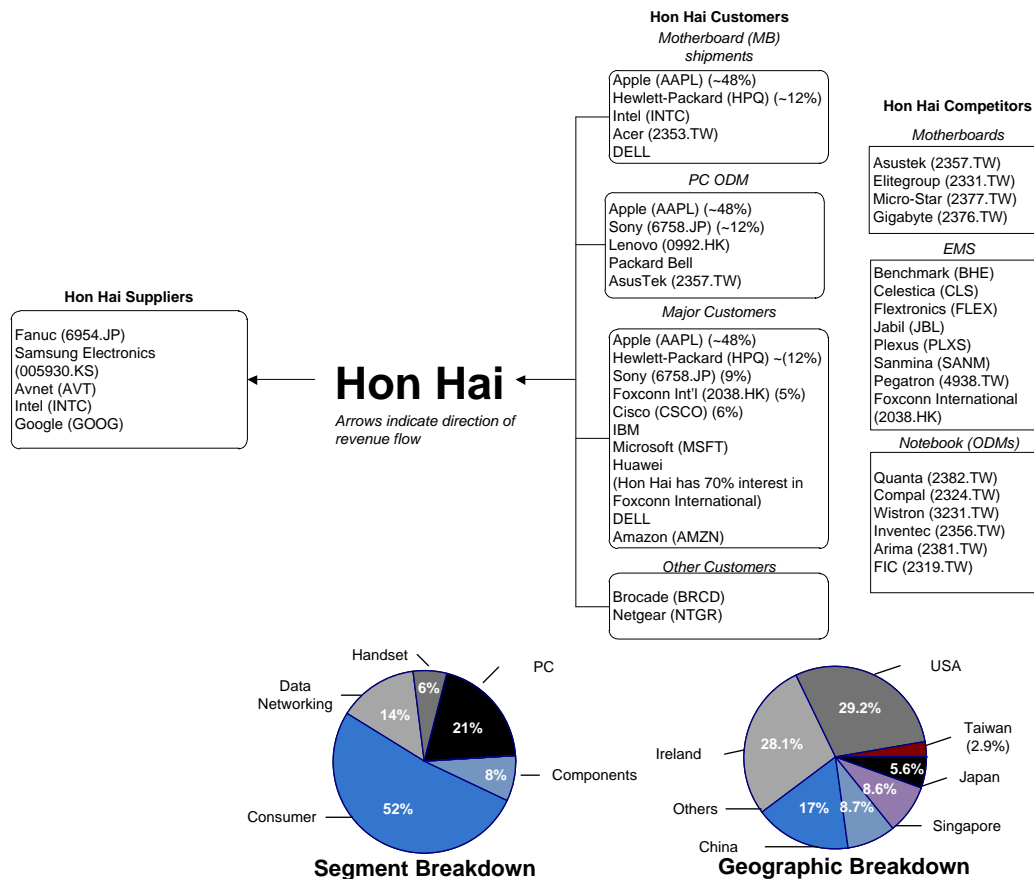
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 393. Hon Hai (2317.TW)

Sector: Electronic Manufacturing Services

## Hon Hai (2317.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Hosiden

Citi Analyst: Yuta Fukasawa

Hosiden Corp. is engaged in the manufacture and sale of electrical appliances, information telecommunications equipment, office machines, medical equipment, and electronic products.

The company operates through the following segments: Mechanical Parts, Acoustic Components, Liquid Crystal Display (LCD) Device, and Composite Parts.

- The Mechanical Parts segment includes connectors, jacks, and switches.
- The Acoustic Components segment consists of microphones, headphones, headsets, speakers, and receivers.
- The LCD Device segment comprises mainly of passive LCD units.
- The Composite Parts segment deals with other products such as remote controls and solenoids.

The company was founded in April 1947 and is headquartered in Yao, Japan.

Figure 394. Hosiden (6804.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	453739.0	307883.0	201680.0	172936.0	230883.0	215498.0	212240.0	210500.0	209500.0
- y/y growth	8.2%	-32.1%	-34.5%	-14.3%	33.5%	-6.7%	-8.1%	-2.3%	-1.3%
<b>Gross Margins</b>	8.6%	7.8%	7.1%	3.5%	4.1%	5.2%		6.3%	
<b>Operating Margins</b>	5.5%	3.8%	1.6%	-2.4%	-0.2%	0.3%		1.2%	
<b>EPS</b>	187.04	94.43	19.29	-78.56	32.38	18.90	13.02	32.59	14.08
- y/y growth	87.7%	-49.5%	-79.6%	-507.3%	141.2%	-41.6%	-59.8%	72.4%	8.1%
<b>Cash</b>	30215.0	48619.0	56941.0	57655.0	50504.0	47344.6		49167.1	
<b>Debt</b>	31909.0	14664.0	14402.0	5026.0	5737.0	8403.0		8403.0	
<b>Net Cash/Shr</b>	270.6	519.4	630.2	862.7	763.7	715.9		743.5	
<b>Tangible Book Value/Shr</b>	1312.0	1394.9	1366.8	1246.9	1279.2	1309.9		1330.4	

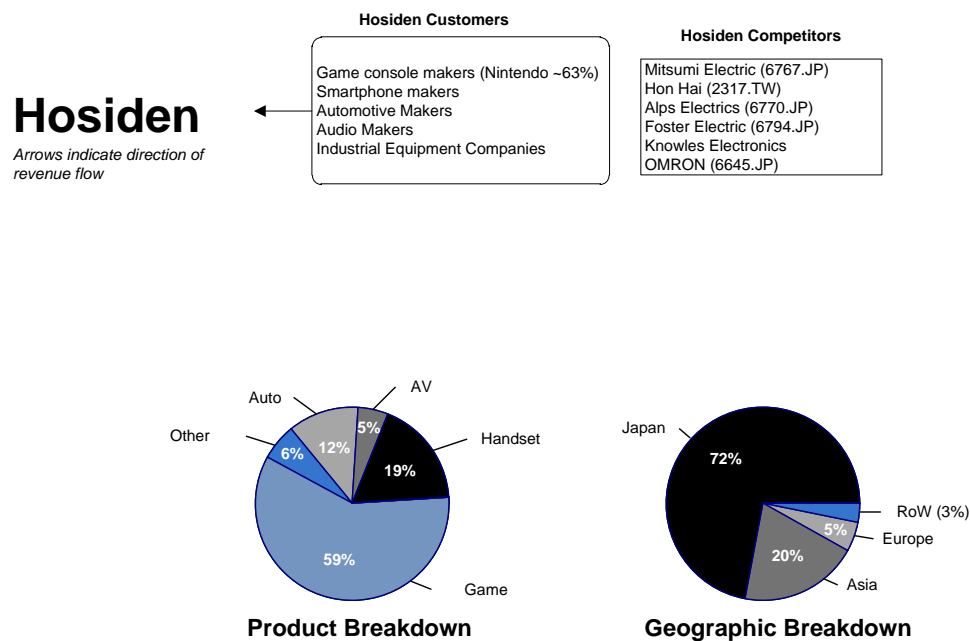
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 395. Hosiden (6804.JP)

Sector: Electronic Components

Hosiden (6804.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Hoya

Citi Analyst: Masahiro Shibano

HOYA Corp. engages in the manufacture and sale of imaging products, electronics, and medical-related equipment.

The company's operations are carried out through the following segments: Information Technology, Life Care, and Other.

- The Information Technology segment includes electronics and imaging-related products.
- The Life Care segment offers health care and medical-related products.
- The Other segment is comprised of information system design and new business operations.

The company was founded on November 1, 1941 and is headquartered in Tokyo, Japan.

Figure 396. Hoya (7741.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	454194.0	413524.0	423063.0	376940.0	372494.0	409996.0	414404.0	414806.0	439177.0
<b>- y/y growth</b>	-5.7%	-9.0%	2.3%	-10.9%	-1.2%	10.1%	11.3%	1.2%	6.0%
<b>Gross Margins</b>	41.8%	43.6%	45.9%	46.3%	44.0%	48.7%		52.1%	
<b>Operating Margins</b>	13.0%	15.6%	17.5%	15.5%	24.0%	20.2%		20.7%	
<b>EPS</b>	58.01	87.65	138.10	98.93	165.11	136.56	132.34	147.48	148.70
<b>- y/y growth</b>	-69.3%	51.1%	57.6%	-28.4%	66.9%	-17.3%	-19.8%	8.0%	12.4%
<b>Cash</b>	214540.0	173307.0	185252.0	204772.0	248896.0	328053.8		365008.5	
<b>Debt</b>	116206.0	105418.0	103184.0	102045.0	62728.0	61500.0		61500.0	
<b>Net Cash/Shr</b>	242.3	165.5	195.8	333.7	435.8	621.2		706.8	
<b>Tangible Book Value/Shr</b>	776.8	812.0	866.3	884.6	1082.4	1249.2		1329.5	

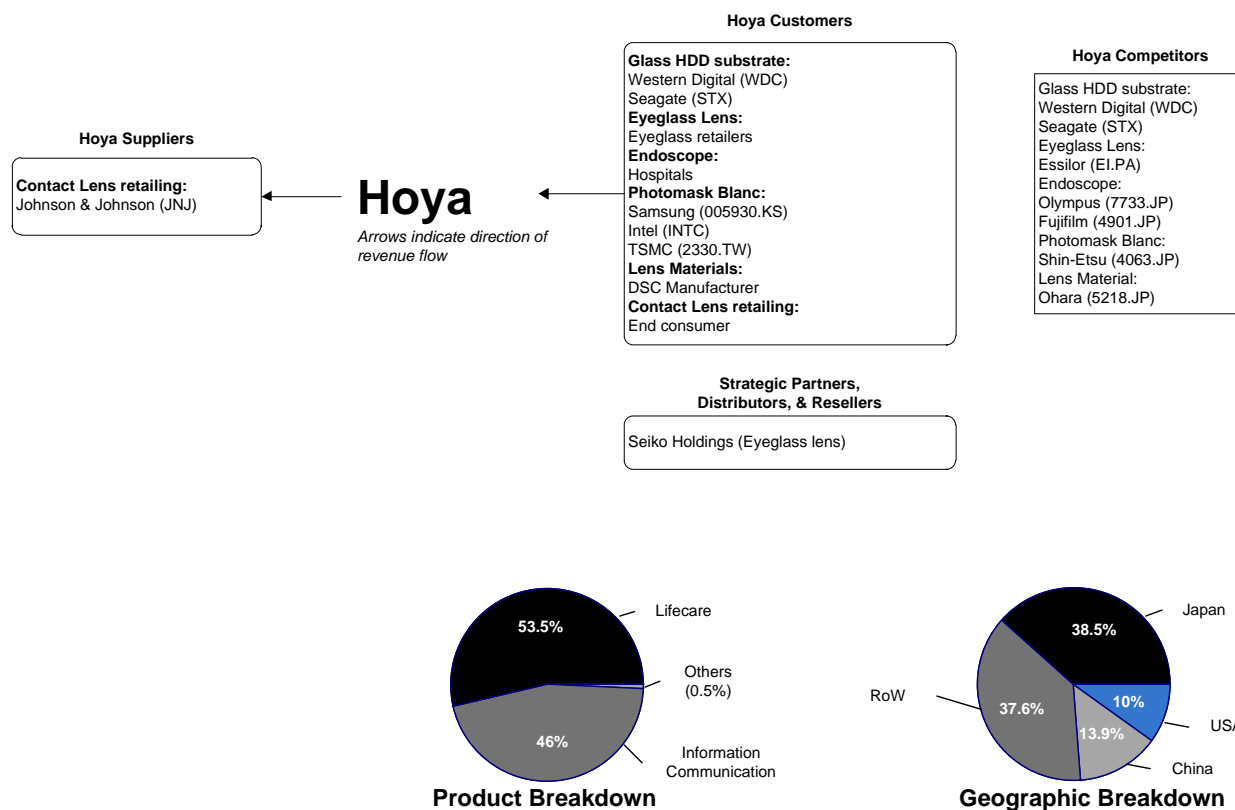
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 397. Hoya (7741.JP)

Sector: Hardware

Hoya (7741.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## HTC Corporation

HTC Corp. engages in the design and manufacture of mobile devices.

The company has two divisions: Smartphone and Others.

- The Smartphone division offers mobile phones based on Android and Windows Phone operating systems.
- The Others division provides relevant technical and after-sales service support for its products.

The company was founded on May 15, 1997 by Hsiueh Hong Wang and Huo Tu Cho and is headquartered in Taoyuan, Taiwan.

Figure 398. HTC Corporation (2498.TW) Results and Forecasts

	2008	2009	2010	2011	2012	Street 2013E	Street 2014E
<b>Revenues</b>	152353.2	144492.5	278761.2	465794.8	289020.2	203893.8	193707.4
– y/y growth	29%	–5%	93%	67%	–38%	–29%	–5%
<b>Gross Margins</b>	33%	32%	30%	28%	24%		
<b>Operating Margins</b>	20%	17%	16%	15%	7%		
<b>EPS</b>	33.0	26.0	46.0	72.7	19.7	–1.6	–1.3
– y/y growth	0%	–21%	77%	58%	–73%	NM	NM
<b>Cash</b>	64237.7	67153.8	75355.1	88494.4	57874.8		
<b>Debt</b>	150.6	119.2	24.4	0.0	0.0		
<b>Net Cash/Shr</b>	41.6	31.9	53.6	102.4	27.6		
<b>Tangible Book Value/Shr</b>	69.7	74.9	87.0	93.2	81.7		

(Revenues, Cash and Debt in Millions in Local Currency)

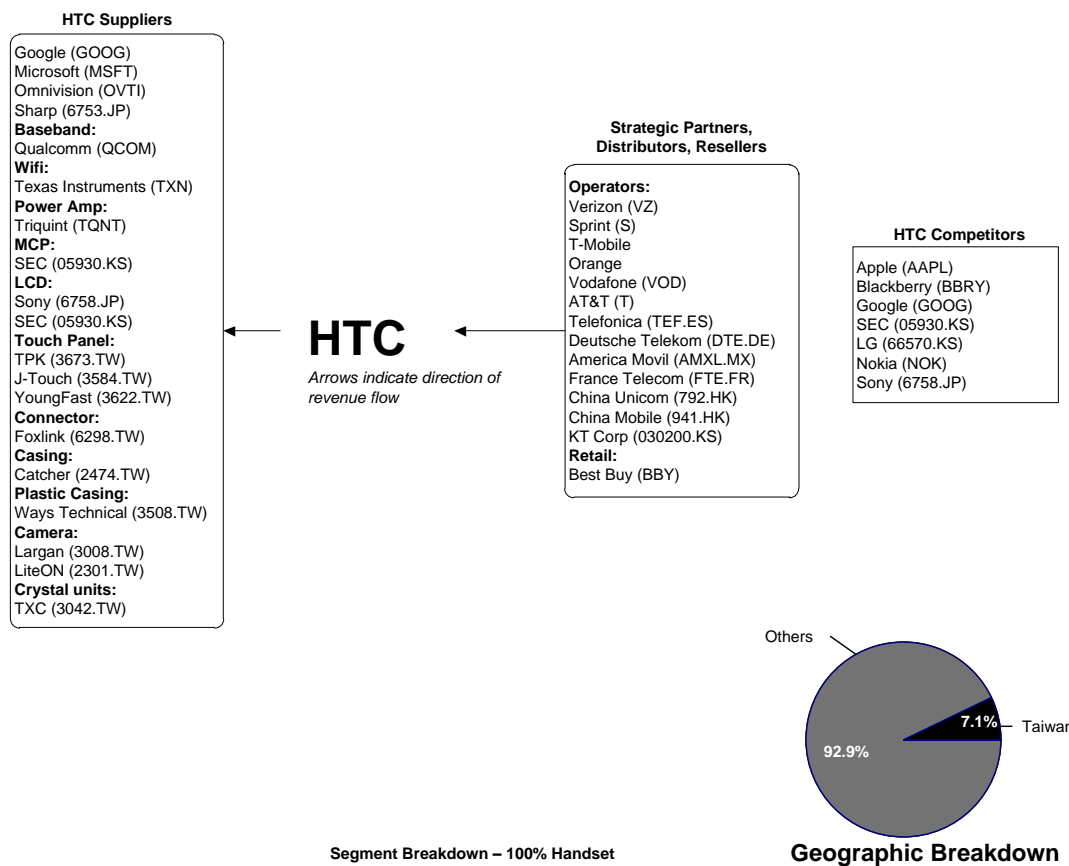
Source: Citi Research, Company Reports, FactSet



Figure 399. HTC Corporation (2498.TW)

Sector: Telecom Equipment

## HTC Corporation (2498.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Huawei

Huawei Technologies Co. Ltd. is a Chinese multinational networking and telecommunications equipment and services company. It is the largest telecommunications equipment maker in the world, having overtaken Ericsson in 2012.

The company manufactures telecommunications equipment and broadband networking products. It offers voice and data switching platforms for communications service providers. The company also makes optical networking systems, wireless products, corporate networking equipment, network management and messaging software products.

The company serves Asian carriers such as China Telecom, China Unicom and SingTel. Huawei has over 140,000 employees, around 46% of whom are engaged in research and development (R&D). It has 20 R&D institutes in countries including China, the United States, Pakistan, Germany, Colombia, Sweden, Ireland, India, Russia, and Turkey,

Huawei was founded in 1987 by ex-military officer Ren Zhengfei and formed as a private company owned by its employees. The company is headquartered in Shenzhen, Guangdong

Figure 400. Huawei Results and Estimates

	2009	2010	2011	2012	2013	Street 2014E	Street 2015E
<b>Revenues</b>	146607.0	182548.0	203929.0	220198.0	N/A	N/A	N/A
- <i>y/y growth</i>	19.1%	24.5%	11.7%	8.0%	N/A	N/A	N/A
<b>Gross Margins</b>	39.6%	44.0%	37.5%	39.8%	N/A	N/A	N/A
<b>Operating Margins</b>	15.2%	16.8%	9.1%	9.1%	N/A	N/A	N/A
<b>Net Profit</b>	19001.00	24716.00	11647.00	15380.00	N/A	N/A	N/A
- <i>y/y growth</i>	140.8%	30.1%	-52.9%	32.1%	N/A	N/A	N/A
<b>Cash</b>	38214.00	55458.00	62342.00	71649.00	N/A	N/A	N/A
<b>Debt</b>	16115.00	12959.00	20327.00	20754.00	N/A	N/A	N/A
<b>Net Cash/Shr</b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Tangible Book Value/Shr</b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A

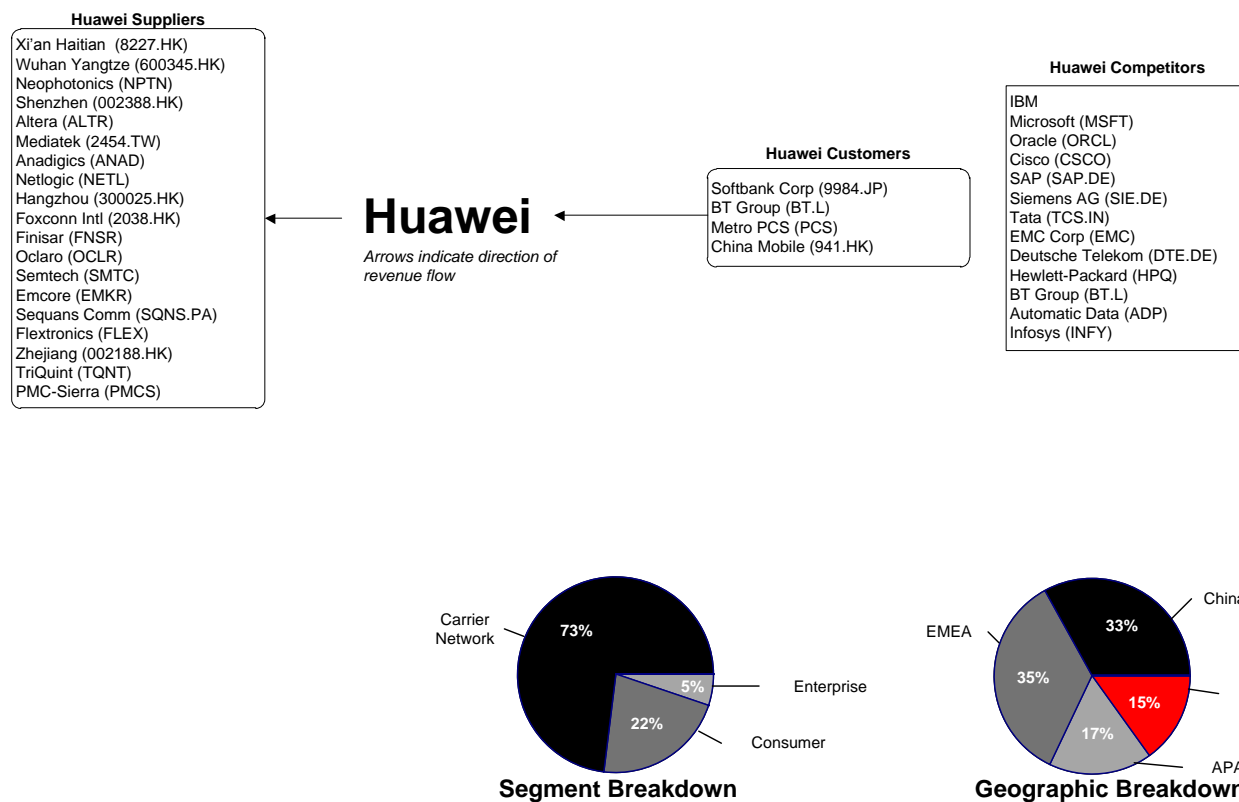
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports

Figure 401. Huawei

Sector: Networking & Telecommunications Equipment

Huawei



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Hynix

Citi Analyst: Henry Kim, CFA

SK Hynix manufactures semiconductors, such as DRAM, NAND flash memory and SRAM chips.

Figure 402. Hynix (000660.KS) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	7906350.0	12098667.0	10395811.0	10162000.0	14165000.0	17031384.8	15975083.0	18736250.2	16722731.0
- y/y growth	16.0%	53.0%	-14.1%	-2.2%	39.4%	20.2%	12.8%	10.0%	4.7%
<b>Gross Margins</b>	20.6%	39.5%	16.1%	15.9%	37.4%	44.8%		43.3%	
<b>Operating Margins</b>	2.4%	27.1%	3.1%	-2.2%	23.9%	31.0%		30.1%	
<b>EPS</b>	-588.42	4459.56	-94.91	-228.60	4025.80	5839.19	4928.18	5975.84	4959.92
- y/y growth	94.2%	857.9%	-102.1%	-140.9%	1861.0%	45.0%	22.4%	2.3%	0.6%
<b>Cash</b>	1518461.0	2194706.0	1875927.0	1784616.0	2786000.0	5320203.0		7089099.6	
<b>Debt</b>	7016374.0	5943117.0	6776465.0	6471976.0	4550000.0	3550000.0		2550000.0	
<b>Net Cash/Shr</b>	-4157.3	-2018.6	-3475.1	-2821.0	-1252.6	3341.8		6859.8	
<b>Tangible Book Value/Shr</b>	8413.2	12834.1	12033.1	12550.9	16753.9	23156.9		29298.3	

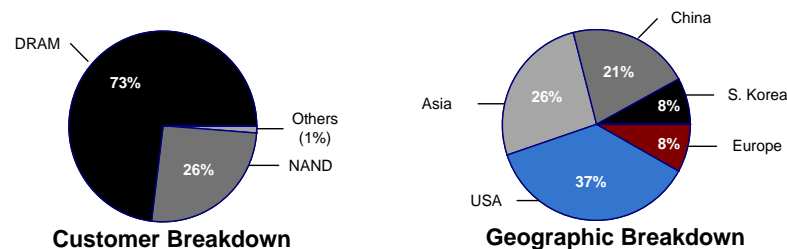
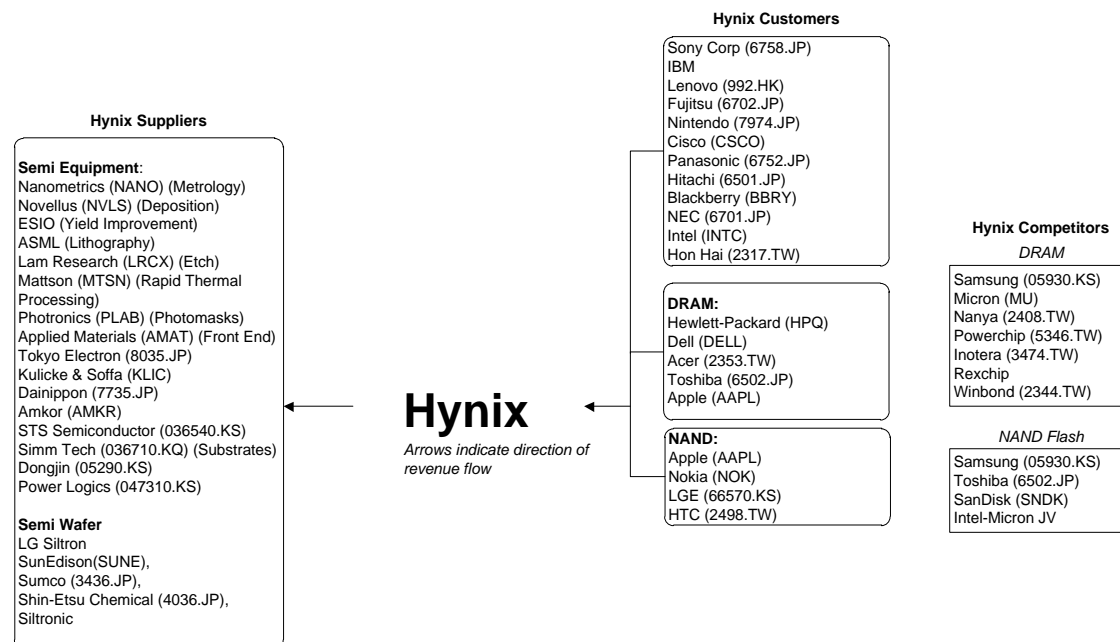
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 403. Hynix (000660.KS)

Sector: Semiconductors

## Hynix Semiconductor (000660.KS)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Ibiden

Citi Analyst: Yuta Fukasawa

Ibiden is a components maker involved in the development and manufacture of printed circuit boards, flip-chip chip scale package substrates, and diesel particulate filters. The company is pursuing PCB and flip-chip CSP substrate business for smartphone and tablet PC applications. A PCB facility in Malaysia was completed in 2011 and the company is looking to make the most of demand.

In the market for MPU-use flip-chip packages (50% share), Ibiden is the world leader in terms of production capacity, and vies for market share with Shinko Electric.

In DPFs (50% share), the company has facilities in France and Hungary to serve the European market, which is the largest in the world. It is moving into DPFs for heavy equipment.

Figure 404. Ibiden (4062.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	309300.0	274204.0	304968.0	300863.0	285946.0	301567.0	308796.0	317600.0	324600.0
- y/y growth	-25.2%	-11.3%	11.2%	-1.3%	-5.0%	5.5%	8.0%	5.3%	5.1%
<b>Gross Margins</b>	19.4%	23.9%	27.1%	21.6%	18.1%	23.4%		23.8%	
<b>Operating Margins</b>	3.4%	7.8%	11.1%	5.2%	1.9%	7.6%		8.3%	
<b>EPS</b>	-59.76	81.06	135.65	73.70	15.87	115.97	116.54	121.66	115.25
- y/y growth	-119.4%	235.6%	67.3%	-45.7%	-78.5%	630.9%	634.5%	4.9%	-1.1%
<b>Cash</b>	83824.0	80120.0	94299.0	105154.0	83230.0	94853.8		69828.3	
<b>Debt</b>	54103.0	21697.0	23463.0	63737.0	63924.0	63318.0		58318.0	
<b>Net Cash/Shr</b>	518.5	509.7	613.0	416.2	283.0	553.3		227.2	
<b>Tangible Book Value/Shr</b>	1676.8	1727.8	1745.2	1761.9	1801.3	1957.8		2041.7	

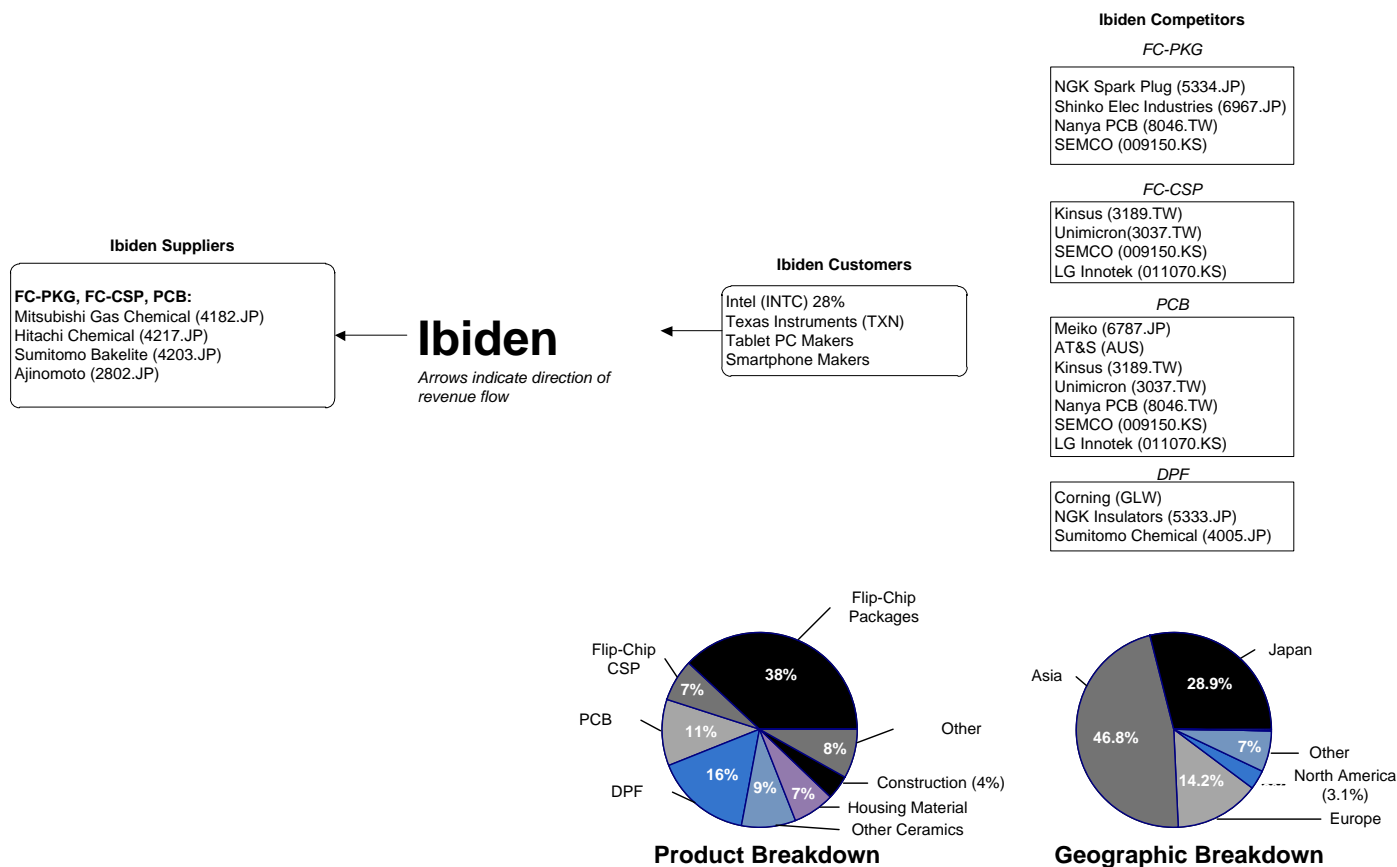
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 405. Iriden (4062.JP)

Sector: Electronic Components

## Iriden (4062.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Infineon

Citi Analyst: Amit Harchandani

Infineon Technologies offers semiconductors and system solutions for automotive and industrial electronics and chip card and security applications. In the 2013 fiscal year (ending September 2013), the company reported sales of EUR 3.84 billion.

**Most Relevant Relationships:** Siemens, Continental

Figure 406. Infineon (IFXGN.DE) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	2184.0	3295.0	3997.0	3904.0	3844.0	4210.6	4238.7	4556.6	4564.2
<b>- y/y growth</b>	N/A		21.3%	-2.3%	-1.5%	9.5%	10.3%	8.2%	7.7%
<b>Gross Margins</b>	3.8%	37.5%	41.4%	36.6%	34.4%	37.2%		38.1%	
<b>Operating Margins</b>	-29.3%	14.4%	19.7%	13.5%	9.8%	13.0%		14.6%	
<b>EPS</b>	-1.22	0.56	0.98	0.38	0.25	0.38	0.40	0.48	0.50
<b>- y/y growth</b>	N/A		74.1%	-61.6%	-34.6%	52.7%	61.8%	28.9%	25.4%
<b>Cash</b>	1507.0	1727.0	2692.0	2235.0	2286.0	2051.0		2179.7	
<b>Debt</b>	850.0	396.0	305.0	295.0	303.0	193.0		193.0	
<b>Net Cash/Shr</b>	1.4	1.2	2.1	1.8	1.9	1.7		1.9	
<b>Tangible Book Value/Shr</b>	2.0	2.3	3.0	3.2	3.4	3.2		3.5	

(Revenues, Cash and Debt in Millions in Local Currency)

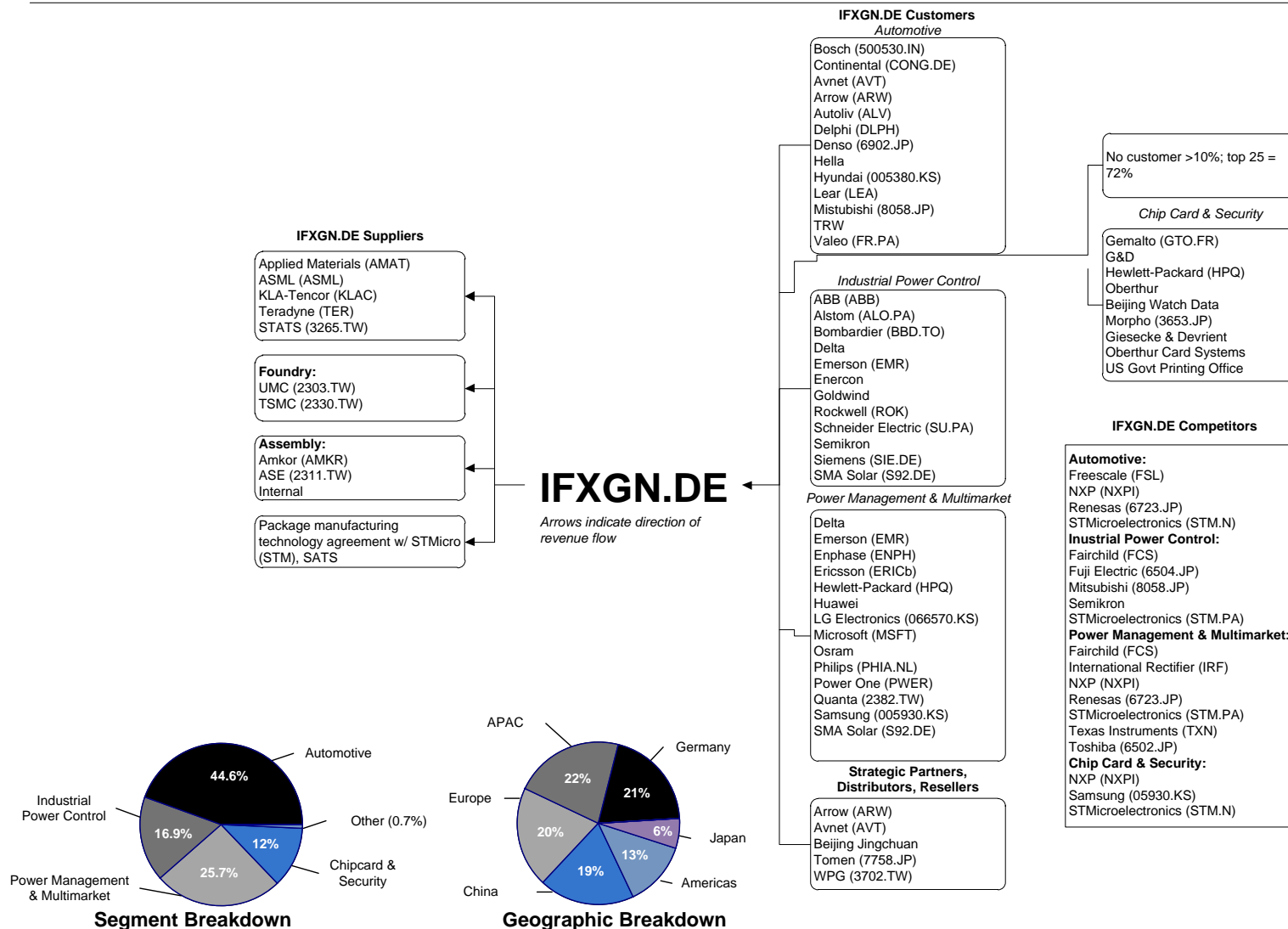
Source: Citi Research, Company Reports, FirstCall



Figure 407. Infineon (IFXGN.DE)

Sector: Semiconductors

## Infineon (IFXGN.DE; IFX)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Infoblox Inc.

Citi Analyst: Jeremy David, CFA

Infoblox leads the market for mission-critical Domain Name System (DNS), Dynamic Host Configuration Protocol (DHCP) and IP Address Management (IPAM) services with a scalable product portfolio of physical and virtual appliances and a patented Grid technology enabling all Infoblox appliances to be managed through a single pane of glass.

Infoblox appliances - specifically, the "Trinzic" product family - replace and augment traditional DNS and DHCP servers, offering better performance and a richer feature set, including automation, reporting capabilities, and integration with other IT workflow, thereby lowering the total management costs associated with DNS/ DHCP. IP Address Management (IPAM) tools embedded in the Trinzic appliances can further lower these costs.

According to Infoblox, the total opportunity for dedicated DDI solutions is \$6.9B (assuming 100% penetration of the "eligible" installed base of DNS/ DHCP servers), corresponding to a \$1.4B annualized TAM assuming a 5 year replacement cycle. However, the market today is a lot smaller than \$1.4B and remains immature; most CIOs don't have DDI on their priority list and most organizations don't have a budget for DDI projects. As a result of evangelizing its market, we estimate that Infoblox has earned 40-50% share of the budding DDI network services market.

Figure 408. Infoblox (BLOX) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	N/A	N/A	132.8	169.2	225.0	251.6	252.6	288.5	290.5
<b>- y/y growth</b>	N/A	N/A	N/A	27.4%	33.0%	11.8%	12.3%	14.7%	15.0%
<b>Gross Margins</b>	N/A	N/A	79.3%	79.3%	79.7%	79.2%		77.6%	
<b>Operating Margins</b>	N/A	N/A	3.5%	4.1%	9.4%	7.9%		7.8%	
<b>EPS</b>	N/A	N/A	0.08	0.12	0.37	0.32	0.33	0.27	0.35
<b>- y/y growth</b>	N/A	N/A	N/A	41.8%	218.2%	-13.8%	-10.9%	-16.5%	7.3%
<b>Cash</b>	N/A	N/A	42.2	156.6	209.3	262.7		295.9	
<b>Debt</b>	N/A	N/A	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	N/A	N/A	1.1	3.4	3.9	4.6		5.1	
<b>Tangible Book Value/Shr</b>	N/A	N/A	-3.0	2.2	2.9	3.4		3.6	

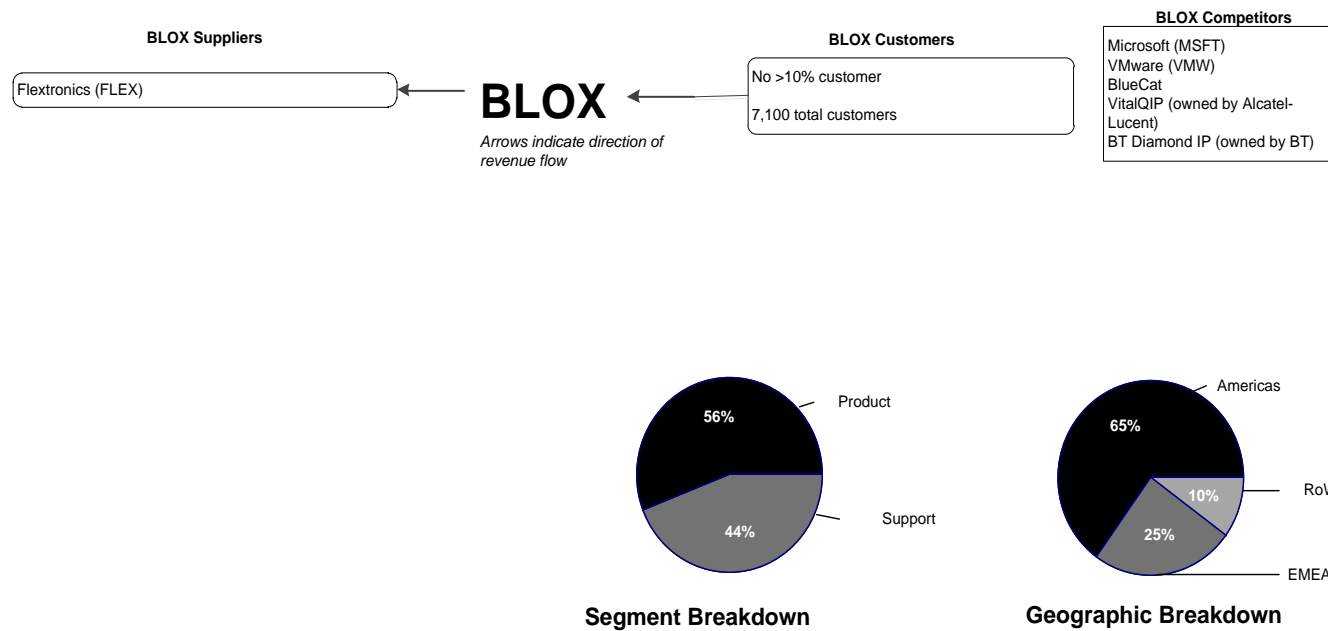
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 409. Infoblox (BLOX)

Sector: Hardware

## Infoblox (BLOX)



Source: Company reports, CIRA estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Ingram Micro Inc.

Citi Analyst: Jim Suva, CPA

Ingram Micro is one of the world's largest IT distributors (by revenue) and competes with Tech Data and Synnex.

Ingram Micro operates more than 100 distribution centers worldwide, bringing to market the products of more than 1,300 suppliers. Product categories include networking (10-15% of revenues), software (15-20%), systems (30-35%), and peripherals/other (35-40%). Services offered by Ingram Micro include marketing, market research, business intelligence, and supply chain services.

Ingram Micro's customer base of 190,000 various resellers include VARs (value added resellers), corporate resellers, direct marketers, retailers, Internet-based resellers, and government and education resellers.

Fiscal 2011 revenues of \$36.3B were 42% from North America, 31% Europe, 22% APAC, and 5% Latin America. For these same regions, operating margin was 1.9%, 1.2%, 0.6% and 1.4%, respectively, with an overall operating margin of 1.3%.

Ingram is based in Santa Ana, CA and employs about 15,500 people.

Figure 410. Ingram Micro (IM) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	29515.4	34589.0	36328.7	37827.3	42553.9	43882.9	43984.1	45245.9	45752.9
- y/y growth	-14.1%	17.2%	5.0%	4.1%	12.5%	3.1%	3.4%	3.1%	4.0%
<b>Gross Margins</b>	5.6%	5.4%	5.3%	5.4%	5.9%	5.9%		5.9%	
<b>Operating Margins</b>	1.1%	1.4%	1.3%	1.3%	1.4%	1.5%		1.7%	
<b>EPS</b>	1.34	1.90	1.73	1.94	2.37	2.60	2.61	3.06	3.01
- y/y growth	-16.4%	41.6%	-8.6%	12.3%	21.9%	9.9%	10.1%	17.6%	15.3%
<b>Cash</b>	910.9	1155.6	891.4	595.1	674.4	912.8		1318.5	
<b>Debt</b>	379.5	636.4	392.4	1054.5	846.2	846.2		846.2	
<b>Net Cash/Shr</b>	3.7	3.8	3.7	-2.3	-0.8	0.7		3.2	
<b>Tangible Book Value/Shr</b>	17.8	20.1	20.9	18.5	19.5	20.8		23.5	

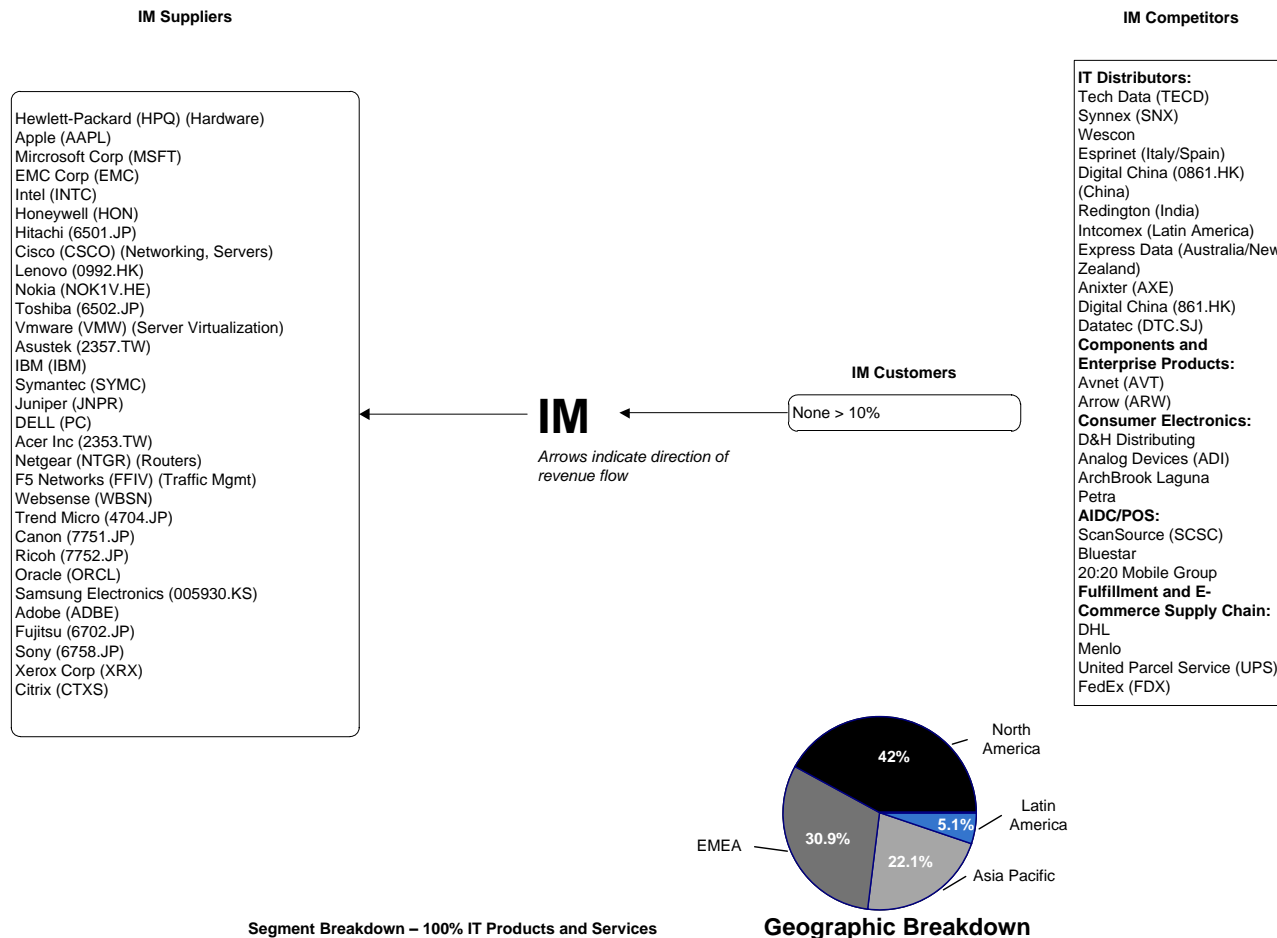
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research

Figure 411. Ingram Micro (IM)

Sector: Wholesale IT Distribution

## Ingram Micro (IM)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Innolux

Citi Analyst: Winnie Hong, CFA

Following the acquisition of Chi Mei Optoelectronics and Toppoly in March 2010, Innolux Corp is now engaged in LCD panels, OEM, and touch panel businesses.

The company is the largest panel maker in Taiwan in terms of capacity and the worldwide market share of its large-size panels was 17% in 2012.

Figure 412. Innolux Corp. (3481.TW) Results and Forecasts

	2009	2010	2011	2012	2013	Street 2014E	Street 2015E
<b>Revenues</b>	164726.2	480044.0	501134.2	480913.0	422729.0	377319.9	369206.9
- y/y growth	2.5%	191.4%	4.4%	-4.0%	-12.1%	-10.7%	-2.2%
<b>Gross Margins</b>	2.6%	4.0%	-7.2%	1.0%	8.9%		
<b>Operating Margins</b>	-2.1%	-1.3%	-12.6%	-3.9%	3.6%		
<b>EPS</b>	-0.74	-2.30	-8.81	-3.97	0.56	0.18	0.45
- y/y growth	-148.2%	-209.8%	-283.3%	55.0%	114.2%	-67.6%	146.4%
<b>Cash</b>	36510.5	62561.5	54378.1	41006.5	42647.0		
<b>Debt</b>	46543.5	293332.0	330786.6	268970.6	200301.0		
<b>Net Cash/Shr</b>	1.9	-18.7	-0.1	-15.1	-6.1		
<b>Tangible Book Value/Shr</b>	29.2	35.4	26.8	21.6	21.0		

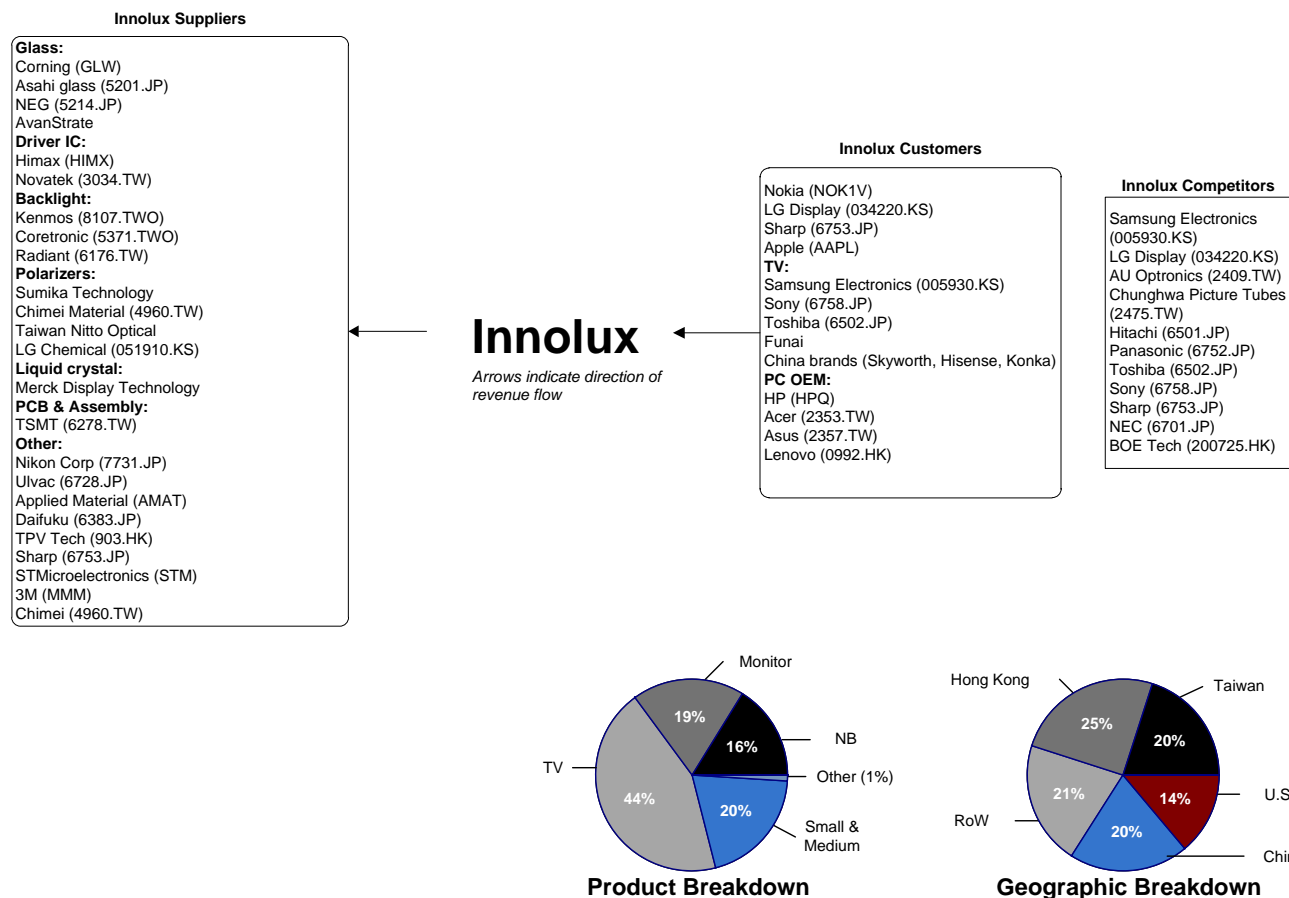
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 413. Innolux Corp (3481.TW)

Sector: Technology General

## Innolux Corp (3481.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Integrated Device Technology, Inc.

Citi Analyst: Glen Yeung

Integrated Device Technology is a manufacturer of a broad array of semiconductor devices.

- On an end-market basis, Computing (PC clocks, PC audio, Memory Interface) accounts for 37% of total revenue.
- Communications (communications clocks, enterprise, wireless, wireline, switching solutions) accounts for about 46% of revenue.
- The consumer segment (game consoles, DisplayPort) accounts for 17% of sales.

IDT has approximately 2,053 employees worldwide and is headquartered in San Jose, CA.

Figure 414. Integrated Devices Technology (IDTI) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	663.2	535.9	625.7	526.7	487.2	484.3	484.3	501.4	514.6
<b>- y/y growth</b>	0.0%	-19.2%	16.8%	-15.8%	-7.5%	-0.6%	-0.6%	3.5%	6.3%
<b>Gross Margins</b>	50.8%	50.4%	56.9%	56.7%	58.7%	60.7%		61.8%	
<b>Operating Margins</b>	16.3%	8.6%	15.5%	11.5%	7.9%	15.5%		19.8%	
<b>EPS</b>	0.65	0.29	0.62	0.38	0.21	0.46	0.45	0.58	0.63
<b>- y/y growth</b>	0.0%	-55.7%	114.0%	-38.4%	-44.3%	116.3%	114.4%	25.7%	39.4%
<b>Cash</b>	296.1	343.2	299.2	325.5	297.2	462.7		477.9	
<b>Debt</b>	14.3	21.8	15.8	16.5	22.0	19.5		19.5	
<b>Net Cash/Shr</b>	1.7	1.9	1.8	2.1	1.9	2.8		2.9	
<b>Tangible Book Value/Shr</b>	2.5	2.6	2.9	3.4	3.0	4.0		4.1	

(Revenues, Cash and Debt in Millions in Local Currency)

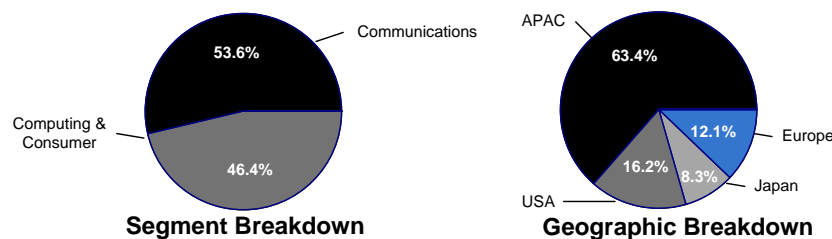
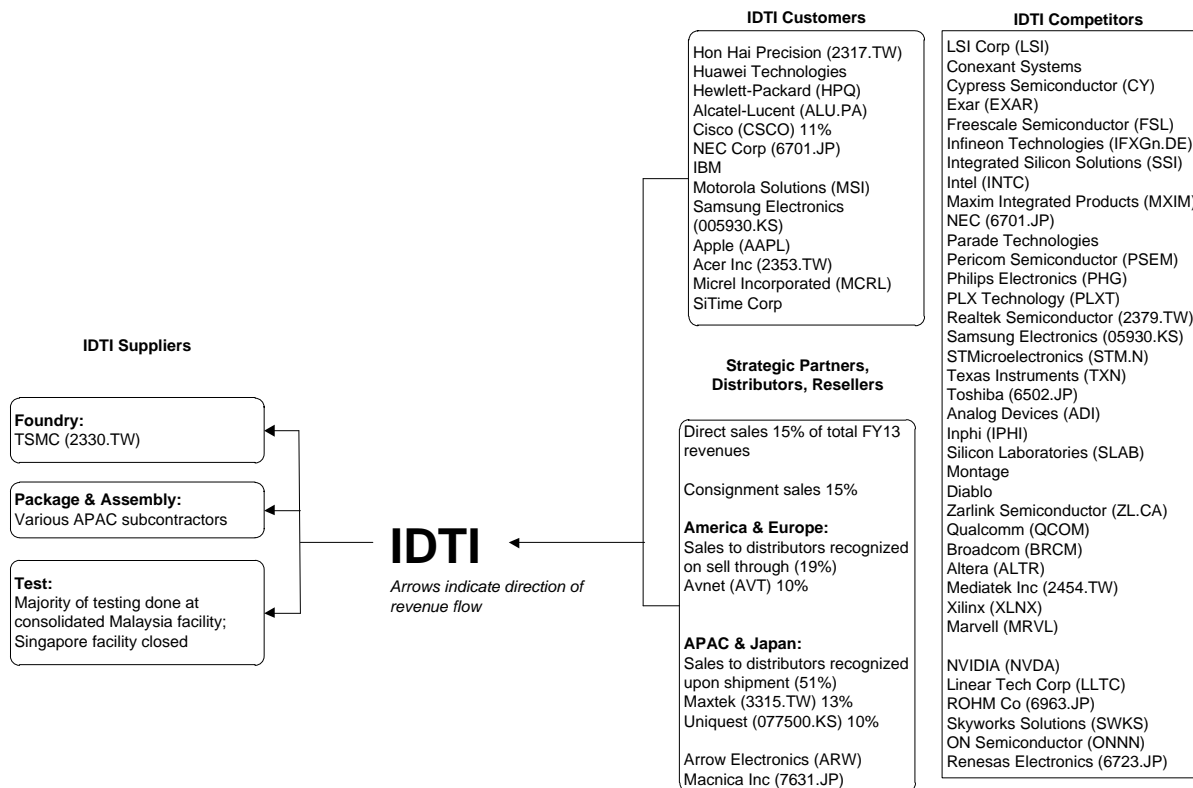
Source: Citi Research, Company Reports, FirstCall



Figure 415. Integrated Device Technology, Inc. (IDTI)

Sector: Semiconductors

## Integrated Device Technology, Inc. (IDTI)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Intel

Citi Analyst: Glen Yeung

Intel Corporation (INTC) is the largest semiconductor manufacturer in the world and supplies the world with most of the CPUs used in PCs, workstations, and servers.

Intel derives most of its sales from client PCs (notebook and desktop) as well as servers. Intel has recently diversified its revenue sources with the purchase of McAfee (software) and Infineon's Wireless Communications unit, in addition to other services and silicon (NAND).

Intel manufactures microprocessors, chipsets and other products at its fabs in Arizona, Oregon, Massachusetts, New Mexico, Ireland, and Israel.

Figure 416. Intel (INTC) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	35127.0	43623.0	53999.0	53341.0	52708.0	53004.6	53143.9	53818.2	54671.5
- <i>y/y growth</i>	-6.5%	24.2%	23.8%	-1.2%	-1.2%	0.6%	0.8%	1.5%	2.9%
<b>Gross Margins</b>	55.8%	65.3%	62.5%	62.1%	59.8%	59.0%		58.9%	
<b>Operating Margins</b>	24.7%	35.7%	32.4%	27.4%	23.8%	22.5%		22.9%	
<b>EPS</b>	1.04	2.01	2.39	2.13	1.93	1.75	1.85	1.87	1.99
- <i>y/y growth</i>	0.1%	93.4%	18.9%	-10.9%	-9.3%	-9.5%	-4.1%	6.8%	7.3%
<b>Cash</b>	13920.0	21885.0	14837.0	18162.0	20087.0	19715.6		19527.3	
<b>Debt</b>	2221.0	2115.0	7331.0	13448.0	13446.0	13446.0		13446.0	
<b>Net Cash/Shr</b>	2.1	3.5	1.4	1.0	1.4	1.3		1.3	
<b>Tangible Book Value/Shr</b>	5.7	7.2	4.9	6.2	7.5	8.0		8.8	

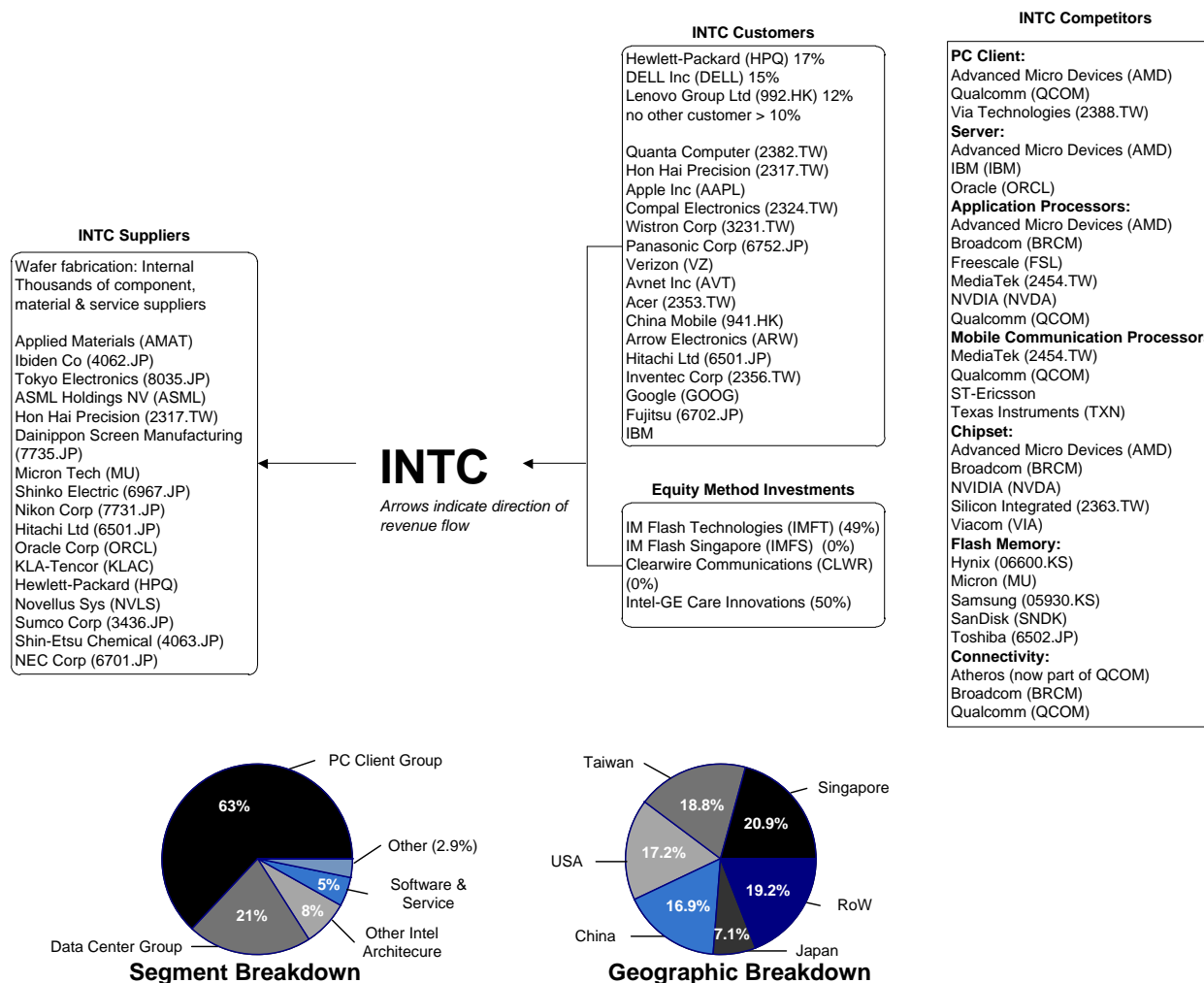
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 417. Intel (INTC)

Sector: Semiconductors

## Intel (INTC)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## International Business Machines Corp.

Citi Analyst: Jim Suva, CPA

IBM is the world's largest enterprise IT company and is a significant player in virtually every major segment of the enterprise market, including services, servers, storage, software, and semiconductors.

The company generated almost \$100B revenue in 2013 and has led the world in the number of US patents granted for more than a decade. Revenue categories include Global Services, Hardware, Software, and Global Financing, which were 53%, 15%, 29%, and 3% of 2013 total revenue, respectively.

Figure 418. IBM (IBM) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	95757.0	99870.0	106917.0	104507.0	99751.0	99474.0	99302.2	102096.3	100662.1
- <i>y/y growth</i>	-7.6%	4.3%	7.1%	-2.3%	-4.6%	-0.3%	-0.4%	2.6%	1.4%
<b>Gross Margins</b>	45.7%	46.1%	47.2%	48.7%	49.6%	50.2%		50.6%	
<b>Operating Margins</b>	17.8%	18.3%	19.5%	20.8%	21.7%	23.1%		23.8%	
<b>EPS</b>	10.03	11.72	13.49	15.30	17.04	18.05	17.85	20.02	19.88
- <i>y/y growth</i>	11.9%	16.9%	15.1%	13.4%	11.4%	5.9%	4.8%	11.0%	11.4%
<b>Cash</b>	13974.0	11651.0	11922.0	11129.0	11066.0	7419.9		9340.0	
<b>Debt</b>	26100.0	28624.0	31320.0	32040.0	39718.0	44718.0		44718.0	
<b>Net Cash/Shr</b>	-5.9	-8.0	-9.0	-11.2	-19.8	-30.2		-29.8	
<b>Tangible Book Value/Shr</b>	-7.2	-11.6	-15.1	-20.6	-18.5	-25.5		-22.6	

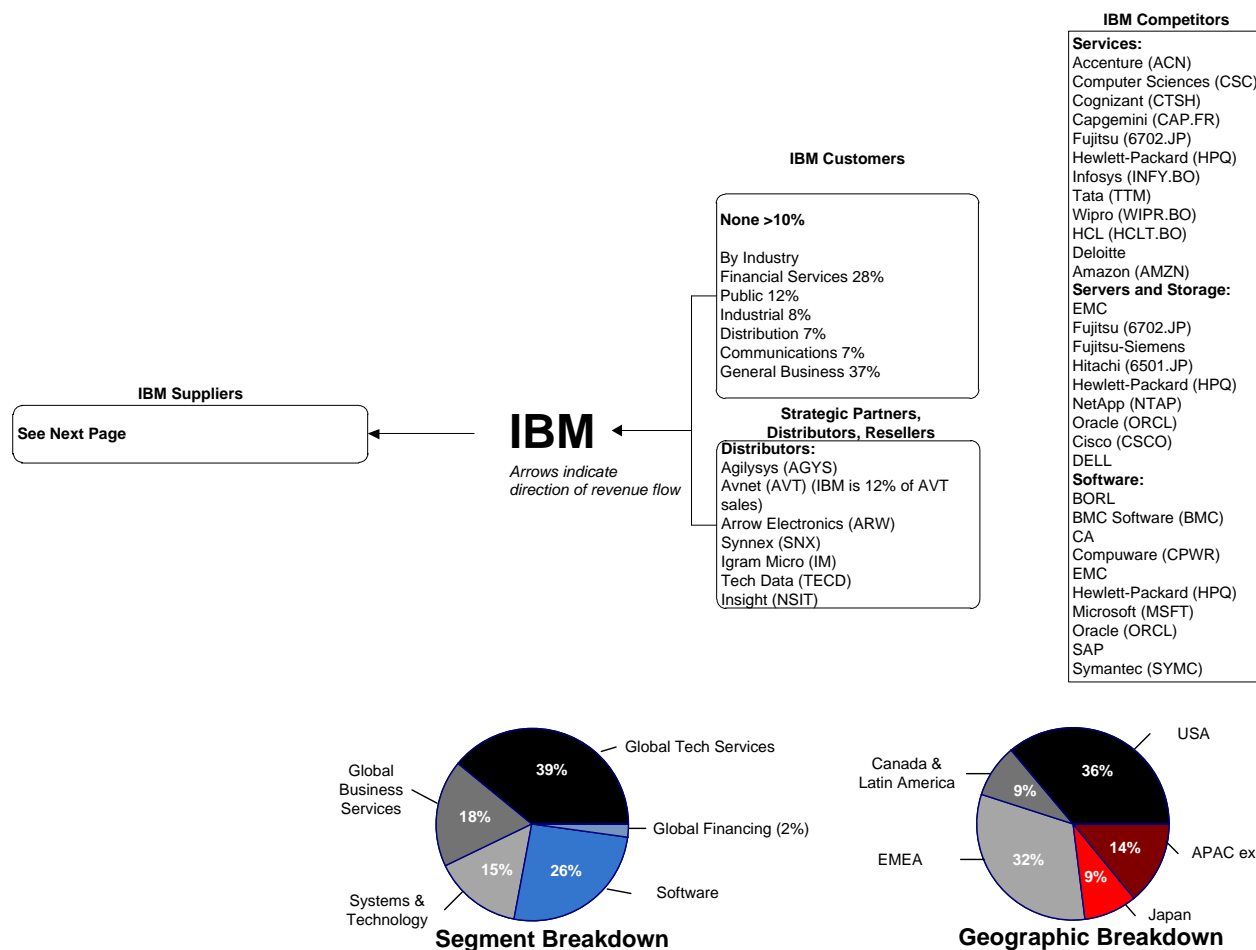
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 419. IBM (IBM)

Sector: PC & Enterprise Hardware

## IBM (IBM)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.  
Note: Growth markets represent 23% of total revenues with China representing 5%

Source: Citi Research

**Figure 420. IBM Supplier - In 2012, approximately 90% of global spend in Production and Logistics Procurement (in support of hardware and logistics business operations) occurred with the following firms:**

Acbel Polytech (6282.TW)	Altis Semiconductor
Amkor Technology (AMKR)	Applied Materials (AMAT)
ASML (ASML)	Avnet (AVT) (IBM is 12% of AVT sales)
Benchmark (BHE) (IBM is 21% of BHE sales)	Brocade (BRCD)
Celestica (CLS) (IBM is >10% of CLS sales)	Cisco Systems (CSCO)
Compro Business Services	Dai Nippon Printing (7912.JP)
Delta Electronics (2308.TW)	Elpida Memory
Emerson Network Power	Emulex (ELX)
Endicott Interconnect	Flextronics (FLEX)
Fuji Electric (6504.JP)	Geodis
GLOBALFOUNDRIES	Hitachi (6501.JP)
Hon Hai (2317.TW)	Hynix (000660.KS)
Intel (INTC)	Jabil Circuit (JBL)
Kingston Technology	KLA-Tencor (KLAC)
Kyocera (6971.JP)	Lam Research (LRCX)
Lenovo (0992.HK)	Mellanox Technologies (MLNX)
Micron Technology (MU)	NEC (6701.JP)
NetApp (NTAP)	NuFlare Technology (6256.JP)
Pegatron (4938.TW)	Qlogic (QLGC)
Samsung (0593.KS)	Seagate (STX)
Shin-Etsu Handotai	SMART Modular Technologies
Tel-Ad Electronics	The Karrie Group (1050.HK)
Tokyo Electronic Ltd. (9501.JP)	Toshiba (6502.JP)
Venture	Volterra (VLTR)
Wistron (3231.TW)	Xyratex (XRTX)

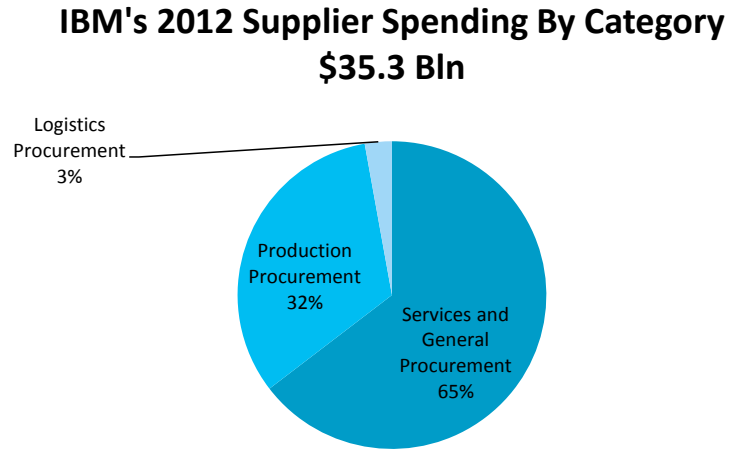
Source: Citi Research, Company Reports

**Figure 421. IBM Supplier (Continued) In Services and General Procurement (in support of our software, services and overall operations) approximately 45% of global spend was with the following firms:**

Adecco Group	American Airlines
American Express (AMEX)	Artech Information Systems
AT&T (T)	BMC Software (BMC)
CA Technologies	CBRE Group (CBRE)
CDI (CDI)	Cisco Systems (CSCO)
Clarius Group	Collabera
CTG	CVS Caremark (CVS)
Deloitte Touche Tohmatsu	Delta Air Lines (DAL)
EMC (EMC)	Fluor (FLR)
Fujitsu (6702.JP)	George P. Johnson
Hays (HAS.LN)	Hewlett-Packard (HPQ)
Hilton (HLT)	Hitachi (6501.JP)
HSG Zander	Infinite Computer Solutions
Infor Global Solutions	Internet Initiative Japan (3774.JP)
IT Holdings (3626.JP)	Johnson Controls (JCI)
Jones Lang LaSalle (JLL)	Juniper Networks (JNPR)
LeasePlan	Lenovo (0992.HK)
Manpower (MAN)	Marriott (MAR)
Microsoft (MSFT)	Mitsubishi (6503.JP)
Oracle (ORCL)	Randstad (RAND)
Ricoh (7752.JP)	Rocket Software
SAP (SAP)	SDI International Corp.
SHI International	Sumitomo Corporation (8316.JP)
TES	Verizon (VZ)
WPP Group	ZeroChaos

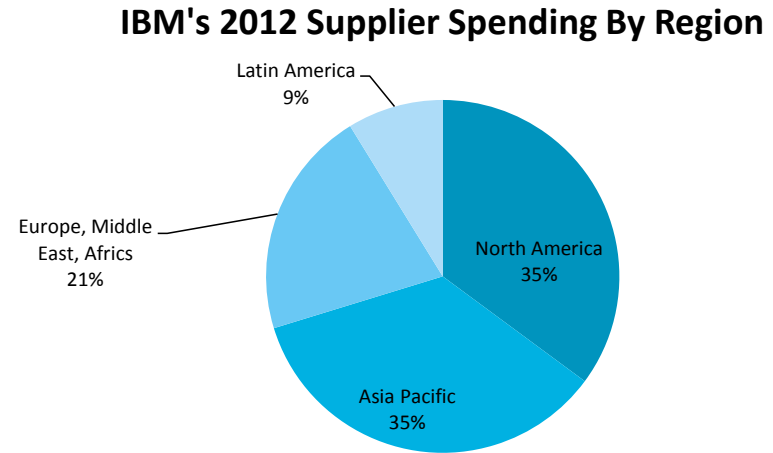
Source: Citi Research, Company Reports

Figure 422. 2012 Supplier Spending BY Category (Dollars in Bln)



Source: Citi Research, Company Reports

Figure 423. 2012 Supplier Spending by Supplier Location



Source: Citi Research, Company Reports

## International Rectifier Corp.

Citi Analyst: Terence Whalen

International Rectifier is a leading manufacturer of power transistors, power control modules and analog power integrated circuits that control, condition and convert electrical power for a wide range of motors, electronic systems, lighting and automotive subsystems.

IRF reports revenue across six product segments: Power Management Devices (37% of sales), Energy Saving Products (16%), Enterprise Power (13%), Automotive (10), and High-Rel / Aerospace and Defense (21%).

The company derives 23% of its sales from the U.S., 19% from Europe, 48% from Asia-Pacific and 10% from Japan.

Figure 424. International Rectifier Corp (IRF) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	740.4	895.3	1176.6	1050.6	977.0	1093.1	1092.5	1179.0	1205.9
<b>- y/y growth</b>		20.9%	31.4%	-10.7%	-7.0%	11.9%	11.8%	7.9%	10.4%
<b>Gross Margins</b>	30.4%	32.7%	39.5%	32.4%	26.3%	36.1%		37.8%	
<b>Operating Margins</b>	-9.3%	2.2%	12.3%	-0.4%	-6.0%	7.2%		10.1%	
<b>EPS</b>	-1.33	0.17	1.99	-0.27	-1.04	0.87	0.87	1.37	1.49
<b>- y/y growth</b>		113.0%	1056.5%	-113.6%	-281.3%	183.6%	184.1%	58.5%	71.0%
<b>Cash</b>	482.9	541.1	484.7	369.9	454.5	557.4		703.8	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	6.7	7.6	6.9	5.5	6.6	7.7		9.6	
<b>Tangible Book Value/Shr</b>	14.7	15.7	17.2	17.3	16.3	17.7		19.3	

(Revenues, Cash and Debt in Millions in Local Currency)

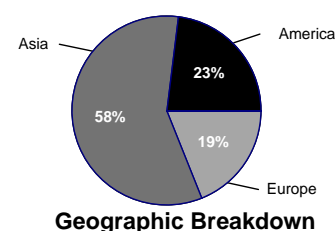
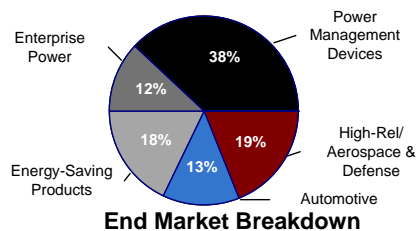
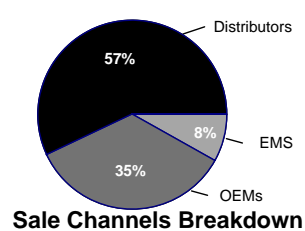
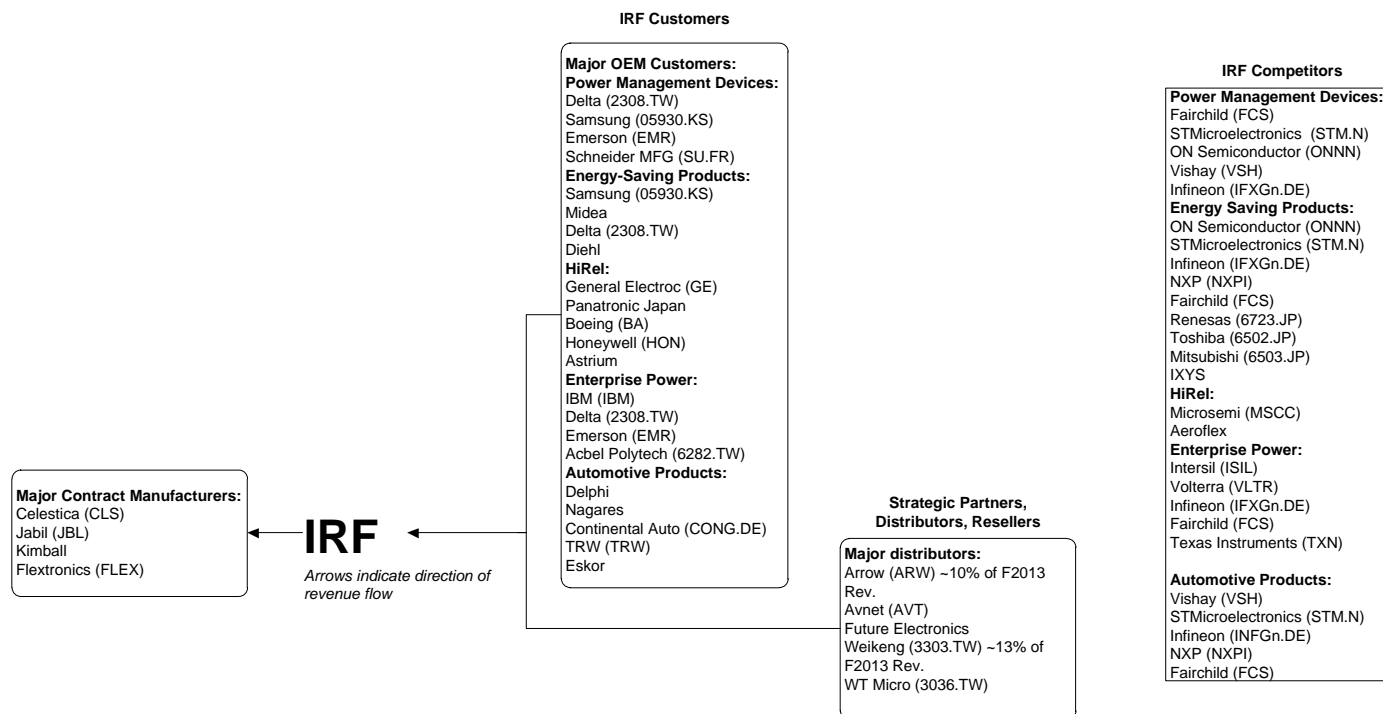
Source: Citi Research, Company Reports, FirstCall



Figure 425. International Rectifier Corp (IRF)

Sector: Semiconductors

## International Rectifier Corp. (IRF)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Intersil Corp.

Citi Analyst: Terence Whalen

Intersil Corporation (ISIL) develops and manufactures analog integrated circuits (ICs) including both power management and signal path devices.

Intersil reports revenue across three end-markets: consumer (20% of 2012 revenue), computing (21%), and industrial (59%).

Intersil's primary competitors are Advanced Analogic Technology, Fairchild Semiconductor, Linear Technology, Maxim Integrated, ON Semiconductor Richtek, Texas Instruments, and Volterra.

Intersil's fiscal year ends in December.

Figure 426. Intersil Corp (ISIL) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	611.4	822.4	760.5	607.9	575.2	551.8	579.1	543.8	608.2
- <i>y/y growth</i>		34.5%	-7.5%	-20.1%	-5.4%	-4.1%	0.7%	-1.4%	5.0%
<b>Gross Margins</b>	54.8%	58.2%	57.5%	54.3%	55.0%	55.7%		55.7%	
<b>Operating Margins</b>	9.3%	15.8%	11.2%	0.0%	8.4%	9.0%		9.4%	
<b>EPS</b>	0.42	0.78	0.45	-0.46	0.37	0.30	0.65	0.32	0.74
- <i>y/y growth</i>		86.7%	-41.5%	-202.2%	180.6%	-19.2%	74.6%	4.8%	13.0%
<b>Cash</b>	361.2	383.0	410.2	163.6	194.8	217.1		236.5	
<b>Debt</b>	0.0	275.0	200.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	3.0	0.9	1.7	1.5	1.5	1.7		1.8	
<b>Tangible Book Value/Shr</b>	5.6	2.7	3.2	2.7	2.6	2.7		2.8	

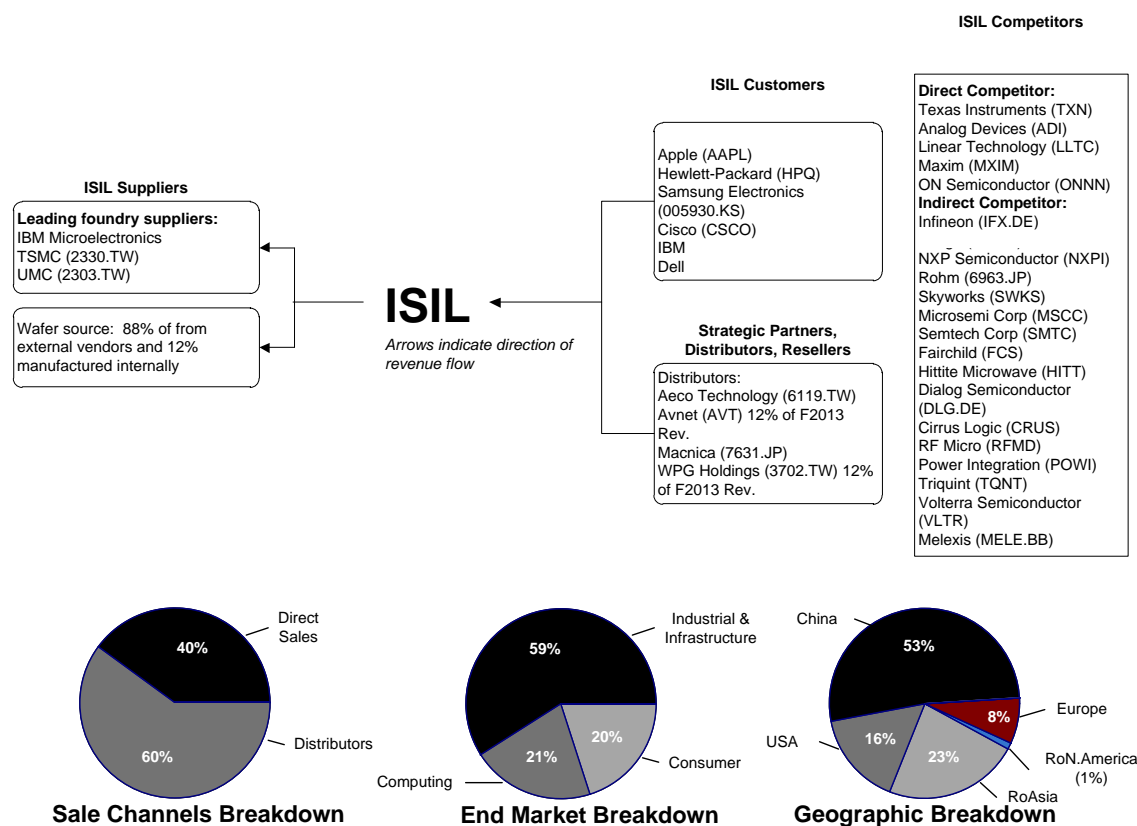
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 427. Intersil Corp (ISIL)

Sector: Semiconductors

## Intersil Corp. (ISIL)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Jabil Circuit, Inc.

Citi Analyst: Jim Suva, CPA

Jabil Circuit is a leading global provider of EMS products and services and is the third-largest contract manufacturer in the world.

The company's offerings include design, engineering, and manufacturing solutions for OEMs, as well as after-market service and repair.

Approximately 50% of sales are from Diversified Manufacturing Services, which includes Healthcare & Instrumentation 5%, Industrial & Clean Tech 10% and Specialized Services 35%. Enterprise & Infrastructure represents 29% and High Velocity Systems represent 21%.

Jabil has one customer over 10% of revenue (Apple near 20%). Cisco and HP are also major customers but slightly below the 10% level and Jabil is moving away from Blackberry.

The company has a unique work-cell approach to its customers, under which it assigns a worldwide project manager for each customer, who essentially owns, launches, manages, and assumes the risk and rewards for the customer manufacturing relationship.

Figure 428. Jabil Circuit Inc (JBL) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	11691.8	13409.4	16518.8	17151.9	18336.9	15502.5	15569.3	16049.4	16222.8
- y/y growth	-8.5%	14.7%	23.2%	3.8%	6.9%	-15.5%	-15.1%	3.5%	4.2%
<b>Gross Margins</b>	6.2%	7.5%	7.6%	7.7%	7.4%	6.3%		7.1%	
<b>Operating Margins</b>	2.1%	3.7%	4.3%	4.3%	3.9%	2.2%		3.3%	
<b>EPS</b>	0.64	1.54	2.35	2.41	2.26	0.50	0.55	1.65	1.72
- y/y growth	-42.3%	138.3%	53.1%	2.3%	-5.9%	-77.9%	-75.8%	229.8%	213.9%
<b>Cash</b>	876.3	744.3	888.6	1217.3	1011.4	1640.2		2654.4	
<b>Debt</b>	1234.4	1186.5	1186.8	1676.4	1906.0	1836.2		1836.2	
<b>Net Cash/Shr</b>	-0.8	-1.3	-1.0	-2.1	-3.3	-0.2		4.9	
<b>Tangible Book Value/Shr</b>	6.4	6.8	8.1	9.2	7.9	11.0		12.7	

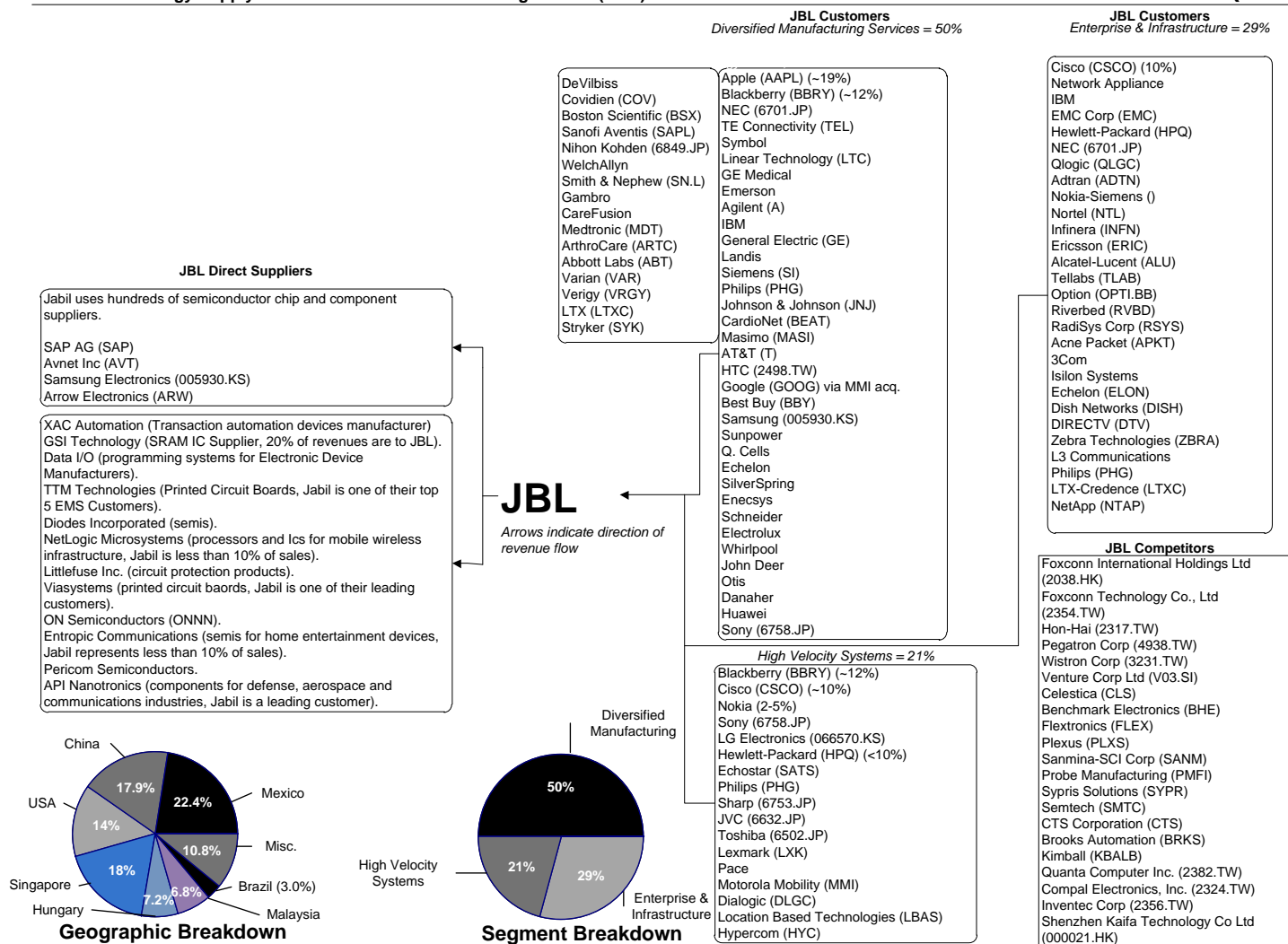
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 429. Jabil Circuit Inc (JBL)

## Sector: Technology Supply Chain – Electronic Manufacturing Service (EMS)

## Jabil (JBL)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.  
Note: Business segments as per latest quarterly results

Source: Citi Research

## Ju Teng

Citi Analyst: Wei Chen

Ju Teng is a leading casing company for electronics products (NB, tablet, and TV), in particular notebook (NB) casings, with the largest global market share, at 30%.

Ju Teng has seven production plants in China and a workforce of >30,000 yielding annual production capacity of 90mn notebooks and 6m TV casings. In recent years, Ju Teng has also started to make inroads into tablet and smartphone casings.

Figure 430. Ju Teng (3336.HK) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	7463.9	7166.2	8234.5	9201.3	9441.0	9266.7	10111.5	10601.8	10933.8
- y/y growth	3.0%	-4.0%	14.9%	11.7%	2.6%	-1.8%	7.1%	14.4%	8.1%
<b>Gross Margins</b>	18.0%	12.9%	10.5%	15.2%	20.0%	20.6%		21.5%	
<b>Operating Margins</b>	13.2%	6.4%	4.1%	9.2%	13.3%	14.3%		15.2%	
<b>EPS</b>	0.68	0.30	0.23	0.53	0.71	0.80	0.81	1.00	0.97
- y/y growth	2.6%	-56.2%	-23.4%	135.3%	33.9%	11.6%	13.4%	26.0%	19.1%
<b>Cash</b>	616.5	883.8	697.8	1206.2	895.3	1156.3		1280.1	
<b>Debt</b>	2096.7	2139.5	2622.0	4081.7	3862.5	3862.5		3862.5	
<b>Net Cash/Shr</b>	-0.6	-0.4	-1.2	-0.3	-0.7	-0.4		-0.3	
<b>Tangible Book Value/Shr</b>	3.5	3.9	4.2	4.7	5.2	5.8		6.6	

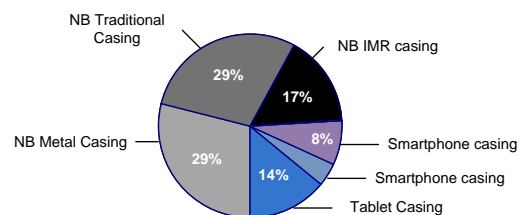
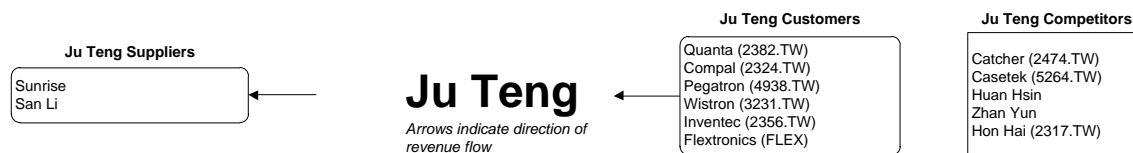
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

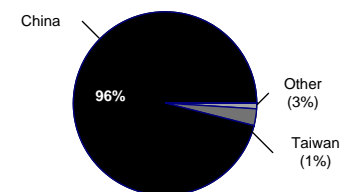
Figure 431. Ju Teng (3336.HK)

Sector: PC & Enterprise Hardware

Ju Teng (3336.HK)



Product Breakdown



Geographic Breakdown

Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Juniper Networks, Inc.

Citi Analyst: Ehud Gelblum, Ph.D

Juniper Networks develops networking equipment including routers, switches, and security solutions which it sells to service provider and enterprise customers globally.

Juniper began developing core routers (47% FY12 revenue) for service providers, added security products (15% FY12 revenue) with its 2004 acquisition of NetScreen Technologies, and introduced the internally-developed EX switching product family in 2008, initially focused on campus switching applications followed by the QFabric data center switching product family in 2011 (switching 13% FY12 revenue). Services account for the remaining 25% of revenue. On an end-market basis, service providers accounted for 64% of revenue in FY12 with enterprise comprising the remainder.

Juniper has several flagship product families, including the T-series core routers, MX edge routers, PTX supercore switches, EX switches, QFabric switches, and SRX security services gateway.

Key customers include Verizon and AT&T which may account for >10% of revenue in any given quarter.

The company was founded in 1996 and went public in 1999. The company is based in Sunnyvale, CA, and has 9,234 employees as of December 2012.

Figure 432. Juniper Networks (JNPR) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	3315.9	4093.3	4448.7	4365.5	4669.1	4879.5	4938.6	5130.3	5193.1
- <i>y/y growth</i>	-7.2%	23.4%	8.7%	-1.9%	7.0%	4.5%	5.8%	5.1%	5.2%
<b>Gross Margins</b>	65.7%	67.5%	65.5%	64.3%	64.2%	64.4%		64.4%	
<b>Operating Margins</b>	20.2%	24.0%	20.6%	15.6%	19.2%	21.4%		24.7%	
<b>EPS</b>	0.92	1.32	1.19	0.85	1.29	1.52	1.55	1.99	1.89
- <i>y/y growth</i>	-22.0%	43.5%	-9.8%	-28.2%	50.5%	18.4%	20.5%	30.7%	22.0%
<b>Cash</b>	2175.2	2286.4	3551.7	2849.3	2845.9	2850.8		3221.9	
<b>Debt</b>	0.0	0.0	999.0	999.2	999.3	1999.3		1999.3	
<b>Net Cash/Shr</b>	4.1	4.2	4.7	3.5	3.6	1.8		2.8	
<b>Tangible Book Value/Shr</b>	4.5	4.9	5.8	5.5	6.3	4.6		5.5	

(Revenues, Cash and Debt in Millions in Local Currency)

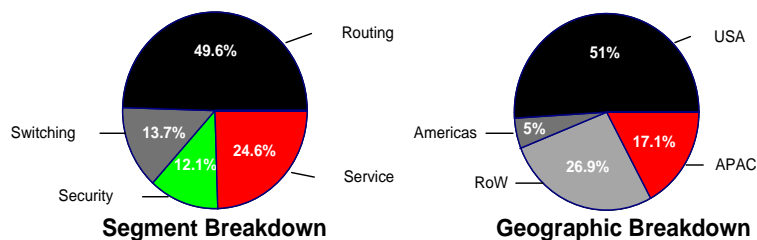
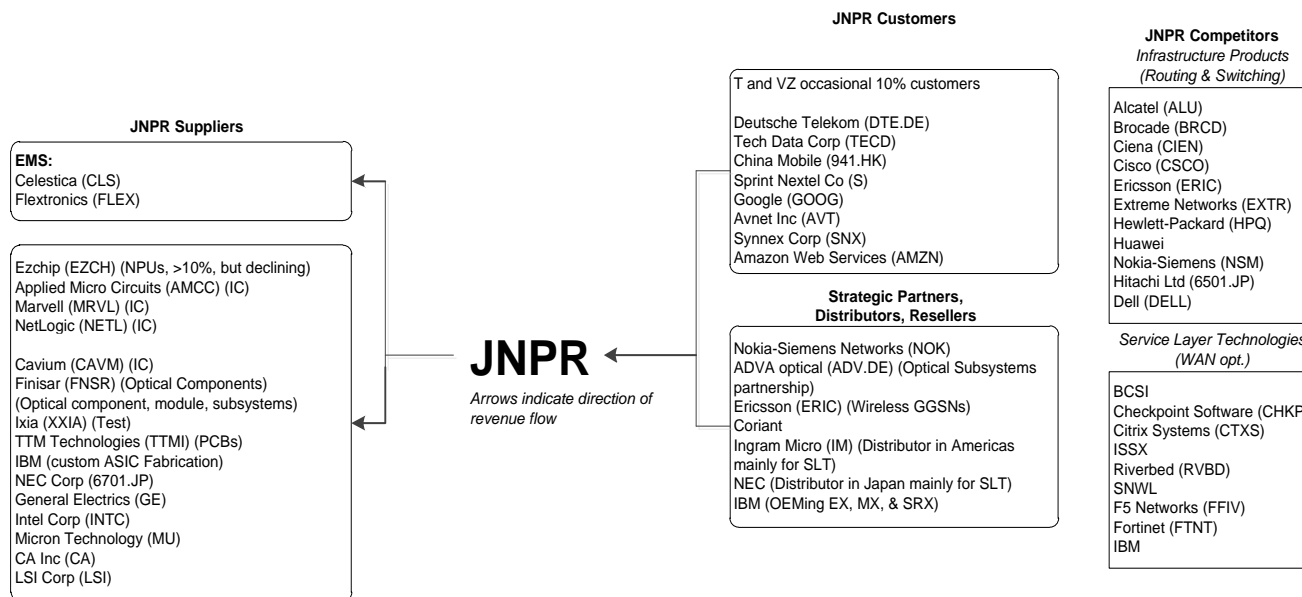
Source: Citi Research, Company Reports, FirstCall



Figure 433. Juniper Networks (JNPR)

Sector: Telecom Equipment

## Juniper Networks (JNPR)



Source: Company reports, CIRA estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Kinsus Interconnect Technology

Citi Analyst: Roland Shu

Kinsus is a major supplier of substrate, with high exposure to communication (handset and base station >50%, networking >20%).

Kinsus' main manufacturing is in Taiwan, however the China site started contributing in 4Q10. Kinsus purchased 51% of Piotek (PCB company in China) from Pegatron, with full revenue integration in 4Q10.

Pegatron is the largest shareholder with a 39% holding. The company was established in 2000. It

Figure 434. Kinsus Interconnect Technology (3189.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	11083.0	17594.8	22752.4	22034.3	23102.8	24929.7	25595.8	27140.7	28050.5
- <i>y/y growth</i>	-9.3%	58.8%	29.3%	-3.2%	4.8%	7.9%	10.8%	8.9%	9.6%
<b>Gross Margins</b>	30.2%	25.1%	22.7%	23.7%	26.9%	27.9%		27.4%	
<b>Operating Margins</b>	18.6%	16.2%	12.0%	12.7%	14.9%	15.4%		14.9%	
<b>EPS</b>	4.30	5.50	6.28	6.27	7.23	7.42	8.51	7.79	9.58
- <i>y/y growth</i>	-13.7%	27.8%	14.1%	0.0%	15.2%	2.6%	17.7%	5.1%	12.7%
<b>Cash</b>	9884.1	10524.7	12228.7	14525.0	15676.0	16726.0		19256.2	
<b>Debt</b>	1215.3	2775.1	5374.5	5441.7	4694.2	4766.1		4468.8	
<b>Net Cash/Shr</b>	20.5	18.9	18.9	26.9	31.5	33.8		39.7	
<b>Tangible Book Value/Shr</b>	42.2	44.8	48.9	51.8	56.5	60.0		64.1	

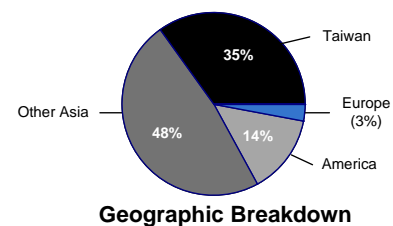
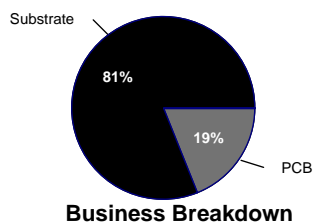
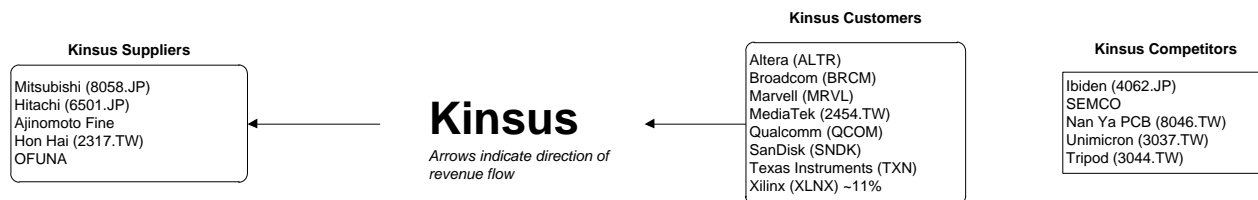
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 435. Kinsus Interconnect Technology (3189.TW)

Sector: Semiconductors

## Kinsus Interconnect Technology (3189.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## KLA Tencor Corp.

Citi Analyst: Terence Whalen

KLA-Tencor Corp. (KLAC) is the leading supplier of process control equipment used in the fabrication of integrated circuits.

Process control systems are used to analyze product and process quality at critical junctures of the manufacturing process. Data is collected and analyzed, and the results of which are used to optimize processes and enhance yields.

The company's products include wafer inspection, thin film measurement, metrology, and reticle inspection systems.

Headquartered in San Jose, CA, the company was formed in April 1997, when KLA merged with Tencor Corporation to become the single largest provider of process control equipment in the world.

Figure 436. KLA-Tencor (KLAC) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1520.2	1820.8	3175.2	3171.9	2842.8	3057.0	3018.6	3420.9	3359.3
- <i>y/y growth</i>	-39.7%	19.8%	74.4%	-0.1%	-10.4%	7.5%	6.2%	11.9%	11.3%
<b>Gross Margins</b>	42.8%	55.2%	60.3%	58.1%	56.5%	58.6%		58.6%	
<b>Operating Margins</b>	1.0%	20.9%	37.8%	33.1%	26.6%	29.1%		32.1%	
<b>EPS</b>	-0.22	1.54	4.91	4.65	3.30	3.91	3.79	4.81	4.68
- <i>y/y growth</i>	-109.8%	801.7%	218.6%	-5.4%	-29.0%	18.4%	14.9%	23.2%	23.4%
<b>Cash</b>	1329.9	1534.0	2038.5	2534.4	2918.9	2963.2		3485.0	
<b>Debt</b>	745.2	745.7	746.3	746.8	747.4	747.6		747.6	
<b>Net Cash/Shr</b>	3.4	4.6	7.6	10.5	12.8	13.2		16.3	
<b>Tangible Book Value/Shr</b>	10.0	11.4	14.6	17.6	18.8	20.9		24.3	

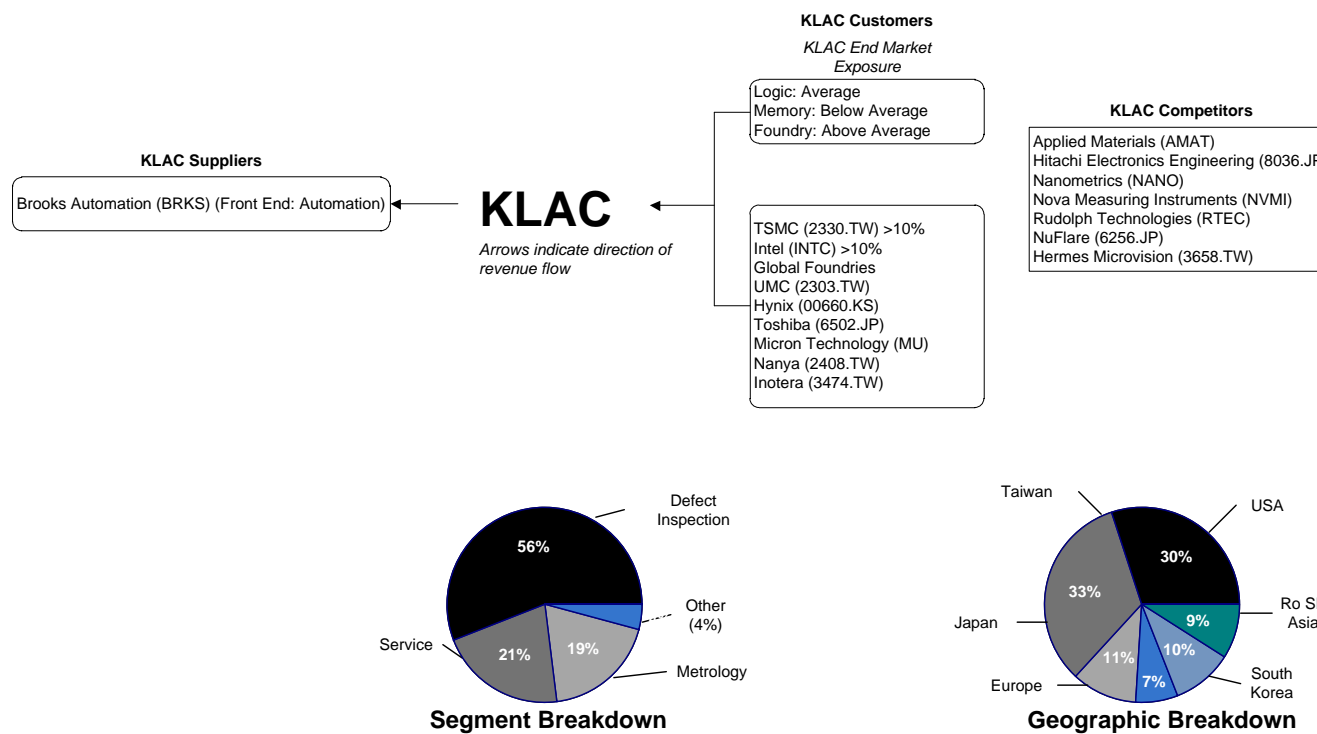
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 437. KLA-Tencor (KLAC)

Sector: Semiconductor Equipment: Front End

## KLA-Tencor (KLAC)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Konica Minolta Holdings

Citi Analyst: Masahiro Shibano

Konica Minolta, Inc. operates a holding company with interests in printing equipment manufacturing and distribution, the manufacture and sale of office equipment, imaging systems, optical devices, and measuring instruments.

The company operates through the following business domains: Offices, Production Printing, Performance Materials Business, Optics and Sensing Business, Sensing, Healthcare Business, Industrial Inkjet Business and Planetarium Business.

- The Offices domain is in charge of the global deployment of office equipment, centering on multi-functional peripherals and laser printers.
- The Production Printing domain applies resources in the form of their own digital printing technology, broad product line and global support system.
- The Performance Materials domain presents business by TAC film for LCD polarizers, barrier film, and functional film for windows, high-precision photo plates and organic light emitting diode lighting.
- The Optics and Sensing Business includes high value-added pickup lenses for optical disks.
- The Sensing domain utilizes advanced light-measuring technologies to provide customers with products for precise measurements.
- The Healthcare Business serves the healthcare field with products that use digital imaging technology.
- The Industrial Inkjet Business targets industrial inkjet markets, including high-performance print heads, multi-function inks, print units for label printing and textile printing systems.
- The Planetarium Business manufactures planetariums and projectors.

The company was founded by Rokusaburo Sugiura in April 1873 and is headquartered in Tokyo, Japan.

Figure 438. Konica Minolta (4902.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	947843.0	804465.0	777953.0	767879.0	813073.0	936976.0	939536.0	960410.0	968560.0
– y/y growth	-11.5%	-15.1%	-3.3%	-1.3%	5.9%	15.2%	15.6%	2.5%	3.1%
<b>Gross Margins</b>	45.1%	45.3%	45.6%	46.3%	46.2%	47.8%		49.2%	
<b>Operating Margins</b>	5.9%	5.5%	5.1%	5.3%	5.0%	6.4%		8.2%	
<b>EPS</b>	28.62	31.93	48.84	38.52	28.52	51.14	41.22	88.08	72.85
– y/y growth	-77.9%	11.6%	53.0%	-21.1%	-26.0%	79.3%	44.5%	72.2%	76.7%
<b>Cash</b>	85753.0	85533.0	87886.0	90640.0	93413.0	159047.0		193047.0	
<b>Debt</b>	230407.0	197357.0	192567.0	227932.0	224895.0	225000.0		210000.0	
<b>Net Cash/Shr</b>	-70.7	-49.2	-56.9	-174.2	-75.6	35.9		100.0	
<b>Tangible Book Value/Shr</b>	780.4	792.4	807.8	819.1	878.1	980.4		1068.4	

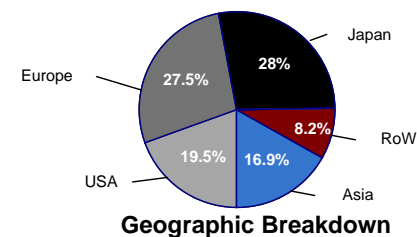
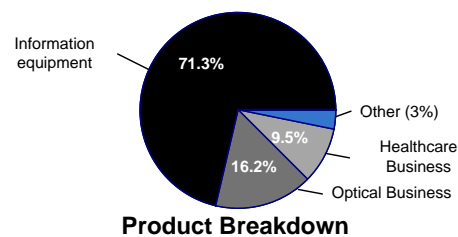
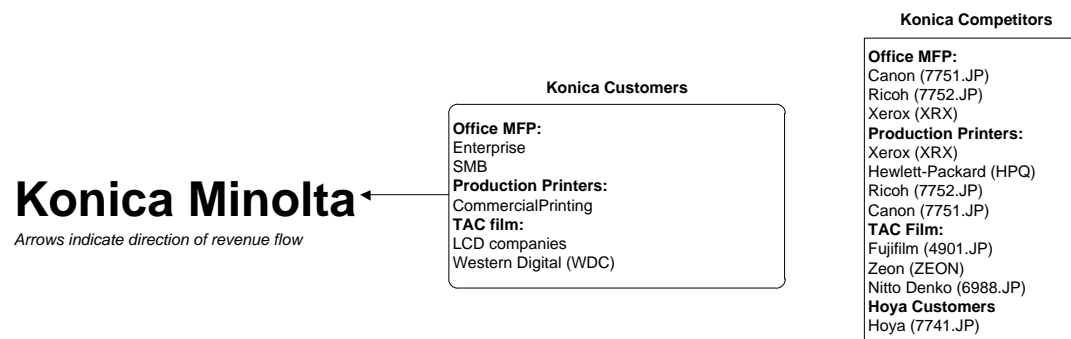
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 439. Konica Minolta (4902.JP)

Sector: Hardware

## Konica Minolta Holdings (4902.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Kyocera

Citi Analyst: Yuta Fukasawa

Kyocera is an electronic equipment manufacturer that develops and produces electronic components, solar cells, mobile handsets, and complex equipment.

The company's seven key businesses are fine ceramic parts (parts for manufacturing equipment, sapphire substrates), semiconductor components (organic and inorganic packages), applied fine ceramic products (solar cells), electronic devices (MLCCs, thin film components, connectors, liquid crystal components), and telecom equipment (complex equipment).

Kyocera was established as a ceramics maker, but has expanded through acquisitions (equipment maker Mita Kogyo, now Kyocera Mita, handset operations of Sanyo Electric, US passive components maker AVX, etc.).

With the "Amoeba Management System" developed by founder Kazuo Inamori, profit structures are in place for each division. The company's balance sheet is very solid, with financial assets of c ¥800bn. Issues include boosting competitiveness of low margin businesses like MLCCs and mobile handsets.

Figure 440. Kyocera (6971.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1128586.0	1073805.0	1266924.0	1190870.0	1280054.0	1438188.0	1436976.0	1508700.0	1493870.0
- <i>y/y growth</i>	-12.5%	-4.9%	18.0%	-6.0%	7.5%	12.4%	12.3%	4.9%	4.0%
<b>Gross Margins</b>	25.9%	26.6%	29.8%	26.9%	25.6%	25.8%		25.6%	
<b>Operating Margins</b>	3.8%	5.9%	12.3%	8.2%	6.0%	8.2%		8.4%	
<b>EPS</b>	157.23	218.47	667.23	432.58	362.37	239.50	237.45	256.76	263.40
- <i>y/y growth</i>	-72.2%	38.9%	205.4%	-35.2%	-16.2%	-33.9%	-34.5%	7.2%	10.9%
<b>Cash</b>	471390.0	525183.0	519300.0	479228.0	529190.0	586955.1		638147.9	
<b>Debt</b>	53403.0	46596.0	43077.0	35869.0	33807.0	37233.0		37233.0	
<b>Net Cash/Shr</b>	2359.8	2703.2	2696.0	2496.7	2771.1	1537.9		1677.4	
<b>Tangible Book Value/Shr</b>	6274.4	6419.1	6865.3	6956.3	7778.8	4587.3		4753.5	

(Revenues, Cash and Debt in Millions in Local Currency)

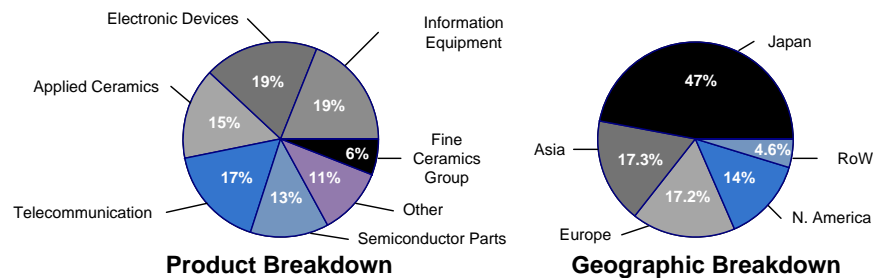
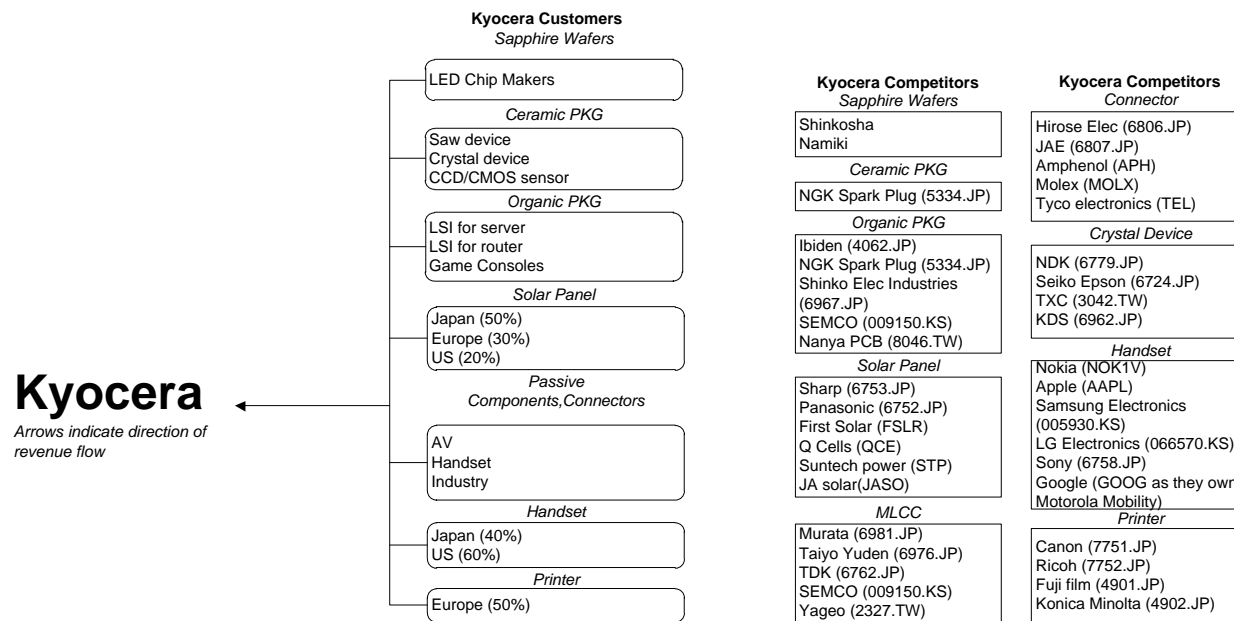
Source: Citi Research, Company Reports, FirstCall



Figure 441. Kyocera (6971.JP)

Sector: Electronic Components

## Kyocera (6971.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Lam Research Corp.

Citi Analyst: Terence Whalen

Lam Research (LRCX) is a leading capital equipment supplier to the global semiconductor industry.

The company's core technologies focus on the selective removal of insulating and conductive materials from the surface of a wafer during the chip manufacturing cycle. Lam's product portfolio consists of plasma-based etch solutions for all three key three etch markets.

Lam acquired Novellus Systems in 2012 and added deposition and dry strip markets to its portfolio.

Figure 442. Lam Research (LRCX) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1115.9	2133.8	3237.7	2665.2	3598.9	4585.5	4495.1	4163.5	4778.2
- <i>y/y growth</i>	-54.9%	91.2%	51.7%	-17.7%	35.0%	27.4%	24.9%	-9.2%	6.3%
<b>Gross Margins</b>	34.8%	45.7%	46.2%	40.7%	39.0%	43.3%		45.4%	
<b>Operating Margins</b>	-9.8%	19.0%	25.2%	12.2%	12.0%	18.9%		17.4%	
<b>EPS</b>	-1.00	2.61	5.86	2.02	2.32	4.43	4.17	3.79	4.68
- <i>y/y growth</i>	-128.2%	360.3%	124.5%	-65.5%	14.8%	90.7%	79.5%	-14.3%	12.3%
<b>Cash</b>	579.4	826.5	2122.2	2862.7	2497.2	2785.4		3670.1	
<b>Debt</b>	46.2	22.6	743.3	1463.3	976.2	988.4		988.4	
<b>Net Cash/Shr</b>	4.3	6.3	11.1	14.8	8.8	10.4		15.7	
<b>Tangible Book Value/Shr</b>	9.5	12.1	18.2	19.7	11.6	15.9		19.7	

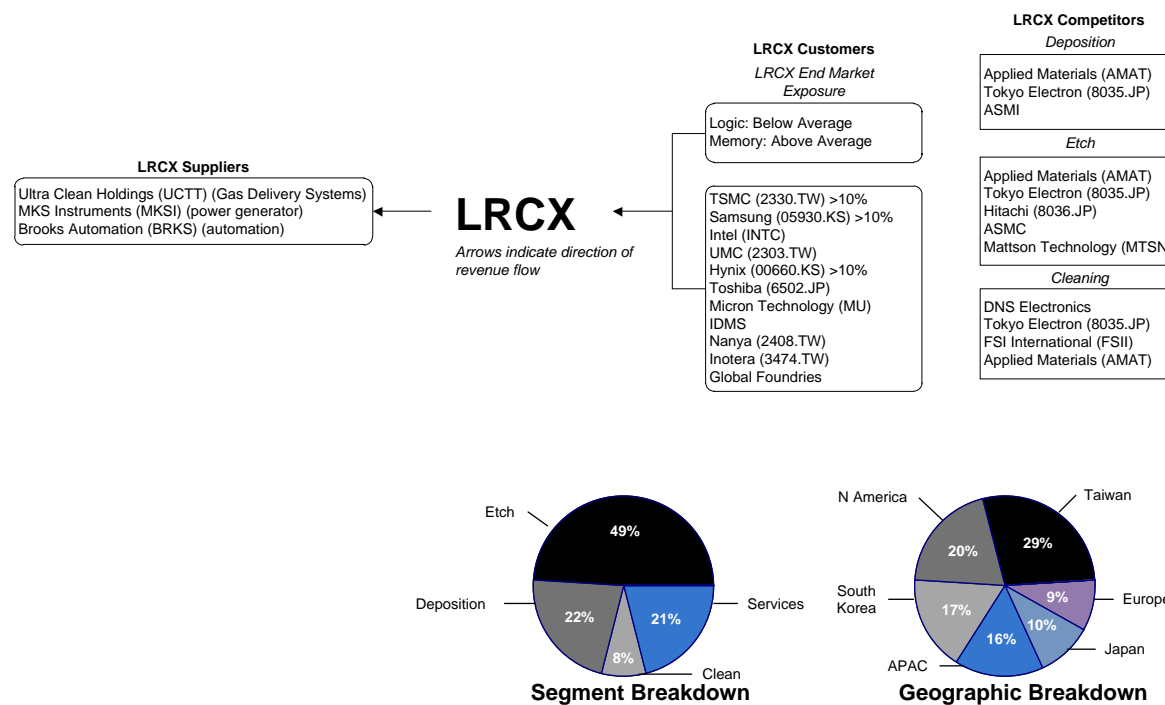
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 443. Lam Research (LRCX)

Sector: Semiconductor Equipment: Front End

## Lam Research (LRCX)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Largan Precision

Citi Analyst: Winnie Hong, CFA

Largan is a plastic/ glass/ hybrid lens supplier in Taiwan with end-applications including phone cameras, DSCs, MFPs and tablets. More than 80% of its revenue is driven by phone camera lenses.

Figure 444. Largan Precision (3008.TW) Results and Forecasts

	2009	2010	2011	2012	2013	Street 2014E	Street 2015E
<b>Revenues</b>	8154.4	12351.5	15984.1	20072.0	27433.3	33647.0	38165.0
- <i>y/y growth</i>	9.0%	51.5%	29.4%	25.6%	36.7%	22.7%	13.4%
<b>Gross Margins</b>	43.8%	47.0%	43.4%	41.7%	47.2%		
<b>Operating Margins</b>	33.4%	37.7%	34.2%	33.9%	39.3%		
<b>EPS</b>	18.68	30.15	38.76	41.58	71.64	83.25	94.93
- <i>y/y growth</i>	-23.7%	61.4%	28.5%	7.3%	72.3%	16.2%	14.0%
<b>Cash</b>	6626.7	8578.5	11268.2	11604.5	18154.9		
<b>Debt</b>	16.5	111.9	443.9	93.1	75.8		
<b>Net Cash/Shr</b>	49.8	64.0	84.0	86.5	135.3		
<b>Tangible Book Value/Shr</b>	102.2	122.2	147.7	171.9	227.1		

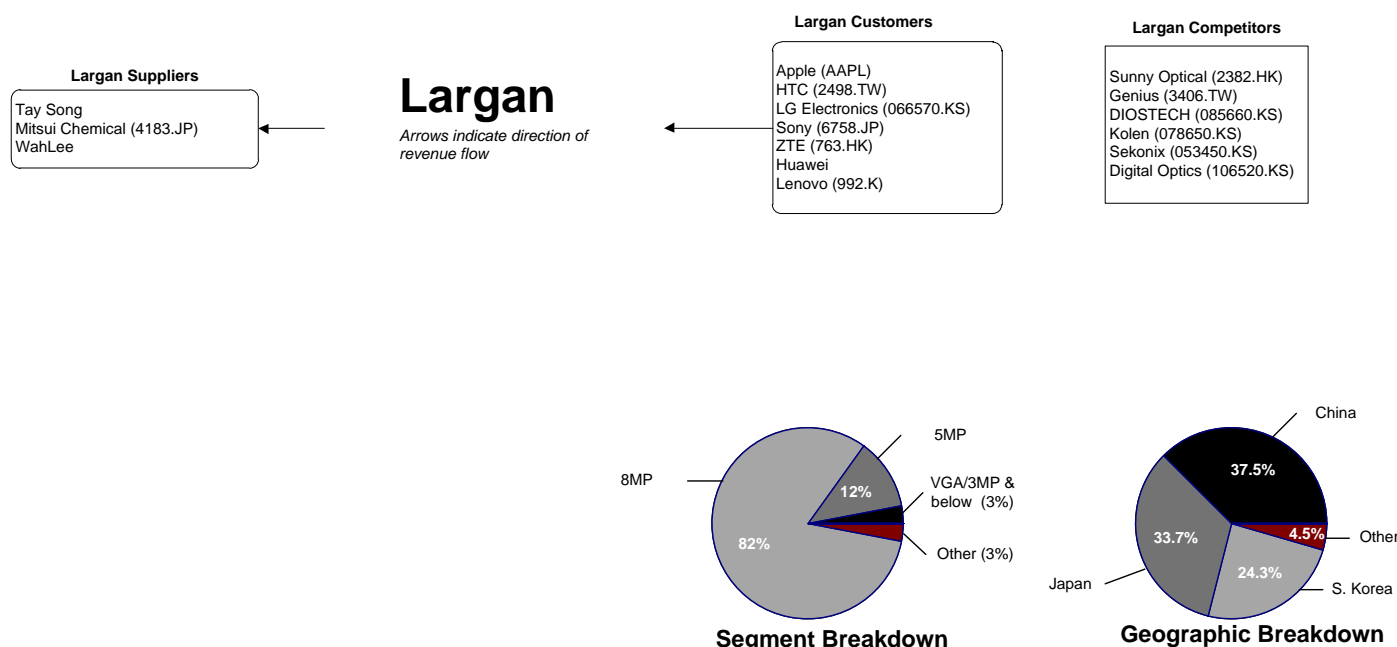
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 445. Largan Precision (3008.TW)

Sector: Electronic Components

## Largan Precision (3008.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Lenovo Group

Citi Analyst: Wei Chen

Established in 1984 as New Technology Development Inc, Lenovo is the world's largest PC OEM with 18.5% global market share as of 4Q CY13. Lenovo established its market position after acquiring IBM's PC Division in 2Q05.

The company was listed on the Hong Kong Stock Exchange in 1994 and maintains principal operations in Raleigh N.C., Beijing, and Singapore.

Figure 446. Lenovo (0992.HK) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	115874.5	128751.9	167888.9	230014.3	262723.6	297715.6	297373.9	311984.3	354318.2
- y/y growth	-9.1%	11.1%	30.4%	37.0%	14.2%	13.3%	13.2%	4.8%	19.1%
<b>Gross Margins</b>	12.1%	10.8%	10.9%	11.7%	13.1%	12.9%		12.6%	
<b>Operating Margins</b>	-1.3%	1.3%	1.8%	2.0%	2.4%	2.7%		2.4%	
<b>EPS</b>	-0.20	0.11	0.22	0.36	0.48	0.63	0.61	0.56	0.65
- y/y growth	-146.2%	155.3%	100.3%	64.7%	31.6%	31.3%	26.6%	-10.8%	7.8%
<b>Cash</b>	14441.9	18934.9	23311.0	32393.9	27740.0	26488.3		20731.0	
<b>Debt</b>	6985.2	4578.6	2112.5	488.9	3718.5	3541.0		11210.2	
<b>Net Cash/Shr</b>	1.2	1.8	2.4	3.2	2.5	2.5		1.3	
<b>Tangible Book Value/Shr</b>	1.1	1.3	1.4	1.8	2.0	2.2		2.5	

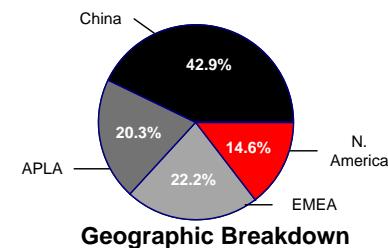
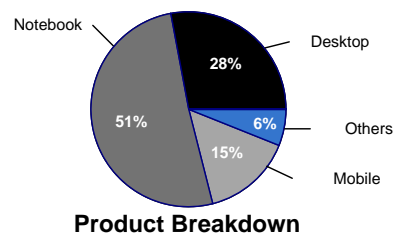
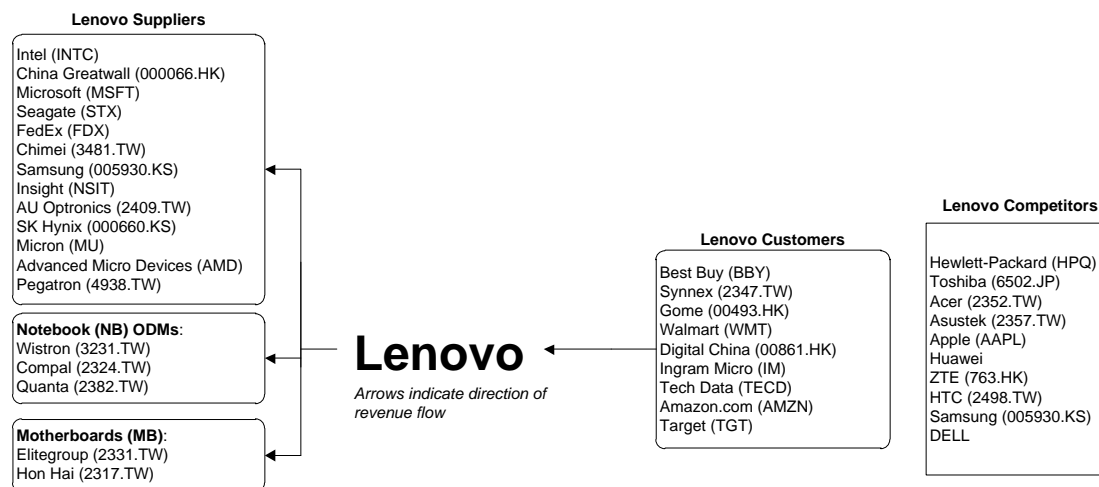
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 447. Lenovo (0992.HK)

Sector: PC & Enterprise Hardware

Lenovo (0992.HK)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Lexmark International

Citi Analyst: Jim Suva, CPA

Lexmark develops, manufactures and supplies printing, imaging, document workflow, and content management solutions for the office. The company operates in the office imaging and enterprise content management and business process management markets.

Lexmark products include laser printers, inkjet printers (recently announced plans to exit the inkjet market), multifunction devices, dot matrix printers and associated supplies, and ECM and BPM software solutions and services.

The company operates through two segments: Imaging Solutions and Services and Perceptive Software.

- The Imaging Solutions and Services segment offers a broad portfolio of monochrome and color laser printers, laser multifunction products, inkjet all-in-one devices and accessories, as well as software applications, software solutions and managed print services to help businesses efficiently capture, manage and access information.
- Perceptive Software segment (6% of 2013 revenues) offers a complete suite of ECM and BPM software products and solutions according to the needs of different users in industries such as healthcare, higher education, government and financial services.

Primary competitors are HP, Epson, Samsung & Canon, which account for a majority of worldwide market share. Distinguishing itself, however, Lexmark is one of only two companies worldwide to develop and market its own technology in all three high-volume segments of the printer market (color inkjet, mono, and color laser).

The company was founded in 1991 and is headquartered in Lexington, KY. It employs more than 12,000 globally.

Figure 448. Lexmark International Inc. (LXK) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	3879.9	4210.6	4178.6	3803.2	3683.0	3520.7	3531.0	3440.4	3457.6
– y/y growth	-14.3%	8.5%	-0.8%	-9.0%	-3.2%	-4.4%	-4.1%	-2.3%	-2.1%
<b>Gross Margins</b>	35.1%	37.0%	38.6%	39.1%	40.7%	41.2%	41.2%	41.4%	41.4%
<b>Operating Margins</b>	9.2%	12.3%	12.5%	10.5%	11.0%	10.8%	10.8%	10.6%	10.6%
<b>EPS</b>	3.25	4.96	4.90	3.77	4.19	3.90	3.91	3.79	4.01
– y/y growth	1.7%	52.5%	-1.1%	-23.1%	11.1%	-7.0%	-6.7%	-2.7%	2.6%
<b>Cash</b>	1132.5	1217.2	1149.4	905.8	1054.7	1101.7		1221.1	
<b>Debt</b>	648.9	649.1	649.3	299.6	699.6	699.6		699.6	
<b>Net Cash/Shr</b>	6.2	7.1	6.4	8.7	5.5	6.4		8.5	
<b>Tangible Book Value/Shr</b>	13.0	13.4	14.5	10.7	10.8	11.0		13.4	

(Revenues, Cash and Debt in Millions in Local Currency)

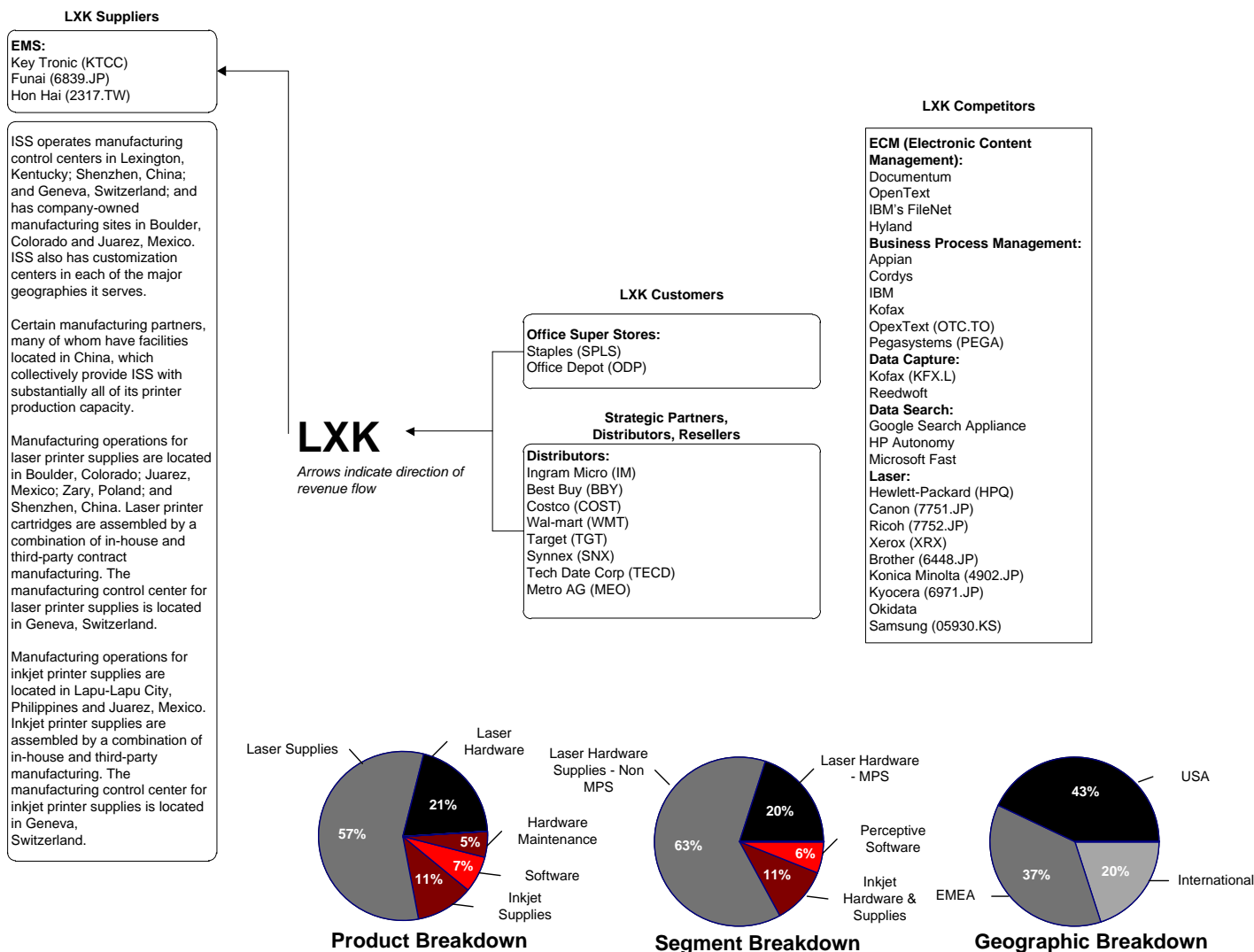
Source: Citi Research, Company Reports, FirstCall



Figure 449. Lexmark International Inc. (LXK)

Sector: Imaging

## Lexmark International Inc. (LXK)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## LG Display

Citi Analyst: Henry Kim, CFA

LG Display (LGD), formerly known as LG Philips LCD, is a TFT-LCD manufacturer that has positioned itself as a premium product leader in the industry. The company makes LCD TVs, monitors, notebook PC panels and small/medium panels for mobile applications.

Figure 450. LG Display (034220.KS) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	20038000.0	25511000.0	24291733.0	29430000.0	27033000.0	24786287.8	26514188.0	24971636.8	28064497.0
- y/y growth	23.2%	27.3%	-4.8%	21.2%	-8.1%	-8.3%	-1.9%	0.7%	5.8%
<b>Gross Margins</b>	12.8%	14.6%	5.0%	10.2%	13.0%	14.3%		15.0%	
<b>Operating Margins</b>	5.0%	5.1%	-3.1%	3.1%	4.3%	4.7%		5.1%	
<b>EPS</b>	3122.63	3241.88	-2203.40	660.00	1170.97	2132.96	1645.70	2469.36	2254.86
- y/y growth	2.8%	3.8%	-168.0%	130.0%	77.4%	82.2%	40.5%	15.8%	37.0%
<b>Cash</b>	2867982.0	3134009.0	2332977.0	2653753.0	2323409.0	2824599.6		3316574.6	
<b>Debt</b>	3379870.0	4558585.0	4523028.0	4455857.0	3902779.0	3787882.1		3787882.1	
<b>Net Cash/Shr</b>	2212.9	1887.7	-3883.0	-2199.0	-1876.5	-475.8		899.2	
<b>Tangible Book Value/Shr</b>	24485.1	26399.7	22838.3	23609.3	25969.3	28102.3		30571.7	

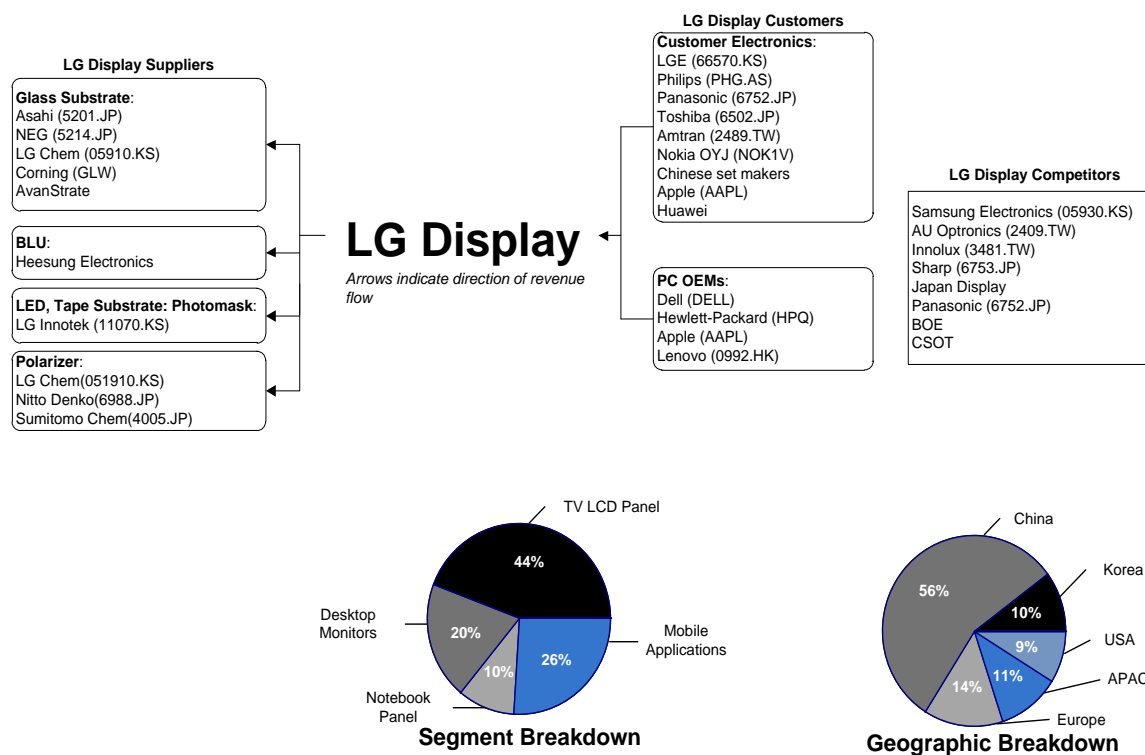
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 451. LG Display (034220.KS)

Sector: LCD Displays

## LG Display (034220.KS; LGD)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## LG Electronics

Citi Analyst: Henry Kim, CFA

LGE has four main business divisions: home appliances, display, media, and handsets.

The home-appliance division, accounting for 20% of global sales, is the cash cow. LGE boasts leading domestic market shares for many white goods such as air conditioners (54%), washing machines (50%) and refrigerators (49%).

The display & media division, accounting for 41% of sales, produces digital storage, TV and PDP modules and should benefit from the accelerating trend towards digital TV.

The handset division, accounting for 22% of sales, is the fastest growing unit.

Figure 452. LG Electronics (066570.KS) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	55492000.0	55753800.0	54256500.0	50960000.0	58140400.0	61785521.2	60310247.0	64263318.9	63273185.0
- y/y growth	100.8%	0.5%	-2.7%	-6.1%	14.1%	6.3%	3.7%	4.0%	4.9%
<b>Gross Margins</b>	25.5%	21.6%	22.5%	24.2%	23.1%	23.3%		23.5%	
<b>Operating Margins</b>	4.8%	0.3%	0.7%	2.2%	2.2%	1.9%		2.1%	
<b>EPS</b>	15444.73	8295.29	-2870.19	429.58	1079.76	5040.36	4287.51	5498.32	6094.22
- y/y growth	373.5%	-46.3%	-134.6%	115.0%	151.4%	366.8%	297.1%	9.1%	42.1%
<b>Cash</b>	2465746.0	1991631.0	2347142.0	1886299.0	2699300.0	2205417.7		1974556.9	
<b>Debt</b>	6908598.0	7192935.0	7435618.0	6470654.0	9210997.0	9110997.0		9010997.0	
<b>Net Cash/Shr</b>	-917.7	-8053.9	-11673.0	-15517.3	-23811.2	-26829.2		-28239.9	
<b>Tangible Book Value/Shr</b>	70658.7	74844.4	64322.0	61117.6	53906.3	59235.3		65358.0	

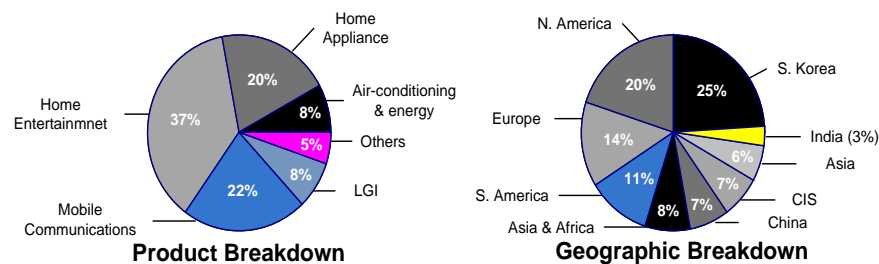
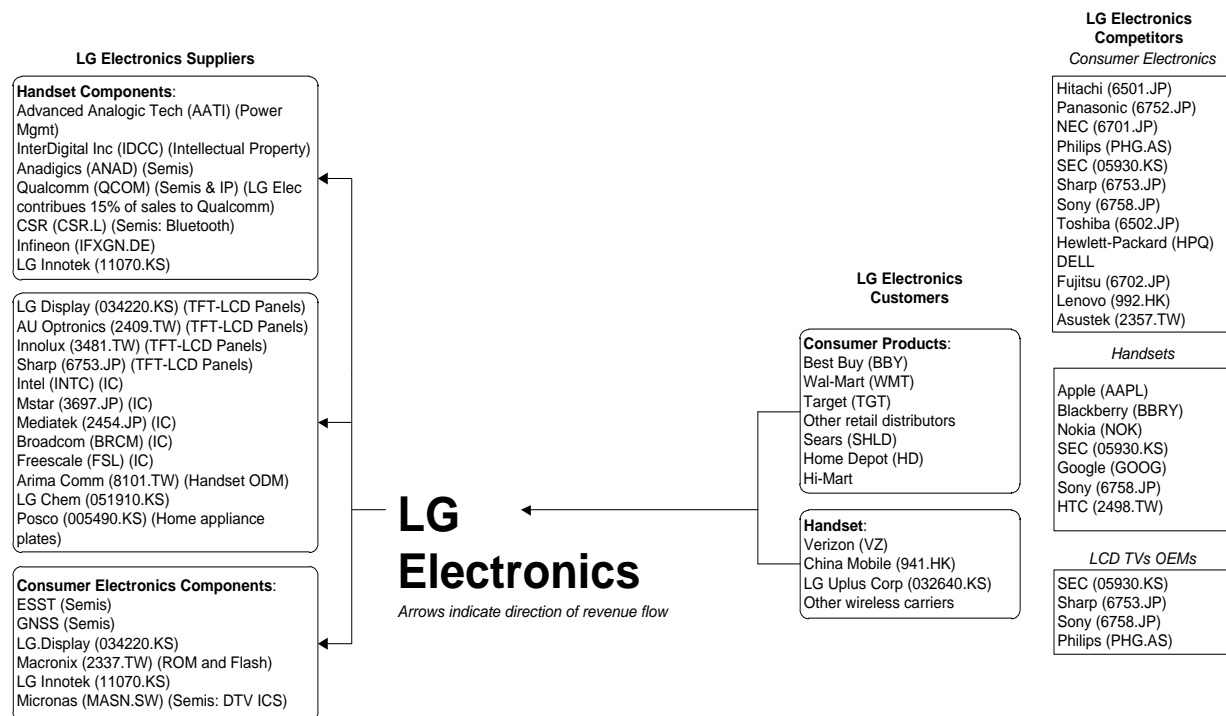
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 453. LG Electronics (66570.KS)

Sector: Diversified Technology

## LG Electronics (66570.KS)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## LG Innotek

Citi Analyst: Henry Kim, CFA

LG Innotek is an affiliate of the LG Group that manufactures electronic components.

Currently the company has four business units: LED, Optics Solution, Substrate & Material, and Automotive Components & Electronics. On July 1, 2009, LG Innotek merged with LG Micron to diversify its product portfolio and enhance economies of scale.

The company was founded in 1970 as Goldstar-Alps Electronics and listed in July 2008.

Figure 454. LG Innotek (011070.KS) Results and Forecasts

	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	4103500.0	4553018.8	5315900.0	6211500.0	6589662.5	6581809.0	6983493.1	7170432.0
- y/y growth	15.3%	11.0%	16.8%	16.8%	6.1%	6.0%	6.0%	8.9%
<b>Gross Margins</b>	12.5%	8.6%	10.6%	11.1%	12.4%		12.7%	
<b>Operating Margins</b>	3.9%	-1.0%	1.5%	2.2%	2.8%		3.4%	
<b>EPS</b>	10330.35	-7212.98	-1234.62	768.53	3705.81	4736.78	4798.53	8811.81
- y/y growth	166.4%	-169.8%	82.9%	162.2%	382.2%	516.3%	29.5%	86.0%
<b>Cash</b>	245241.0	435601.0	352807.0	400500.0	327201.2		414116.2	
<b>Debt</b>	1648829.0	2244761.0	2167732.0	2160300.0	1620400.0		1550400.0	
<b>Net Cash/Shr</b>	-62072.9	-55341.3	-56766.5	-55874.7	-36353.7		-29723.0	
<b>Tangible Book Value/Shr</b>	67017.4	59190.5	55703.9	56975.4	66581.2		72535.0	

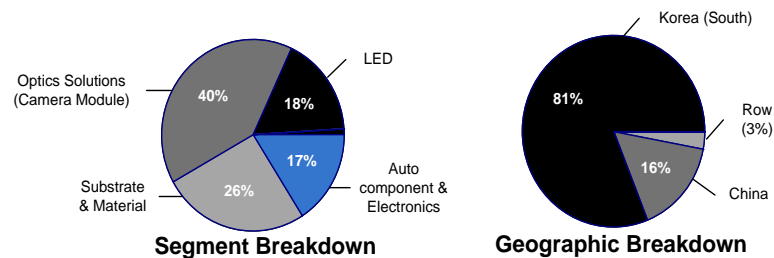
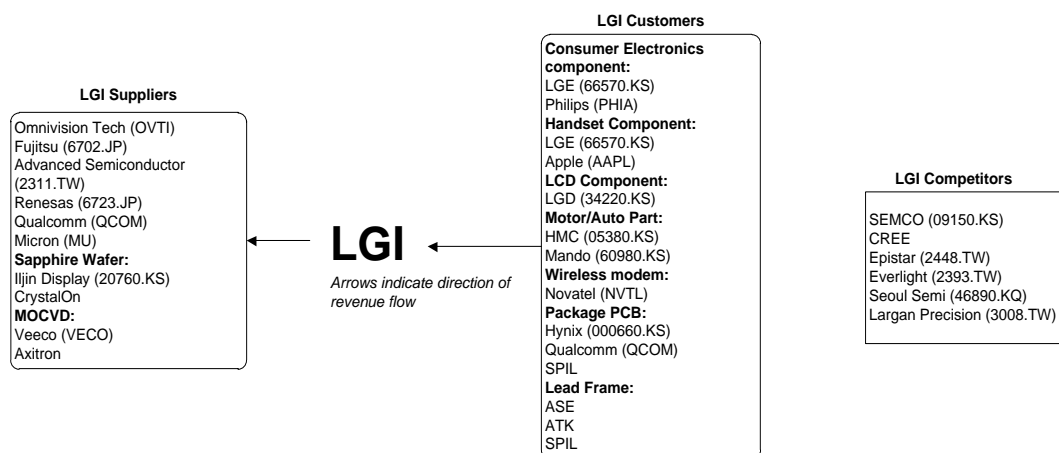
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 455. LG Innotek (011070.KS)

Sector: EMS

## LG Innotek (011070.KS)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Linear Technology

Citi Analyst: Terence Whalen

Linear Technology Corp. (LLTC) manufactures analog products across a range of horizontal and vertical markets including industrial (40%), networking (12% orders), automotive (16%), computing (13%), telecom (8%), handset (1%), consumer (3%), and satellite/military (6%).

Linear's product portfolio is anchored in power management 60%+ but is diversified across other device types like operational amplifiers, interface, data converters, and radio frequency. LLTC derives 50% of sales from third party distributors recognizing distributor revenue sell-through domestically and sell-in internationally.

Linear's margins structure is helped by market savvy management, proprietary products, price discipline, long revenue life products, horizontal market penetration, and efficient manufacturing.

LLTC produces 90%+ of its products internally and assembles and tests the bulk (80%-85%) of them as well. Manufacturing facilities are located in Sunnyvale, CA and Camas, WA. The company also uses third party fabs such as TSMC.

Competitors include Maxim Integrated Products, Analog Devices, and Texas Instruments. Linear's fiscal year ends in June.

Figure 456. Linear Technology (LLTC) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	968.5	1170.0	1484.0	1266.6	1282.2	1397.0	1390.2	1549.2	1526.1
<b>- y/y growth</b>	-17.6%	20.8%	26.8%	-14.6%	1.2%	8.9%	8.4%	10.9%	9.8%
<b>Gross Margins</b>	75.4%	77.0%	78.1%	75.3%	74.8%	75.8%		76.7%	
<b>Operating Margins</b>	43.0%	48.2%	52.1%	46.0%	44.7%	46.6%		49.3%	
<b>EPS</b>	1.34	1.61	2.43	1.71	1.71	1.89	1.93	2.38	2.26
<b>- y/y growth</b>	-22.0%	20.6%	50.7%	-29.6%	0.1%	10.3%	12.4%	26.2%	17.6%
<b>Cash</b>	868.7	958.1	922.5	1203.1	1524.7	1856.6		2237.6	
<b>Debt</b>	1405.6	767.0	785.7	805.6	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	-2.4	0.8	0.6	1.7	6.4	7.7		9.2	
<b>Tangible Book Value/Shr</b>	-1.5	-0.1	2.1	3.3	4.4	5.8		7.6	

(Revenues, Cash and Debt in Millions in Local Currency)

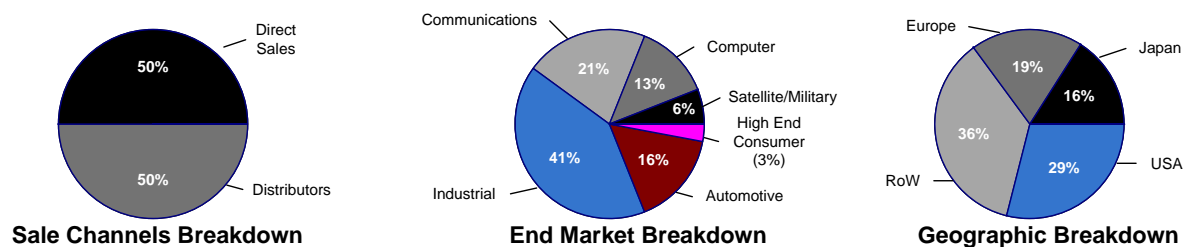
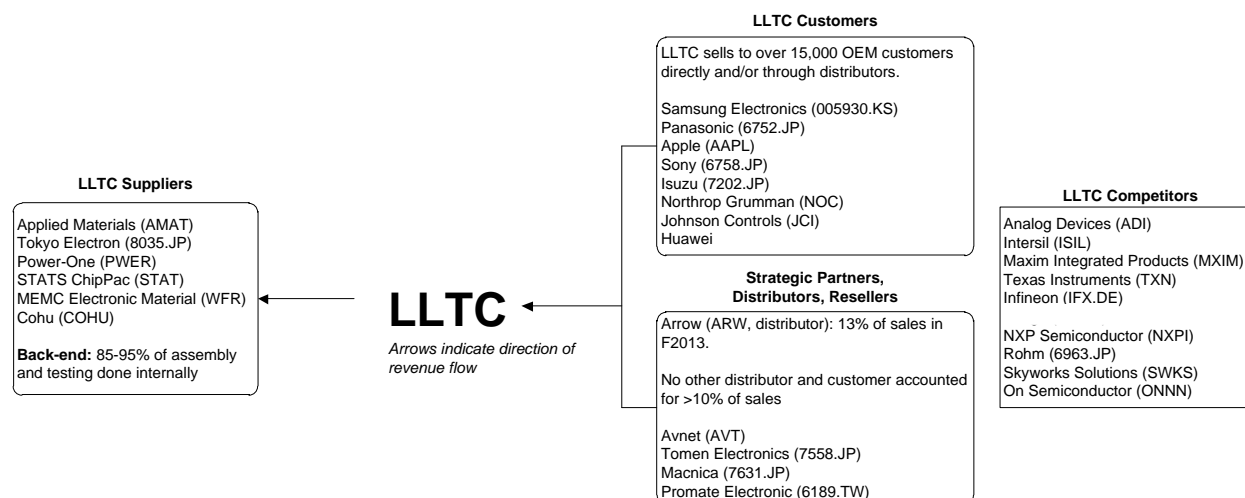
Source: Citi Research, Company Reports, FirstCall



Figure 457. Linear Technology (LLTC)

Sector: Semiconductors

## Linear Technology (LLTC)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Mabuchi Motor

Citi Analyst: Yuta Fukasawa

Mabuchi Motor makes an extensive range of small motors and commands a high share of many motor markets, with a strong presence, for instance, in the fistsize DC brush motor market.

The company's competitiveness stems from its standardization strategy-derived cost competitiveness. Its standardization strategies involve: 1) the standardization of products by streamlining its product range after narrowing down customer needs, 2) the subsequent standardization of parts, processes, production equipment, and operations, and 3) profitability improvements through the stabilization of operating rates and the lowering of reject rates through planned production. In relation to the standardization of products, market share growth is vital. In relation to (2) and (3), by aiming to achieve the theoretically lowest possible cost level, costs can be reduced to a level that other companies cannot attain.

The company's four main segments are automotive products, audio & visual equipment, optical & precision equipment, and home & industrial equipment. CD drive motors were previously the main earnings driver in the audio & visual equipment segment, but the rise of the MP3 player has dampened demand greatly.

Growth in shipments of motors used in consumer electronics has generally declined in the post-Lehman collapse era. However, Mabuchi Motor has increased its focus on automotive motors, and through the rigorous implementation of its standardization strategies, automotive motors have steadily become the main earnings driver.

Figure 458. Mabuchi (6592.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	70369.0	82752.0	78886.0	85254.0	108401.0	118700.0	117808.0	130400.0	126023.0
- y/y growth	-24.0%	17.6%	-4.7%	8.1%	27.2%	9.5%	8.7%	9.9%	7.0%
<b>Gross Margins</b>	26.4%	27.4%	24.1%	24.7%	24.8%	26.5%		25.9%	
<b>Operating Margins</b>	4.3%	8.0%	3.9%	5.9%	8.6%	11.0%		11.7%	
<b>EPS</b>	155.54	150.25	-13.28	182.31	300.21	279.66	294.09	336.74	332.15
- y/y growth	64.0%	-3.4%	-108.8%	1472.6%	64.7%	-6.8%	-2.0%	20.4%	12.9%
<b>Cash</b>	85554.0	85253.0	77998.0	91746.0	113166.0	110261.9		111104.1	
<b>Debt</b>	0.0	0.0	0.0	0.0	510.0	510.0		510.0	
<b>Net Cash/Shr</b>	2441.7	2433.4	2227.8	2618.7	3218.1	3135.2		3159.2	
<b>Tangible Book Value/Shr</b>	4099.4	4157.2	4210.0	4530.1	5491.5	5610.2		5761.8	

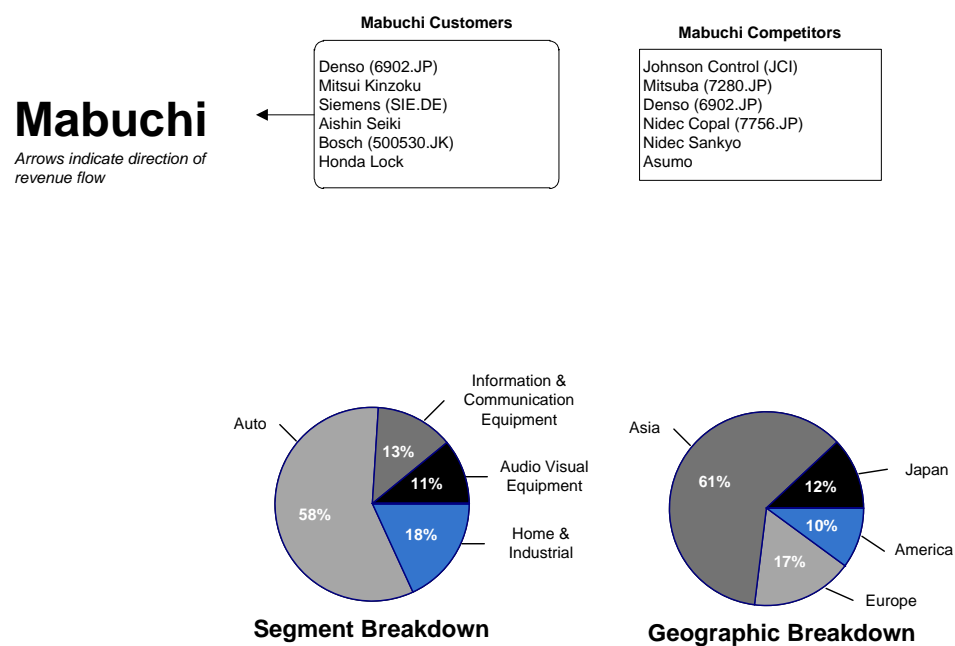
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 459. Mabuchi (6592.JP)

Sector: Electronic Components & Equipment

## Mabuchi Motor (6592.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## MagnaChip Semiconductor Corp.

Citi Analyst: Terence Whalen

Magnachip is a Korean-based analog and mixed-signal vendor of display products (37% sales), power products (15% sales), and foundry services (48% sales). The company focuses on high-volume consumer products including consumer electronics, TVs, cell phones, notebooks and tablets.

Magnachip operates on a hybrid model with a traditional semiconductor business that designs, manufactures, and sells merchant chips and a foundry service business that fabricates chips for other fabless companies. The company has three manufacturing facilities in Korea where it fabricates majority of its products.

Magnachip originated as part of LG Electronic's semiconductor division and evolved into Hynix's analog mixed-signal division before it spun off in 2004. Magnachip completed its initial public offering in March 2011.

Magnachip's top five customers in 2011 include LG Display, Cirrus Logic, SiliconWorks, Sitronix, and Elan.

Magnachip is headquartered in Seoul, Korea, and has offices in Sunnyvale, California. Magnachip's fiscal year ends 12/31.

Figure 460. MagnaChip Semiconductor Corp (MX) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	560.1	770.4	772.8	819.6	836.4	848.4	850.3	888.5	873.7
- y/y growth		37.6%	0.3%	6.1%	2.0%	1.4%	1.7%	4.7%	2.8%
<b>Gross Margins</b>	28.3%	31.6%	30.3%	32.2%	32.0%	31.7%		32.5%	
<b>Operating Margins</b>	11.1%	15.0%	12.6%	13.9%	13.2%	12.5%		13.8%	
<b>EPS</b>	0.53	2.17	1.62	2.09	2.24	2.14	2.19	2.51	2.29
- y/y growth		311.2%	-25.6%	28.8%	7.3%	-4.5%	-2.3%	17.6%	4.9%
<b>Cash</b>	64.9	172.2	168.9	182.4	192.4	229.3		289.0	
<b>Debt</b>	61.1	246.9	201.4	201.7	223.9	223.9		223.9	
<b>Net Cash/Shr</b>	0.1	-1.9	-0.8	-0.5	-0.9	0.1		1.8	
<b>Tangible Book Value/Shr</b>	4.3	3.6	3.9	8.2	9.6	12.2		15.0	

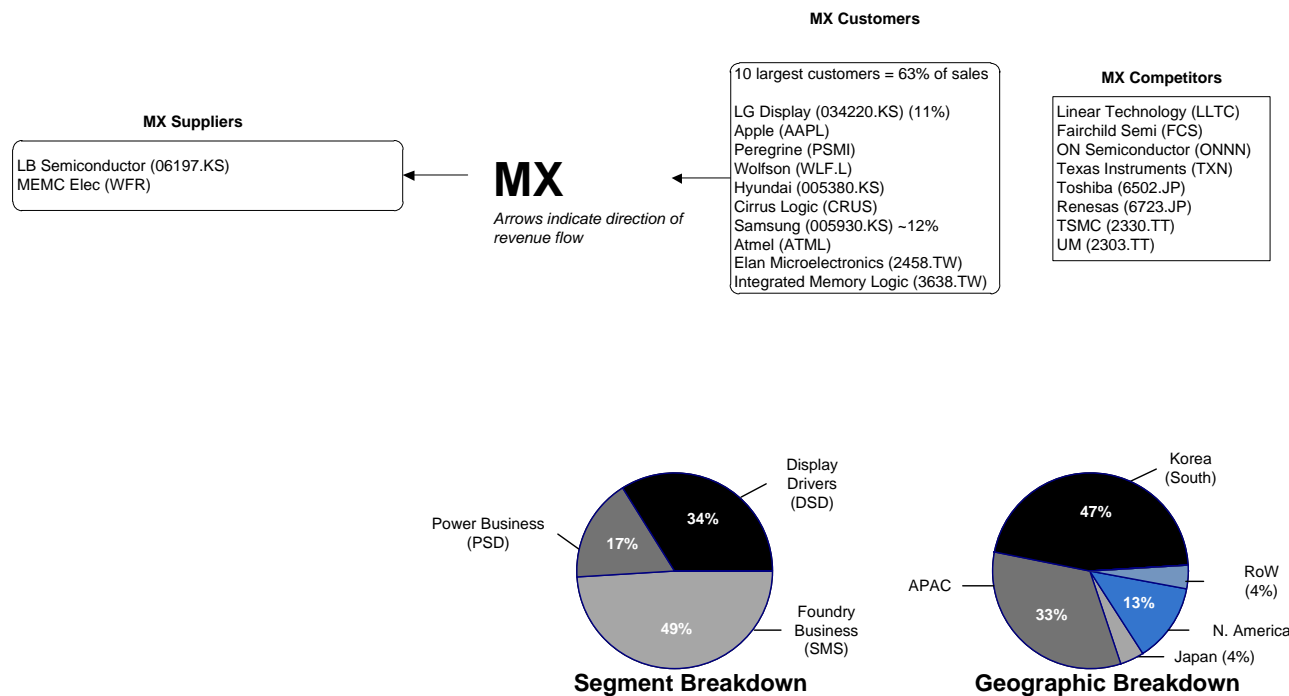
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 461. MagnaChip Semiconductor Corp (MX)

Sector: Semiconductor

## MagnaChip Semiconductor Corp. (MX)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Marvell

Citi Analyst: Glen Yeung

Marvell is a fabless semiconductor provider of high-performance application-specific standard products. It is one of the largest fabless semiconductor companies in the world behind Qualcomm, Broadcom and Nvidia.

The company's core strength is the design and development of complex system-on-a-chip (SoC) solutions, leveraging its technology portfolio of intellectual property in the area of analog, mixed-signal, digital signal processing, and embedded ARM-based microprocessor integrated circuits.

Nearly half of Marvell's revenues come from the storage market, where they maintain a leading share at top storage OEMs. Approximately a quarter of Marvell's sales comes from Networking (PON, Ethernet, Embedded), where Marvell participates in the data center market.

Marvell's mobile and wireless segment (approx. a quarter of sales) came via their acquisition in 2006 of Intel's x-Scale processor division and was the primary driver of growth, namely benefiting from RIMM (Blackberry), which was a major customer of Marvell's communications processor business.

Marvell has about 5,000 employees globally and is incorporated in Bermuda with a U.S. operating office in Santa Clara, California.

Figure 462. Marvell (MRVL) Results and Forecasts

	2010	2011	2012	2013	2014	CIR 2015E	Street 2015E	CIR 2016E	Street 2016E
<b>Revenues</b>	2807.7	3611.9	3393.0	3168.6	3404.4	3675.1	3746.2	3746.2	3931.7
- y/y growth	-3.0%	28.6%	-6.1%	-6.6%	7.4%	8.0%	10.0%	1.9%	5.0%
<b>Gross Margins</b>	56.3%	59.2%	56.8%	52.9%	51.4%	50.5%		50.9%	
<b>Operating Margins</b>	14.5%	25.0%	17.8%	9.3%	8.5%	9.7%		10.6%	
<b>EPS</b>	0.99	1.64	1.27	0.86	1.03	1.05	1.07	1.13	1.18
- y/y growth	122.4%	65.6%	-22.5%	-32.1%	20.2%	1.3%	3.7%	8.1%	10.0%
<b>Cash</b>	1796.7	2930.0	2246.5	1919.0	1969.4	2316.8		2847.3	
<b>Debt</b>	2.5	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	2.7	4.3	3.6	3.3	3.8	4.4		5.4	
<b>Tangible Book Value/Shr</b>	3.5	5.2	4.9	4.5	5.1	5.7		6.7	

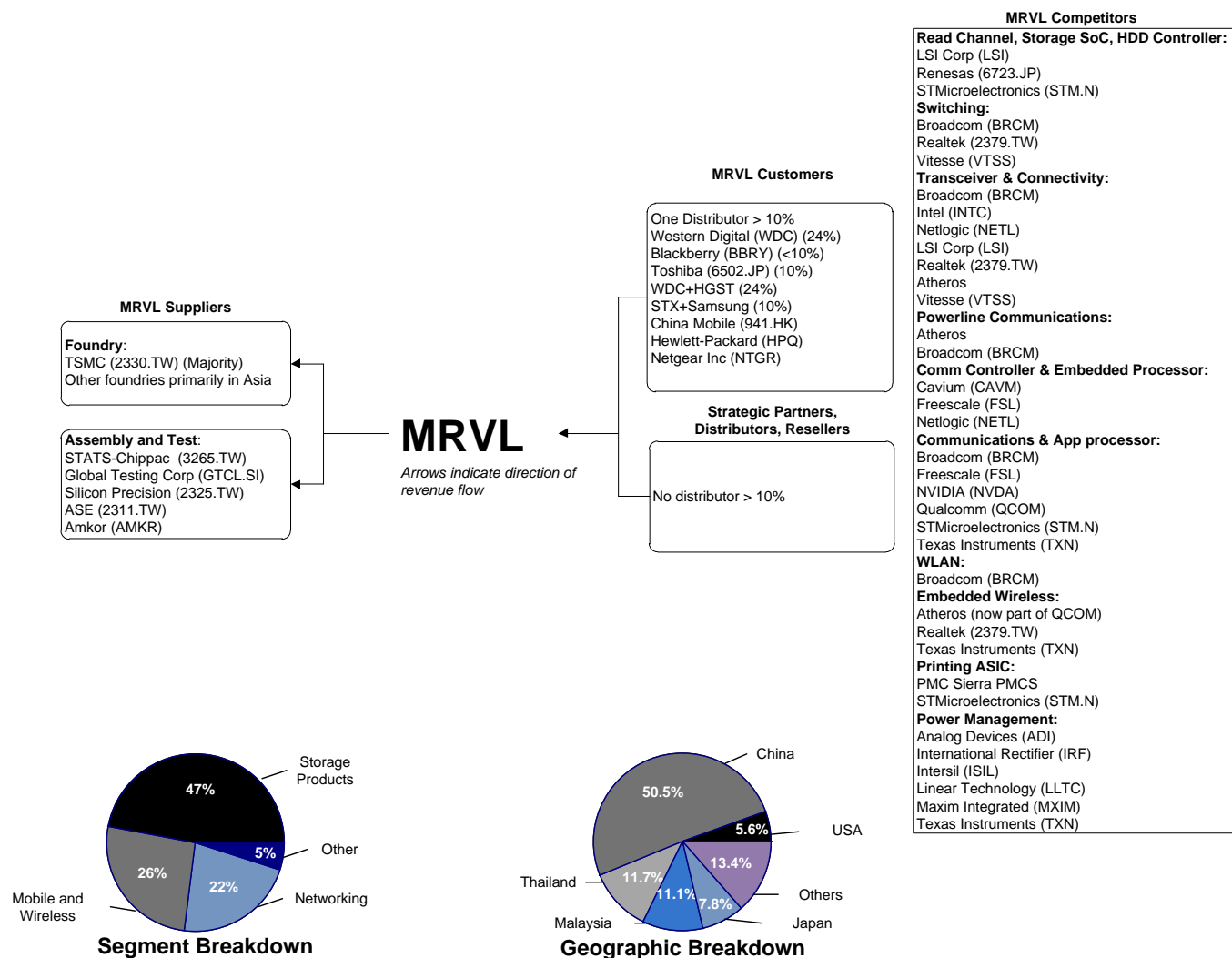
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 463. Marvell (MRVL)

Sector: Semiconductors

## Marvell (MRVL)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Maxim Intergrated

Citi Analyst: Terence Whalen

Maxim Integrated Products (MXIM) manufactures analog mixed-signal circuits for a wide range of markets, including industrial, automotive, computing, wireless, and wireline applications. Sales are spread across consumer (41%), industrial (26%), computing (16%) and communications (19%).

Maxim has a broad base of customers and a diversified product portfolio that leverages precision analog and digital capabilities together into proprietary mixed-signal parts.

Manufacturing facilities are located in San Jose, California; Beaverton, Oregon; and San Antonio, Texas. Maxim's fiscal year ends 6/30.

Figure 464. Maxim Integrated Products (MXIM) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1646.0	1997.6	2472.3	2403.5	2441.5	2451.9	2449.3	2670.5	2670.8
- <i>y/y growth</i>	-19.8%	21.4%	23.8%	-2.8%	1.6%	0.4%	0.3%	8.9%	9.0%
<b>Gross Margins</b>	51.6%	59.7%	61.9%	60.4%	61.3%	56.8%		59.0%	
<b>Operating Margins</b>	14.6%	24.7%	30.3%	25.6%	27.5%	24.3%		27.3%	
<b>EPS</b>	0.56	1.07	1.72	1.59	1.76	1.55	1.63	1.95	2.00
- <i>y/y growth</i>	-49.3%	90.3%	60.8%	-7.5%	10.8%	-11.7%	-7.2%	25.4%	22.7%
<b>Cash</b>	913.4	826.5	1012.9	956.4	1200.0	1192.9		1247.2	
<b>Debt</b>	0.0	300.0	300.0	309.1	505.6	1003.8		1003.8	
<b>Net Cash/Shr</b>	2.9	1.7	2.4	3.2	2.3	0.7		0.9	
<b>Tangible Book Value/Shr</b>	8.5	6.6	6.6	6.1	6.2	4.3		4.2	

(Revenues, Cash and Debt in Millions in Local Currency)

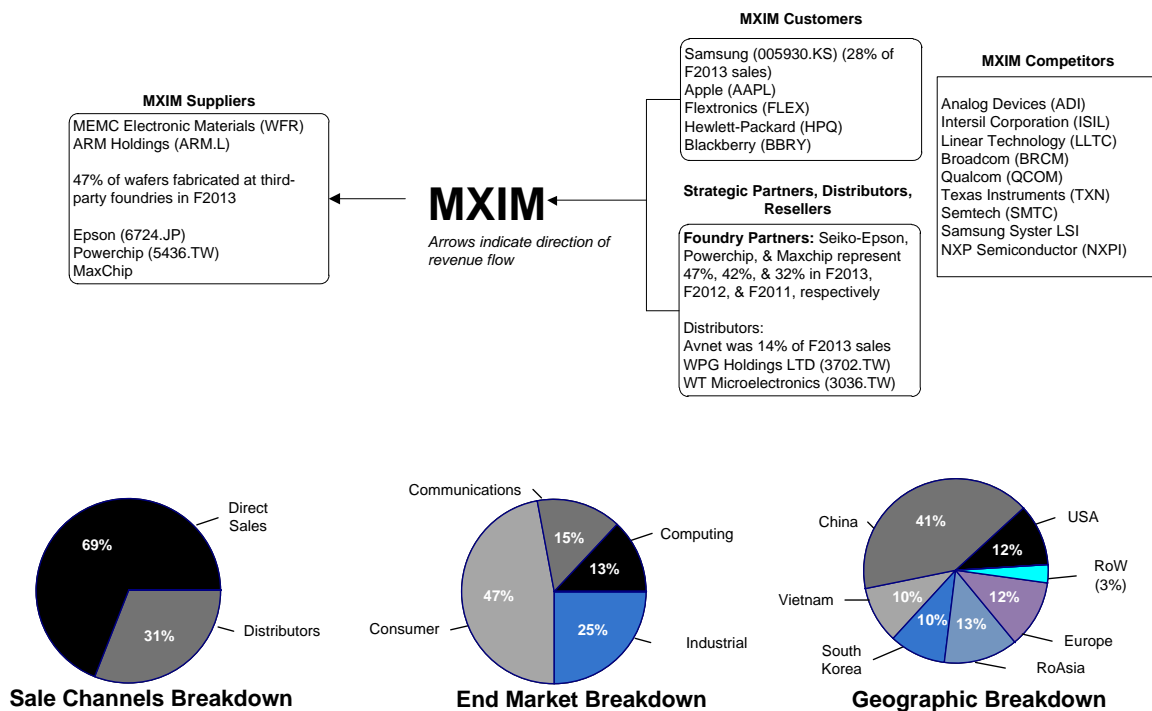
Source: Citi Research, Company Reports, FirstCall



Figure 465. Maxim Integrated Products (MXIM)

Sector: Semiconductors

## Maxim Integrated Products, Inc. (MXIM)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## MediaTek

Citi Analyst: Roland Shu

MTK (MTK) is a fabless IC company which designs products for mobile handsets, compact disk players (DVD-RW, CD-RW, CD-ROM, DVD-ROM), DVD players, and digital televisions.

The company has sales and research subsidiaries in Mainland China, Singapore, India, the US, Japan, Korea, Denmark, and England. It primarily sells its products in China and exports to emerging-market countries.

MediaTek was founded in 1997, is listed on the Taiwan Stock Exchange, and has its headquarters in Taiwan.

Figure 466. MediaTek (2454.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	115511.6	113522.0	86857.5	99263.2	136056.0	181781.2	188142.3	179401.3	214457.0
- <i>y/y growth</i>	27.8%	-1.7%	-23.5%	14.3%	37.1%	33.6%	38.3%	-1.3%	14.0%
<b>Gross Margins</b>	58.7%	53.7%	45.3%	41.4%	44.0%	44.5%		42.8%	
<b>Operating Margins</b>	31.5%	27.4%	14.2%	12.6%	18.6%	18.5%		17.1%	
<b>EPS</b>	33.86	28.26	12.25	12.82	20.48	21.17	26.11	19.15	29.14
- <i>y/y growth</i>	88.0%	-16.5%	-56.7%	4.7%	59.7%	3.4%	27.5%	-9.5%	11.6%
<b>Cash</b>	96847.3	92073.0	91032.3	90276.1	139219.0	140135.1		143872.5	
<b>Debt</b>	0.0	0.0	4254.9	9023.2	29145.5	29145.5		29145.5	
<b>Net Cash/Shr</b>	89.3	84.0	81.7	73.7	103.5	90.7		92.0	
<b>Tangible Book Value/Shr</b>	100.4	102.0	104.5	143.7	145.3	137.0		139.9	

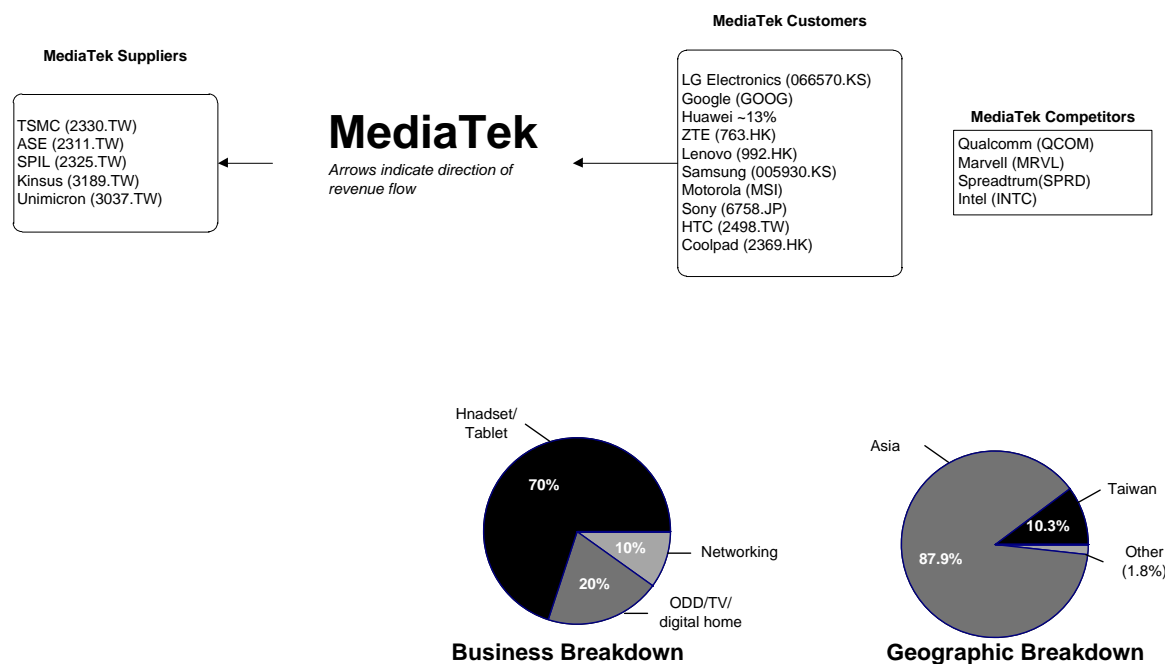
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 467. MediaTek (2454.TW)

Sector: Semiconductors

MediaTek (2454.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Meyer Burger Technology AG

Citi Analyst: Jason Channell

Meyer Burger is a leading supplier of equipment to the solar manufacturing industry specializing in precision wire saws to cut silicon into ingots and wafers, having over 50% market share.

The acquisition of Roth & Rau has broadened its product offering to cover cell and module manufacturing equipment.

Figure 468. Meyer Burger Technology AG (MBTN.CH) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	420.9	826.0	1315.0	645.2	410.0	615.0	486.0	738.0	718.6
- <i>y/y growth</i>	-7.6%	96.2%	59.2%	-50.9%	-36.5%	50.0%	18.5%	20.0%	47.9%
<b>Gross Margins</b>	9.8%	15.5%	8.9%	-21.0%	-35.5%	-8.0%		1.0%	
<b>Operating Margins</b>	9.9%	15.6%	15.1%	-19.6%	-35.5%	-8.0%		1.0%	
<b>EPS</b>	0.79	1.83	2.15	-1.79	-1.39	-0.48	-0.78	0.01	0.29
- <i>y/y growth</i>	-26.9%	131.4%	17.5%	-183.2%	22.3%	65.7%	44.0%	101.4%	137.7%
<b>Cash</b>	96.6	393.5	260.2	134.5	300.7	237.5		264.5	
<b>Debt</b>	82.9	0.9	9.9	133.8	133.8	133.8		133.8	
<b>Net Cash/Shr</b>	1.0	7.3	4.4	0.0	2.1	1.2		1.6	
<b>Book Value/Shr</b>	1.3	4.5	3.4	2.5	3.0	3.0		3.4	

(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 469. Meyer Burger Technology AG (MBTN.CH)

Sector: Alternative Energy

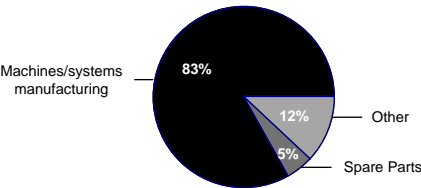
Meyer Burger Technology AG (MBTN.CH)

**MBTN.CH**

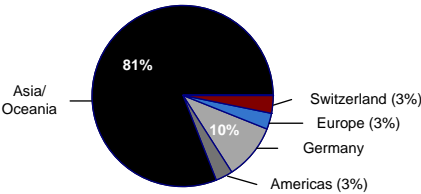
Arrows indicate direction of revenue flow

**Meyer Burger Competitors**

Applied Materials (AMAT)  
GT Solar  
Centrotherm (CTN.DE)  
Manz (M5Z.DE)  
Roth & Rau (R8R.DE)



Segment Breakdown



Geographic Breakdown

Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Microchip Technology

Citi Analyst: Terence Whalen

Microchip Technology (MCHP) designs and manufactures semiconductors for a variety of horizontal (industrial, medical, consumer appliance) and vertical (automotive, consumer electronic) markets.

Eighty percent of sales are microcontrollers, embedded devices that combine analog circuitry with basic memory and processing capability. The bulk of controllers are 8-bit (59% sales estimated) with a faster growing 16-bit business (8.5% sales estimated) and a nascent 32-bit lineup. Outside of controllers, Microchip has ancillary businesses in EEPROM & Flash memory (13%), and analog and mixed signal interface circuits (12.4%).

Microchip manufactures 95%+ of its products internally and recognizes 65% of sales through distributors using conservative sell-through recognition.

Microchip acquired analog TelCom Semiconductor in 2001, microcontroller PowerSmart in 2002, touch screen controller Hampshire Company in 2008, bid unsuccessfully for Atmel Semiconductor in 2008, and recently acquired SST.

Microchip was spun out of electronics conglomerate General Instruments and initially offered shares to the public in 1993. Microchip's fiscal year ends in March.

Figure 470. Microchip Technology (MCHP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	903.3	947.7	1450.9	1383.2	1606.1	1927.4	1927.9	2159.3	2092.2
- y/y growth		4.9%	53.1%	-4.7%	16.1%	20.0%	20.0%	12.0%	8.5%
<b>Gross Margins</b>	57.2%	56.4%	59.7%	57.3%	53.1%	58.4%		60.4%	
<b>Operating Margins</b>	26.6%	26.4%	33.9%	29.6%	24.9%	28.7%		31.6%	
<b>EPS</b>	1.11	1.13	2.18	1.72	1.63	2.20	2.42	2.66	2.71
- y/y growth		2.1%	92.9%	-20.9%	-5.3%	34.8%	48.1%	20.9%	12.1%
<b>Cash</b>	1389.9	1214.3	1243.5	1459.0	1578.6	1374.0		1739.9	
<b>Debt</b>	1149.2	340.7	347.3	355.1	983.4	1019.5		1019.5	
<b>Net Cash/Shr</b>	1.3	4.7	4.6	5.4	2.9	1.7		3.3	
<b>Tangible Book Value/Shr</b>	5.1	8.0	9.1	9.9	6.2	7.5		9.0	

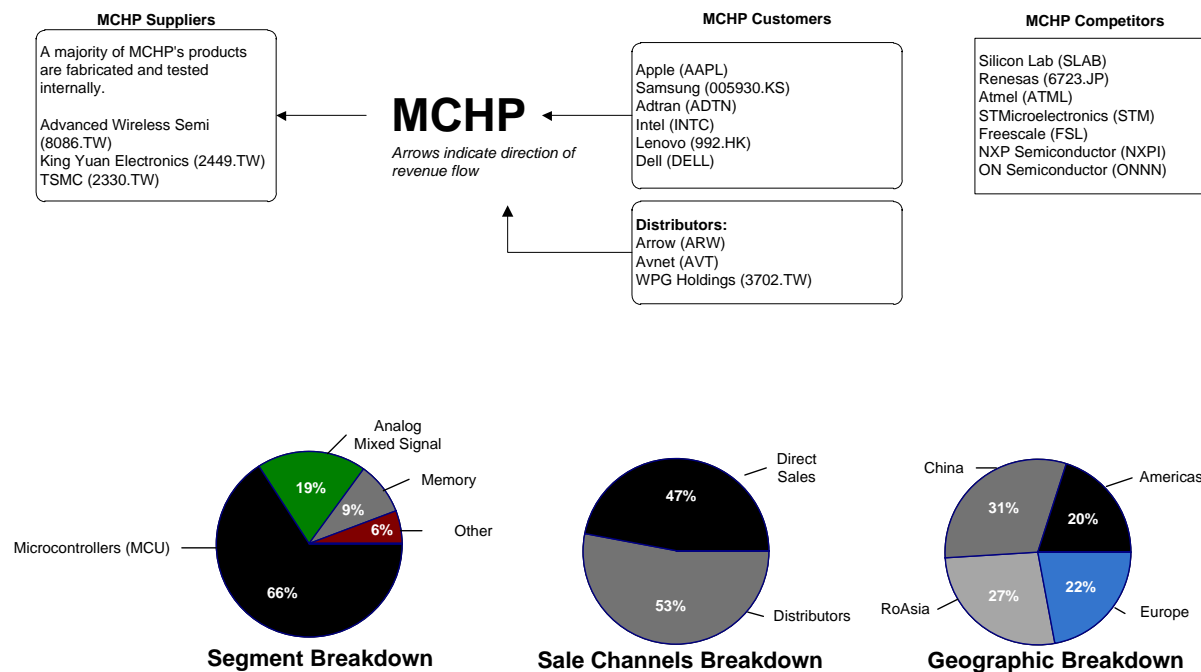
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 471. Microchip Technology (MCHP)

Sector: Semiconductors

## Microchip Technology (MCHP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Micron

Citi Analyst: Glen Yeung

Micron Technology (MU) is the fourth-largest WW manufacturer of Dynamic Random Access Memory (DRAM) with ~13% market share.

Approximately 38% of Micron's revenues are from DRAM sales (PC DRAM & Specialty DRAM). Micron is the third-largest manufacturer of NAND Flash (~45% of sales), with NOR flash accounting for ~11% of sales from its acquisition of Numonyx. Micron also manufactures CMOS image sensors for Aptina under a wafer supply agreement (~6% of sales), and is a ~30% owner of Inotera (although taking more than 50% of wafers due to additional equity investment), and 50% owner of both MeiYa and Transform.

Micron partnered with Intel in Jan 2006 to form a NAND Flash manufacturing joint venture, IM Flash Technologies (IMFT). Under the updated agreement with Intel, Micron will own Intel's prior portion of the fab in Manassas, and IM Flash Singapore, with continued shared ownership of the Lehi, Utah fab (Micron 51% ownership).

In June 2006, Micron acquired Lexar Media, a manufacturer of Flash memory products.

DRAM, NAND, and NOR prices are a function of supply and demand, and are subject to extreme volatility, impacting revenues and operating profitability.

Figure 472. Micron (MU) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	4803.0	8482.0	8788.0	8234.0	9073.0	16014.8	16014.3	16385.6	16634.4
<b>- y/y growth</b>	-17.8%	76.6%	3.6%	-6.3%	10.2%	76.5%	76.5%	2.3%	3.9%
<b>Gross Margins</b>	-9.1%	32.0%	20.0%	11.8%	20.4%	36.4%		42.6%	
<b>Operating Margins</b>	-32.5%	18.7%	4.2%	-7.5%	1.9%	21.4%		28.8%	
<b>EPS</b>	-2.32	1.76	0.16	-1.04	-0.28	2.26	2.96	3.26	2.96
<b>- y/y growth</b>	-10.8%	175.9%	-90.8%	-738.8%	73.1%	907.3%	1158.6%	44.3%	0.1%
<b>Cash</b>	1485.0	2913.0	2160.0	2559.0	3101.0	5439.2		8974.2	
<b>Debt</b>	2803.0	2360.0	2001.0	3262.0	6037.0	4943.0		4743.0	
<b>Net Cash/Shr</b>	-1.1	1.2	0.3	-0.5	-1.3	1.7		4.8	
<b>Tangible Book Value/Shr</b>	5.8	8.7	8.2	7.4	8.6	14.2		21.1	

(Revenues, Cash and Debt in Millions in Local Currency)

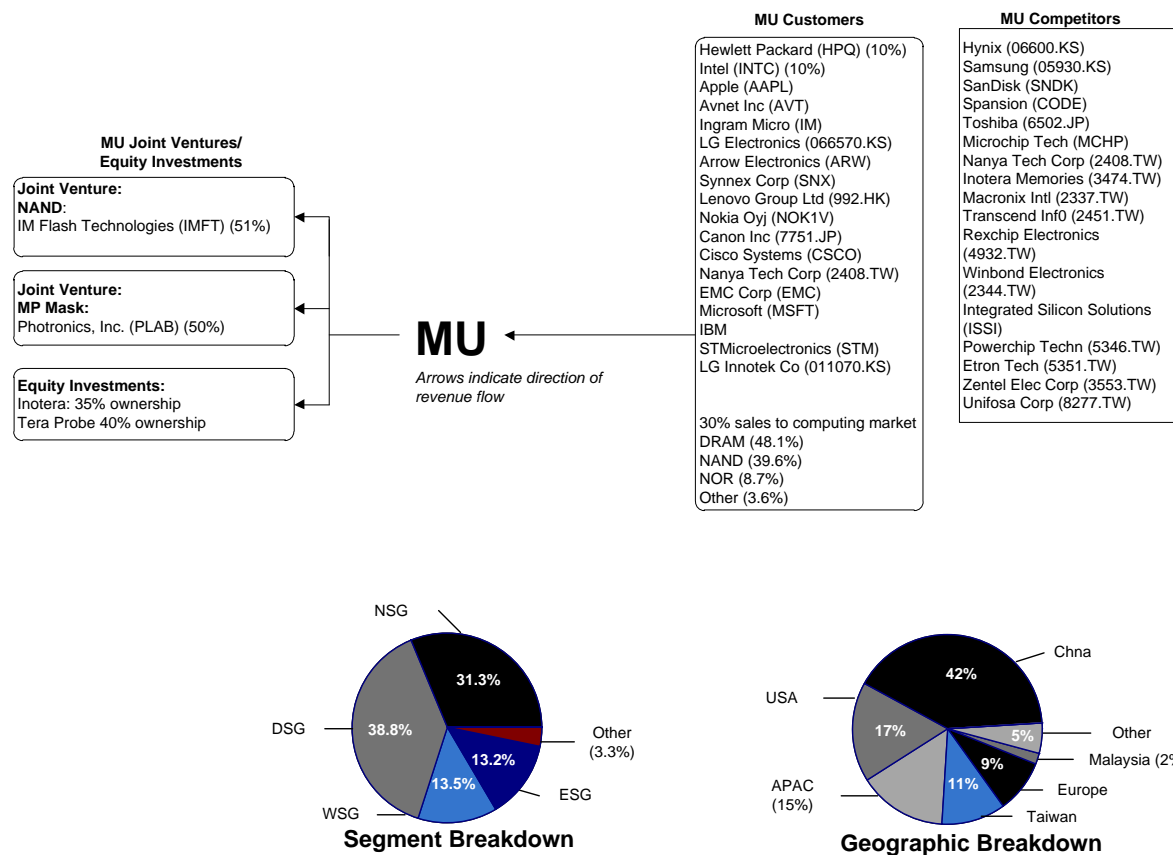
Source: Citi Research, Company Reports, FirstCall



Figure 473. Micron (MU)

Sector: Semiconductors

## Micron (MU)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Mitsubishi Electric

Citi Analyst: Kota Ezawa

Mitsubishi Electric is an industrial electronics firm producing everything from semiconductors and home appliances (air-conditioners, TVs) to social infrastructure and industrial machinery.

Quick to dispose of unprofitable businesses like DRAM and mobile phones, MELCO's business portfolio is solid. Appealing points include a stable social infrastructure business, high margins in industrial automation systems (FA and automotive equipment), and growth potential for power semiconductors.

MELCO cooperates with MHI in the area of social infrastructure (electric power equipment). MHI manages projects while MELCO supplies generating equipment, and a lack of project risk means stable earnings for MELCO.

Many of MELCO's FA products boast high market shares (sequencers, servo motors, inverters), so margins are high too.

MELCO is the global leader in IGBTs (share of about 30%), a power semiconductor. IGBTs are eco-friendly devices that should benefit from increased use of inverters in air-conditioners and the growing popularity of eco-friendly vehicles.

Figure 474. Mitsubishi Electric (6503.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	3665119.0	3353298.0	3645331.0	3639468.0	3567184.0	3881000.0	3950381.0	4013000.0	4090459.0
- y/y growth	-9.5%	-8.5%	8.7%	-0.2%	-2.0%	8.8%	10.7%	3.4%	3.5%
<b>Gross Margins</b>	26.0%	25.3%	28.0%	27.8%	27.0%	28.4%		29.3%	
<b>Operating Margins</b>	3.8%	2.8%	6.4%	6.2%	4.3%	5.9%		6.8%	
<b>EPS</b>	5.67	13.18	58.00	52.20	32.38	67.72	67.63	85.13	78.99
- y/y growth	-92.3%	132.5%	340.0%	-10.0%	-38.0%	109.1%	108.9%	25.7%	16.8%
<b>Cash</b>	358616.0	391118.0	472067.0	392181.0	298881.0	425000.0		482000.0	
<b>Debt</b>	677864.0	537500.0	484352.0	542291.0	540572.0	440000.0		440000.0	
<b>Net Cash/Shr</b>	-3.9	-8.1	88.7	23.5	-3.2	76.8		103.4	
<b>Tangible Book Value/Shr</b>	223.4	308.5	358.3	426.5	494.0	630.1		707.9	

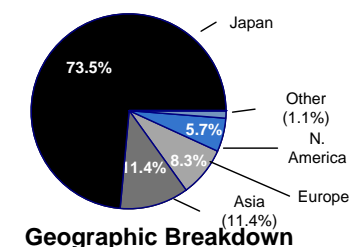
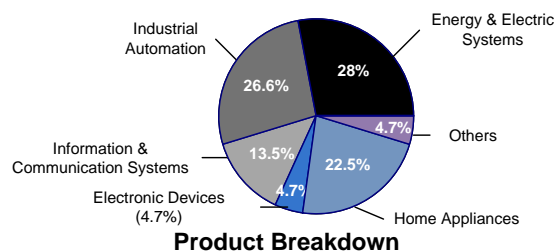
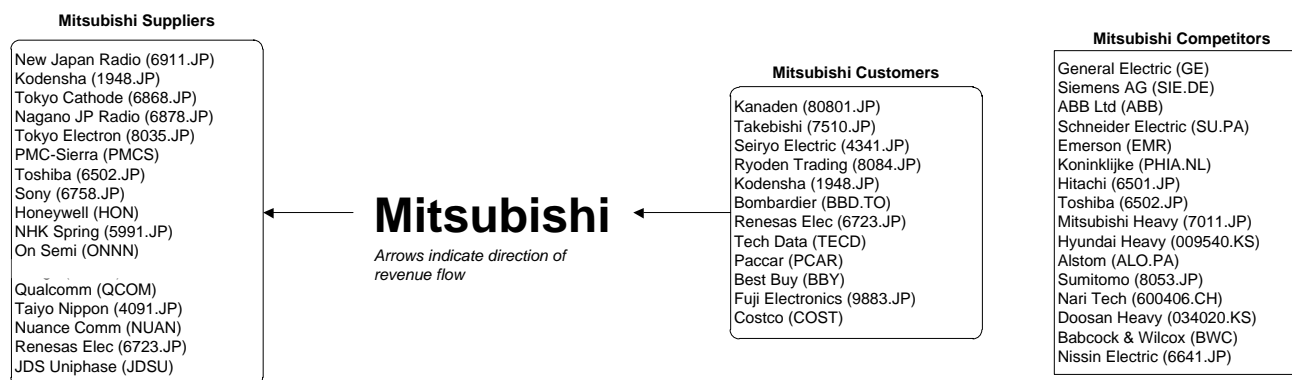
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 475. Mitsubishi Electric (6503.JP)

Sector: Technology - General

## Mitsubishi Electric (6503.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Mitsumi Electric

Citi Analyst: Yuta Fukasawa

Mitsumi Electric Co., Ltd. engages in the manufacture and sale of electrical components and telecommunications equipment.

The company's products include electronic parts, semiconductor devices, mechanical parts, measurement equipment, optical products, medical and hygienic equipment, metals, and ceramics.

The company was founded on April 16, 1949 and is headquartered in Tama, Japan.

Figure 476. Mitsumi Electric (6767.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	247734.0	207536.0	187418.0	167207.0	152098.0	156805.0	159345.0	172600.0	168617.0
- <i>y/y growth</i>	-18.0%	-16.2%	-9.7%	-10.8%	-9.0%	3.1%	4.8%	10.1%	5.8%
<b>Gross Margins</b>	14.4%	11.4%	4.0%	1.8%	4.0%	6.8%		8.3%	
<b>Operating Margins</b>	8.4%	4.5%	-2.7%	-5.0%	-2.9%	0.1%		2.1%	
<b>EPS</b>	127.57	67.50	-40.50	-324.01	-132.00	15.81	10.05	27.44	32.76
- <i>y/y growth</i>	-54.3%	-47.1%	-160.0%	-700.0%	59.3%	112.0%	107.6%	73.5%	225.9%
<b>Cash</b>	38955.0	57247.0	45115.0	58178.0	45907.0	48811.7		43454.9	
<b>Debt</b>	7242.0	5675.0	5072.0	5013.0	5737.0	6428.0		6428.0	
<b>Net Cash/Shr</b>	445.4	654.6	515.9	665.3	524.9	558.2		496.9	
<b>Tangible Book Value/Shr</b>	1673.8	1698.5	1596.1	1246.7	1160.3	1211.7		1229.1	

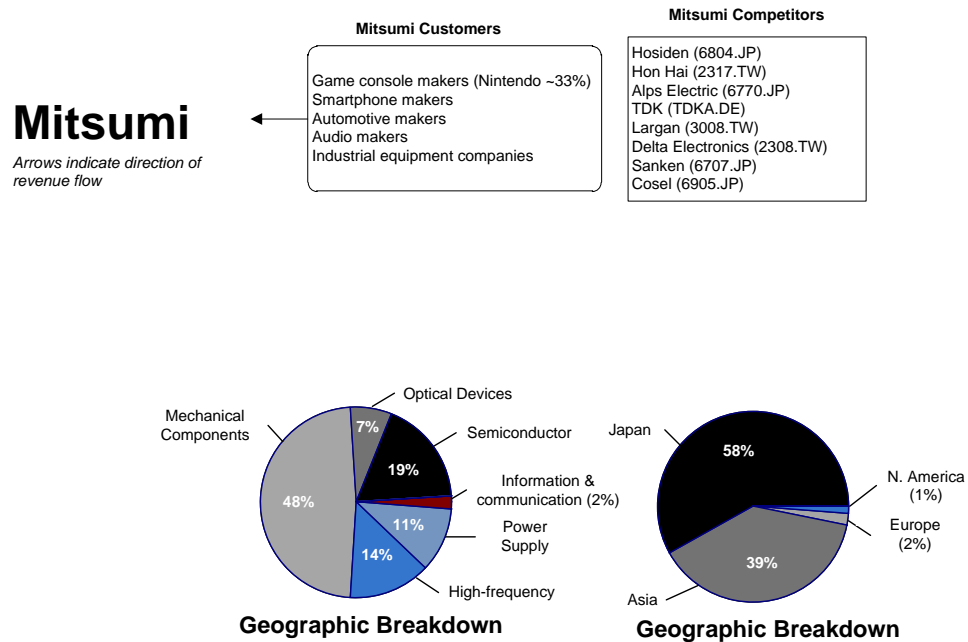
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 477. Mitsumi Electric (6767.JP)

Sector: Electronic Components

## Mitsumi Electric (6767.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Motorola Solutions (MSI)

Citi Analyst: Ehud Gelblum, Ph.D

Motorola Solutions is a leading provider of mission-critical communication infrastructure, devices, software and services.

The company operates in two businesses - government and enterprise.

- The government business (\$6B in sales in 2013) sells public safety radio systems (product names: ASTRO and TETRA) and professional and commercial radio systems (MOTOTRBO). MSI has deployed over 10,000 radio systems in over 100 different countries.
- The enterprise business (\$2.7B in sales in 2013) sells rugged and enterprise-grade mobile computers and tablets, laser/imaging/RFID based data capture devices, and WLAN products, mostly into the retail, transportation and logistics, manufacturing, and utilities verticals.

Major competitors include Harris (HRS) and Cassidian (a unit of European aeronautic defense and space company EADS) for radio systems, and Honeywell, Datalogic, Bluebird, and smartphone and tablet OEMs for enterprise products.

MSI targets 18.5% operating margin and plans to reach a net debt position in 2014.

Figure 478. Motorola Solutions (MSI) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	N/A	7617.0	8203.0	8698.0	8696.0	8801.3	8765.0	9093.2	9107.4
<b>- y/y growth</b>	N/A	N/A	7.7%	6.0%	0.0%	1.2%	0.8%	3.3%	3.9%
<b>Gross Margins</b>	N/A	50.5%	50.9%	50.4%	49.3%	49.3%		49.8%	
<b>Operating Margins</b>	N/A	9.9%	10.5%	14.5%	14.0%	16.6%		17.5%	
<b>EPS</b>	N/A	1.86	2.61	3.20	4.73	4.05	4.00	4.85	4.51
<b>- y/y growth</b>	N/A	N/A	40.7%	22.6%	47.9%	-14.6%	-15.6%	20.0%	12.9%
<b>Cash</b>	N/A	8863.0	5091.0	3603.0	3227.0	1663.8		1916.5	
<b>Debt</b>	N/A	2703.0	1535.0	1863.0	2461.0	2462.0		3462.0	
<b>Net Cash/Shr</b>	N/A	20.2	11.6	5.9	2.8	-3.3		-7.2	
<b>Tangible Book Value/Shr</b>	N/A	28.0	11.8	6.3	8.4	2.3		-1.6	

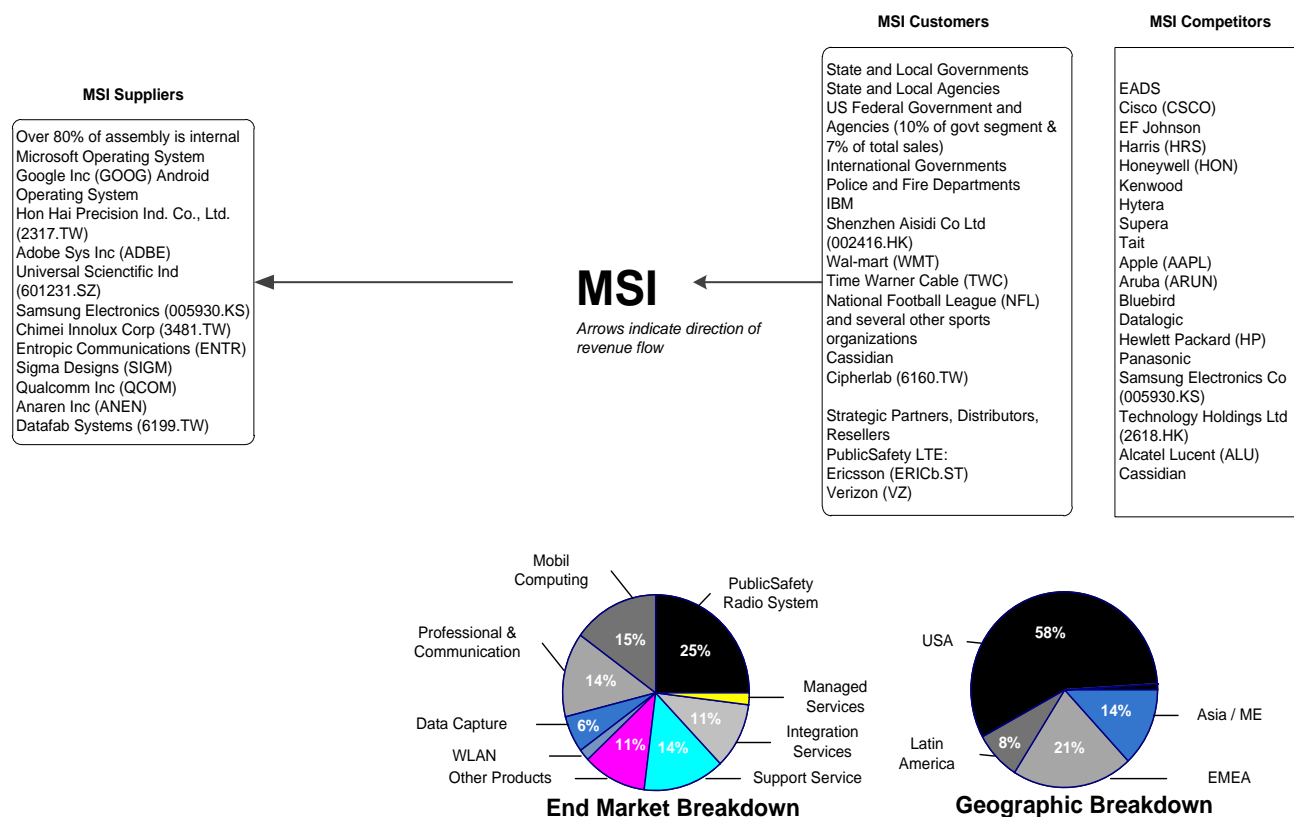
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 479. Motorola Solutions (MSI)

Sector: Communications Equipment

## Motorola Solutions (MSI)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Murata

Citi Analyst: Yuta Fukasawa

Murata Manufacturing Co., Ltd. engages in research, development, manufacture, and sale of electronic components and devices made from fine ceramics.

The company operates through the following divisions: Components, Modules, and Other.

- The Components division offers capacitors and piezoelectric products.
- The Modules segment provides communication modules and power supplies.
- The Other segment handles employee welfares, staffing, education and training, and facility maintenance services, including operational software for affiliates.

The company was founded in October 1944 and is headquartered in Nagaokakyo, Japan.

Figure 480. Murata (6981.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	523946.0	530819.0	617954.0	584662.0	681021.0	845781.0	842882.0	928600.0	903463.0
– <i>y/y growth</i>	-17.1%	1.3%	16.4%	-5.4%	16.5%	24.2%	23.8%	9.8%	7.2%
<b>Gross Margins</b>	24.0%	27.9%	32.8%	29.2%	29.7%	34.4%		34.3%	
<b>Operating Margins</b>	-3.1%	5.0%	12.5%	7.7%	8.6%	15.3%		15.3%	
<b>EPS</b>	16.48	115.35	249.23	144.35	200.81	433.23	427.71	467.30	492.59
– <i>y/y growth</i>	-95.3%	599.9%	116.1%	-42.1%	39.1%	115.7%	113.0%	7.9%	15.2%
<b>Cash</b>	223428.0	163467.0	150446.0	144066.0	184717.0	288229.8		326605.6	
<b>Debt</b>	9259.0	5489.0	8889.0	37196.0	55606.0	84002.0		84002.0	
<b>Net Cash/Shr</b>	1026.1	761.6	696.1	643.2	839.9	1321.7		1503.2	
<b>Tangible Book Value/Shr</b>	3372.6	3417.2	3528.7	3392.2	3624.6	4195.0		4493.6	

(Revenues, Cash and Debt in Millions in Local Currency)

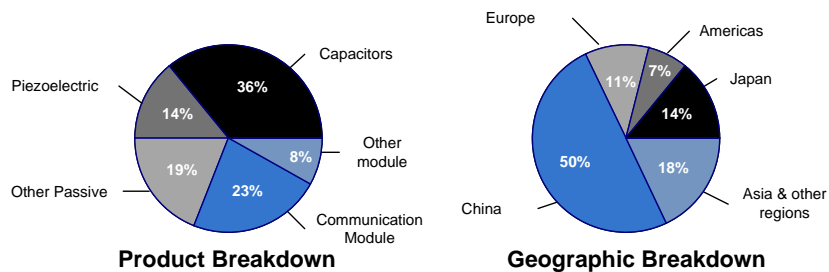
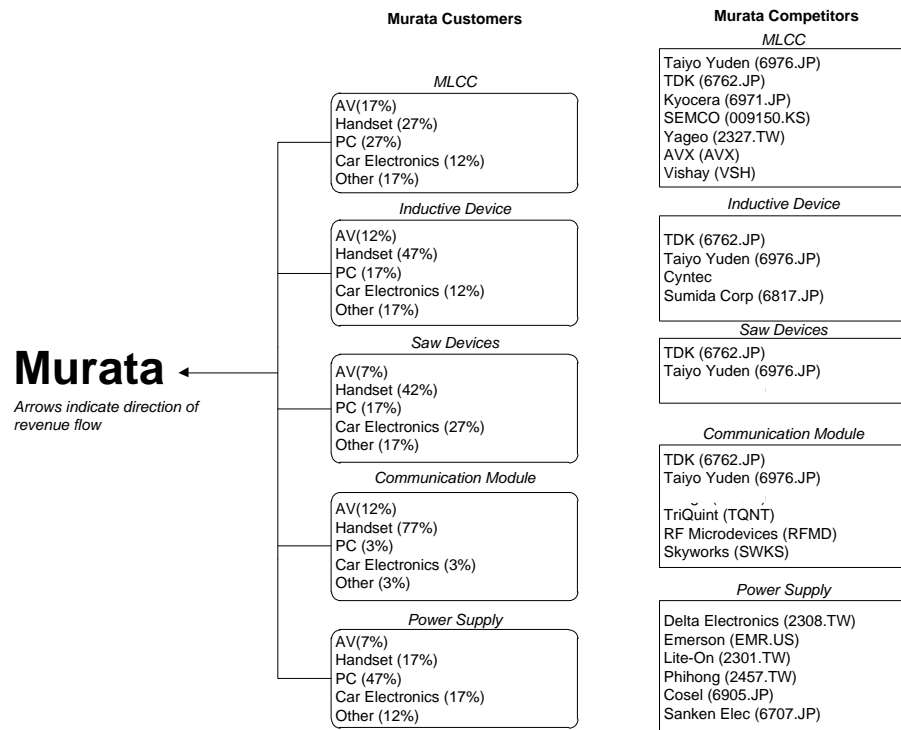
Source: Citi Research, Company Reports, FirstCall



Figure 481. Murata (6981.JP)

Sector: Electronic Components

## Murata (6981.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## NEC

Citi Analyst: Kota Ezawa

NEC is an integrated IT firm which handles a wide range of fields, including IT services, hardware, and telecom equipment.

NEC has the second largest share of the Japanese IT services market after Fujitsu, and the Pasolink small base stations, in the past, had leading global market share for three years running, so it does have competitive businesses. However, earnings have remained weak since an FY3/01 peak and market cap has been on a steady decline.

In April 2010 NEC removed the former NEC Electronics, which had been the biggest cause of earnings weakness, from its consolidated books and made progress with structural improvements in mobile phones, where failed forays abroad and other missteps led to the booking of big losses.

We think that the markets for NEC's core businesses of IT services and carrier networks (telecom equipment) will enter a medium-term recovery and that the path to growth is finally visible after a decade of weakness.

Figure 482. NEC (6701.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	4215603.0	3583148.0	3115424.0	3036836.0	3071609.0	2984000.0	3006241.0	2975000.0	3021029.0
- <i>y/y growth</i>	-8.7%	-15.0%	-13.1%	-2.5%	1.1%	-2.9%	-2.1%	-0.3%	0.5%
<b>Gross Margins</b>	30.5%	30.4%	29.4%	29.9%	30.3%	30.7%		32.2%	
<b>Operating Margins</b>	-0.1%	1.4%	1.9%	2.4%	3.7%	3.1%		4.3%	
<b>EPS</b>	-137.48	4.30	-4.82	-42.44	11.71	7.39	11.17	20.01	18.15
- <i>y/y growth</i>	-1408.5%	103.1%	-212.1%	-780.9%	127.6%	-36.9%	-4.6%	170.8%	62.5%
<b>Cash</b>	226601.0	195095.0	184662.0	195443.0	198961.0	227000.0		284000.0	
<b>Debt</b>	897137.0	697048.0	661518.0	684934.0	855752.0	943000.0		933000.0	
<b>Net Cash/Shr</b>	-169.9	-83.3	-59.0	-114.6	-76.2	-103.9		-82.0	
<b>Tangible Book Value/Shr</b>	222.1	225.0	220.1	180.1	179.5	73.1		88.9	

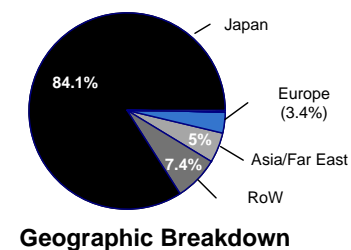
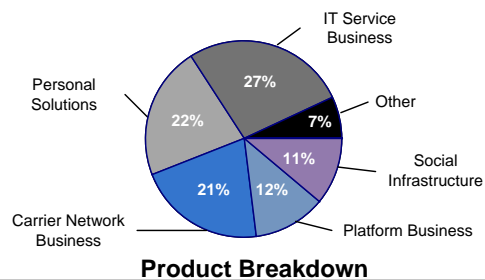
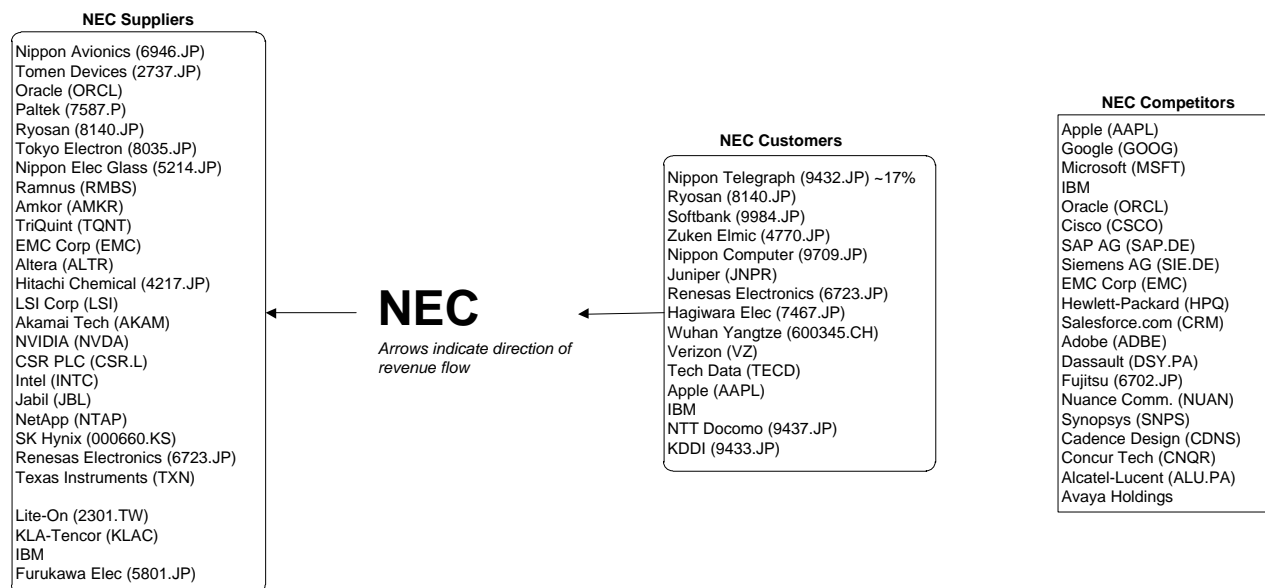
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 483. NEC (6701.JP)

Sector: Technology - General

## NEC (6701.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## NetApp, Inc.

Citi Analyst: Jim Suva, CPA

Founded in 1992, NetApp is a leading provider of networked storage and data management solutions addressing both the SAN and NAS markets, providing unified storage systems that support both FC/iSCSI SAN protocols as well as file-based storage protocols (NFS, CIFS).

The company provides a broad portfolio of application, cloud, and service provider solutions that help customers streamline operations and lower the costs associated with storing and managing their data. The company pioneered the network attached storage, or NAS, appliance market.

The company's products are largely comprised of industry standard hardware components, but leverage a unique operating system and file system (ONTAP), a highly scalable and flexible operating system that concurrently supports any mix of storage area network and network-attached storage environments. NetApp's Data ONTAP operating system provides the foundation to build a shared storage infrastructure and an enterprise-wide data fabric for the full breadth of business applications and data storage and protection requirements.

The company's portfolio of efficiency technologies helps its customers reduce their storage spending and get more from the storage assets they already own. Product sales comprised 65% of total revenues in FY2013 while software and services 14% and 21% respectively of total revenues in FY 2013.

Based in Sunnyvale CA, NetApp has approximately 13,060 employees globally.

Figure 484. Netapp Inc (NTAP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	3535.1	3931.4	5041.6	6233.2	6332.4	6347.5	6351.2	6557.1	6548.5
- y/y growth		11.2%	28.2%	23.6%	1.6%	0.2%	0.3%	3.3%	3.1%
<b>Gross Margins</b>	61.1%	65.0%	65.6%	60.9%	60.7%	62.7%		62.7%	
<b>Operating Margins</b>	11.6%	16.1%	19.3%	17.8%	15.3%	17.8%		18.4%	
<b>EPS</b>	1.09	1.51	2.11	2.41	2.28	2.76	2.74	3.11	3.01
- y/y growth		38.4%	40.1%	14.1%	-5.3%	20.9%	20.0%	12.8%	9.7%
<b>Cash</b>	2604.2	3724.0	5174.7	5398.5	6952.6	4834.9		5066.1	
<b>Debt</b>	1429.5	1273.4	1343.3	1471.8	2505.9	995.2		995.2	
<b>Net Cash/Shr</b>	3.5	6.9	12.6	13.3	15.5	11.1		12.4	
<b>Tangible Book Value/Shr</b>	2.8	5.3	8.2	8.7	9.9	7.8		8.7	

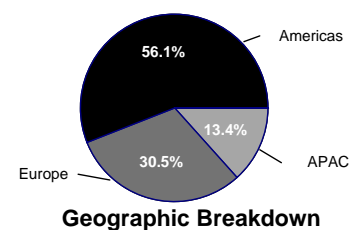
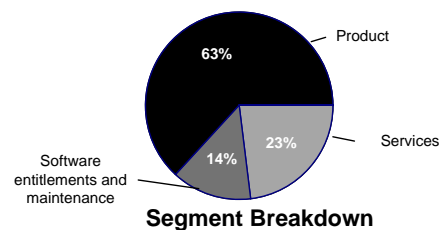
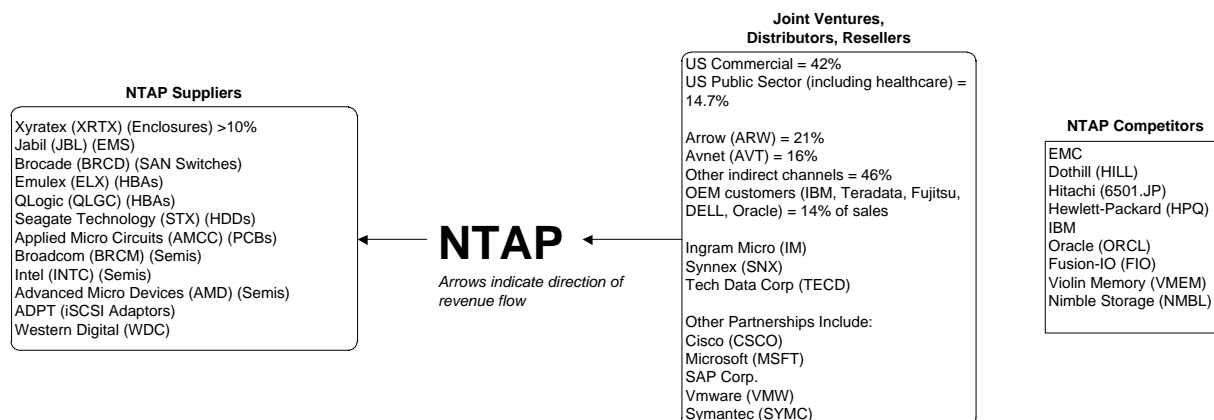
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 485. NetApp (NTAP)

Sector: Storage

## NetApp, Inc. (NTAP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Nidec

Citi Analyst: Yuta Fukasawa

NIDEC CORP. engages in the design, development, manufacture, and sale of electric motor drives and related components.

The company operates in the following divisions: Small Precision Motors, General Motors, Machinery, Electronic and Optical Components, and Other.

- The Small Precision Motors division includes spindle motors for hard disk drives, brushless direct-current motors and fans for optical disk drives, computers, and game machines, and other small precision motors for mobile phones and other products.
- The General Motors division consists of motors for automobiles, electric household appliances, and industrial equipment.
- The Machinery division is comprised of test systems, measuring devices, power transmission equipment, factory automation systems, card readers, and industrial robots.
- The Electronic and Optical Components division offers camera shutters, lens units, switches, trimmer potentiometers, motor-driven actuator units, and precision plastic mold products.
- The Other division provides auto parts, pivot assemblies, and other services.

The company was founded by Shigenobu Nagamori on July 23, 1973 and is headquartered in Kyoto, Japan

Figure 486. Nidec (6594.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	610803.0	586029.0	675988.0	682320.0	709270.0	871125.0	874368.0	975380.0	974942.0
- y/y growth	-16.2%	-4.1%	15.4%	0.9%	3.9%	22.8%	23.3%	12.0%	11.5%
<b>Gross Margins</b>	21.3%	25.8%	26.0%	23.2%	19.3%	22.9%		23.1%	
<b>Operating Margins</b>	8.5%	13.4%	13.7%	10.7%	2.5%	9.8%		11.3%	
<b>EPS</b>	194.44	373.04	363.00	277.27	55.49	406.81	429.09	524.55	568.29
- y/y growth	-29.6%	91.9%	-2.7%	-23.6%	-80.0%	633.1%	673.2%	28.9%	32.4%
<b>Cash</b>	203898.0	127200.0	97066.0	138100.0	194972.0	268462.2		308545.8	
<b>Debt</b>	225803.0	118709.0	154961.0	188518.0	311157.0	327967.0		327967.0	
<b>Net Cash/Shr</b>	1380.6	900.7	-33.0	250.9	337.9	-13.4		263.3	
<b>Tangible Book Value/Shr</b>	1482.9	1771.1	1715.3	1835.8	1512.2	2661.6		3061.7	

(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

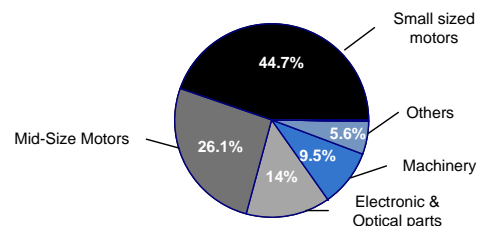
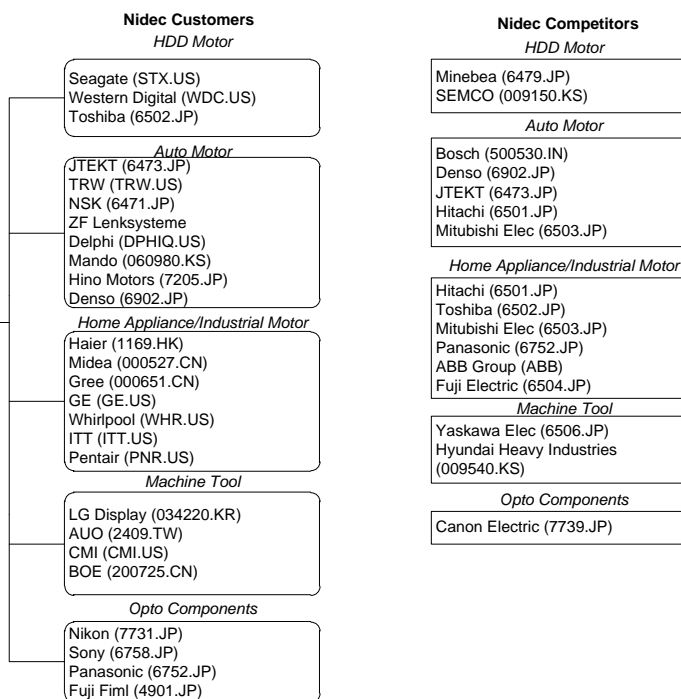
Figure 487. Nidec (6594.JP)

Sector: Electronic Components

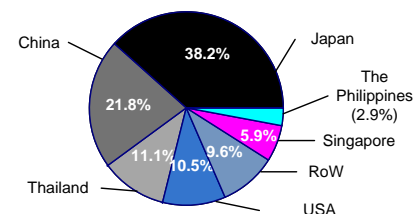
## Nidec (6594.JP)

### Nidec

Arrows indicate direction of revenue flow



Product Breakdown



Geographic Breakdown

Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Nikon Corp

Citi Analyst: Masahiro Shibano

Nikon Corp. engages in the manufacture and sale of optical instruments.

The company operates through the following segments: Precision Equipment, Imaging Products, Instruments, and Other.

- The Precision Equipment segment covers products and services related to integrated circuit and liquid crystal display steppers.
- The Imaging Products segment manufactures and sells imaging products and peripherals such as digital single-lens reflex cameras, compact digital cameras, and interchangeable camera lenses.
- The Instruments segment offers microscopes, measuring, and inspection equipment.
- The Other segment includes glass, sport optics, and customized products business.

The company was founded by Koyata Iwasaki on July 25, 1917 and is headquartered in Tokyo, Japan.

Figure 488. Nikon (7731.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	879719.0	785498.0	887512.0	918651.0	1010493.0	981180.0	1005509.0	952800.0	1007665.0
– <i>y/y growth</i>	–8.0%	–10.7%	13.0%	3.5%	10.0%	–2.9%	–0.5%	–2.9%	0.2%
<b>Gross Margins</b>	36.2%	29.7%	35.2%	38.3%	34.3%	35.7%		38.5%	
<b>Operating Margins</b>	5.5%	–1.8%	6.1%	8.7%	5.0%	6.1%		7.5%	
<b>EPS</b>	70.51	–31.82	68.89	149.57	107.07	121.29	123.78	116.22	124.55
– <i>y/y growth</i>	–62.7%	–145.1%	316.5%	117.1%	–28.4%	13.3%	15.6%	–4.2%	0.6%
<b>Cash</b>	80350.0	107680.0	181077.0	132404.0	110281.0	167589.0		185189.0	
<b>Debt</b>	106029.0	94801.0	81432.0	81250.0	81339.0	80000.0		60000.0	
<b>Net Cash/Shr</b>	52.0	179.7	293.6	175.3	120.2	296.5		366.0	
<b>Tangible Book Value/Shr</b>	945.6	928.1	970.9	1081.7	1225.6	1375.9		1462.3	

(Revenues, Cash and Debt in Millions in Local Currency)

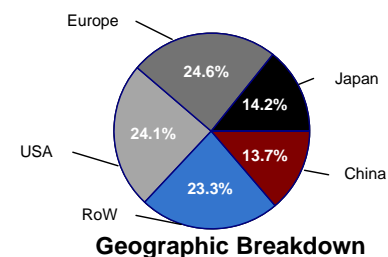
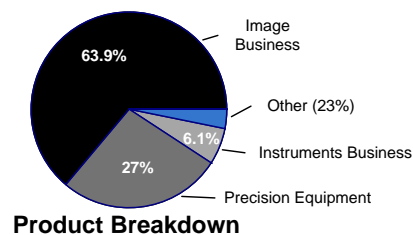
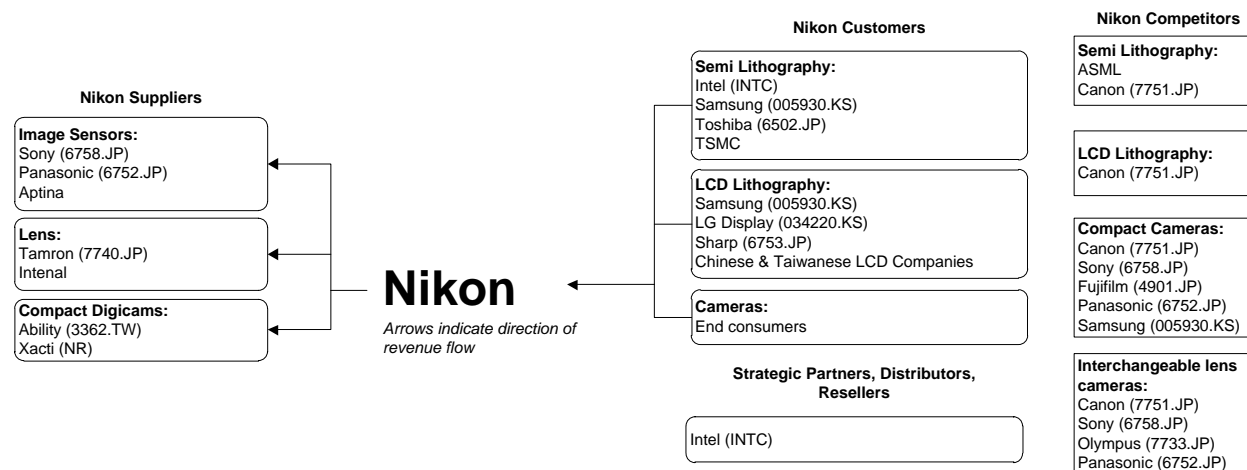
Source: Citi Research, Company Reports, FirstCall



Figure 489. Nikon (7731.JP)

Sector: Imaging

## Nikon Corp. (7731.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Nippon Electric Glass

Citi Analyst: Asushi Ikeda

The company began making CRT glass in the 1950s and formed a technical alliance with Owens-Illinois (US) in 1963, leading to full-scale CRT glass manufacturing in 1965. At that time Asahi Glass commanded 70% of the domestic market; by the late 1990s NEG had a domestic market share of c50% and a global market share of c30%, and in FY3/99 CRT glass accounted for more than 70% of its sales. CRT glass remained the pillar of earnings until FY3/03 and the OP margin on CRT glass remained steady at c20%.

NEG then shifted to PDP and LCD glass amid the rapid contraction of the CRT market. It also focused on electronic component-use glass, to establish a reputation as an all-round specialty glass maker. The company has c23% share of the global market for LCD glass. Major customers include LG Display and AUO.

Originally spun off from NEC in 1949, NEG was a maker of vacuum tube glass then expanded its business by concentrating on tube glass and other niche markets..

Figure 490. Nippon Electric Glass (5214.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	335662.0	332387.0	390195.0	338214.0	287303.0	252200.0	253535.0	234500.0	251886.0
- y/y growth	-8.9%	-1.0%	17.4%	-13.3%	-15.1%	-12.2%	-11.8%	-7.0%	-0.7%
<b>Gross Margins</b>	30.1%	35.8%	36.7%	26.5%	18.1%	17.2%		12.8%	
<b>Operating Margins</b>	22.8%	29.6%	30.1%	18.2%	8.7%	6.5%		1.3%	
<b>EPS</b>	43.89	110.41	137.91	39.02	21.32	22.32	21.94	-2.81	12.39
- y/y growth	-58.3%	151.6%	24.9%	-71.7%	-45.4%	4.7%	2.9%	-112.6%	-43.5%
<b>Cash</b>	96693.0	98081.0	118808.0	105827.0	129420.0	147443.1		130485.8	
<b>Debt</b>	109882.0	96826.0	91272.0	83811.0	99603.0	97000.0		86000.0	
<b>Net Cash/Shr</b>	103.9	82.0	138.8	131.5	105.6	133.6		129.6	
<b>Tangible Book Value/Shr</b>	701.6	808.7	932.1	945.5	983.0	993.1		974.0	

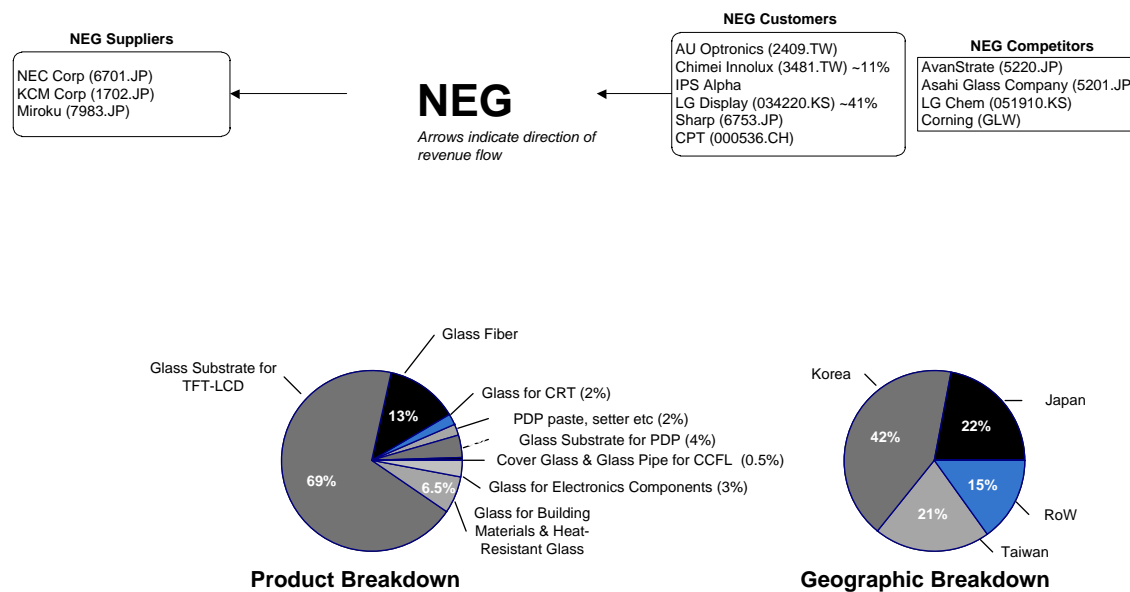
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 491. Nippon Electric Glass (5214.JP)

Sector: Technology General

## Nippon Electric Glass (5214.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Nokia Oyj

Citi Analyst: Ehud Gelblum, Ph.D

Nokia operates three segments: Devices and Services, Location and Commerce (HERE) and Nokia Solutions and Networks (NSN).

- The Device and Services division currently accounts for ~52% of group revenues and is focused on developing smart phones, mass market phones and related services and applications.

On September 2, 2013 Nokia entered into a definitive agreement to sell its Devices and Services business (including operations, design teams) to Microsoft. Nokia and Microsoft also entered into a non-exclusive cross licensing agreement over the next 10 years with an option to extend. The transaction is expected to close in Q1 2014. As part of this transaction, 32,000 employees, or 36% of Nokia's headcount will transition from Nokia to Microsoft, while about 57,000 remain at Nokia within the NSN, HERE, and Advanced Technologies division. Nokia is headquartered in Espoo, Finland.

- The Nokia Solutions and Networks (NSN) segment (~46% of current revenues and 88% of "New" Nokia revenues) provides a portfolio of mobile, fixed and converged network technology, as well as professional services including managed services, consultancy and systems integration, and deployment and maintenance services to operators and services providers.
- The Location & Commerce segment (~2% of current revenues and 7% of "New" Nokia) includes the development of location-based products and services for consumers, as well as platform and local commerce services for feature phones and smart phones, device manufacturers, application developers, internet service providers, merchants, and advertisers.

Nokia also retains its Advanced Technologies business, which comprises the balance of "New" Nokia revenue who main business is licensing of its 30,000 patents in 10,000 patent families.

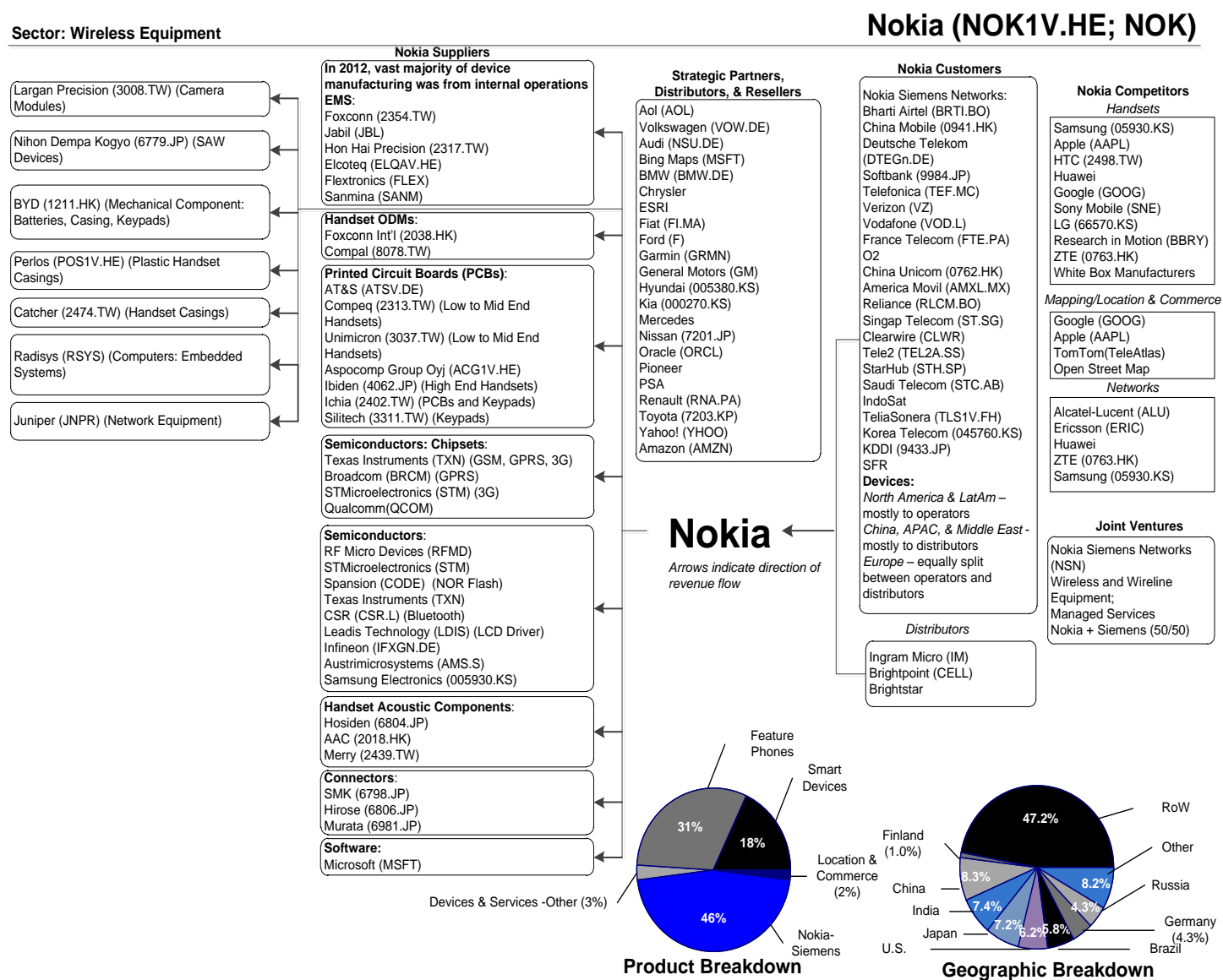
Figure 492. Nokia (NOK1V.HE) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	40984.0	42448.0	38659.0	26548.0	12711.0	12861.1	12747.8	13131.8	13141.5
- <i>y/y growth</i>	-19.2%	3.6%	-8.9%	-31.3%	-52.1%	1.2%	0.3%	2.1%	3.1%
<b>Gross Margins</b>	32.4%	30.2%	29.3%	28.7%	42.1%	44.1%		44.2%	
<b>Operating Margins</b>	8.5%	7.6%	4.7%	0.7%	7.1%	8.9%		9.9%	
<b>EPS</b>	0.66	0.61	0.29	-0.06	0.20	0.24	0.22	0.26	0.28
- <i>y/y growth</i>	-50.9%	-7.6%	-52.4%	-120.7%	441.6%	15.8%	8.8%	9.5%	23.8%
<b>Cash</b>	8873.0	12275.0	10902.0	9909.0	9256.0	14458.9		15146.1	
<b>Debt</b>	5203.0	5279.0	5321.0	5549.0	6662.0	6662.0		6477.0	
<b>Net Cash/Shr</b>	1.2	2.2	1.9	1.3	1.5	2.8		3.0	
<b>Tangible Book Value/Shr</b>	1.4	1.8	1.5	0.7	0.8	2.4		2.6	

(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 493. Nokia (NOK1V.HE)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Novatek

Citi Analyst: Roland Shu

Novatek Microelectronics Corp., Ltd. designs, manufactures, and markets integrated circuits (ICs).

The company's products are used in telecommunication, computer peripherals, consumer electronics, and LCD (liquid crystal display) drivers.

Figure 494. Novatek (3034.TW)

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	26996.8	36261.4	35034.3	37028.7	41449.7	44868.0	46886.6	47478.8	51182.0
- <i>y/y growth</i>	3.1%	34.3%	-3.4%	5.7%	11.9%	8.2%	13.1%	5.8%	9.2%
<b>Gross Margins</b>	30.4%	26.9%	25.4%	28.1%	27.7%	27.4%		27.2%	
<b>Operating Margins</b>	15.0%	14.4%	12.1%	13.4%	13.1%	13.1%		13.1%	
<b>EPS</b>	6.79	7.69	6.16	7.36	7.81	8.43	9.31	8.82	10.16
- <i>y/y growth</i>	10.0%	13.3%	-19.9%	19.5%	6.2%	7.9%	19.1%	4.6%	9.1%
<b>Cash</b>	14637.8	16003.3	16042.8	18122.7	18292.3	19640.9		20707.2	
<b>Debt</b>	6296.8	7897.5	7856.4	7347.1	6348.5	7363.3		7854.1	
<b>Net Cash/Shr</b>	24.7	26.9	26.7	30.0	30.1	32.3		34.0	
<b>Tangible Book Value/Shr</b>	34.6	36.9	36.9	39.6	40.4	43.0		45.5	

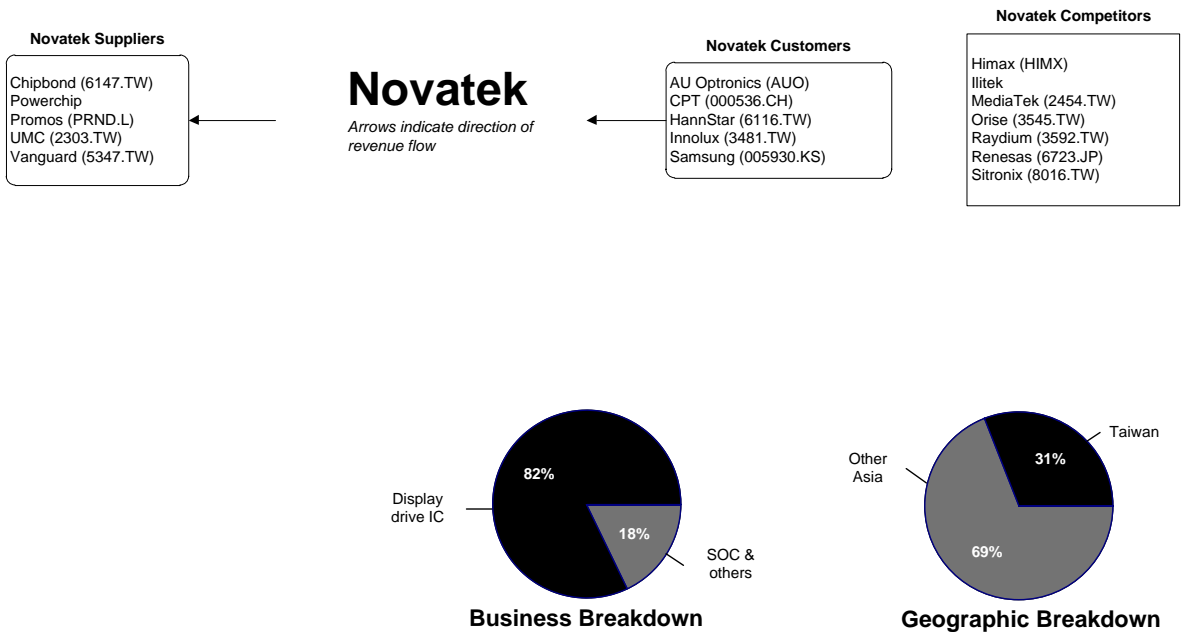
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 495. Novatek (3034.TW)

Sector: Semiconductors

Novatek (3034.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## NVIDIA

Citi Analyst: Glen Yeung

Nvidia Corp (NVDA) is a fabless semiconductor company and a leading vendor of graphics processors predominantly used in PCs (desktop/notebook/servers), but also increasingly deployed in handsets, tablets, and game consoles.

Nvidia's strength is in stand-alone (or discrete) graphics processors, and has made notable inroads into the applications processor market with its Tegra processors.

Revenues are segmented into graphics processors (GPU), professional solutions (PSB), and consumer products (which includes Nvidia's Tegra family).

Nvidia is headquartered in Santa Clara, California.

Figure 496. NVIDIA (NVDA) Results and Forecasts

	2010	2011	2012	2013	2014	CIR 2015E	Street 2015E	CIR 2016E	Street 2016E
<b>Revenues</b>	3326.4	3543.3	3997.9	4280.2	4130.2	4322.1	4421.2	4607.1	4625.2
- y/y growth	-2.9%	6.5%	12.8%	7.1%	-3.5%	4.6%	7.0%	6.6%	4.6%
<b>Gross Margins</b>	35.4%	39.8%	51.4%	52.0%	54.9%	54.0%		54.0%	
<b>Operating Margins</b>	-3.0%	5.6%	16.2%	15.1%	12.0%	11.5%		13.0%	
<b>EPS</b>	-0.15	0.42	0.94	0.90	0.74	0.67	0.83	0.85	0.92
- y/y growth	-69.8%	372.5%	125.7%	-4.5%	-17.3%	-10.2%	10.9%	26.9%	11.4%
<b>Cash</b>	1728.2	2490.6	3129.6	3727.9	4671.8	4542.7		5278.9	
<b>Debt</b>	0.0	0.0	0.0	0.0	1356.4	1356.4		1356.4	
<b>Net Cash/Shr</b>	3.9	4.1	5.1	6.0	5.6	5.9		7.5	
<b>Tangible Book Value/Shr</b>	4.0	4.4	5.3	6.3	6.0	6.2		7.8	

(Revenues, Cash and Debt in Millions in Local Currency)

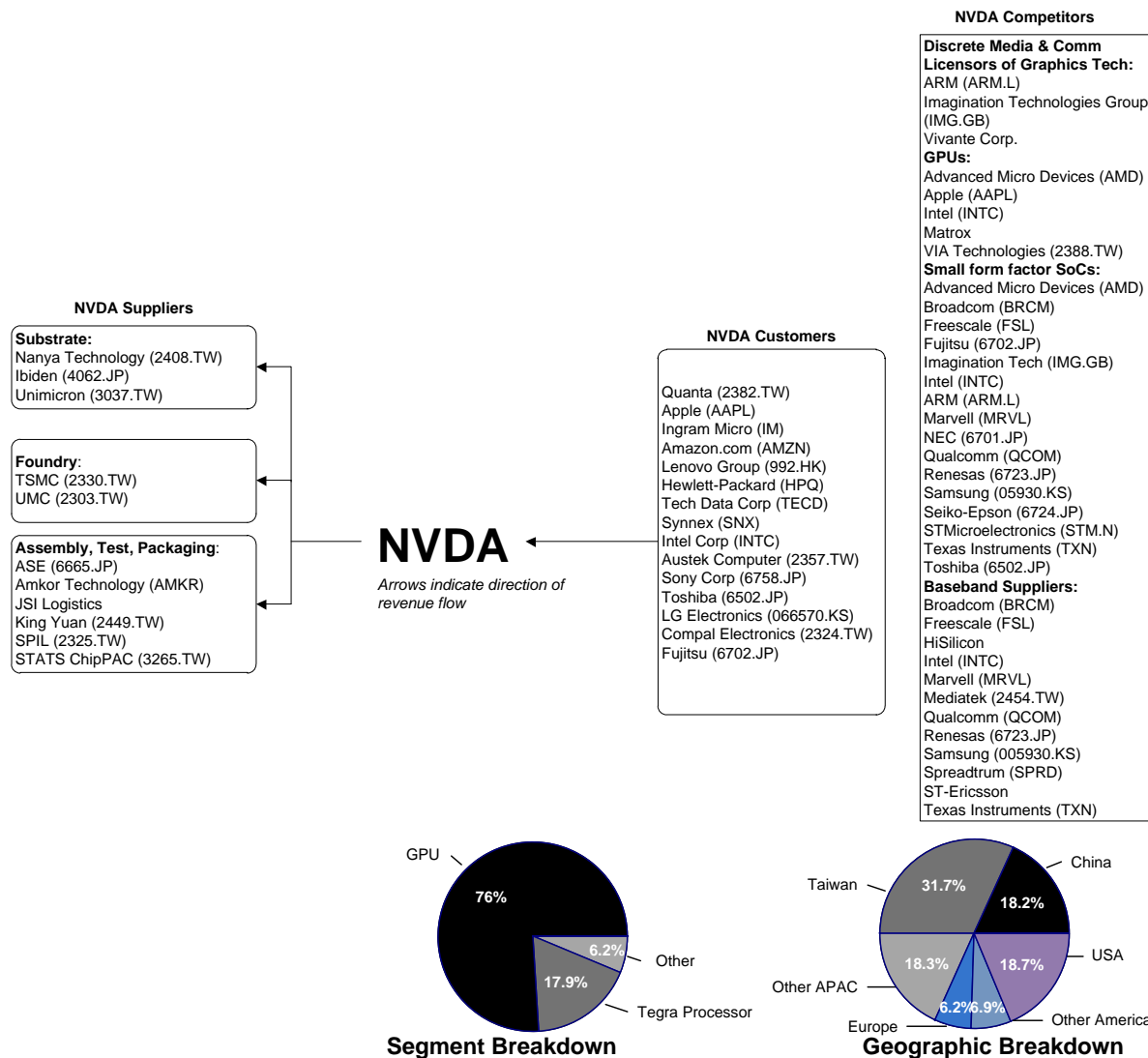
Source: Citi Research, Company Reports, FirstCall



Figure 497. NVIDIA (NVDA)

Sector: Semiconductors

## NVIDIA (NVDA)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Olympus

Citi Analyst: Masahiro Shibano

Olympus Corp. is engaged in the manufacture and sale of precision machineries and instruments.

The company operates through the following segments: Medical Systems, Life Science and Industrial Systems, Imaging Systems, Information and Communication, and Others.

- The Medical Systems segment covers endoscopes, and endoscopic surgery and therapy.
- The Life Science and Industrial Systems segment manufactures and sells biological and industrial microscopes, industrial endoscopes, non-destructive testing equipment, and printers.
- The Imaging Systems segment deals with digital cameras and recording devices.
- The Information and Communication segment sells mobile terminals such as mobile phones.
- The Others segment includes biomaterial manufacturing and sales, and system development.

The company was founded by Takeshi Yamashita on October 12, 1919 and is headquartered in Tokyo, Japan.

Figure 498. Olympus (7733.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	980803.0	883086.0	847105.0	848548.0	743851.0	722400.0	718483.0	739600.0	749334.0
- y/y growth	-13.1%	-10.0%	-4.1%	0.2%	-12.3%	-2.9%	-3.4%	2.4%	4.3%
<b>Gross Margins</b>	47.0%	46.2%	45.8%	45.2%	50.8%	61.0%		62.0%	
<b>Operating Margins</b>	4.4%	6.9%	4.5%	4.2%	4.7%	10.5%		12.4%	
<b>EPS</b>	-188.16	196.20	14.45	-183.53	28.23	45.50	25.42	135.87	140.44
- y/y growth	-193.1%	204.3%	-92.6%	-1370.3%	115.4%	61.2%	-10.0%	198.6%	452.5%
<b>Cash</b>	136877.0	206783.0	213561.0	200088.0	229610.0	324125.4		360125.4	
<b>Debt</b>	642839.0	661481.0	648787.0	642426.0	560390.0	437000.0		397000.0	
<b>Net Cash/Shr</b>	-1446.1	-1272.7	-1149.9	-1237.3	-680.4	-111.5		88.0	
<b>Tangible Book Value/Shr</b>	-534.6	-197.2	-338.7	-558.8	-72.4	510.9		676.0	

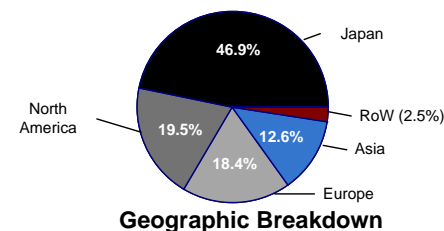
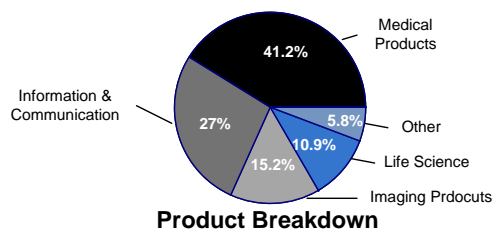
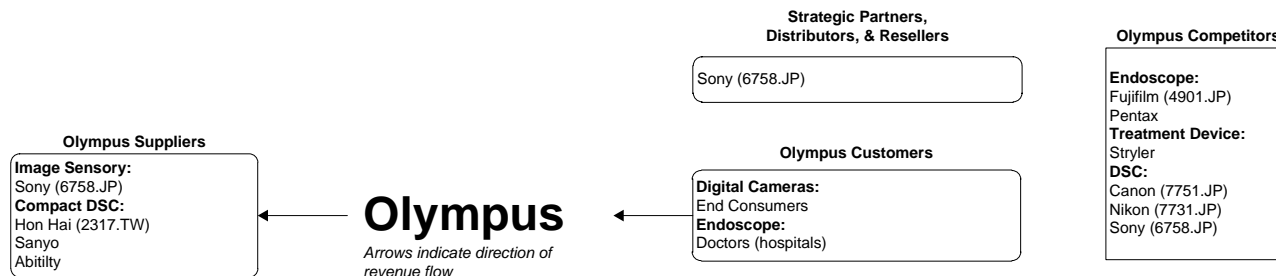
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 499. Olympus (7733.JP)

Sector: Hardware

## Olympus (7733.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## On Semiconductor

Citi Analyst: Terence Whalen

ON Semiconductor Corporation designs, manufactures and markets power management, data management and standard semiconductor integrated circuits (ICs).

ON's 2012 end-market exposure includes Computing (16%), Consumer (20%), Industrial (20%), Communication (18%), and Automotive (26%). ON recognizes distributor revenue on sell-through; a policy change made in January.

Gross margins are low compared to other analog IC companies given ON's 45% leverage to commodity discrete/logic.

Competitors include Fairchild Semiconductor, Renesas, Rohm, ST Microelectronics, Toshiba, and Texas Instruments.

ON is a Motorola / Texas Pacific Group recapitalization brought public in 2000 and partially financed through its approximately \$1B debt. ONNN acquired Sanyo semiconductor business in January 2011.

Figure 500. ON Semiconductor Corp (ONNN) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1768.9	2313.4	3442.3	2894.9	2782.7	2965.7	2973.5	3117.3	3111.5
- <i>y/y growth</i>	N/A		48.8%	-15.9%	-3.9%	6.6%	6.9%	5.1%	4.6%
<b>Gross Margins</b>	35.1%	41.3%	29.3%	32.9%	33.7%	35.9%		36.6%	
<b>Operating Margins</b>	11.1%	19.1%	13.4%	8.2%	10.2%	13.6%		14.6%	
<b>EPS</b>	0.35	0.90	0.88	0.43	0.54	0.79	0.77	0.90	0.92
- <i>y/y growth</i>	N/A		-1.2%	-51.0%	25.4%	44.5%	40.6%	14.9%	20.1%
<b>Cash</b>	571.2	623.3	901.5	631.7	625.7	978.8		1377.3	
<b>Debt</b>	933.5	888.8	1207.0	1011.9	942.2	942.2		942.2	
<b>Net Cash/Shr</b>	-0.4	-0.3	0.1	-0.1	-0.3	0.5		1.4	
<b>Tangible Book Value/Shr</b>	1.2	2.0	2.1	2.0	2.3	3.1		3.9	

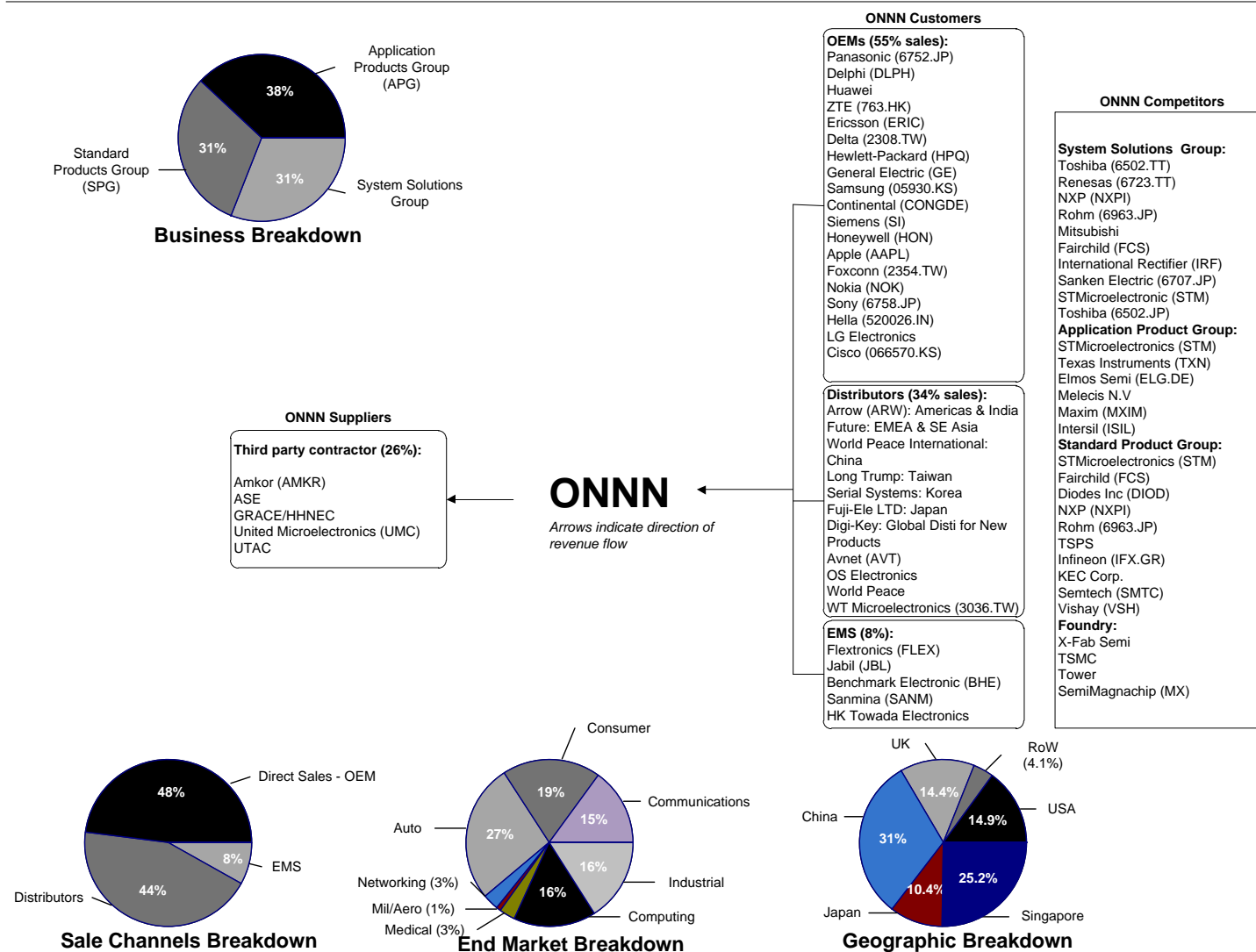
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 501. ON Semiconductor Corp (ONNN)

Sector: Semiconductors

## ON Semiconductor Corp. (ONNN)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Panasonic

Citi Analyst: Kota Ezawa

Panasonic is an integrated electronics maker. It operates in diverse fields, including consumer electronics, electronic components, and housing facilities, and is one of the world's largest electronics companies by sales.

Panasonic is now focusing on environment-related business opportunities, especially batteries. The conversion of Sanyo Electric, the world's top maker of lithium-ion batteries, into a subsidiary in December 2009 is one part of this strategy. How quickly Panasonic can generate synergies will be a point of interest moving forward.

The main issue near term is restoring profitability in the mainstay digital AVC networks segment, particularly in the TV business, which is burdened by heavy capex. This calls into question the wisdom of a vertically integrated operation (for example, in house production of panels.)

Panasonic was founded in Osaka in 1918

Figure 502. Panasonic (6752.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	7765507.0	7417980.0	8692672.0	7846216.0	7303045.0	7526100.0	7519522.0	7364300.0	7497873.0
- y/y growth	-14.4%	-4.5%	17.2%	-9.7%	-6.9%	3.1%	3.0%	-2.1%	-0.3%
<b>Gross Margins</b>	27.0%	28.0%	26.5%	25.3%	24.6%	28.6%		29.6%	
<b>Operating Margins</b>	0.9%	2.6%	3.5%	0.6%	2.2%	3.8%		4.4%	
<b>EPS</b>	-181.68	-49.97	35.75	-333.96	-326.28	47.37	54.60	158.59	72.20
- y/y growth	-236.9%	72.5%	171.5%	-1034.2%	2.3%	114.5%	116.7%	234.8%	32.2%
<b>Cash</b>	1165153.0	1201944.0	1044723.0	611469.0	497957.0	601000.0		706000.0	
<b>Debt</b>	745665.0	1327992.0	1595269.0	1575615.0	1143395.0	920000.0		920000.0	
<b>Net Cash/Shr</b>	246.3	83.6	-56.8	-142.9	-71.4	4.8		50.2	
<b>Tangible Book Value/Shr</b>	1083.3	610.7	527.2	323.2	53.9	146.0		313.0	

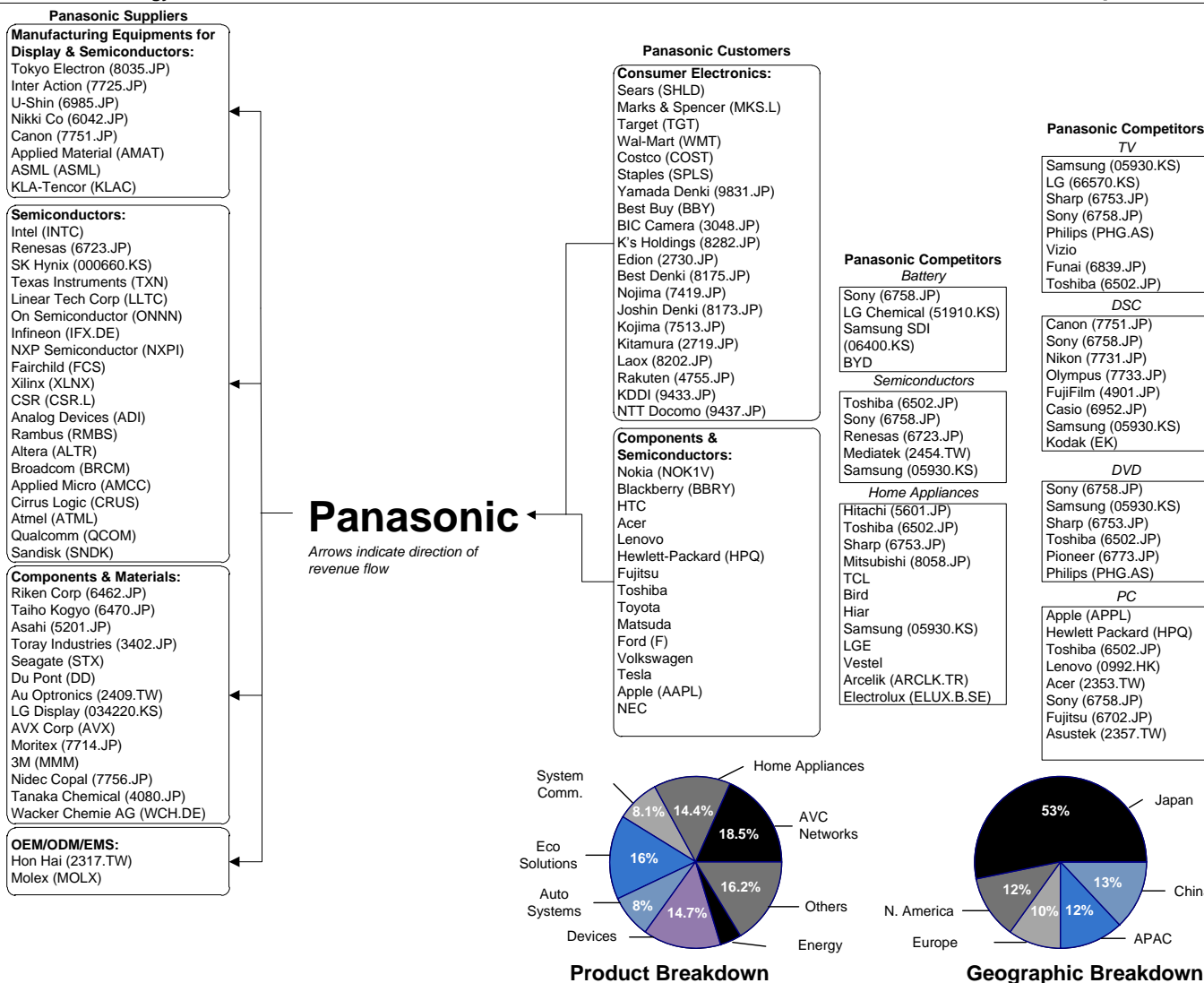
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 503. Panasonic (6752.JP)

Sector: Diversified Technology

Panasonic (6752.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Pegatron

Citi Analyst: Wei Chen

Pegatron provides Design and Manufacturing Services (DMS) to NB PC brands and other consumer electronics vendors.

Its product lines include motherboards, desktop PCs, notebook PCs, game consoles, networking equipment, set-top boxes, and LCD TVs.

Originally the manufacturing division of Asustek Computer, Pegatron Corporation was established in 2007 and spun off in June 2010.

Figure 504. Pegatron Corp. (4938.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	538081.7	530531.4	599942.7	881895.4	949751.9	1067843.5	985964.5	1154593.4	1017027.0
- y/y growth		-1.4%	13.1%	47.0%	7.7%	12.4%	3.8%	8.1%	3.2%
<b>Gross Margins</b>	6.0%	5.7%	4.5%	4.8%	4.8%	5.0%		4.9%	
<b>Operating Margins</b>	2.0%	1.6%	0.2%	1.3%	1.6%	1.8%		1.7%	
<b>EPS</b>	2.95	2.75	0.05	2.71	4.16	5.16	4.26	5.71	4.65
- y/y growth		-6.8%	-98.2%	5380.9%	53.7%	24.0%	2.4%	10.8%	9.2%
<b>Cash</b>	40205.2	49668.7	57325.9	68197.5	74261.0	85863.5		96427.6	
<b>Debt</b>	19055.5	26325.9	52665.3	55955.6	60742.2	60742.2		60742.2	
<b>Net Cash/Shr</b>	14.1	16.9	12.7	18.1	19.8	24.6		29.2	
<b>Tangible Book Value/Shr</b>	41.9	40.3	40.6	42.0	46.4	49.3		52.3	

(Revenues, Cash and Debt in Millions in Local Currency)

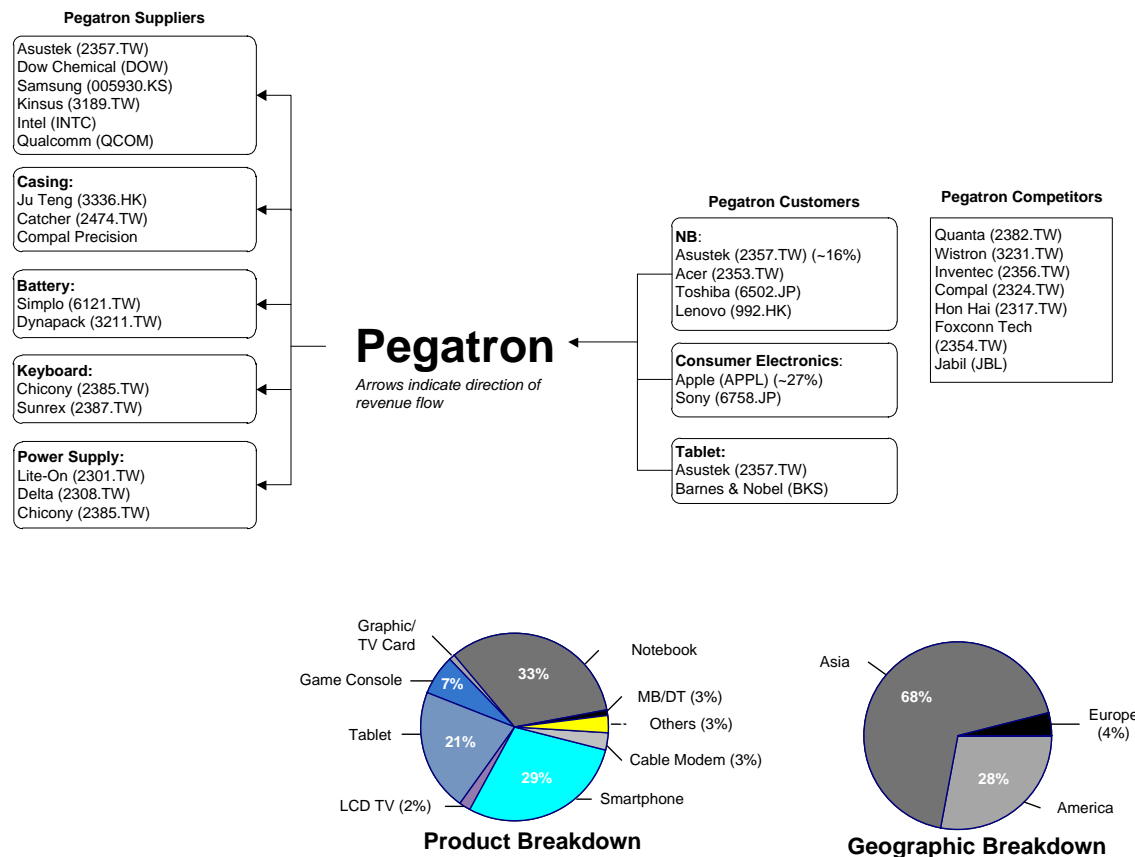
Source: Citi Research, Company Reports, FirstCall



Figure 505. Pegatron Corp. (4938.TW)

Sector: PC & Enterprise Hardware

## Pegatron Corp. (4938.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Pioneer

Citi Analyst: Kota Ezawa

Pioneer is a mid-tier electronics maker. The mainstays of Pioneer sales are the car electronics segment, which consists of car navigation systems and car audio products, and the home electronics segment, which consists of DJ systems, DVD and Blu-ray disk player/recorders, PC drives, and home theater systems.

Pioneer withdrew from the PDP business in 2009, and thereafter it focused on traditional car navigational systems and car audio products, while also developing new products in both car electronics and home electronics. This has diversified the earnings structure. Although Pioneer has not always been able to perform up to its full abilities due to the March 11, 2011 earthquake and tsunami in Japan, the flooding in Thailand, and anti-Japanese sentiment in China, moving forward it aims for growth by capturing demand in developing markets and leveraging its low-end product strategy.

Pioneer was founded in Tokyo in 1938.

Figure 506. Pioneer (6773.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	558837.0	438998.0	457545.0	436753.0	451841.0	507200.0	490987.0	498500.0	500413.0
- y/y growth	-27.8%	-21.4%	4.2%	-4.5%	3.5%	12.3%	8.7%	-1.7%	1.9%
<b>Gross Margins</b>	14.5%	16.6%	22.1%	21.4%	20.2%	19.7%		20.5%	
<b>Operating Margins</b>	-9.8%	-4.0%	3.5%	2.9%	1.3%	1.9%		2.3%	
<b>EPS</b>	-551.04	-197.61	29.08	11.43	-60.90	0.58	1.30	11.44	13.17
- y/y growth	-495.2%	64.1%	114.7%	-60.7%	-632.8%	101.0%	102.1%	1868.1%	914.1%
<b>Cash</b>	63745.0	90245.0	47566.0	45953.0	22059.0	39300.0		39000.0	
<b>Debt</b>	177115.0	164597.0	87832.0	89511.0	96212.0	95000.0		90000.0	
<b>Net Cash/Shr</b>	-14.2	11.4	4.8	112.0	28.2	114.2		106.2	
<b>Tangible Book Value/Shr</b>	538.5	330.1	264.2	261.7	238.0	254.3		249.7	

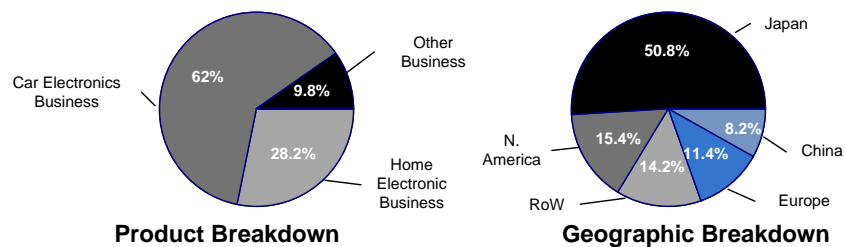
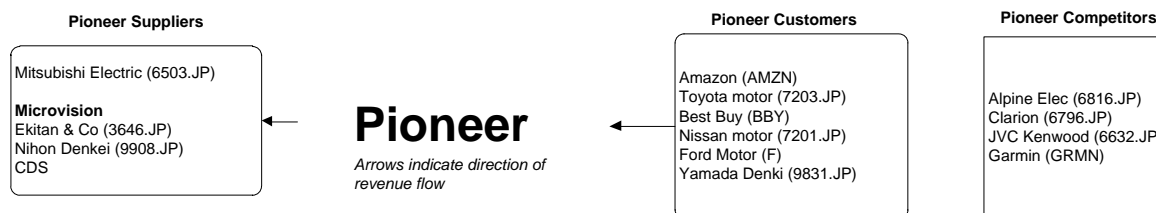
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 507. Pioneer (6773.JP)

Sector: Consumer Electronics

Pioneer (6773.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Plexus

Citi Analyst: Jim Suva, CPA

Plexus is one of the smaller EMS companies, with approximately 1-2% market share. The company provides electronics manufacturing services for major high-technology OEMs, primarily in the communications and medical sectors.

Sales by end markets include: 31% networking & communications, 31% medical, 25% industrial/commercial and 13% defense/security/aerospace.

The company's largest customer used to be Juniper Networks comprising ~ 12% of sales (as of 4Q12). Despite the announced disengagement between PLXS and JNPR, PLXS has had impressive wins that should more than offset the loss of JNPR. GE Health & GE Industrial is the next biggest customer (~10%).

Plexus is headquartered in Neenah, Wisconsin,

Figure 508. Plexus (PLXS) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1616.6	2013.4	2231.2	2306.7	2228.0	2267.2	2260.4	2512.4	2480.5
- y/y growth	-12.2%	24.5%	10.8%	3.4%	-3.4%	1.8%	1.5%	10.8%	9.7%
<b>Gross Margins</b>	9.6%	10.1%	9.6%	9.5%	9.6%	9.7%		9.8%	
<b>Operating Margins</b>	3.8%	4.8%	4.5%	4.5%	4.3%	4.9%		5.1%	
<b>EPS</b>	1.33	2.14	2.30	2.39	2.33	2.60	2.61	3.05	3.02
- y/y growth	-30.8%	61.4%	7.4%	3.8%	-2.6%	11.7%	12.1%	17.3%	15.8%
<b>Cash</b>	258.4	188.2	242.1	297.6	341.9	350.1		407.9	
<b>Debt</b>	150.8	130.6	287.6	270.4	261.3	260.7		260.7	
<b>Net Cash/Shr</b>	3.1	1.8	-0.7	1.1	2.4	2.7		4.4	
<b>Tangible Book Value/Shr</b>	13.4	16.3	14.7	18.5	20.5	23.5		26.6	

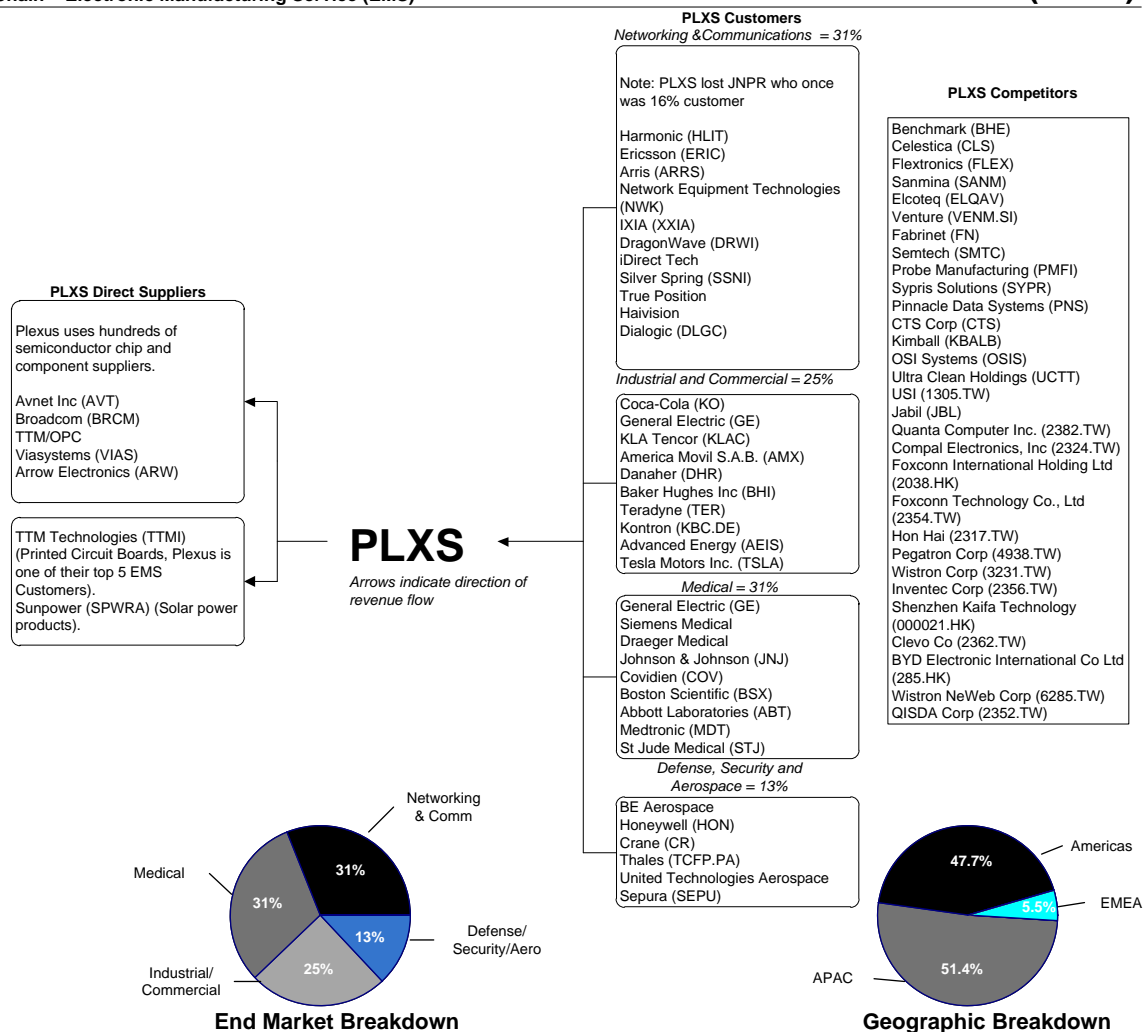
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 509. Plexus (PLXS)

Sector: Technology Supply Chain – Electronic Manufacturing Service (EMS)

## Plexus (PLXS)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Polycom Inc.

Citi Analyst: Kimberly Watkins, CFA

Polycom Inc. is a supplier of voice and video and conferencing solutions to enterprise and service provider customers.

The company reports revenue in three segments:

- 1) UC group systems (69% 2012 revenue), including telepresence, group video solutions supporting various numbers of connections, and group voice systems.
- 2) UC personal devices (13% 2012 revenue), including desktop video solutions and voice phones.
- 3) UC Platform (18% 2012 revenue), including video and voice media servers and network management solutions.

In 2012, Polycom held a 26% share of the \$2.7B video conferencing market per Infonetics. Key partners include Microsoft, IBM, and AT&T.

In fall 2012 Polycom launched a host of new products to address the migration to software-based video solutions.

Polycom was founded in 1990 and went public in 1996. Based in San Jose, CA, the company has 3,750 employees as of December 2012.

Figure 510. Polycom Inc. (PLCM) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	967.0	1218.5	1402.2	1392.6	1368.4	1365.8	1358.4	1408.4	1390.4
<b>- y/y growth</b>	-9.6%	26.0%	15.1%	-0.7%	-1.7%	-0.2%	-0.7%	3.1%	2.4%
<b>Gross Margins</b>	58.8%	60.4%	62.1%	60.5%	59.3%	58.6%		58.5%	
<b>Operating Margins</b>	14.2%	14.7%	16.3%	10.8%	8.9%	10.0%		12.4%	
<b>EPS</b>	0.60	0.75	1.07	0.69	0.55	0.73	0.72	0.96	0.83
<b>- y/y growth</b>	-20.3%	26.2%	42.9%	-35.9%	-20.3%	32.9%	30.8%	32.1%	15.9%
<b>Cash</b>	454.8	494.3	534.7	674.3	527.3	633.7		774.8	
<b>Debt</b>	0.0	0.0	0.0	0.0	248.4	242.2		235.9	
<b>Net Cash/Shr</b>	2.7	2.8	3.0	3.8	1.7	2.8		3.9	
<b>Tangible Book Value/Shr</b>	3.0	3.8	4.2	4.6	2.3	3.4		4.5	

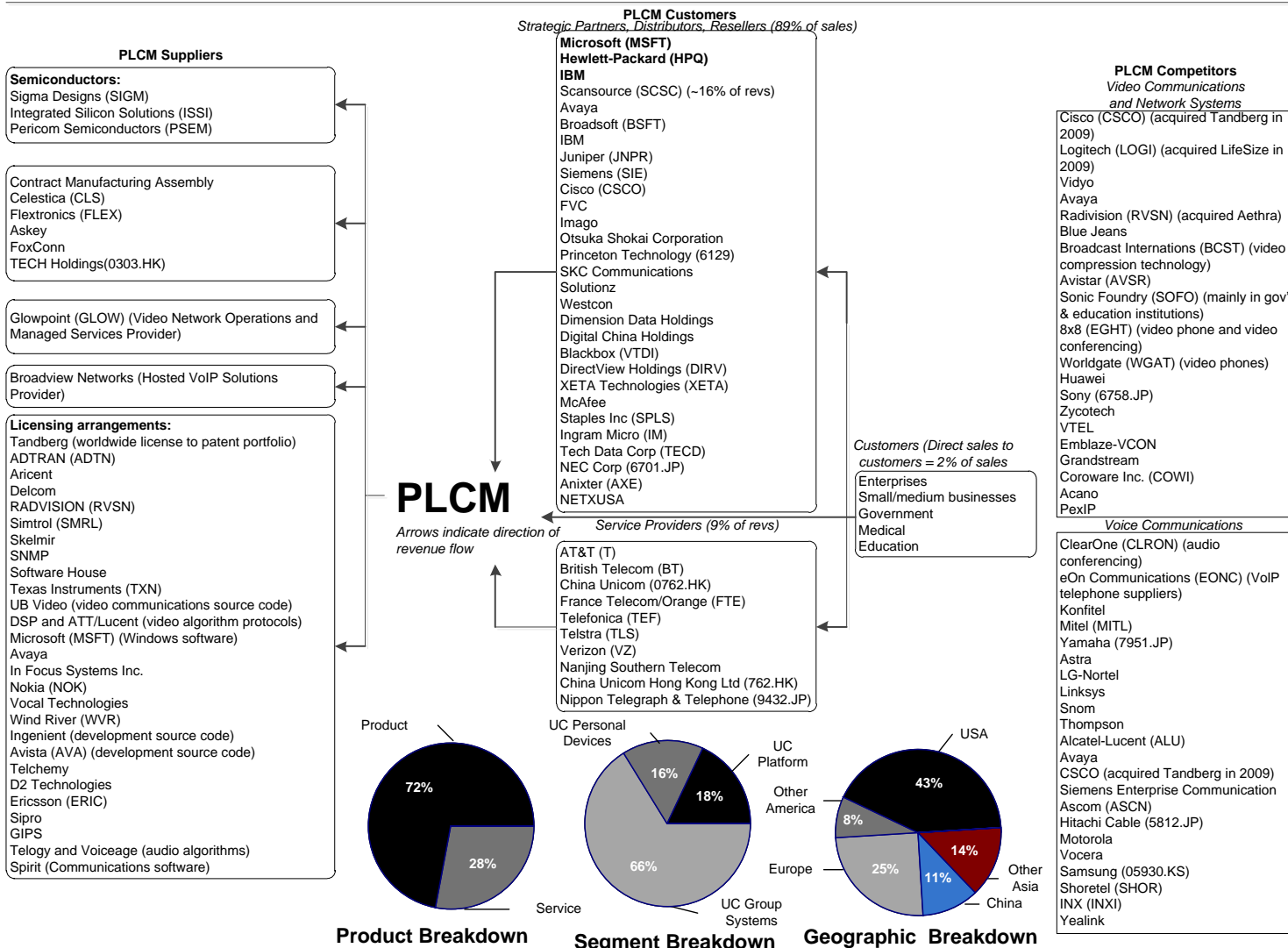
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 511. Polycom Inc. (PLCM)

Sector: Communications Equipment

Polycom Inc. (PLCM)



Source: Company reports, CIRA estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Powertech Technology

Citi Analyst: Roland Shu

Powertech was founded in May 1997, initially providing testing services to Powerchip and Macronix. In 1999, Kingston Technology, the world's largest memory module provider, became the largest shareholder. Soon after, management was replaced by executives from Kingston and the company started to provide turnkey solutions by expanding its packaging capacities.

Over the past years, it has expanded its footprint into the Japanese market by gaining business from IDMs such as Toshiba and Elpida.

Figure 512. Powertech Technology (6239.TW)

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	29968.5	37830.0	39451.3	41611.1	37604.5	36810.0	39505.2	37215.4	42196.0
- <i>y/y growth</i>	-3.9%	26.2%	4.3%	5.5%	-9.6%	-2.1%	5.1%	1.1%	6.8%
<b>Gross Margins</b>	23.9%	27.1%	24.2%	17.8%	14.6%	13.7%		12.9%	
<b>Operating Margins</b>	19.7%	22.6%	19.1%	11.9%	8.2%	7.7%		6.9%	
<b>EPS</b>	6.77	9.86	5.93	4.56	2.83	2.47	3.13	2.30	3.62
- <i>y/y growth</i>	-26.1%	45.7%	-39.8%	-23.1%	-38.0%	-12.7%	10.7%	-6.9%	15.5%
<b>Cash</b>	8999.8	11078.3	13830.2	20470.4	22503.7	25034.8		27729.7	
<b>Debt</b>	14612.5	14673.6	23100.6	19027.4	19483.6	18394.8		17142.8	
<b>Net Cash/Shr</b>	0.4	1.9	-2.0	7.8	6.0	10.6		15.7	
<b>Tangible Book Value/Shr</b>	34.4	42.6	44.7	46.7	47.0	47.8		48.6	

(Revenues, Cash and Debt in Millions in Local Currency)

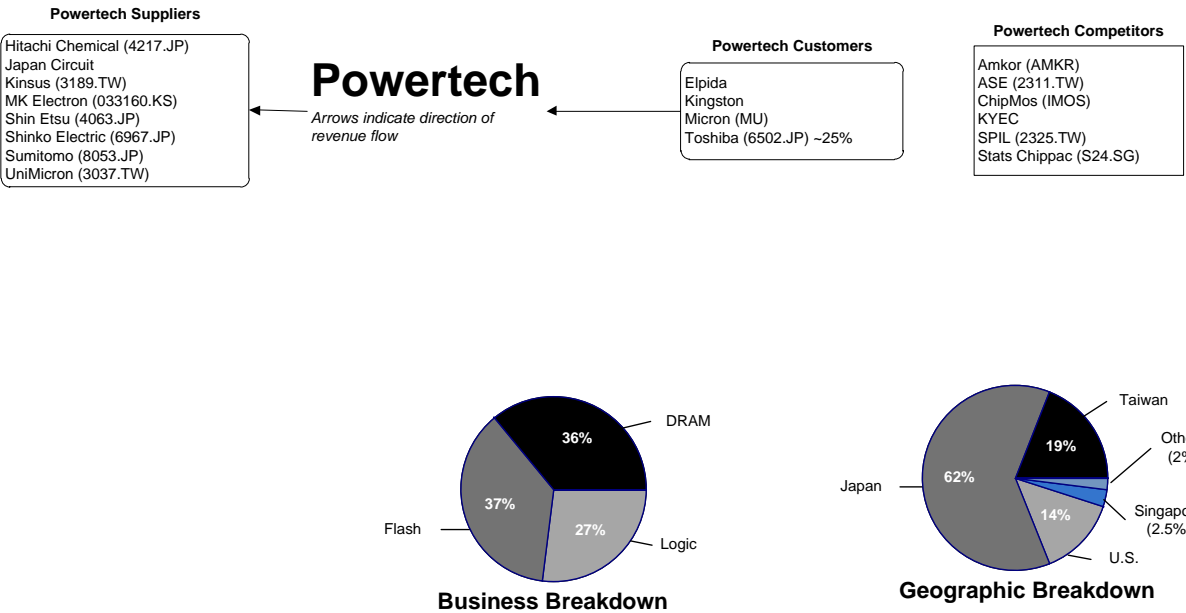
Source: Citi Research, Company Reports, FirstCall



Figure 513. Powertech Technology (6239.TW)

Sector: Semiconductors

Powertech Technology (6239.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Qualcomm

Citi Analyst: Ehud Gelblum, Ph.D

Qualcomm is the #1 vendor of baseband modems globally, derived from its invention of the code division multiple access (CDMA) standard.

Having started in satellite and digital radio, Qualcomm now generates the vast majority of its revenues from semiconductor sales (Qualcomm CDMA Technologies, QCT) and royalties from the licensing of its CDMA technology and its derivatives (Qualcomm Technology Licensing, QTL). The company generates revenue to a lesser degree from wireless internet services and satellite mobile communications systems and services (Qualcomm Wireless & Internet, QWI).

Among wireless chip vendors, Qualcomm is the most profitable, with an average GAAP operating margin of ~30% over the past five years. This strong position makes Qualcomm one of the largest chip companies in the world, ranking #9 within the global chip industry, and as the largest fabless semiconductor company.

Qualcomm is headquartered in San Diego, CA.

Figure 514. Qualcomm (QCOM) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	10385.0	10981.0	14958.0	19121.0	24865.0	27080.2	26787.7	29620.3	29151.7
- y/y growth	-6.7%	5.7%	36.2%	27.8%	30.0%	8.9%	7.7%	9.4%	8.8%
<b>Gross Margins</b>	71.3%	70.3%	68.1%	64.5%	61.8%	61.6%		63.3%	
<b>Operating Margins</b>	40.1%	39.3%	40.7%	37.1%	34.8%	35.9%		37.8%	
<b>EPS</b>	2.20	2.46	3.20	3.71	4.51	5.12	5.11	5.72	5.68
- y/y growth	-2.5%	11.8%	30.3%	16.0%	21.5%	13.6%	13.3%	11.7%	11.0%
<b>Cash</b>	11069.0	10279.0	11652.0	12374.0	14966.0	16882.1		22268.3	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	6.6	6.2	6.9	7.1	8.5	9.8		13.1	
<b>Tangible Book Value/Shr</b>	9.4	9.9	12.1	15.3	16.8	18.6		21.3	

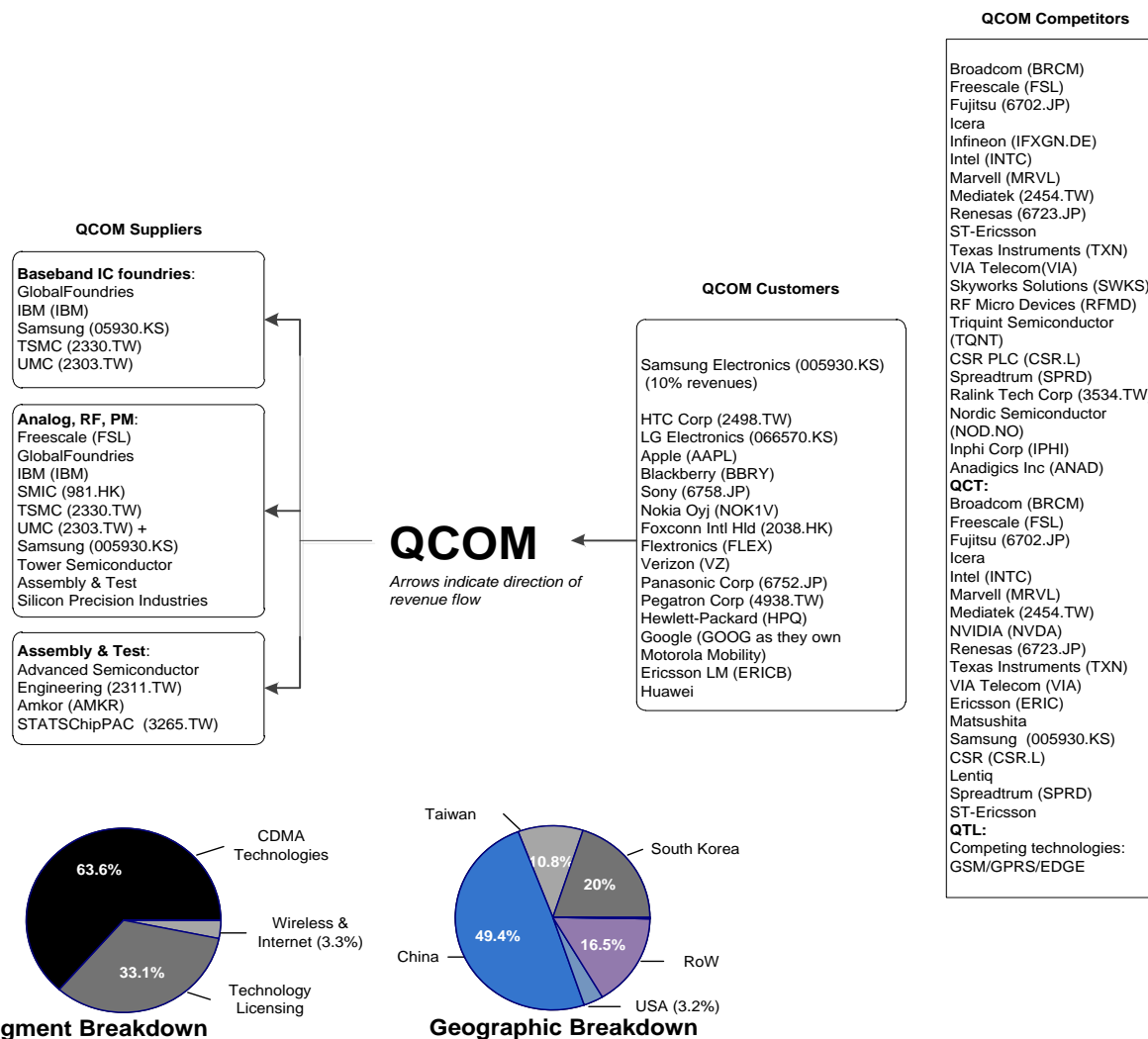
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 515. Qualcomm (QCOM)

Sector: Wireless Equipment

## Qualcomm (QCOM)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Quanta Computer

Citi Analyst: Wei Chen

Quanta Computer Incorporated (2382.TW) is an original design manufacturer (ODM) of notebook (NB) PCs and other electronic hardware.

It is the world's largest NB ODM in terms of shipments in 1H13, with major customers including Acer, Apple, HPQ, Lenovo, Sony, and Toshiba.

Founded in 1988, Quanta Computer is based in Taiwan.

Figure 516. Quanta Computer (2382.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	839791.2	1124727.6	1109727.9	1017544.5	853494.6	881309.0	912227.4	932718.3	952089.7
- y/y growth	2.6%	33.9%	-1.3%	-8.3%	-16.1%	3.3%	6.9%	5.8%	4.4%
<b>Gross Margins</b>	5.4%	3.5%	3.8%	3.9%	4.4%	4.3%		4.2%	
<b>Operating Margins</b>	2.6%	1.4%	1.4%	1.5%	1.7%	1.7%		1.6%	
<b>EPS</b>	5.90	4.85	6.01	5.99	4.82	4.82	5.61	4.91	6.27
- y/y growth	6.5%	-17.8%	23.8%	-0.2%	-19.6%	0.0%	16.5%	1.8%	11.7%
<b>Cash</b>	101777.0	171641.8	284781.4	200195.5	244911.0	264840.1		276953.8	
<b>Debt</b>	64803.2	160960.6	301393.0	200944.0	173890.0	173890.0		173890.0	
<b>Net Cash/Shr</b>	26.9	37.0	65.7	47.2	55.3	60.4		63.6	
<b>Tangible Book Value/Shr</b>	28.2	29.1	30.3	32.2	32.0	33.6		35.3	

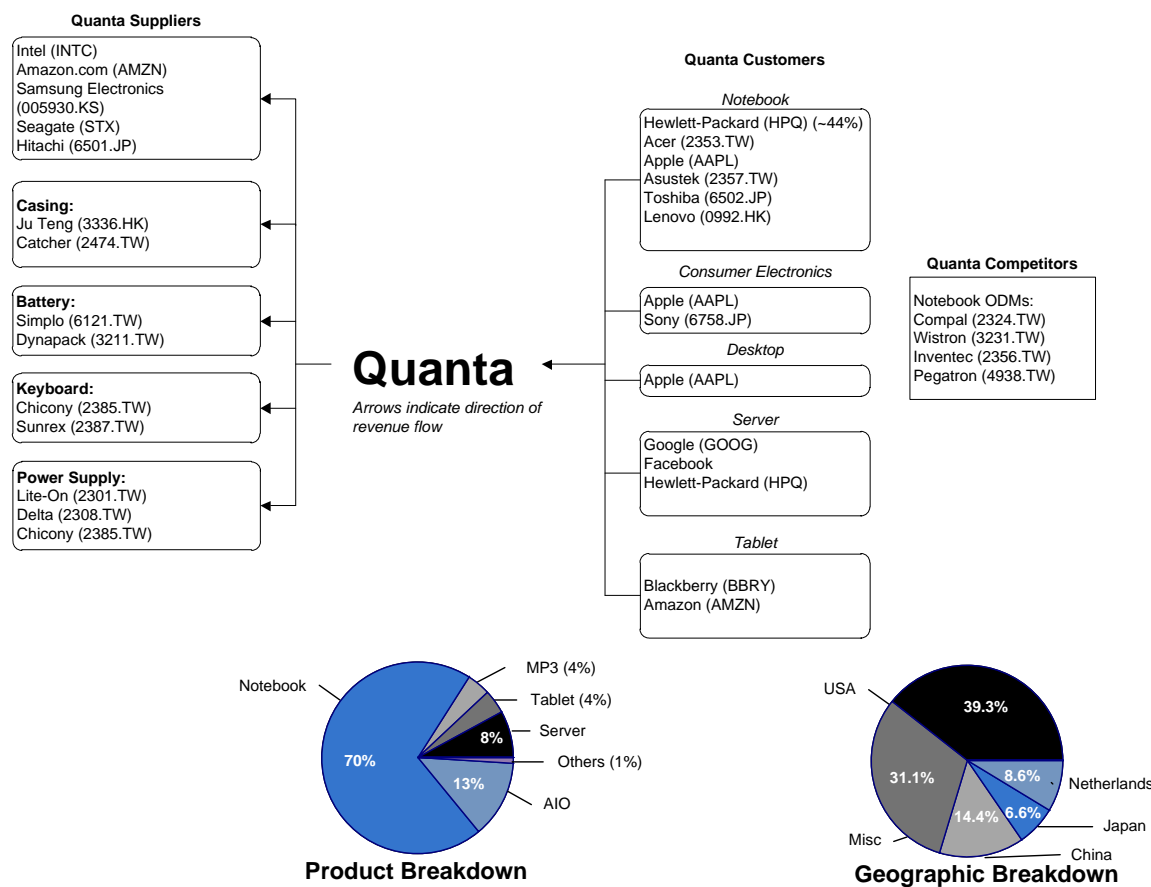
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 517. Quanta Computer (2382.TW)

Sector: PC & Enterprise Hardware

## Quanta Computer (2382.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Radiant Opto-Electronics

Citi Analyst: Winnie Hong, CFA

Radiant is one of the leading backlight module makers in the world, providing backlight units (BLU) and light guide plates for different applications.

IT products contribute >95% of total revenues and TV <5% in 2013. As the industry is moving to greater supply chain integration, Radiant is also actively developing customers and building LCM operations to collaborate with major customers such as Samsung and AUO.

Radiant Opto-Electronics was founded in 1995.

Figure 518. Radiant (6176.TW) Results and Forecasts

	2009	2010	2011	2012	2013	Street 2014E	Street 2015E
<b>Revenues</b>	36702.4	48311.5	63431.4	76212.2	63548.9	67263.5	77737.4
- <i>y/y growth</i>	7.9%	31.6%	31.3%	20.1%	-16.6%	5.8%	15.6%
<b>Gross Margins</b>	9.2%	9.6%	10.6%	11.8%	13.7%		
<b>Operating Margins</b>	4.9%	6.3%	7.2%	8.2%	8.9%		
<b>EPS</b>	2.93	5.59	9.43	11.70	10.00	11.30	13.00
- <i>y/y growth</i>	7.5%	90.9%	68.8%	24.1%	-14.5%	12.9%	15.1%
<b>Cash</b>	9179.1	11391.8	17435.0	16653.7	26805.7		
<b>Debt</b>	4609.2	4849.5	14839.1	7221.9	11500.0		
<b>Net Cash/Shr</b>	17.6	20.6	29.1	28.6	50.1		
<b>Tangible Book Value/Shr</b>	29.0	30.9	39.9	43.7	46.8		

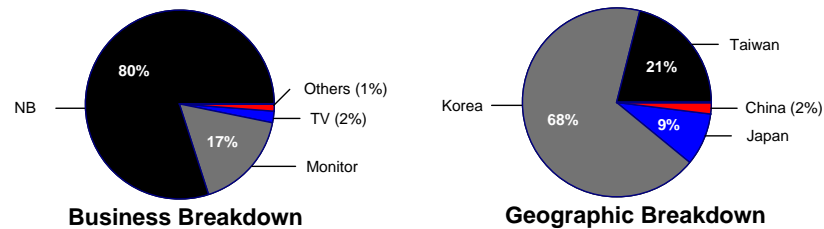
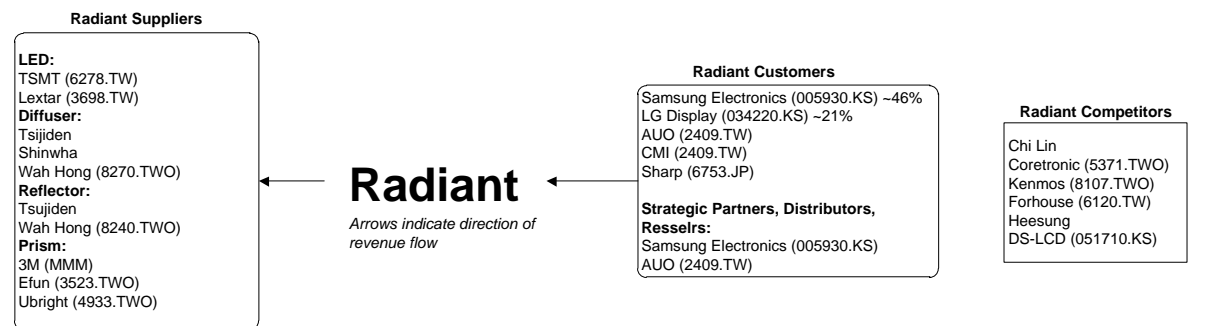
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 519. Radiant (6176.TW)

Sector: Semiconductors and Components

## Radiant Opto-Electronics Corp. (6176.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Rambus

Citi Analyst: Terence Whalen

Rambus invents, develops, and licenses patented designs to numerous companies.

It operates four business units: 1) Memory and Interface Division (MID) (92% of C12 sales); 2) Cryptography Research (CRI); 3) Lighting and Display Technology (LDT); and 4) Mobile Technologies Division (MTD). CRI, LDT, and MTD are new business units.

As of December 2012, Rambus holds 1,735 US and foreign patents and has an additional 1,121 patents pending. Rambus is US-based and was founded in 1990.

Figure 520. Rambus (RMBS) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	113.0	323.4	312.4	234.1	271.5	300.0	299.0	313.4	324.9
- <i>y/y growth</i>	-20.7%	186.2%	-3.4%	-25.1%	16.0%	10.5%	10.1%	4.5%	8.7%
<b>Gross Margins</b>	93.9%	97.9%	92.3%	87.9%	88.2%	88.6%		89.3%	
<b>Operating Margins</b>	-78.0%	33.8%	16.2%	3.7%	27.9%	35.6%		37.7%	
<b>EPS</b>	-1.01	1.34	-0.07	-0.52	-0.14	0.30	0.22	0.43	0.42
- <i>y/y growth</i>	44.6%	233.0%	-105.0%	-677.1%	72.2%	304.5%	249.7%	45.4%	92.2%
<b>Cash</b>	460.2	512.0	289.5	203.3	387.7	343.0		469.2	
<b>Debt</b>	248.0	149.4	177.3	193.5	313.0	154.2		159.5	
<b>Net Cash/Shr</b>	3.3	3.1	1.0	0.1	2.1	1.6		2.6	
<b>Tangible Book Value/Shr</b>	2.1	3.7	1.2	0.4	0.9	1.7		2.6	

(Revenues, Cash and Debt in Millions in Local Currency)

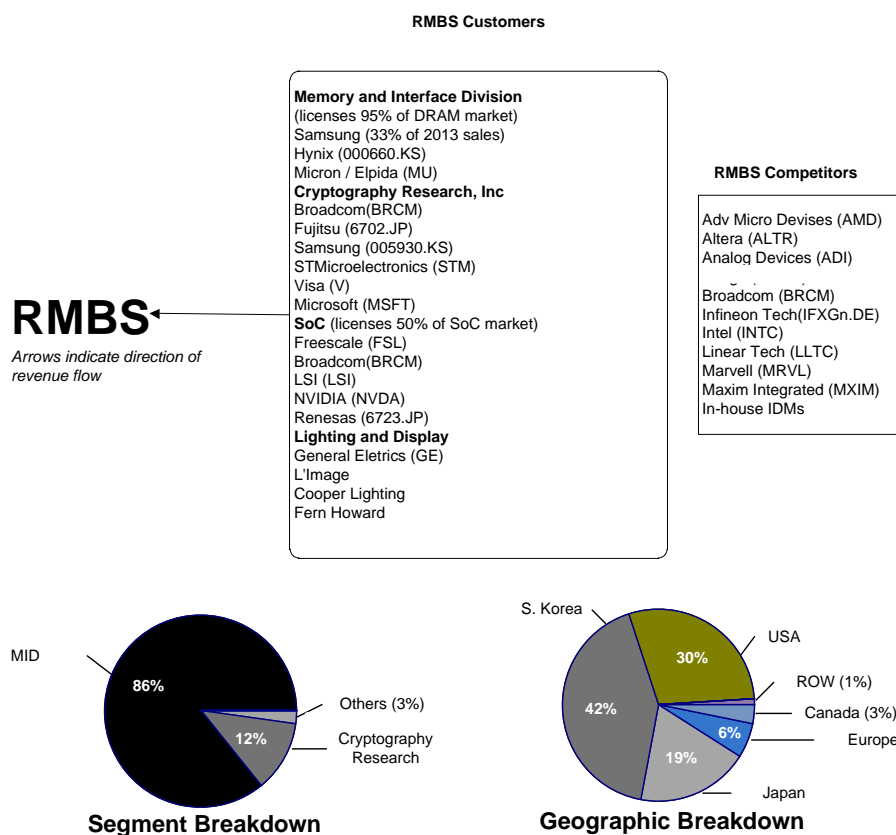
Source: Citi Research, Company Reports, FirstCall



Figure 521. Rambus (RMBS)

Sector: Semiconductors

## Rambus (RMBS)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Renewable Energy Corp.

Citi Analyst: Jason Channell

REC ASA is a polysilicon and silane gas manufacturer. It is one of the premier manufacturers of polysilicon globally, using both Siemens and FBR technology.

Renewable Energy has production facilities in the US (Moses Lake and Butte).

Figure 522. Renewable Energy Corp. (REC.NO) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	8831.0	13776.0	13366.0	3063.0	2023.2	2380.7	3098.8	2386.4	3213.6
- <i>y/y growth</i>	7.8%	56.0%	-3.0%	-77.1%	-33.9%	17.7%	53.2%	0.2%	3.7%
<b>Gross Margins</b>	51.2%	42.1%	54.2%	13.5%	12.9%	27.4%		28.9%	
<b>Operating Margins</b>	9.7%	5.7%	1.8%	-43.3%	-21.3%	-11.5%		-6.5%	
<b>EPS</b>	0.20	-0.59	-0.54	-0.60	-0.20	-0.11	-0.03	-0.08	0.02
- <i>y/y growth</i>	-92.0%	-389.4%	7.5%	-10.9%	66.6%	44.3%	84.1%	32.7%	168.8%
<b>Cash</b>	1689.0	850.0	1593.0	1623.0	944.5	1271.2		1248.3	
<b>Debt</b>	11977.0	8786.0	6272.0	3731.0	1867.8	2288.8		1988.8	
<b>Net Cash/Shr</b>	-12.3	-7.3	-4.0	-1.3	-0.2	-0.1		-0.1	
<b>Tangible Book Value/Shr</b>	18.7	19.7	10.8	2.7	1.7	1.6		1.5	

(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 523. Renewable Energy Corp. (REC.NO)

Sector: Alternative Energy

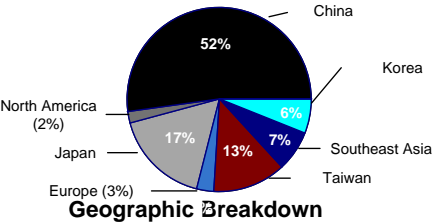
Renewable Energy Corp. ASA (REC.NO)

REC.NO

Arrows indicate direction of revenue flow

REC Competitors

- Changzhou
- GCL(3800.HK)
- Hemlock
- Jinko Solar (JKS)
- LDK Solar (LDK)
- MEMC (WFR)
- OCI (010060.KS)
- Renesola (SOL)
- Shanghai Chaori (005506.HK)
- Wacker Chemie (WCH.DE)
- Wacker Chemie (WCH.DE)
- Daqo (DQ)



Segment Breakdown - 100% Silicon

Geographic Breakdown

Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Ricoh Co

Citi Analyst: Masahiro Shibano

Ricoh Co., Ltd. is engaged in the development, production, sale, and provision of services for imaging, solution and industrial products.

The company operates through the following segments: Imaging and Solutions, Industrial Products, and Other.

- The Imaging and Solutions segment provides imaging and network systems solutions. Its products include monochrome and color digital PPCs/MFPs, laser printers, GELJET printers, digital duplicators, projectors, video conference systems, facsimiles, scanners, related parts and supplies, services, support and software.
- The Industrial Products segment manufactures and sells thermal media, optical and electrical component units, semiconductor devices and electronic components.
- The Other segment includes digital cameras.

The company was founded by Kiyoshi Ichimura on February 6, 1936 and is headquartered in Tokyo, Japan.

Figure 524. Ricoh (7752.JP) Results and Forecasts

	2010	2011	2012	2013	2014	CIR 2015E	Street 2015E	CIR 2015E	Street 2015E
<b>Revenues</b>	2016337.0	1942013.0	1903477.0	1924497.0	2159800.0	2232700.0	2233236.0	2232700.0	2233236.0
– y/y growth	–3.6%	–3.7%	–2.0%	1.1%	12.2%	3.4%	3.4%	0.0%	0.0%
<b>Gross Margins</b>	40.8%	40.7%	39.5%	39.9%	40.1%	38.9%		38.9%	
<b>Operating Margins</b>	3.3%	3.1%	–0.9%	3.3%	5.8%	7.1%		7.1%	
<b>EPS</b>	37.90	26.72	–60.59	44.76	98.24	126.10	117.93	126.10	117.93
– y/y growth	331.2%	–29.5%	–326.8%	173.9%	119.5%	28.4%	20.0%	0.0%	0.0%
<b>Cash</b>	243888.0	181179.0	158671.0	120331.0	117001.0	112001.0		112001.0	
<b>Debt</b>	684445.0	630445.0	741867.0	702780.0	710000.0	680000.0		680000.0	
<b>Net Cash/Shr</b>	–368.2	–405.5	–498.7	–490.9	–514.4	–424.8		–424.8	
<b>Tangible Book Value/Shr</b>	1341.4	1281.5	1134.6	1238.6	1414.1	1502.4		1502.4	

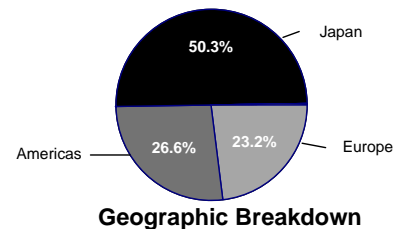
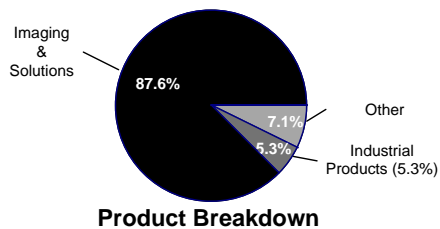
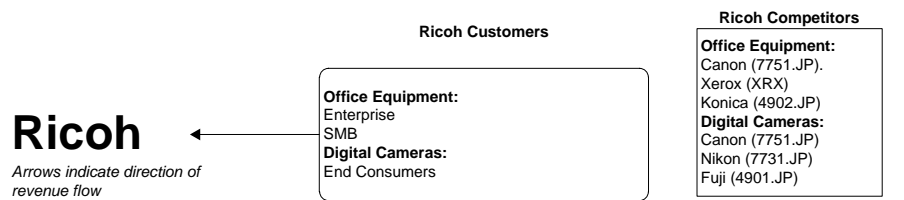
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 525. Ricoh (7752.JP)

Sector: Imaging

Ricoh Co. Ltd. (7752.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Riverbed Technology

Citi Analyst: Kimberly Watkins, CFA

Riverbed is a developer of WAN optimization and performance management solutions sold to enterprise customers.

The company began shipping its flagship Steelhead product line in 2004, which reduces latency and "chattiness" caused by networking and application protocols, creating "LAN-like" connections regardless of location based on its proprietary software. Riverbed held 44% share of the \$1B WAN optimization market in 2012 per Dell'Oro.

The company has expanded into new markets via acquisition over the last 3 years, including application delivery controllers, network performance management, and application performance management. In December 2012 Riverbed completed the acquisition of Opnet, a provider of application and network performance management solutions, the largest acquisition in the company's history.

Riverbed reports revenue in 3 segments, including:

- 1) WAN optimization (73% LTM revenue), housing its flagship Steelhead product line and Granite branch storage solutions.
- 2) Performance management (23% LTM revenue), including Opnet and the Cascade network performance management product line.; and
- 3) Application delivery controller (4% LTM revenue).

The company was founded in 2002, went public in 2006, and is based in San Francisco, CA. Riverbed has 2,566 employees as of December 2012.

Figure 526. Riverbed Technology (RVBD) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	395.9	551.9	728.5	839.7	1057.2	1163.1	1140.5	1253.3	1233.1
– <i>y/y growth</i>	18.8%	39.4%	32.0%	15.3%	25.9%	10.0%	7.9%	7.8%	8.1%
<b>Gross Margins</b>	76.9%	77.8%	78.6%	78.5%	78.9%	78.9%		78.9%	
<b>Operating Margins</b>	19.0%	25.6%	29.4%	26.4%	23.0%	23.5%		25.5%	
<b>EPS</b>	0.34	0.59	0.90	0.99	1.02	1.20	1.14	1.42	1.31
– <i>y/y growth</i>	-42.6%	74.2%	52.7%	10.5%	2.5%	18.0%	12.2%	18.1%	14.7%
<b>Cash</b>	325.7	425.0	470.2	451.1	459.4	604.7		766.8	
<b>Debt</b>	0.0	32.9	0.0	572.1	525.0	519.9		514.9	
<b>Net Cash/Shr</b>	2.2	2.7	2.8	-0.7	-0.3	0.6		1.6	
<b>Tangible Book Value/Shr</b>	2.3	3.2	3.3	-1.9	-1.7	-1.0		0.1	

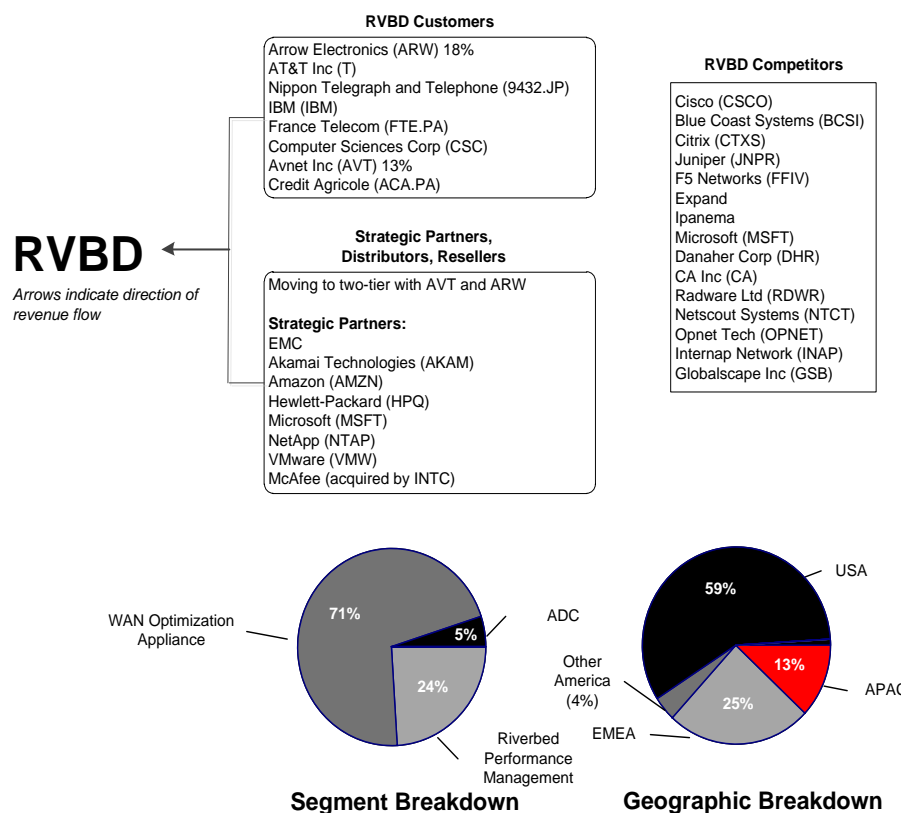
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 527. Riverbed Technology (RVBD)

Sector: Computer Software

## Riverbed Technology (RVBD)



Source: Company reports, CIRA estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Rohm

Citi Analyst: Yuta Fukasawa

ROHM Co., Ltd. engages in the design and manufacture of integrated circuits and other electronic components. It also develops LSI scanner engines designed specifically for cordless hand-held scanners.

The company operates through the following segments: Integrated Circuits, Discrete Semiconductor Devices, and Others.

- The Integrated Circuits segment includes analog ICs, logic ICs, memory ICs, ASICs, and foundry business operations.
- The Discrete Semiconductor Devices segment includes diodes, transistors, light-emitting diodes, and laser diodes.
- The Others segment includes resistors, printhead products, optical modules, tantalum capacitor, power modules, and lighting products.

The company was founded in 1954 and is headquartered in Kyoto, Japan.

Figure 528. Rohm (6963.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	317140.0	335640.0	341885.0	304652.0	292410.0	334401.0	328875.0	352100.0	341089.0
– y/y growth	-15.1%	5.8%	1.9%	-10.9%	-4.0%	14.4%	12.5%	5.3%	3.7%
<b>Gross Margins</b>	31.5%	31.5%	35.9%	31.4%	27.1%	30.2%		32.8%	
<b>Operating Margins</b>	3.3%	5.6%	9.6%	2.1%	-0.3%	6.6%		9.2%	
<b>EPS</b>	89.74	65.10	88.09	-149.39	-486.60	225.39	225.28	193.39	210.76
– y/y growth	-68.5%	-27.5%	35.3%	-269.6%	-225.7%	146.3%	146.3%	-14.2%	-6.4%
<b>Cash</b>	291253.0	280026.0	258380.0	226817.0	240153.0	241490.6		238835.3	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	2657.6	2554.9	2362.5	2104.1	2227.5	2239.9		2215.2	
<b>Tangible Book Value/Shr</b>	5768.8	5790.1	5538.7	5488.3	5375.2	5857.1		5993.4	

(Revenues, Cash and Debt in Millions in Local Currency)

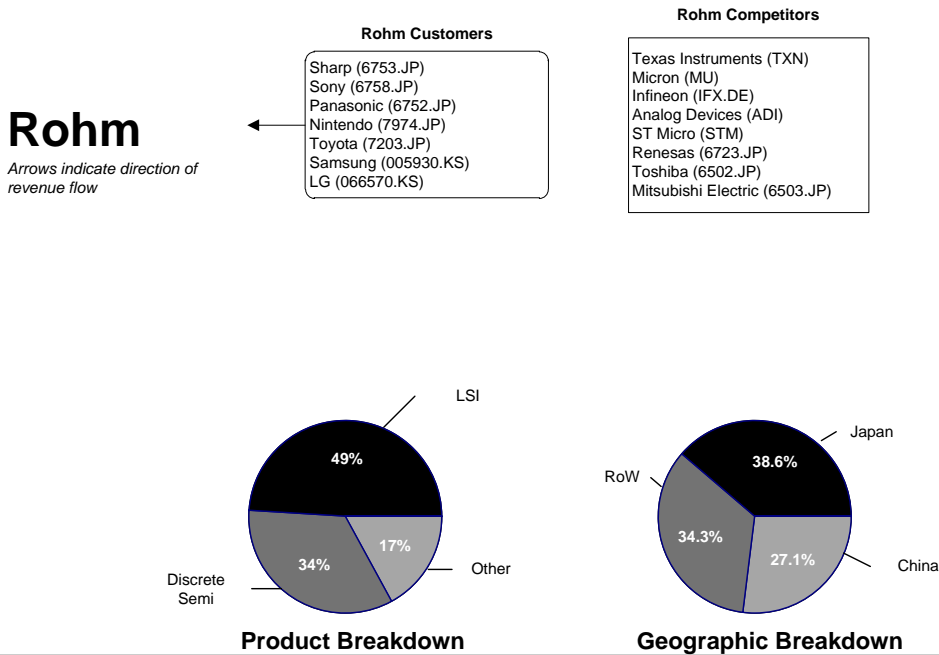
Source: Citi Research, Company Reports, FirstCall



Figure 529. Rohm (6963.JP)

Sector: Semiconductors

Rohm (6963.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Samsung Electro-Mechanics

Citi Analyst: Henry Kim, CFA

SEMCO manufactures electronic components used in computers, audio and video products, industrial electronics, and telecommunications equipment. The company's products include MLCC, packaging substrates and camera modules.

Figure 530. Samsung Electro-Mechanics (009150.KS) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	5550514.0	6968900.0	6031800.0	7912800.0	8306897.3	8115374.3	8390329.0	8635159.8	9018101.0
- <i>y/y growth</i>	29.5%	25.6%	-13.4%	31.2%	5.0%	-2.3%	1.0%	6.4%	7.5%
<b>Gross Margins</b>	21.3%	24.3%	16.3%	17.6%	19.0%	18.5%		18.2%	
<b>Operating Margins</b>	8.7%	11.2%	4.6%	7.3%	6.4%	5.9%		5.6%	
<b>EPS</b>	3799.36	7425.71	4678.76	5901.49	5198.84	4681.29	4530.67	4757.35	5310.20
- <i>y/y growth</i>	490.2%	95.4%	-37.0%	26.1%	-11.9%	-10.0%	-12.9%	1.6%	17.2%
<b>Cash</b>	1088629.0	695981.3	525902.0	683529.0	919586.1	1081410.9		1185566.1	
<b>Debt</b>	1719262.0	1709453.0	1290138.0	1380803.0	1380803.0	1380803.0		1380803.0	
<b>Net Cash/Shr</b>	6432.8	-3440.8	419.3	1393.0	4553.4	6719.9		8114.3	
<b>Tangible Book Value/Shr</b>	32424.0	43239.7	44897.6	47567.3	51616.2	55147.5		58754.8	

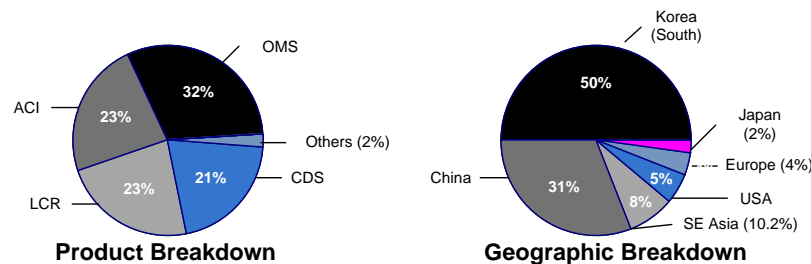
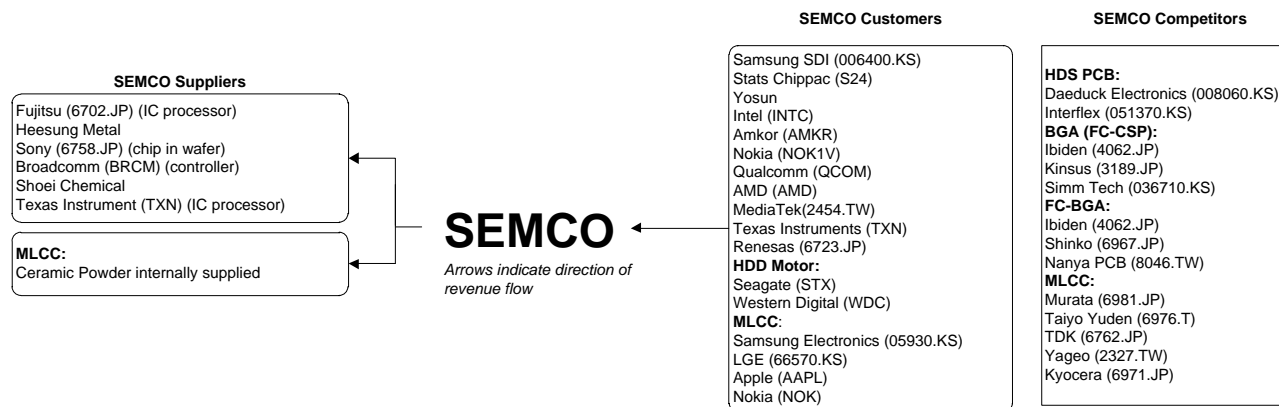
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 531. Samsung Electro-Mechanics (009150.KS)

Sector: Diversified

## Samsung Electro-Mechanics (009150.KS)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Samsung Electronics

Citi Analyst: Henry Kim, CFA

Samsung Electronics (SEC) is a global leader in semiconductor, telecommunications, and digital convergence technology. It is the world's leading producer of memory semiconductors, display panels, mobile phones, monitors and TVs.

SEC has four main business units: 1) Semiconductor; 2) Display Panel; 3) Telecommunications; and 4) Media & Appliances.

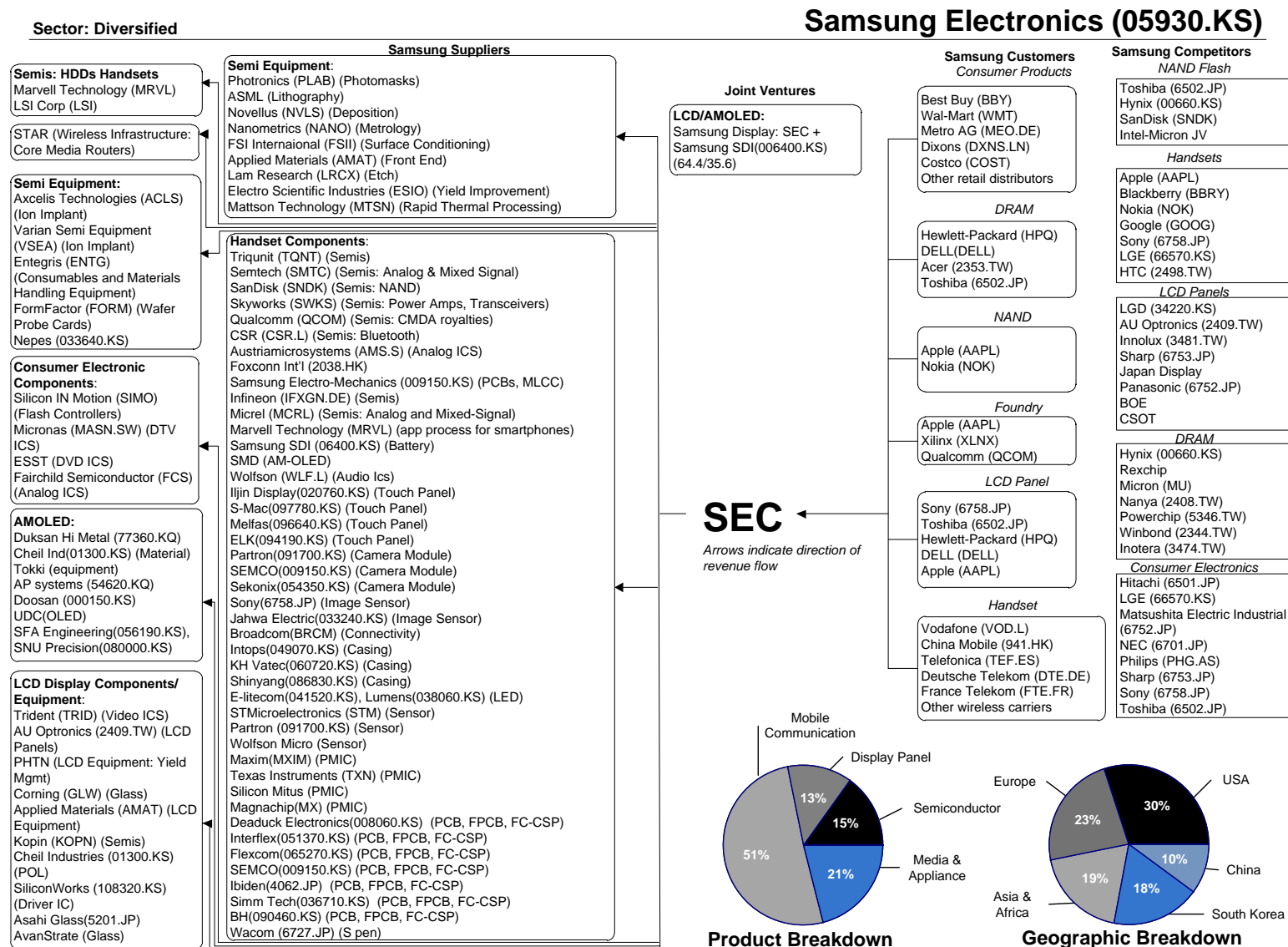
Figure 532. Samsung Electronics (05930.KS) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	136323700.0	154630328.0	165001771.0	201103613.0	228692667.0	233504415.1	237647553.0	245476523.2	252378404.0
- y/y growth	86.9%	13.4%	6.7%	21.9%	13.7%	2.1%	3.9%	5.1%	6.2%
<b>Gross Margins</b>	30.6%	33.6%	32.0%	37.0%	39.8%	41.1%		41.4%	
<b>Operating Margins</b>	8.0%	11.2%	9.5%	14.4%	16.1%	16.3%		16.4%	
<b>EPS</b>	64980.50	107258.02	90864.65	157404.37	202453.15	201497.01	194486.69	213236.79	204471.79
- y/y growth	73.2%	65.1%	-15.3%	73.2%	28.6%	-0.5%	-3.9%	5.8%	5.1%
<b>Cash</b>	20883500.0	22479963.0	26877630.0	37448271.0	54496009.0	67008439.1		81656044.1	
<b>Debt</b>	9394611.0	10775424.0	14646610.0	14895164.0	11160533.0	9108988.7		8596502.4	
<b>Net Cash/Shr</b>	132405.4	144319.7	148778.9	217216.7	354379.2	440883.7		541727.7	
<b>Tangible Book Value/Shr</b>	455792.8	553747.5	623442.0	751726.4	921394.3	1110746.8		1311771.5	

(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 533. Samsung Electronics (05930.KS)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Samsung SDI

Citi Analyst: Henry Kim, CFA

Samsung SDI is a diversified producer of CRT, PDP and rechargeable batteries. The company is also expanding into new energy solution businesses like solar cell, ESS and EV battery.

The company spun off its Mobile Display division to create Samsung Mobile Display, which produces STN-LCD and OLED and is now merged into Samsung Display Co.

Figure 534. Samsung SDI (006400.KS) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	4950300.0	5124300.0	5443900.0	5771202.0	5054252.5	4792433.2	4959715.0	5285365.5	5301604.0
- y/y growth	-5.1%	3.5%	6.2%	6.0%	-12.4%	-5.2%	-1.9%	10.3%	6.9%
<b>Gross Margins</b>	14.6%	15.4%	12.5%	15.7%	15.1%	17.4%		18.3%	
<b>Operating Margins</b>	2.2%	5.6%	2.0%	3.2%	0.5%	2.6%		4.0%	
<b>EPS</b>	4702.19	7811.68	7025.12	32301.00	7877.21	4548.63	7820.94	7024.73	10771.04
- y/y growth	451.1%	66.1%	-10.1%	359.8%	-75.6%	-42.3%	-0.7%	54.4%	37.7%
<b>Cash</b>	1803446.0	1148286.0	801575.0	1011527.0	930655.9	907587.3		812297.4	
<b>Debt</b>	965232.0	358378.0	761366.0	1133053.0	1310339.3	1570339.3		1860339.3	
<b>Net Cash/Shr</b>	31258.7	20200.7	17594.5	11792.3	5627.2	-1464.1		-10140.7	
<b>Tangible Book Value/Shr</b>	109285.3	132641.5	134111.2	161660.5	168058.7	171128.3		176673.9	

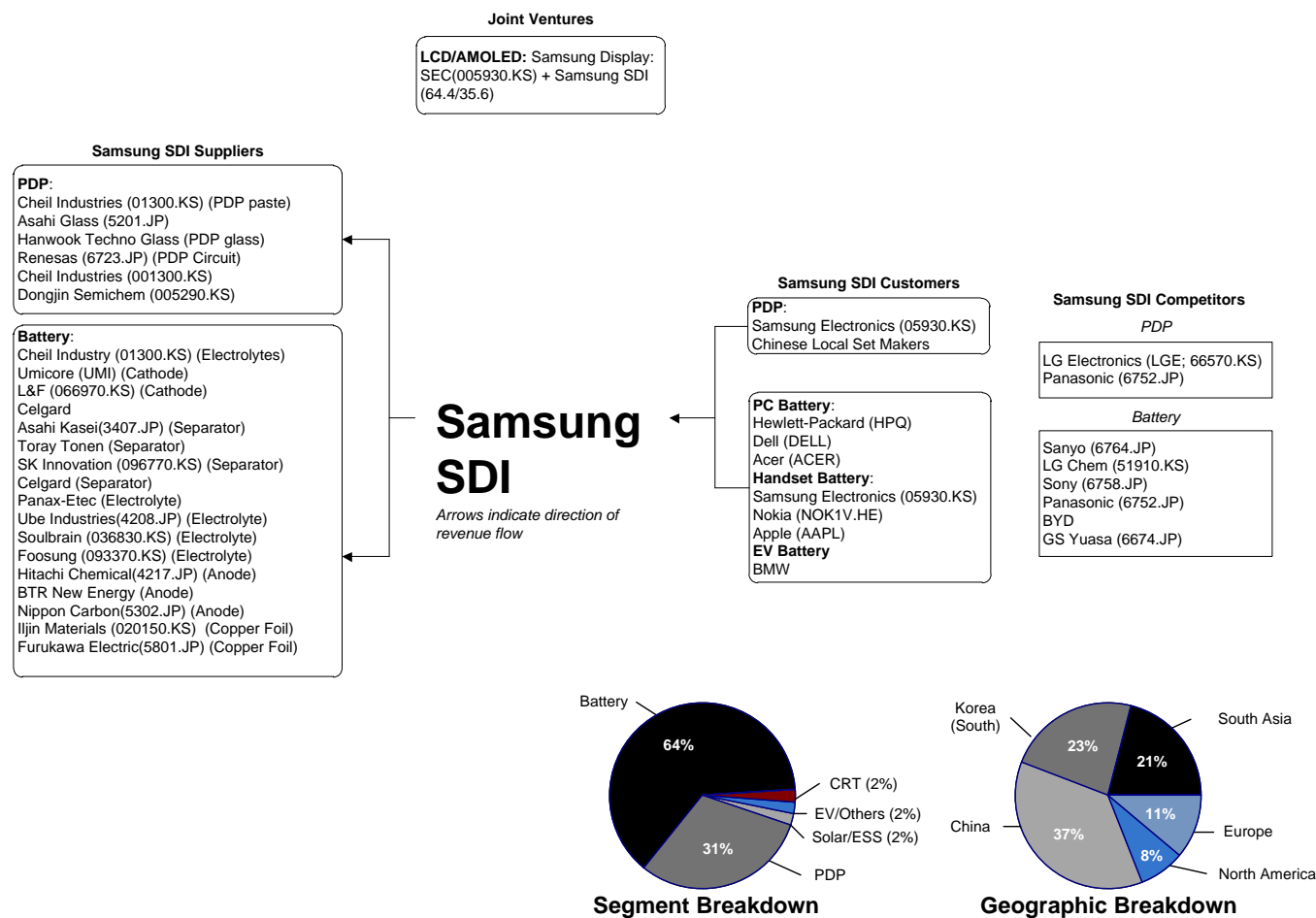
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 535. Samsung SDI (006400.KS)

Sector: Diversified

## Samsung SDI (006400.KS)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Samsung Techwin

Citi Analyst: Henry Kim, CFA

Samsung Techwin started as Samsung Precision Industries Co focusing on aircraft engines and film cameras.

The company now has five business units: Security Solutions (CCTV), Digital & IT Solutions (Semiconductor Materials), Intelligent Machinery & Solutions (Semiconductor Systems), Power Systems and Defense Program. It spun off its DSC camera business in 2009.

Figure 536. Samsung Techwin (012450.KS) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	2642742.8	3197700.0	2946762.3	2934282.0	2912031.0	3179388.4	3110545.0	3745842.4	3480776.0
- y/y growth	13.0%	21.0%	-7.8%	-0.4%	-0.8%	9.2%	6.8%	17.8%	11.9%
<b>Gross Margins</b>	14.6%	18.8%	18.5%	22.2%	22.4%	21.6%		22.3%	
<b>Operating Margins</b>	7.8%	6.7%	3.0%	5.3%	4.2%	4.6%		7.7%	
<b>EPS</b>	3239.44	4408.00	4355.35	2473.18	2504.01	3064.46	2833.61	5326.11	4161.75
- y/y growth	238.8%	36.1%	-1.2%	-43.2%	1.2%	22.4%	13.2%	73.8%	46.9%
<b>Cash</b>	273182.0	111803.0	187847.0	239035.0	226324.5	222098.1		300810.7	
<b>Debt</b>	542285.4	648863.0	675859.0	644039.0	544039.0	444039.0		344039.0	
<b>Net Cash/Shr</b>	-1103.3	-5968.6	-5073.1	-3638.8	-1995.9	-193.2		3170.4	
<b>Tangible Book Value/Shr</b>	18124.7	18650.6	25044.7	25112.3	27116.3	29680.7		34506.8	

(Revenues, Cash and Debt in Millions in Local Currency)

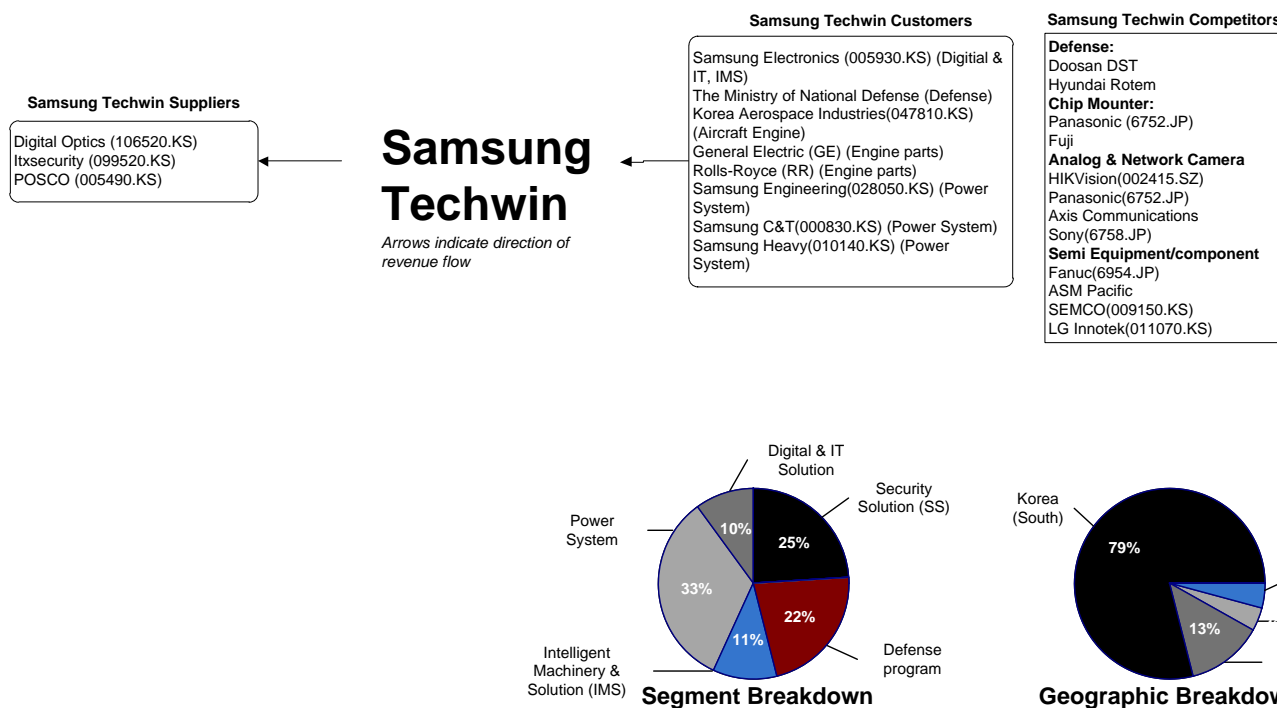
Source: Citi Research, Company Reports, FirstCall



Figure 537. Samsung Techwin (012450.KS)

Sector: Diversified

## Samsung Techwin (012450.KS)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Sanmina-SCI

Citi Analyst: Jim Suva, CPA

Sanmina-SCI Corporation (SANM) is the fifth-largest electronics manufacturing services (EMS) company in the world in terms of CY10 revenue. The company manufactures complex printed circuit board assemblies, custom designed backplane assemblies and subassemblies, multi-layer printed circuit boards (also known as PCBs, Sanmina-SCI is the largest manufacturer of this component in the world), and custom cable and wire harness assemblies. The company also tests and assembles electronic subsystems and systems.

As of the most recent quarter, sales by end-markets include 46% communications, 13% enterprise computing and storage, 10% multi-media, and 31% industrial/defense/medical.

Top customers include Alcatel-Lucent (>10%), Ericsson, EchoStar, IBM, Hewlett Packard, Nokia Siemens, Royal Philips, Nortel and Cisco.

Figure 538. Sanmina (SANM) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	5182.5	6319.3	6602.4	6093.3	5917.1	6033.3	5964.8	6248.1	6168.6
- y/y growth	-28.0%	21.9%	4.5%	-7.7%	-2.9%	2.0%	0.8%	3.6%	3.4%
<b>Gross Margins</b>	6.6%	7.8%	7.8%	7.2%	7.4%	7.8%		7.9%	
<b>Operating Margins</b>	2.7%	3.5%	4.9%	1.9%	3.6%	3.4%		3.8%	
<b>EPS</b>	-0.49	1.30	1.64	1.26	1.45	1.70	1.69	1.99	1.81
- y/y growth	-157.8%	366.7%	25.7%	-22.9%	14.6%	17.7%	17.0%	17.0%	7.0%
<b>Cash</b>	899.2	592.8	640.3	409.6	402.9	576.8		873.7	
<b>Debt</b>	1437.7	1305.7	1242.5	897.4	584.8	644.4		644.4	
<b>Net Cash/Shr</b>	-4.3	-7.9	-6.5	-5.1	-1.9	0.2		3.6	
<b>Tangible Book Value/Shr</b>	6.4	8.4	9.6	11.9	13.2	14.5		16.6	

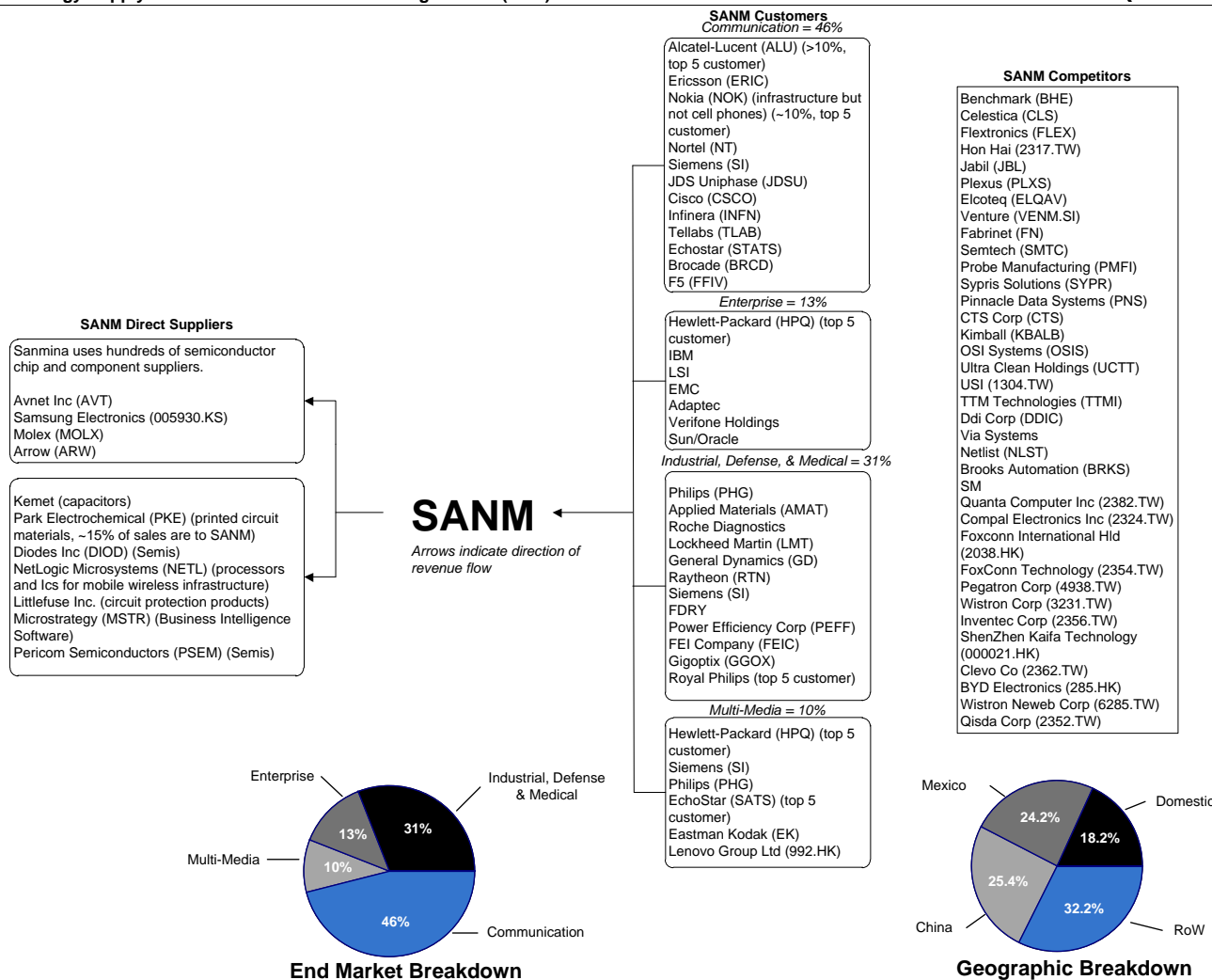
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 539. Sanmina (SANM)

Sector: Technology Supply Chain – Electronic Manufacturing Service (EMS)

Sanmina-SCI (SANM)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.  
Note: Business segments as per latest quarterly results

Source: Citi Research

## Seagate Technology

Citi Analyst: Joe Yoo

Seagate is the second-largest global supplier of hard disk drives. The company shipped 193M drives in FY10 and generated revenues of \$11.4B. The company has traditionally been the dominant player in the Enterprise market, and augmented its position in the desktop PC market through the acquisition of Maxtor in 2006.

Seagate has vertically-integrated operations, and in-sources more than 90% of its key components (heads, media, and substrates). Primary facilities for hard drive assembly are located in China (Wuxi, Suzhou), Thailand (Korat), and Singapore (Ang Mo Kio).

As of June 2010, Seagate employed about 52,600 employees (permanent and temporary) globally, with 45,000 located in Asia. The company is headquartered in Cupertino, CA,

Figure 540. Seagate Technology (STX) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	9806.0	11395.0	10970.0	14937.5	14351.0	13870.1	13823.7	13972.5	13994.6
- y/y growth	-22.8%	16.2%	-3.7%	36.2%	-3.9%	-3.4%	-3.7%	0.7%	1.2%
<b>Gross Margins</b>	14.8%	28.2%	19.5%	31.7%	28.0%	28.5%		29.4%	
<b>Operating Margins</b>	0.0%	16.7%	7.5%	21.7%	15.8%	14.5%		15.8%	
<b>EPS</b>	-0.37	3.35	1.23	6.70	5.29	5.13	5.10	6.04	5.66
- y/y growth	-113.8%	1001.2%	-63.2%	444.1%	-21.0%	-3.1%	-3.7%	17.7%	10.9%
<b>Cash</b>	1541.0	2515.0	3151.0	2118.0	2188.0	2982.8		2780.1	
<b>Debt</b>	2727.0	2502.0	3512.0	2863.0	2777.0	3572.0		3572.0	
<b>Net Cash/Shr</b>	-0.8	0.7	0.4	-1.7	-1.5	-1.7		-2.5	
<b>Tangible Book Value/Shr</b>	3.0	5.4	5.5	5.9	7.1	6.3		5.6	

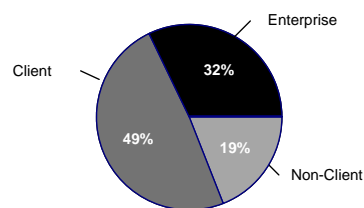
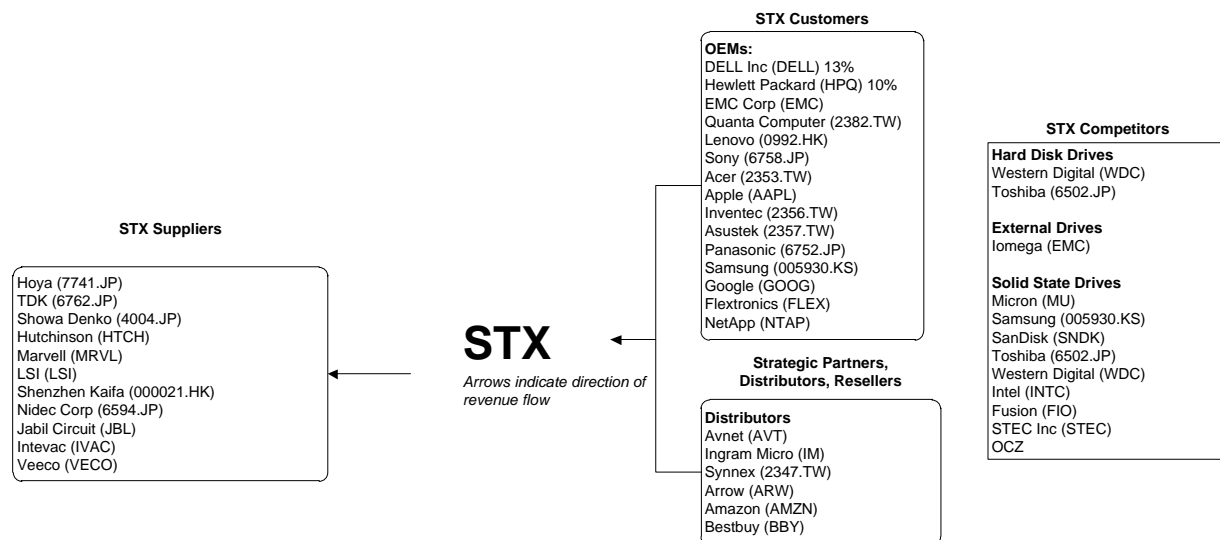
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

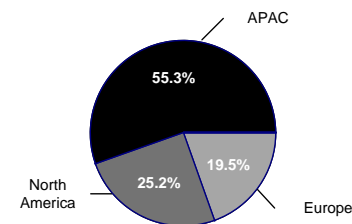
Figure 541. Seagate Technology (STX)

Sector: Storage – Hard Disk Drive

## Seagate Technology (STX)



Product Breakdown



Geographic Breakdown

Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Seiko Epson

Citi Analyst: Masahiro Shibano

Seiko Epson Corp. engages in the development, manufacture, and sales of information equipment.

The company operates through the following segments: Information Equipment, Device and Precision Products, Sensing & Industrial Solutions, and Others.

- The Information Equipment segment offers inkjet printers, page printers, serial impact dot matrix printers, large-format inkjet printers, color image scanners, mini printers, point-of-sale systems printers, projectors, projector panels, label writers, and personal computers.
- The Device and Precision Products segment offers crystal units, crystal oscillators, quartz sensors, complementary metal-oxide semiconductor large scale integration products, watches, watch movements, and plastic corrective lenses.
- The Sensing & Industrial Solutions segment offers, precision industrial robots, integrated circuit handlers, and industrial inkjet equipment, and sensing system equipment.
- The Other segment engages in the intra-group services and small-and medium-sized liquid crystal display.

The company was founded on May 18, 1942 and is headquartered in Suwa, Japan.

Figure 542. Seiko Epson (6724.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1122497.0	985363.0	973663.0	877997.0	851297.0	950200.0	987385.0	949600.0	1014827.0
– y/y growth	-16.7%	-12.2%	-1.2%	-9.8%	-3.0%	11.6%	16.0%	-0.1%	2.8%
<b>Gross Margins</b>	25.8%	26.3%	27.0%	28.3%	27.5%	32.1%		32.9%	
<b>Operating Margins</b>	-0.1%	1.8%	3.4%	2.8%	2.5%	7.3%		7.8%	
<b>EPS</b>	-569.82	-100.42	51.25	26.58	-56.40	224.72	289.16	256.02	288.78
– y/y growth	-686.0%	82.4%	151.0%	-48.1%	-312.2%	498.5%	612.7%	13.9%	-0.1%
<b>Cash</b>	172921.0	193117.0	125807.0	123093.0	106678.0	154212.0		183212.0	
<b>Debt</b>	346047.0	309060.0	270722.0	238812.0	271126.0	268626.0		258626.0	
<b>Net Cash/Shr</b>	-575.3	-144.5	-208.7	-76.1	-200.2	79.4		297.5	
<b>Tangible Book Value/Shr</b>	1557.0	1407.9	1347.7	1377.6	1435.2	1749.8		1953.8	

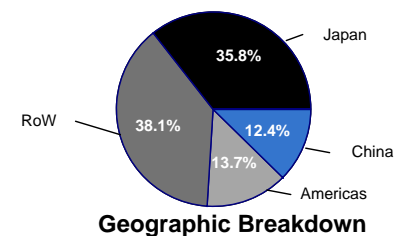
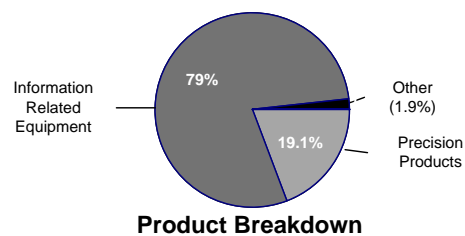
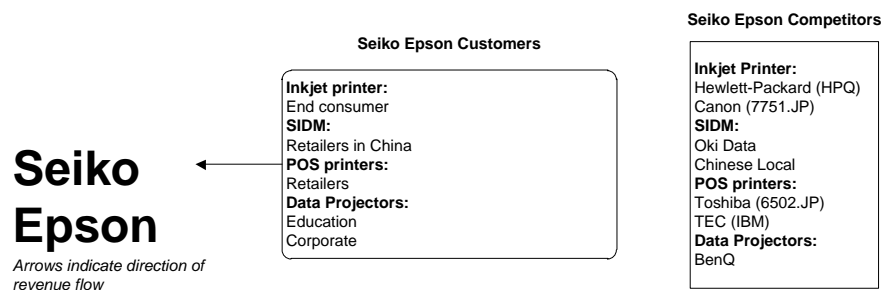
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 543. Seiko Epson (6724.JP)

Sector: Hardware

## Seiko Epson (6724.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Semtech

Citi Analyst: Terence Whalen

Semtech Corporation is a fabless application-focused analog and mixed-signal supplier. Semtech's products are designed into end-applications including consumer (29%), computing (16%), communications (32%), and industrial and military (23%).

Approximately 48% of sales are through distributors and 52% directly to OEMs.

Semtech's top customer is Samsung and Frontek is its top distributor. Samsung was 13% of sales and Frontek was 10% of sales in F2012.

Competitors in power management include Texas Instruments, Linear, Maxim, Fairchild and Intersil; ST Micro, ON semiconductor, NXP, and Infineon in protection products; and Texas Instruments, Silicon labs, and Maxim in test and measurement industrial products. Semtech recognizes distributor revenue on sell-through in North America and Europe and sell-in in Asia.

Semtech's fiscal year ends in January.

Figure 544. Semtech (SMTC) Results and Forecasts

	2009	2010	2011	2012	2013	2014	CIR 2015E	Street 2015E	CIR 2015E	Street 2015E
<b>Revenues</b>	294.8	286.6	454.5	480.6	578.8	595.0	594.1	562.7	594.1	562.7
- y/y growth	N/A			5.7%	20.4%	2.8%	-0.1%	-5.4%	0.0%	0.0%
<b>Gross Margins</b>	54.1%	55.2%	59.5%	59.4%	61.0%	60.3%	59.5%		59.5%	
<b>Operating Margins</b>	15.9%	14.4%	22.9%	22.8%	19.8%	18.1%	19.8%		19.8%	
<b>EPS</b>	0.85	0.87	1.71	1.73	1.70	1.46	1.75	1.56	1.75	1.56
- y/y growth	N/A			0.8%	-1.8%	-14.1%	20.1%	7.1%	0.0%	0.0%
<b>Cash</b> d period		136.1	231.3	310.1	228.2	243.2	336.1		336.1	
<b>Debt</b> company		0.0	0.0	0.0	330.7	291.8	291.8		291.8	
<b>Net Cash/Shr</b> d period		2.2	3.6	4.6	-0.8	-0.4	0.9		0.9	
<b>Tangible Book Value/Shr</b> d period		3.2	5.4	7.2	1.6	2.0	3.4		3.4	

(Revenues, Cash and Debt in Millions in Local Currency)

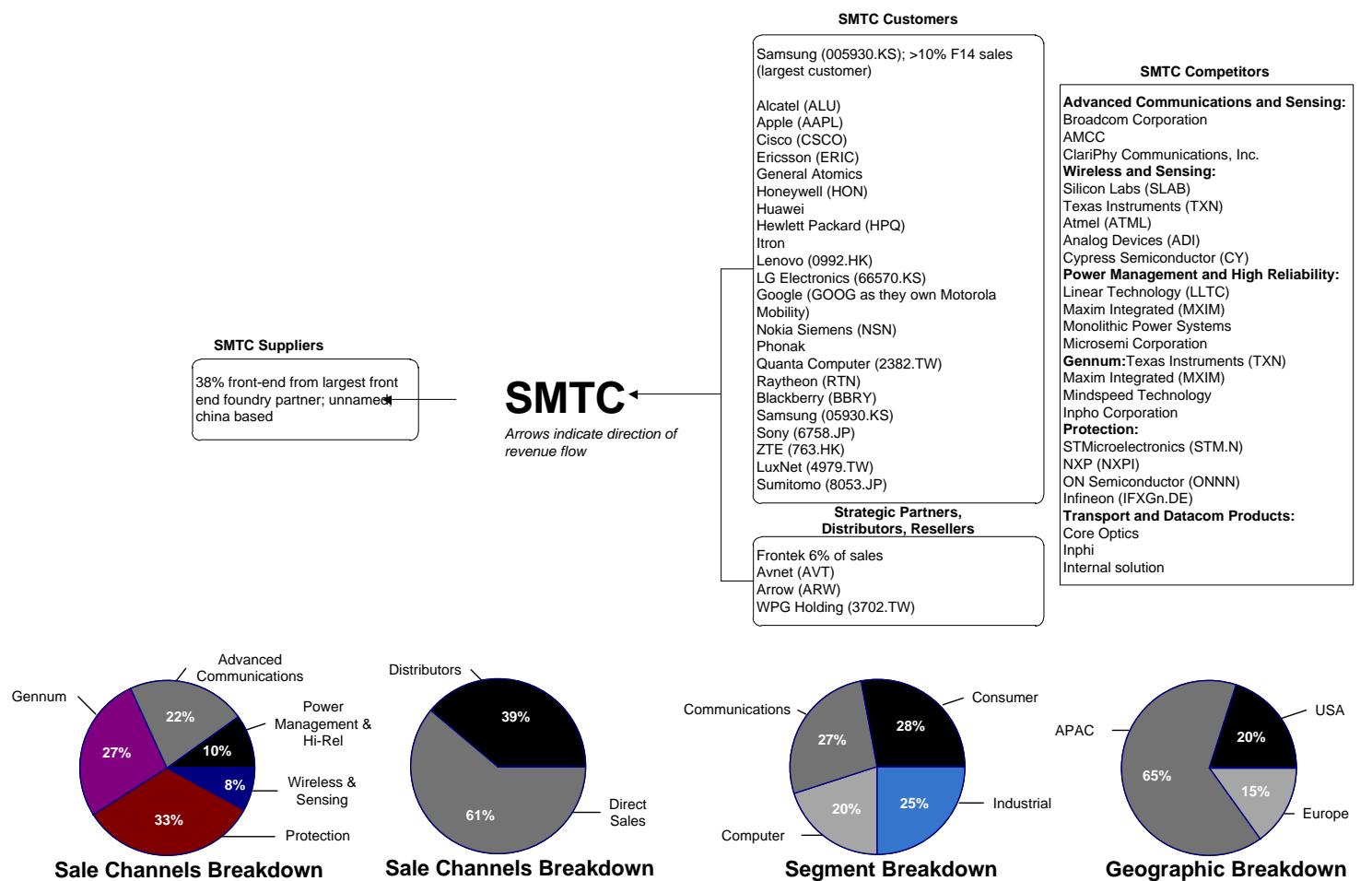
Source: Citi Research, Company Reports, FirstCall



Figure 545. Semtech (SMTC)

Sector: Semiconductors

## Semtech (SMTC)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Sensata

Citi Analyst: Jim Suva, CPA

Sensata Technologies Holding B.V. develops, manufactures, and sells sensors and controls. These products are generally considered mission critical components used in aerospace, automotive, industrial, construction, wireless infrastructure, and Heating, Ventilating, and Air Conditioning systems (HVAC) and generally represent a small portion of total bill of materials for such products and systems.

Sales by end market are 64% automotive (23% Europe Auto, 16% North America Auto, 26% Asia/RoW Auto), 9% HVAC, 9% Industrial, 7% HVOR, and 10% Other. Sales by end market are: 35% Americas, 27% Europe, and 38% Asia Pacific.

Sensata's manufacturing plants are located in Massachusetts, Mexico, Dominican Republic, Brazil, The Netherlands, China, Japan, Korea, and Malaysia.

The company was originally founded as General Plate Company in 1916 to provide gold plating for the jewelry industry. Through various transactions the company was eventually acquired by Texas Instruments in 1959 until 2006 at which time Texas Instruments divested Sensata for \$3 billion to Bain Capital. Sensata filed its initial public offering to trade on the New York Stock Exchange and the stock started trading on March 11, 2010 with the ticker ST. Citi was a co-manager on the offering. Sensata is legally incorporated in the Netherlands as a part of Texas Instruments' historical M&A and also for lower tax reasons while the company's executive management team is in Attleboro, Massachusetts.

Sensata has approximately 11,400 employees of which less than 10% are located in the United States.

The word Sensata is Latin and means for those gifted with sense.

Figure 546. Sensata (ST) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1134.9	1540.1	1826.9	1913.9	1980.7	2185.8	2185.7	2347.6	2376.8
- y/y growth		35.7%	18.6%	4.8%	3.5%	10.4%	10.4%	7.4%	8.7%
<b>Gross Margins</b>	35.5%	38.3%	36.4%	35.2%	36.9%	36.4%		36.6%	
<b>Operating Margins</b>	24.0%	26.9%	24.7%	25.0%	25.8%	25.2%		25.4%	
<b>EPS</b>	0.78	1.77	1.96	1.96	2.15	2.41	2.42	2.61	2.83
- y/y growth		127.0%	10.6%	0.2%	9.5%	12.1%	12.7%	8.1%	17.0%
<b>Cash</b>	148.5	493.7	92.1	413.5	317.9	412.2		568.6	
<b>Debt</b>	2300.8	1889.7	1835.7	1824.7	1724.0	1529.0		1334.0	
<b>Net Cash/Shr</b>	-13.9	-8.0	-9.5	-7.7	-7.8	-6.3		-4.3	
<b>Tangible Book Value/Shr</b>	-13.9	-7.5	-8.2	-6.4	-6.3	-4.3		-2.0	

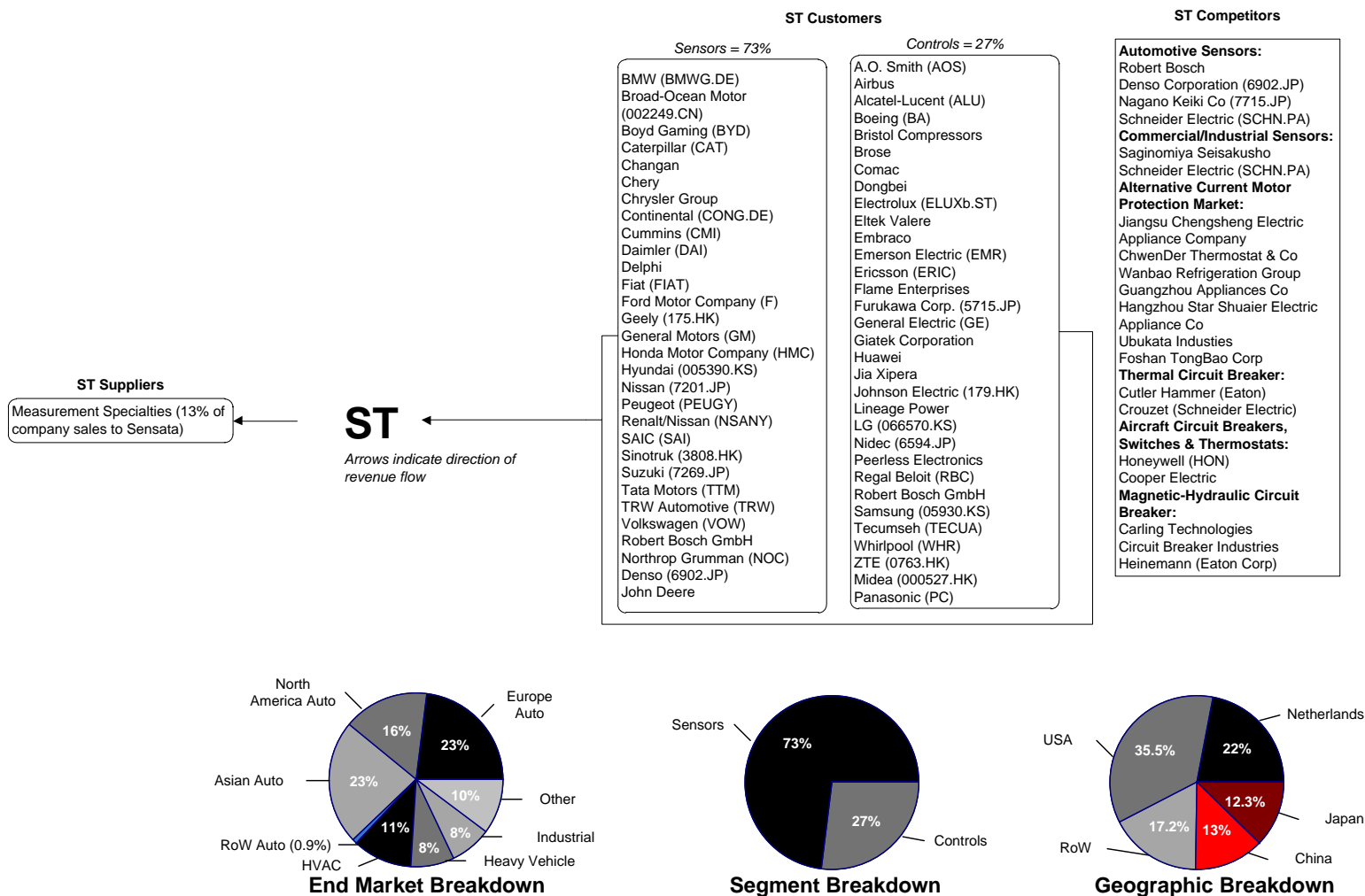
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 547. Sensata (ST)

Sector: Technology Supply Chain - Connectors

## Sensata (ST)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Sharp

Citi Analyst: Kota Ezawa

Sharp makes a range of consumer electronics and appliances, with mainstays of LCD panels and solar cells.

The company was founded in 1912 in Tokyo by Tokuji Hayakawa. The company's name originates from the "Sharp" propelling pencil it developed in 1915. It went on to develop Japan's first radio and TV manufacturing business. Sales are divided between consumer electronics and parts. The LCD business (panels and TVs) makes up some 40% and solar cells around 8% of total sales.

LCDs have grown into a core business, after Sharp developed the world's first calculator with an LCD display in 1973. Since 2009, Sharp has been shifting its emphasis to LCD panels and away from TVs. Sharp began to develop solar cells in 1959 and became the first to successfully mass produce them in 1963. It was number one globally from 2000 to 2006. Competition has intensified however, with newly emergent firms catching up.

Figure 548. Sharp (6753.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	2847227.0	2755948.0	3021973.0	2455850.0	2478586.0	2728000.0	2804250.0	2685000.0	2822422.0
- y/y growth	-16.7%	-3.2%	9.7%	-18.7%	0.9%	10.1%	13.1%	-1.6%	0.6%
<b>Gross Margins</b>	16.0%	19.1%	18.8%	16.8%	10.5%	16.8%		18.2%	
<b>Operating Margins</b>	-1.9%	1.9%	2.6%	-1.5%	-5.9%	2.5%		2.7%	
<b>EPS</b>	-106.68	3.78	16.47	-341.78	-489.83	-2.94	4.95	13.07	19.31
- y/y growth	-222.8%	103.5%	335.7%	-2175.2%	-43.3%	99.4%	101.0%	544.6%	290.2%
<b>Cash</b>	336937.0	348414.0	247888.0	195325.0	191941.0	281000.0		262000.0	
<b>Debt</b>	806480.0	794453.0	820961.0	1094467.0	1143382.0	1119000.0		1050000.0	
<b>Net Cash/Shr</b>	-60.3	-130.4	-250.1	-285.1	-37.0	-135.8		-109.4	
<b>Tangible Book Value/Shr</b>	865.3	876.0	851.2	497.8	58.2	105.0		101.7	

(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 549. Sharp (6753.JP)

Sector: Consumer Electronics

Sharp (6753.JP)

Sharp Suppliers

SK-Elec (6677.JP)  
Kurita Water (6370.JP)  
Kuroda Elec (7517.JP)  
Kuramoto (5216.JP)  
V Tech (7717.JP)  
Geomatec (6907.JP)  
Corning (GLW)  
Tokyo Electron (8035.JP)  
Hon Hai (2317.TW)  
Rohm (6963.JP)  
Nippon Elec Glass (5214.JP)  
CSR PLC (CSR.L)  
Hitachi High Tech (8036.JP)  
Japan Steel Work (5631.JP)  
Tokyo Electron (8035.JP)  
Murata (6981.JP)  
Hitachi Chem (5217.JP)  
Sandisk (SNDK)  
Nuance (NUAN)  
Seiko Epson  
  
Du Pont (DD)  
Cypress (CY)  
Analog Devices (ADI)  
Texas Instruments (TXN)  
Qualcomm (QCOM)  
Renesas Electronics (6723.JP)  
NXP Semiconductor (NXPI)  
Asahi Glass (5201.JP)  
Nitto Denko (6988.JP)  
JSR Corp (4185.JP)

Sharp Customers

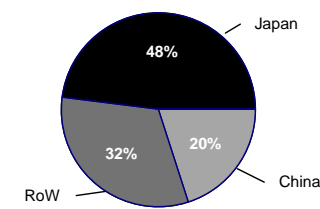
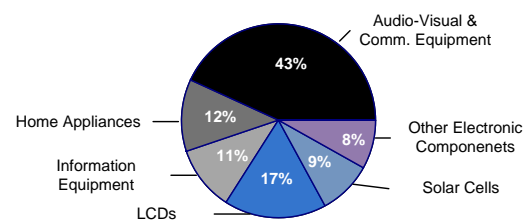
Stanley Elec (6923.JP)  
Canon (7751.JP)  
Best Buy (BBY)  
Wal-Mart (WMT)  
Yamada Denki (9831.JP)  
NTT Docomo (9437.JP)  
Softbank (9984.JP)  
Apple (AAPL) ~13%  
Samsung (005930.KS)  
Hewlett-Packard (HPQ)  
Acer (2353.TW)

**Sharp**

Arrows indicate direction of revenue flow

Sharp Competitors

Apple (AAPL)  
Samsung (005930.KS)  
Motorola (MSI)  
Nokia (NOK1V)  
LG Electronics (066570.KS)  
Blackberry (BBRY)  
ZTE Corp (763.HK)  
TCL Comm. (2618.HK)  
Pantech (5125.MY)  
Sony Ericsson  
Panasonic (6752.JP)  
Avigilon (AVO)  
Innolux (3481.TW)  
LG Display (034220.KS)  
CPT (000536.CH)  
Japan Display  
Sanpower



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Shinko Electric Industries

Citi Analyst: Yuta Fukasawa

Shinko is an electronic parts maker, developing and producing IC packages and leadframes. Its core products are FC-PKG substrates for CPUs, where it has a market share of c30%; this is a market it shares with Ibiden.

The company's strength is its impressive FC-PKG substrate technologies, and it typically boasts a market share of 50% when new products are introduced thanks to generational change resulting from chip miniaturization. Shinko has been instrumental in the development of direct laser laminates, which have become the de facto standard in the manufacture of FC-PKG substrates. It plans to leverage its impressive technologies to focus on the production of high-end products and maintain high levels of profitability.

In January 2011, Shinko announced that it will build two fabs at the Takaoka plant. They will have total floor space of 50,000m2, the same scale as the existing Wakaho plant, which is the core FC-PKG substrate facility, with the increase in production capacity slated to start from 2013, in response to the X72 and successor generations. Over the long run, we expect this to double Shinko's production capacity.

Figure 550. Shinko Electric (6967.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	140510.0	129836.0	140923.0	125825.0	127241.0	144991.0	143127.0	147010.0	143754.0
- y/y growth	-34.6%	-7.6%	8.5%	-10.7%	1.1%	13.9%	12.5%	1.4%	0.4%
<b>Gross Margins</b>	5.1%	13.2%	11.6%	6.2%	12.3%	16.0%		17.3%	
<b>Operating Margins</b>	-4.9%	4.1%	3.3%	-2.9%	2.4%	7.2%		8.2%	
<b>EPS</b>	-44.73	23.61	17.81	-16.61	21.28	60.08	68.04	57.48	52.01
- y/y growth	-153.3%	152.8%	-24.6%	-193.3%	228.2%	182.3%	219.7%	-4.3%	-23.6%
<b>Cash</b>	20173.0	21057.0	23625.0	16261.0	12437.0	14340.9		15558.6	
<b>Debt</b>	600.0	600.0	600.0	600.0	600.0	600.0		600.0	
<b>Net Cash/Shr</b>	149.3	155.9	174.9	120.4	92.0	106.1		115.1	
<b>Tangible Book Value/Shr</b>	974.4	994.7	992.9	955.5	963.9	1005.3		1042.8	

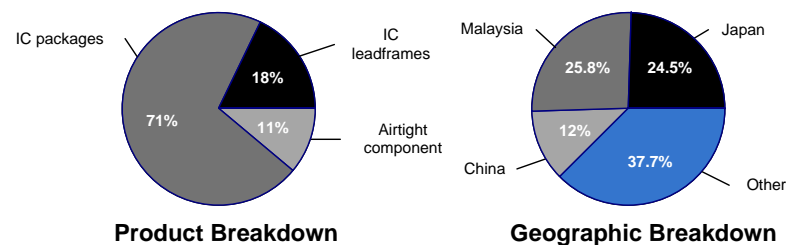
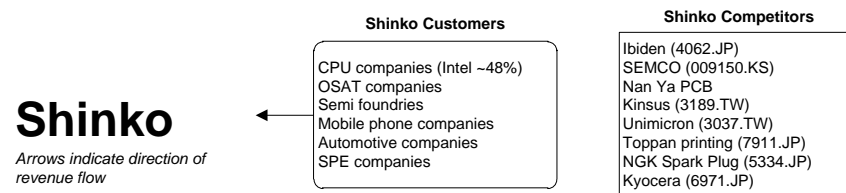
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 551. Shinko Electric (6967.JP)

Sector: Semiconductors

## Shinko Electric Industries (6967.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Silicon Laboratories, Inc.

Citi Analyst: Terence Whalen

Silicon Labs is a non-traditional mixed-signal vendor that: a) is totally fabless so it uses TSMC for foundry and ASE / Amkor for backend and b) designs products with complementary metal oxide silicon (CMOS) which is a difficult process for analog mixed-signal designs but offers cost/size/performance advantages if successfully implemented.

Sales are spread across consumer audio (12%), handset FM tuners (3%), video tuners & demodulators (17%), embedded MCU/wireless (29%), timing (13%), touch (5%), access (19%) and mature products (1%).

Two distributors, Edom Technology and Avnet, represented 22% and 11% of CY12 sales. Samsung represented 19% of sales in 2012 with Cisco, Huawei, LG Electronics, Pace, Panasonic, Sagem, Samsung, Technicolor, Varian Medical Systems and ZTE as other major customers.

SLAB is headquartered in Austin TX, and its fiscal year ends in December.

Figure 552. Silicon Laboratories (SLAB) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	441.0	493.3	491.6	563.3	580.1	619.1	612.6	670.9	657.6
- <i>y/y growth</i>		11.9%	-0.3%	14.6%	3.0%	6.7%	5.6%	8.4%	7.3%
<b>Gross Margins</b>	63.4%	65.7%	60.7%	60.0%	60.8%	60.7%		61.0%	
<b>Operating Margins</b>	15.2%	17.6%	11.8%	15.5%	13.5%	13.9%		16.9%	
<b>EPS</b>	2.40	2.26	1.80	2.16	2.03	2.14	2.09	2.69	2.45
- <i>y/y growth</i>		-5.9%	-20.4%	20.2%	-5.9%	5.4%	2.9%	25.4%	17.3%
<b>Cash</b>	410.2	365.9	307.5	282.0	275.4	339.0		447.1	
<b>Debt</b>	0.0	0.0	0.0	100.0	95.0	95.0		95.0	
<b>Net Cash/Shr</b>	8.8	7.8	6.9	4.3	4.3	5.7		8.2	
<b>Tangible Book Value/Shr</b>	11.0	10.6	10.2	10.4	8.9	11.5		14.7	

(Revenues, Cash and Debt in Millions in Local Currency)

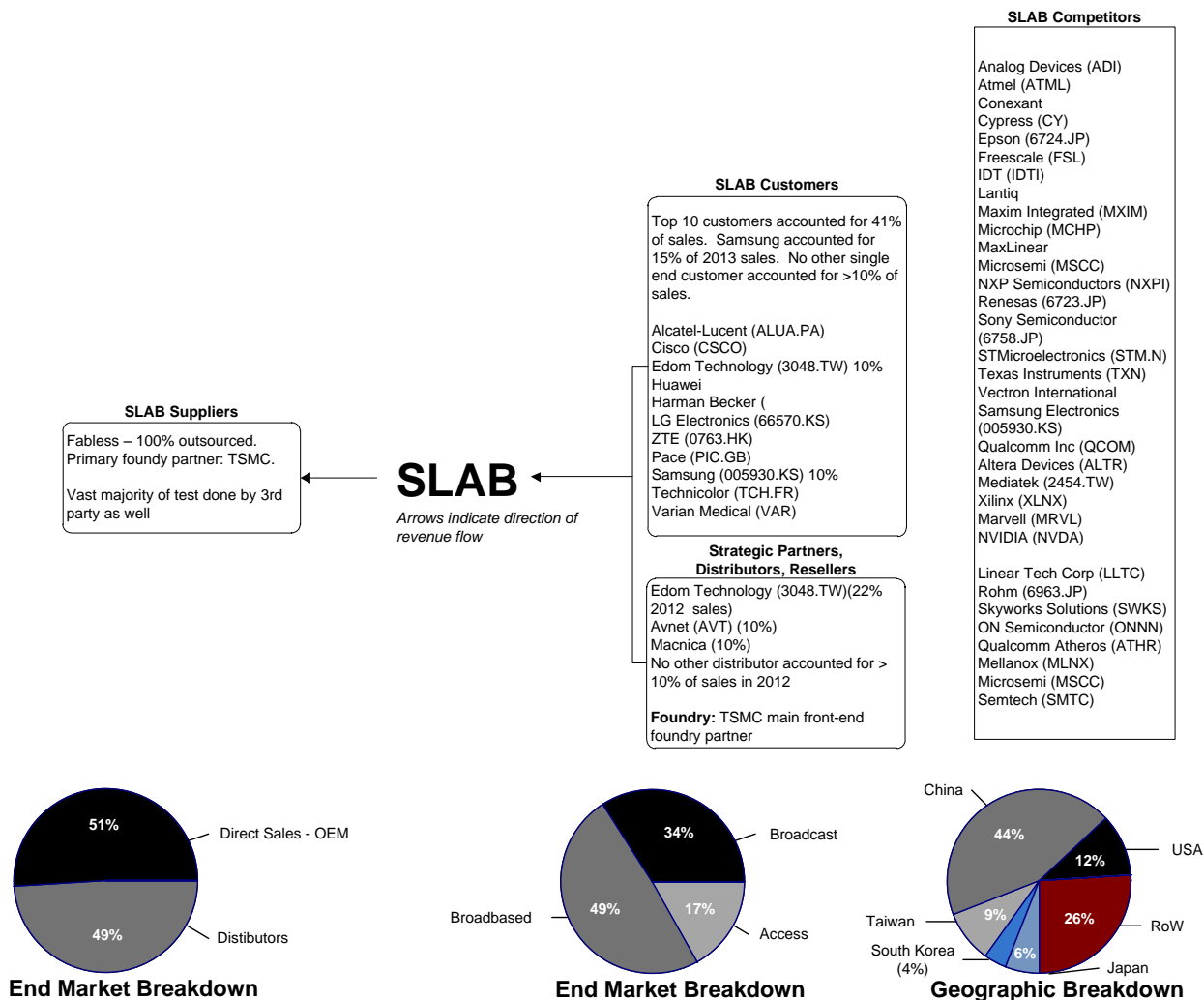
Source: Citi Research, Company Reports, FirstCall



Figure 553. Silicon Laboratories (SLAB)

Sector: Semiconductors

## Silicon Laboratories, Inc. (SLAB)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Simplo Technology

Citi Analyst: Wei Chen

Established in 1992, Simplo specializes in designing and producing battery packs for Notebooks, tablet PC, and electronic vehicle products. With strong execution and cost advantages, Simplo continues to broaden its client base.

Its major customers include PC OEMs (such as HPQ, Dell, Asus, Acer, and Apple) and NB ODMs (such as Quanta, Compal, Wistron, and Inventec).

Figure 554. Simplo Technology (6121.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	34253.1	38699.4	48113.8	58833.4	53691.0	56901.6	60926.2	59375.1	63313.6
- <i>y/y growth</i>	11.4%	13.0%	24.3%	22.3%	-8.7%	6.0%	13.5%	4.3%	3.9%
<b>Gross Margins</b>	17.2%	18.1%	14.3%	12.0%	11.1%	10.3%		9.8%	
<b>Operating Margins</b>	9.7%	10.3%	8.4%	7.3%	6.5%	6.0%		5.8%	
<b>EPS</b>	8.01	10.80	11.96	10.71	10.11	9.68	10.78	9.95	10.62
- <i>y/y growth</i>	2.3%	34.8%	10.8%	-10.4%	-5.6%	-4.3%	6.5%	2.8%	-1.4%
<b>Cash</b>	4760.4	7228.3	7706.3	8715.4	12256.5	14786.6		16284.2	
<b>Debt</b>	320.5	946.2	3141.5	3684.0	1664.0	1664.0		664.0	
<b>Net Cash/Shr</b>	15.5	23.4	25.0	28.3	39.8	48.0		52.8	
<b>Tangible Book Value/Shr</b>	37.2	43.1	51.8	56.4	54.6	58.3		62.5	

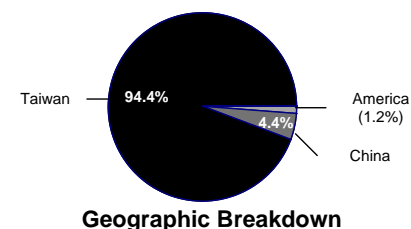
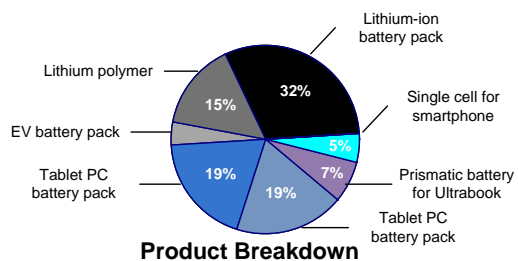
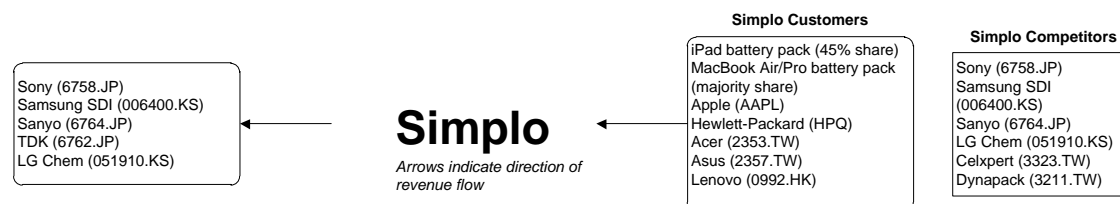
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 555. Simplo Technology (6121.TW)

Sector: Electronic Manufacturing Services

## Simplo Technology Co. Ltd. (6121.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## SMA Solar Technology

Citi Analyst: Jason Channell

SMA produces inverters which are required in every solar installation.

The company offers the entire power range of inverters for residential, commercial and industrial solar installations with a complete functionality suite (power management and storage) and is the market leader with around 16% market share globally.

Figure 556. SMA Solar Technology (S92.DE) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	934.3	1920.1	1676.3	1463.4	938.2	1014.0	1042.3	1188.5	1213.4
- <i>y/y growth</i>	37.1%	105.5%	-12.7%	-12.7%	-35.9%	8.1%	11.1%	17.2%	16.4%
<b>Gross Margins</b>	36.0%	35.6%	27.6%	23.0%	22.4%	24.9%		28.0%	
<b>Operating Margins</b>	24.4%	26.9%	14.3%	7.0%	-9.8%	0.6%		4.5%	
<b>EPS</b>	4.64	10.52	4.79	2.16	-1.84	0.07	0.26	1.02	1.34
- <i>y/y growth</i>	34.8%	126.6%	-54.5%	-54.8%	-185.0%	103.9%	113.9%	1315.0%	422.7%
<b>Cash</b>	225.0	354.1	371.1	185.3	185.2	171.8		143.8	
<b>Debt</b>	20.2	21.2	36.0	37.6	76.6	76.6		76.6	
<b>Net Cash/Shr</b>	5.9	9.6	9.7	4.3	4.0	3.6		2.8	
<b>Tangible Book Value/Shr</b>	11.3	20.1	21.1	21.7	19.1	19.1		19.9	

(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 557. SMA Solar Technology (S92.DE)

Sector: Alternative Energy

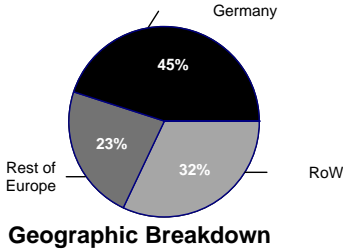
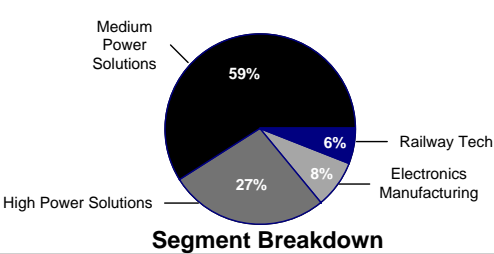
SMA Solar Technology (S92.DE)

S92-DE

Arrows indicate direction of revenue flow

SMA Solar Competitors

- Advanced Energy Industried (AEIS)
- Enphase (ENPH)
- Fronius
- General Electric (GE)
- Isototon
- Kaco New Energy
- Power-One (POWER)
- Satcon (SATC)
- Schneider Electric (SU.PA)
- Siemens (SIE.DE)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Sony

Citi Analyst: Kota Ezawa

Sony is an integrated consumer electronics manufacturer, with TV, digicam, and games operations at its core.

It was founded in 1946 in Tokyo as a producer of electrical communications equipment and measuring devices. Hit products such as the 1955 transistor radio, the 1979 Walkman, and subsequently digicams, digital video recorders, and games with the PlayStation helped to grow earnings and establish the company's brand image.

Sony diversified into movies, music, and finance in the late 1980s. The business model, which brought together hardware and software, went through a long spell of negative synergies but since 2013, smartphones, games, and networks have started to generate synergies. After the current restructuring comes to a stop, we are hopeful that a new growth strategy will emerge to drive the business.

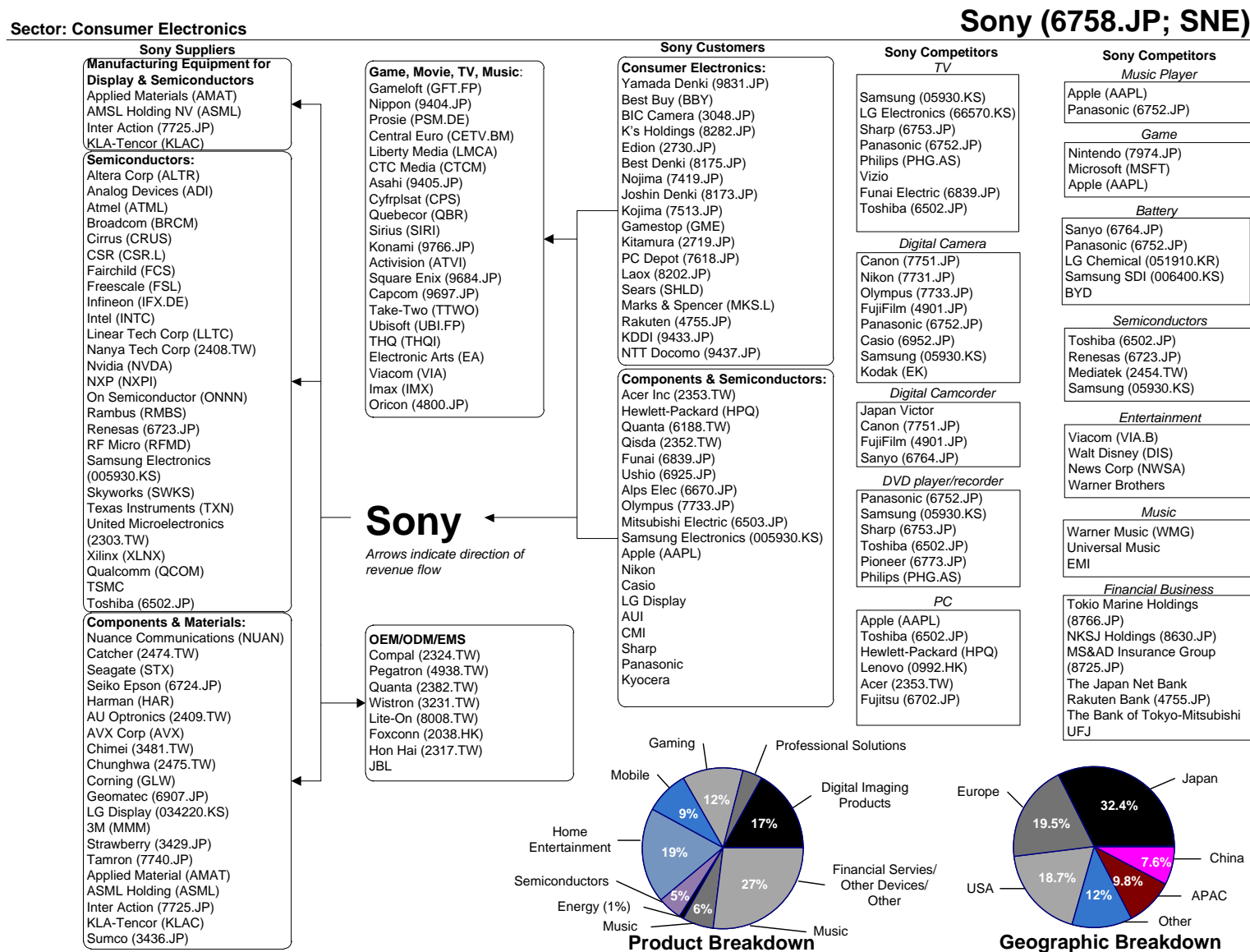
Figure 558. Sony (6758.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	7729993.0	7213998.0	7181273.0	6493212.0	6800852.0	7757000.0	7697793.0	7979000.0	7731470.0
- y/y growth	-12.9%	-6.7%	-0.5%	-9.6%	4.7%	14.1%	13.2%	2.9%	0.4%
<b>Gross Margins</b>	26.8%	32.2%	32.7%	32.4%	34.0%	32.5%		33.9%	
<b>Operating Margins</b>	-2.9%	0.4%	2.8%	-1.0%	3.4%	1.0%		2.2%	
<b>EPS</b>	-94.18	-40.66	-258.48	-454.37	40.19	-86.26	-67.65	50.93	49.24
- y/y growth	-126.8%	56.8%	-535.7%	-75.8%	108.8%	-314.6%	-268.3%	159.0%	172.8%
<b>Cash</b>	1177610.0	1771101.0	1660583.0	1575489.0	1523958.0	1572000.0		1682000.0	
<b>Debt</b>	1111302.0	1208814.0	975586.0	1172582.0	1182610.0	1257000.0		1131000.0	
<b>Net Cash/Shr</b>	492.6	843.9	844.7	809.2	546.8	555.0		757.9	
<b>Tangible Book Value/Shr</b>	-3950.8	-4411.6	-5187.7	-6484.0	-7062.0	-7788.1		-8040.3	

(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 559. Sony (6758.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Spansion Inc.

Citi Analyst: Glen Yeung

Spansion Inc is a top 3 vendor of NOR flash, a form of robust non-volatile memory. Spansion's particular focus is on the embedded NOR flash market, which accounts for over half of the overall NOR market, including wireless.

Spansion emerged from Chapter 11 in May 2010. The key components of their reorganization were new management, streamlined operations, a focus on embedded flash, and a flexible manufacturing strategy.

Based in Sunnyvale, CA, Spansion has 3,400 employees, and currently serves over 4,000 customers.

Figure 560. Spansion (CODE) Results and Forecasts

	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1168.3	1069.9	915.9	971.7	1270.6	1324.7	1298.3	1416.9
- y/y growth		-8.4%	-14.4%	6.1%	30.8%	36.3%	2.2%	7.0%
<b>Gross Margins</b>	21.1%	20.8%	31.0%	26.0%	32.6%		34.1%	
<b>Operating Margins</b>	15.8%	5.8%	12.4%	-2.5%	6.9%		8.1%	
<b>EPS</b>	1.56	1.41	1.03	0.79	1.51	1.37	1.71	1.86
- y/y growth		-9.5%	-27.2%	-22.9%	91.4%	73.2%	13.1%	35.6%
<b>Cash</b>	354.3	262.7	313.9	311.5	430.8		559.5	
<b>Debt</b>	454.9	449.4	416.3	501.9	501.9		501.9	
<b>Net Cash/Shr</b>	-1.0	-2.9	-1.6	-1.6	0.4		2.4	
<b>Tangible Book Value/Shr</b>	3.1	2.9	4.1	3.5	5.3		7.4	

(Revenues, Cash and Debt in Millions in Local Currency)

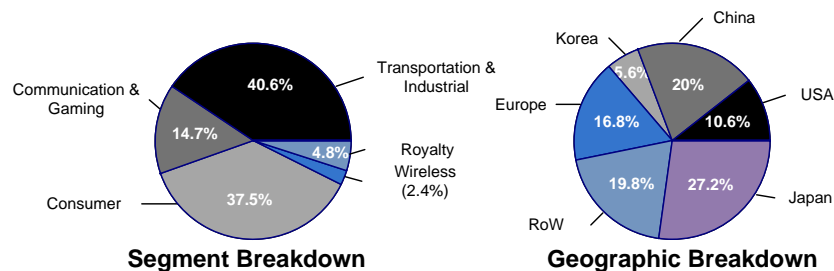
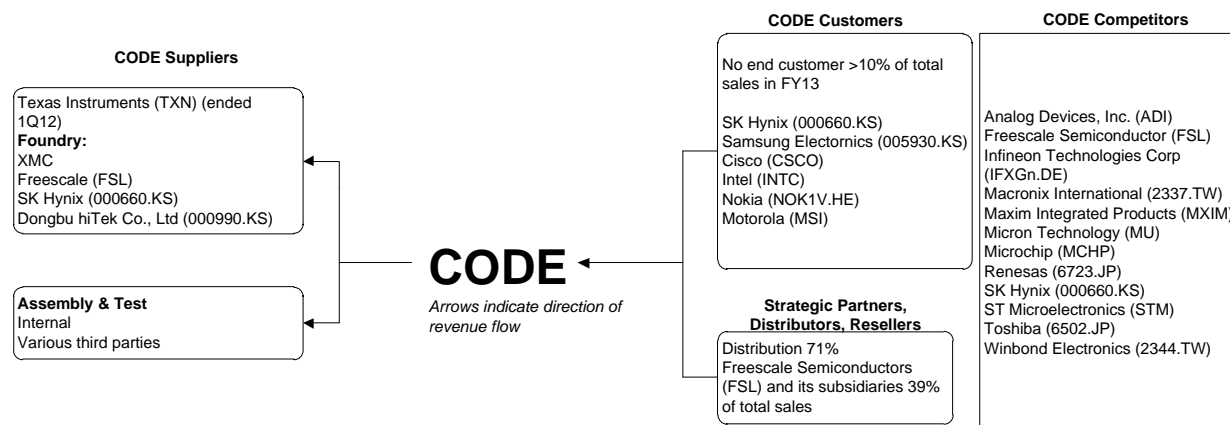
Source: Citi Research, Company Reports, FirstCall



Figure 561. Spansion Inc. (CODE)

Sector: Semiconductors

## Spansion Inc. (CODE)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## SPIL

Citi Analyst: Roland Shu

SPIL is a back-end IC packaging turnkey solutions provider that includes wafer bumping, wafer sort, assembly and testing.

SPIL is the world-wide No.3 Outsourced Assembly and Test (OSAT) provider with an 8.9% market share in 2010, according to Gartner.

SPIL has manufacturing sites in Taiwan (Taichung, Hsinchu, Changhua) and China (Suzhou).

Established in 1984, SPIL listed on the Taiwan Stock Exchange in 1993 and became a public company on the NASDAQ Stock Exchange in 2000.

Figure 562. SPIL (2325.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	59294.6	63857.5	61236.9	64654.6	69356.2	77419.2	77178.0	83887.4	81991.9
- y/y growth	-5.0%	7.7%	-4.1%	5.6%	7.3%	11.6%	11.3%	8.4%	6.2%
<b>Gross Margins</b>	19.3%	15.4%	15.5%	18.2%	20.8%	22.1%		23.4%	
<b>Operating Margins</b>	13.7%	10.0%	8.3%	10.0%	11.4%	13.4%		14.6%	
<b>EPS</b>	2.82	1.81	1.55	1.81	1.89	2.62	2.62	3.07	2.84
- y/y growth	37.8%	-36.0%	-14.0%	16.7%	4.4%	38.7%	38.6%	17.0%	8.4%
<b>Cash</b>	20077.6	15519.0	15941.6	15858.0	16975.2	22053.8		25509.8	
<b>Debt</b>	225.5	5829.4	11046.1	14506.6	21043.6	20449.8		19890.1	
<b>Net Cash/Shr</b>	6.4	3.6	2.1	1.2	0.5	2.3		3.5	
<b>Tangible Book Value/Shr</b>	20.2	19.7	18.9	19.3	20.0	21.3		22.0	

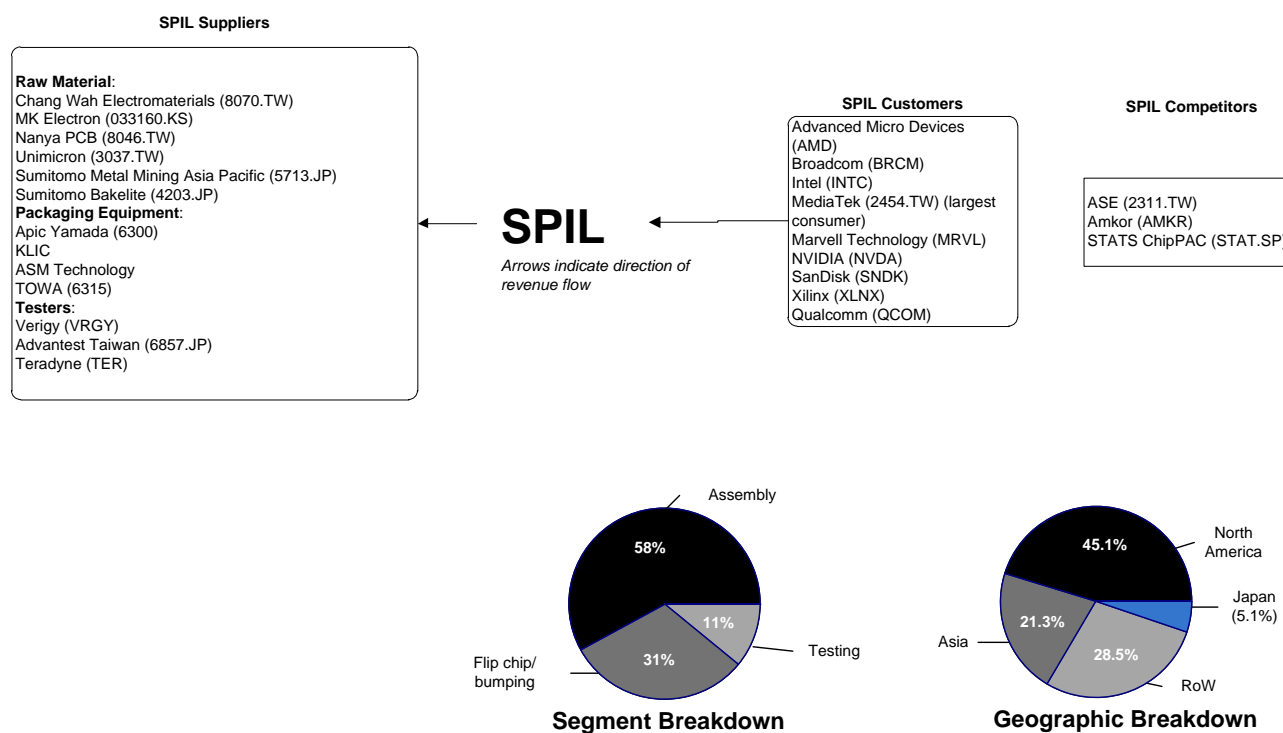
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 563. SPIL (2325.TW)

Sector: Semiconductors

SPIL (2325.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Spirent Communications Plc

Citi Analyst: Hugo Mills

Spirent is a leading global provider of testing and assurance solutions that enable the development and deployment of next generation hardware devices and networking technologies, e.g. ethernet, wireless, positioning, web applications and security.

The company has 1,540 employees and 1,400 customers spread across network equipment manufacturers, telco operators and governments.

Figure 564. Spirent Communications (SPT.L) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	273.7	312.2	329.4	298.1	264.4	281.3	281.0	301.2	304.4
- y/y growth	5.1%	14.1%	5.5%	-9.5%	-11.3%	6.4%	6.2%	7.1%	8.4%
<b>Gross Margins</b>	66.3%	66.6%	66.1%	71.6%	69.4%	69.8%		70.2%	
<b>Operating Margins</b>	20.3%	23.4%	23.6%	25.3%	12.4%	11.9%		15.3%	
<b>EPS</b>	0.09	0.08	0.09	0.09	0.04	0.04	0.04	0.06	0.06
- y/y growth	-14.2%	-13.4%	19.6%	-2.4%	-57.3%	6.2%	12.7%	37.6%	31.5%
<b>Cash</b>	107.6	143.5	152.2	153.0	130.6	113.1		134.9	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	0.2	0.2	0.2	0.2	0.2	0.2		0.2	
<b>Tangible Book Value/Shr</b>	0.2	0.3	0.3	0.3	0.2	0.2		0.3	

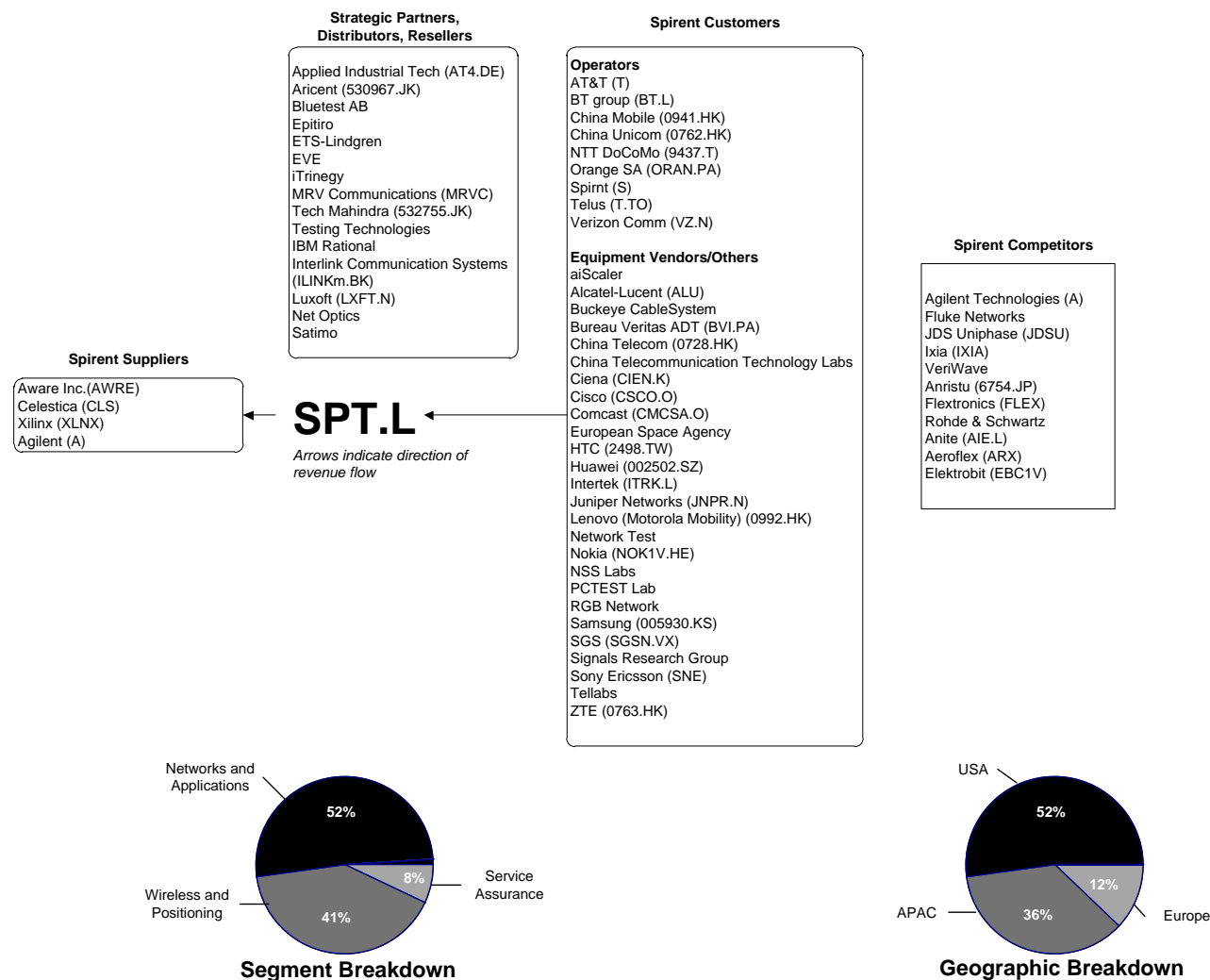
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 565. Spirent Communications (SPT.L)

Sector: Telecom Equipment

## Spirent Communications (SPT.L)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## STMicroelectronics

Citi Analyst: Amit Harchandani

STMicroelectronics is a global semiconductor company that designs and manufactures semiconductor products used in applications such as automotive, computer, telecommunications, consumer electronics, and industrial automation and control.

STMicroelectronics is headquartered in Switzerland.

Figure 566. STMicroelectronics (STM) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	6119.0	7814.7	7000.7	6608.5	6082.4	5924.1	5777.8	6268.6	6126.0
- <i>y/y growth</i>	-9.0%	27.7%	-10.4%	-5.6%	-8.0%	-2.6%	-5.0%	5.8%	6.0%
<b>Gross Margins</b>	30.9%	38.8%	36.7%	32.8%	32.4%	34.4%		36.1%	
<b>Operating Margins</b>	-8.7%	5.6%	1.2%	-7.7%	-1.3%	4.2%		6.4%	
<b>EPS</b>	-0.52	0.56	0.30	-0.26	-0.13	0.22	0.18	0.36	0.37
- <i>y/y growth</i>	-288.6%	208.1%	-45.9%	-184.9%	47.4%	264.2%	233.0%	62.6%	105.6%
<b>Cash</b>	1829.9	2200.4	1795.7	1886.1	1148.6	1221.2		1338.9	
<b>Debt</b>	1740.5	1322.9	1209.5	985.9	572.5	568.7		568.7	
<b>Net Cash/Shr</b>	0.2	1.6	1.3	1.6	0.8	0.9		1.0	
<b>Tangible Book Value/Shr</b>	4.2	4.8	5.0	5.0	4.4	4.3		4.4	

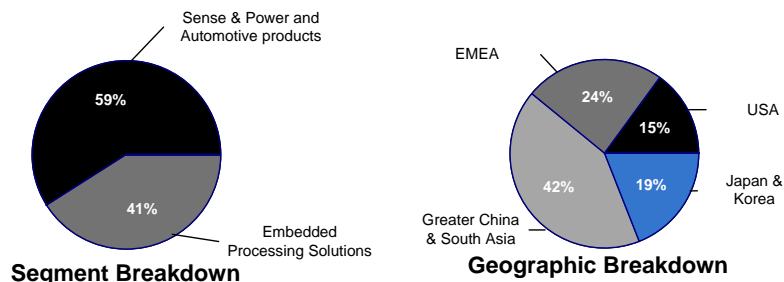
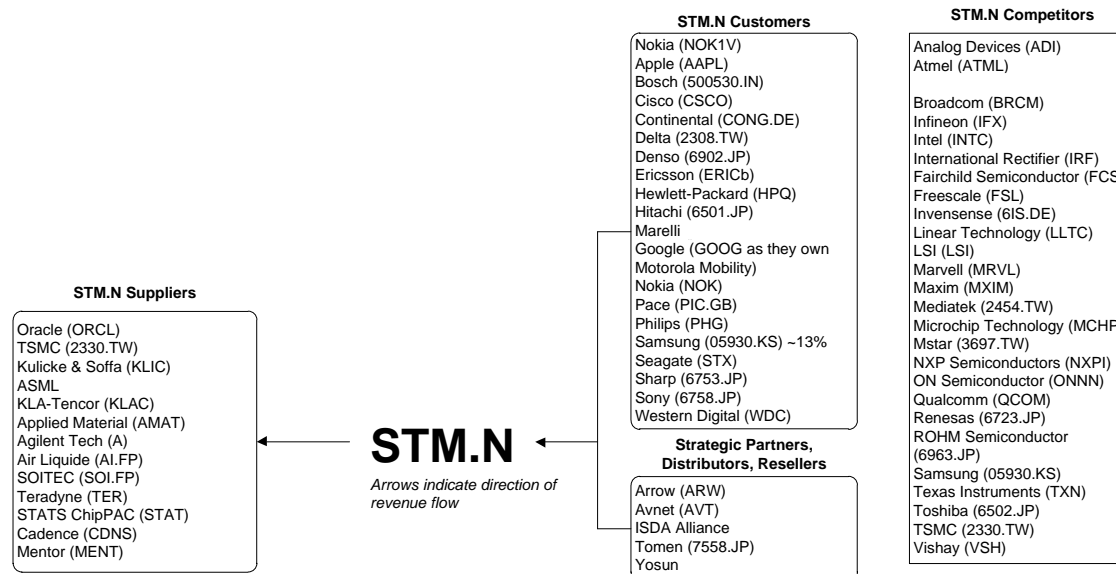
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 567. STMicroelectronics (STM)

Sector: Semiconductors

## STMicroelectronics N.V. (STM)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Stratasys Ltd

Citi Analyst: Ken Wong, CFA

Stratasys has the largest install base of print systems with nearly 65K sold cumulatively.

Stratasys' core print technology is based on fused-deposition modeling (FDM) which entails the extrusion of plastic materials through a heated print head, applied in ultrathin layers to "print" a final object. FDM is the underlying technology that is being used by the recent wave inexpensive consumer desktop printers, including Stratasys' recent acquisition Makerbot. The Objet merger added multi-jetting capabilities to the company's portfolio of print systems. Stratasys also operates a custom on-demand parts service called RedEye.

The company has roughly 260 resellers and over 1000 employees worldwide.

Stratasys Limited was formed after the 2012 merger of Minnesota-based Stratasys Inc with Israel-based Objet Ltd. and the 2013 acquisition of Maketbot.

Figure 568. Stratasys (SSYS) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	98.4	117.3	155.9	215.2	484.4	673.0	673.2	831.8	842.9
- y/y growth	-21.0%	19.3%	32.9%	38.1%	125.0%	38.9%	39.0%	23.6%	25.2%
<b>Gross Margins</b>	47.2%	47.8%	52.9%	51.1%	46.7%	51.0%		52.7%	
<b>Operating Margins</b>	7.6%	16.8%	21.1%	23.3%	20.2%	19.3%		21.1%	
<b>EPS</b>	0.28	0.63	1.03	0.94	1.95	2.19	2.21	2.53	2.93
- y/y growth	-62.4%	123.7%	62.3%	-8.1%	106.6%	12.2%	13.3%	15.8%	32.5%
<b>Cash</b>	48.3	27.6	20.1	133.8	414.1	486.6		647.2	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	2.4	1.3	0.9	3.3	9.8	9.2		10.6	
<b>Tangible Book Value/Shr</b>	6.0	6.9	6.2	6.2	15.7	14.9		15.8	

(Revenues, Cash and Debt in Millions in Local Currency)

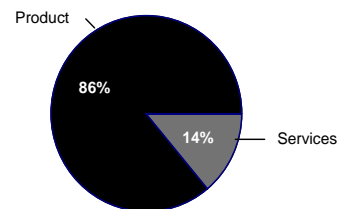
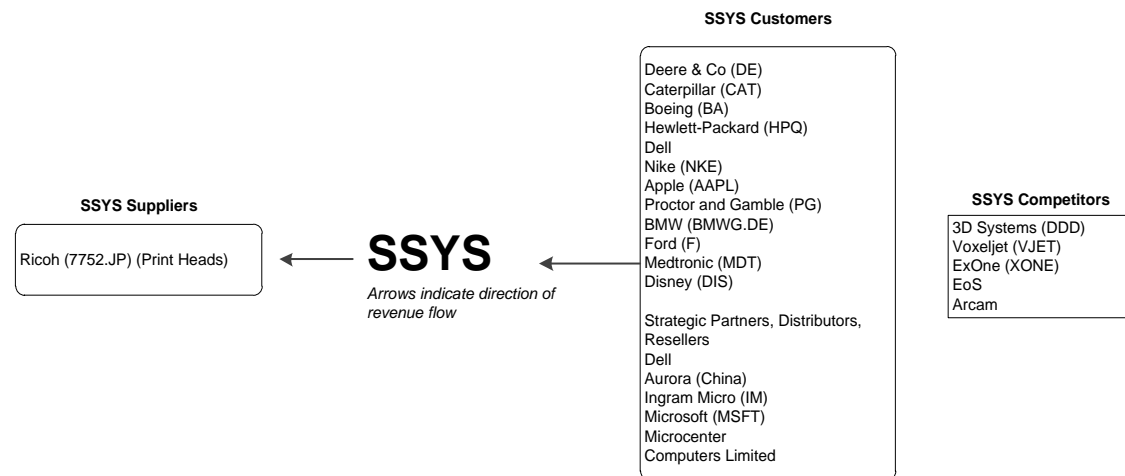
Source: Citi Research, Company Reports, FirstCall



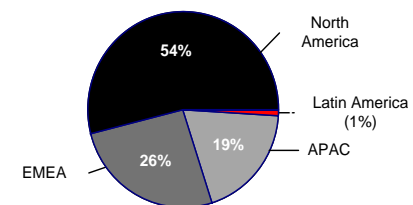
Figure 569. Stratasys (SSYS)

Sector: 3D Printing

## Stratasys Ltd. (SSYS)



Business Breakdown



Geographic Breakdown

Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## SunEdison

Citi Analyst: **Shahriar Pourreza, CFA**

SunEdison has essentially two operating segments: Semiconductor Materials and Solar Energy.

- The Solar Energy segment is SUNE's technology agnostic, solar project development business that designs, installs, finances and monitors solar energy projects at the commercial and utility scale level through SunEdison. SunEdison also provides operations and maintenance services.
- The Semiconductor Materials segment is a leading supplier of raw silicon wafers to the semiconductor industry. SUNE's Semi Materials segment includes virtually all major chipmakers in its customer base, with a #4 leading market share. The company's products include 100mm, 125mm, 150mm, 200mm and 300mm prime polished wafers, epitaxial wafers, and test and monitor wafers for semiconductor devices including memory, logic and microprocessors.

The company was founded in 1959 and located in St. Peters, MO.

Figure 570. SunEdison (SUNE) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1163.6	2239.2	3243.3	2870.4	2555.6	2951.9	3033.6	3526.7	3666.7
– <i>y/y growth</i>	-42.0%	92.4%	44.8%	-11.5%	-11.0%	15.5%	18.7%	19.5%	20.9%
<b>Gross Margins</b>	11.6%	16.1%	17.7%	14.8%	8.1%	24.4%		27.9%	
<b>Operating Margins</b>	-3.2%	4.1%	5.3%	6.5%	-8.5%	13.6%		18.9%	
<b>EPS</b>	-0.11	0.12	0.20	0.28	-0.86	0.47	-0.06	1.06	0.40
– <i>y/y growth</i>	-103.5%	203.1%	67.2%	41.5%	-411.9%	154.8%	93.2%	124.4%	781.4%
<b>Cash</b>	718.6	707.4	585.8	572.6	549.5	1040.3		1296.4	
<b>Debt</b>	416.6	682.7	1926.8	2368.3	3876.3	4809.7		5916.7	
<b>Net Cash/Shr</b>	1.5	0.4	-5.2	-7.2	-12.7	-13.0		-16.0	
<b>Tangible Book Value/Shr</b>	8.2	8.1	2.6	2.0	0.4	0.9		2.0	

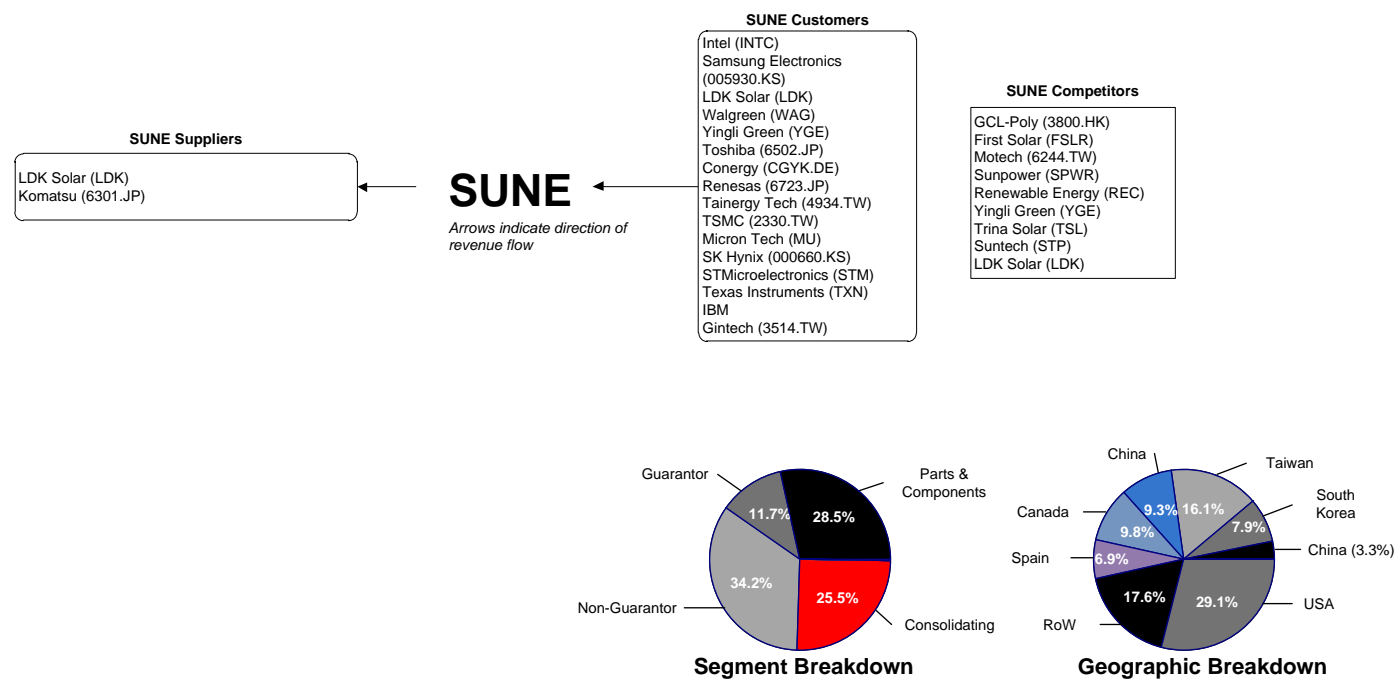
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 571. SunEdison (SUNE)

Sector: Alternative Energy

## SunEdison (SUNE)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Sunpower Corporation

Citi Analyst: **Shahriar Pourreza, CFA**

SunPower Corp. is a vertically integrated manufacturer and service provider of solar photovoltaic technology.

The company offers a suite of solar cells and solar panels based on traditional crystalline silicon technology and leverages proprietary manufacturing processes that have enabled it to achieve industry-leading conversion efficiencies.

With its acquisition of PowerLight in early 2007, the company also entered into the solar systems segment where it designs, manufactures, and installs grid-connected commercial solar electric products and systems, integrating solar panels from both SunPower and external suppliers.

Before its IPO in late 2005, SunPower operated as a subsidiary of Cypress Semiconductor. The company is headquartered in California.

Figure 572. SunPower Corp. (SPWR) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1524.3	2230.3	2498.3	2622.1	2580.7	3000.4	2555.8	3893.8	2978.3
- <i>y/y growth</i>	6.2%	46.3%	12.0%	5.0%	-1.6%	16.3%	-1.0%	29.8%	16.5%
<b>Gross Margins</b>	20.4%	24.8%	13.6%	15.4%	23.7%	19.0%		20.2%	
<b>Operating Margins</b>	8.4%	11.7%	1.2%	3.7%	12.7%	11.5%		12.5%	
<b>EPS</b>	1.01	1.79	0.28	0.19	1.60	1.40	1.19	2.01	1.64
- <i>y/y growth</i>	-53.6%	77.8%	-84.4%	-32.0%	744.9%	-12.7%	-25.5%	43.9%	37.4%
<b>Cash</b>	616.1	644.1	667.1	457.5	1067.1	986.6		1129.9	
<b>Debt</b>	785.5	839.9	975.0	814.3	911.2	668.7		656.2	
<b>Net Cash/Shr</b>	-0.2	-1.9	-3.2	-3.0	1.1	2.2		3.2	
<b>Tangible Book Value/Shr</b>	12.7	13.0	10.7	8.5	9.8	11.1		13.2	

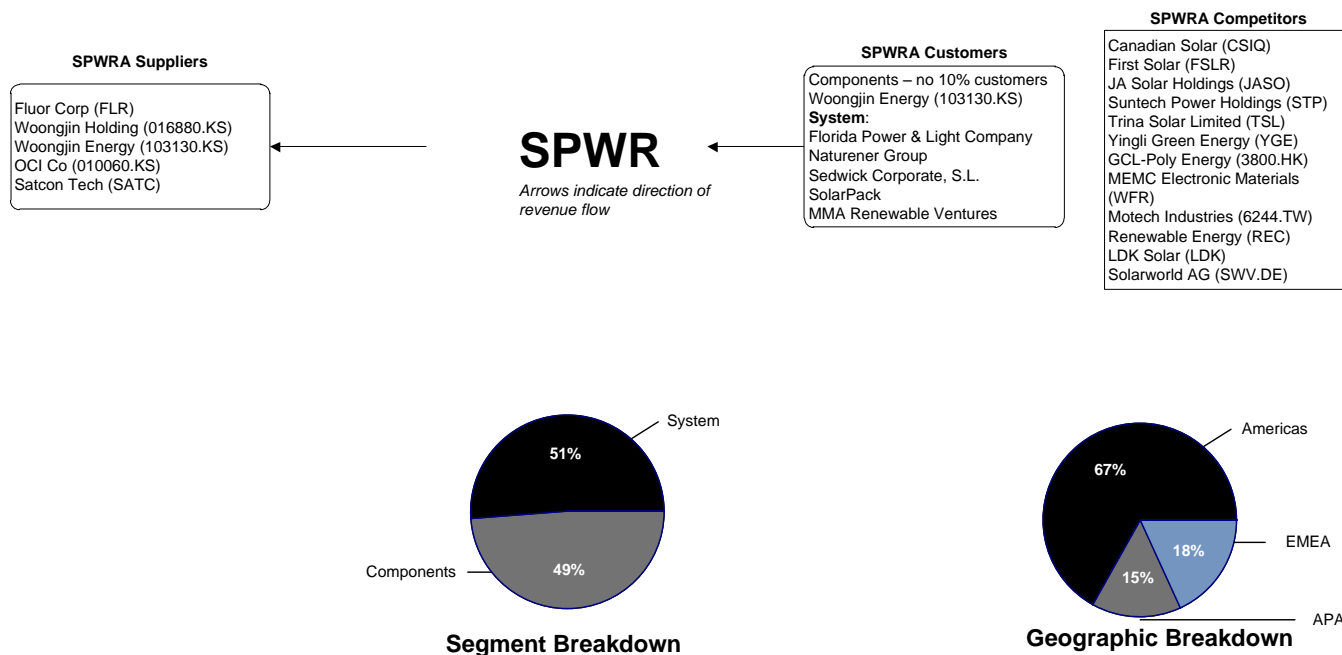
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 573. SunPower Corp. (SPWR)

Sector: Alternative Energy

## SunPower Corporation (SPWR)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Synnex Corp.

Citi Analyst: Jim Suva, CPA

Synnex Corp. is the third-largest wholesale distributor of information technology products in North America behind Ingram Micro and Tech Data.

The company distributes 20,000 systems, software, peripheral, networking, and component products from 100 vendors, including Hewlett-Packard (about ~30% of total revenue), IBM, and Intel. Synnex sells to more than 20,000 small business resellers, direct marketers, corporate resellers, government resellers, and retailers, but does not sell directly to end users. No one customer represents more than 10% of total revenue, but large customers include CDW, Iron Bow Technologies, Staples Business Depot, Insight Enterprises and Systemax.

While traditional wholesale distribution represents 98% of Synnex's total revenue, the company also performs various value-added services (BPO) that include technical support, renewals management, back-office processing, and ITO.

During FY13, the company generated revenue of \$10.8B, gross margin of 6.04%, operating margin of 2.3%, and diluted EPS of \$4.13.

Figure 574. Synnex (SNX) Results and Forecasts

		2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
NX.US	<b>Revenues</b>	7746.2	8614.1	10409.8	10285.5	10845.2	12515.6	12372.9	13425.5	13219.9
	- y/y growth	-0.3%	11.2%	20.8%	-1.2%	5.4%	15.4%	14.1%	7.3%	6.8%
NX.US	<b>Gross Margins</b>	5.7%	5.7%	6.1%	6.4%	6.0%	8.6%		9.4%	
NX.US	<b>Operating Margins</b>	2.0%	2.3%	2.5%	2.5%	2.3%	3.0%		3.2%	
NX.US	<b>EPS</b>	2.67	3.26	4.11	4.00	4.13	5.64	4.95	6.56	5.67
	- y/y growth	6.2%	21.8%	26.3%	-2.9%	3.5%	36.5%	19.7%	16.3%	14.6%
NX.US	<b>Cash</b>	37.8	101.2	67.6	163.7	151.6	78.1		216.5	
NX.US	<b>Debt</b>	303.9	520.4	383.0	275.3	317.9	517.9		517.9	
NX.US	<b>Net Cash/Shr</b>	-3.4	-3.2	-4.2	2.2	2.3	0.3		3.9	
NX.US	<b>Tangible Book Value/Shr</b>	20.5	23.0	25.5	29.4	32.3	25.3		31.3	

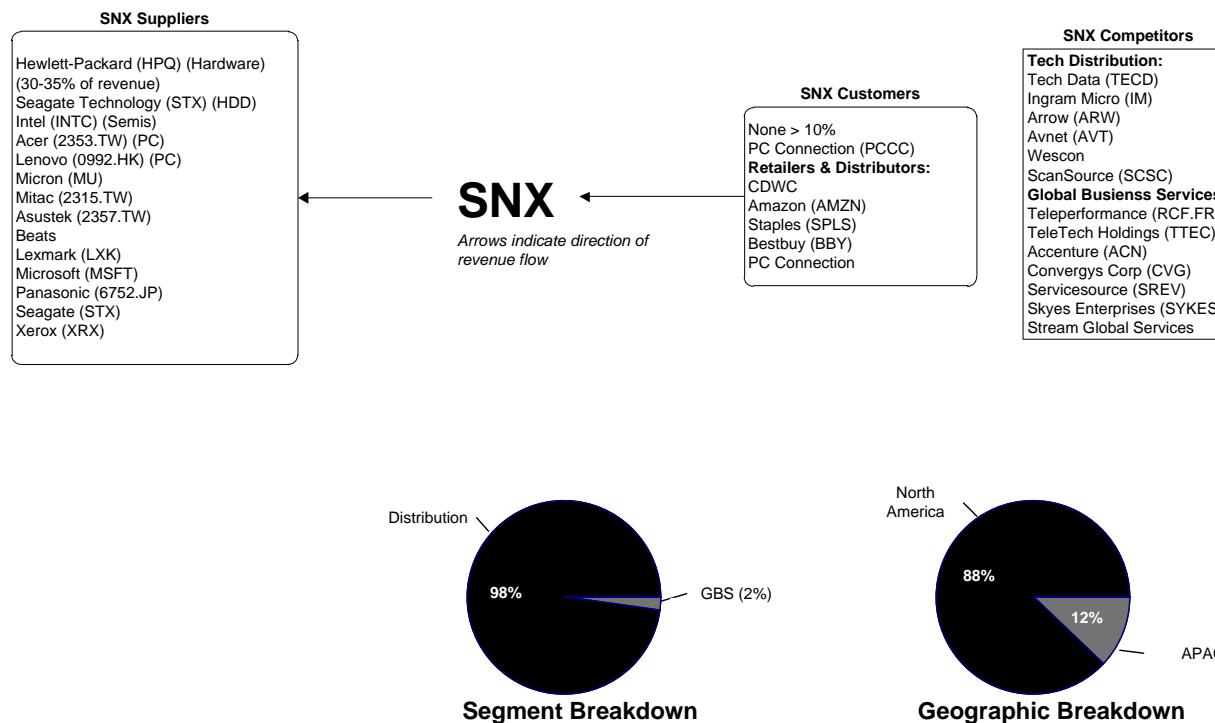
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 575. Synnex (SNX)

Sector: Wholesale IT Distribution

## Synnex (SNX)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Taiyo Yuden

Citi Analyst: Yuta Fukasawa

Taiyo Yuden Co., Ltd. engages in manufacture and sale of electronic components.

The company is composed of three segments: Electronic Component, Recording Media Product and Other segments.

- The Electronic Component segment offers capacitors such as multilayer ceramic capacitor, axial leaded ceramic capacitor, and polyacene capacitor; ferrite and applied products such as multilayer chip inductor, winding chip inductor, and winding power inductor; modules such as power supply modules, high-frequency module, parts embedded wiring board; and surface acoustic wave filters.
- The Recording Media Product and Other segment provide recording media products and involves in the mounting business conducted by its subsidiaries and affiliates.

The company was founded on March 23, 1950 and is headquartered in Tokyo, Japan.

Figure 576. Taiyo Yuden (6976.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	185452.0	195690.0	210401.0	183795.0	192903.0	210041.0	209986.0	226200.0	220647.0
- y/y growth	-22.2%	5.5%	7.5%	-12.6%	5.0%	8.9%	8.9%	7.7%	5.1%
<b>Gross Margins</b>	11.9%	18.7%	21.8%	14.5%	19.6%	23.3%		23.5%	
<b>Operating Margins</b>	-6.9%	2.1%	4.2%	-4.4%	2.6%	6.0%		7.3%	
<b>EPS</b>	-121.52	-5.78	-46.81	-183.71	17.01	71.68	71.87	87.75	89.29
- y/y growth	-248.1%	95.2%	-709.9%	-292.4%	109.3%	321.5%	322.6%	22.4%	24.2%
<b>Cash</b>	37105.0	41785.0	39957.0	27912.0	35356.0	67994.8		62500.1	
<b>Debt</b>	60907.0	51938.0	45004.0	58475.0	62870.0	81572.0		71572.0	
<b>Net Cash/Shr</b>	-25.5	-1.9	89.2	19.1	-20.1	150.6		171.8	
<b>Tangible Book Value/Shr</b>	1155.3	1153.8	1057.0	866.1	962.1	1106.8		1182.6	

(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall



Figure 577. Taiyo Yuden (6976.JP)

Sector: Electronic Components

## Taiyo Yuden (6976.JP)

### Taiyo Yuden

Arrows indicate direction of revenue flow

#### Taiyo Yuden Customers

Capacitors (Consumer products : 15%, PC&tablet :30%, mobile phone:40%, components and others : 15%)

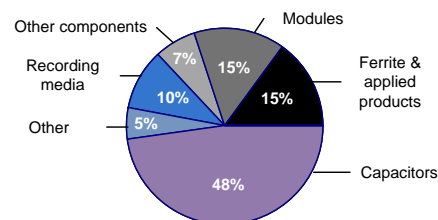
Ferrite products (Consumer products : 25%, PC&tablet :20%, mobile phone:30%, components and others : 25%)

RF components ( smartphone & tablet makers) nents and others : 25%)

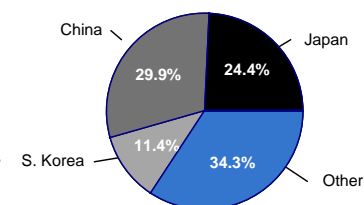
#### Taiyo Yuden Competitors

Murata (6981.JP)  
TDK (6762.JP)  
SEMCO (009150.KS)  
Kyocera (6971.JP)  
Yageo (2327.TW)

Skyworks (SWKS)  
TriQuint (TQNT)  
RF Micro Devices (RFMD)  
Toko (6801.JP)  
Panasonic (6752.JP)  
Cyntec



Product Breakdown



Geographic Breakdown

Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Tamron Co Ltd.

Citi Analyst: Masahiro Shibano

Tamron Co., Ltd. engages in the manufacture and sale of precision optical equipment.

The company operates through the following business segments: Photographic Products, Optical Components, and Commercial and Industrial-use Optics.

- The Photographic Products segment manufactures and sells interchangeable lenses for single-lens reflex (SLR) camera.
- The Optical Components segment develops and markets camcorder lenses, digital still camera lenses, cellular phone camera lenses, and optical device units.
- The Commercial and Industrial-use Optics segment includes lenses for closed-circuit television (CCTV) cameras and automotive lenses.

The company was founded by Takeyuki Arai on November 1, 1950 and is headquartered in Saitama, Japan.

Figure 578. Tamron Co Ltd (7740.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	49892.6	56650.8	58507.0	64353.0	68452.0	72000.0	73546.0	74160.0	77300.0
– <i>y/y growth</i>	-20.2%	13.5%	3.3%	10.0%	6.4%	5.2%	7.4%	3.0%	5.1%
<b>Gross Margins</b>	28.6%	33.5%	33.5%	31.9%	30.6%	33.1%		33.6%	
<b>Operating Margins</b>	4.6%	9.6%	9.7%	8.6%	7.6%	10.7%		11.7%	
<b>EPS</b>	22.76	130.67	136.57	141.60	116.25	193.45	177.88	221.45	202.23
– <i>y/y growth</i>	-78.8%	474.2%	4.5%	3.7%	-17.9%	66.4%	53.0%	14.5%	13.7%
<b>Cash</b>	11887.0	10996.2	12773.0	10822.0	13313.0	16449.0		23601.0	
<b>Debt</b>	6396.6	6528.6	6329.0	5475.0	4700.0	1000.0		0.0	
<b>Net Cash/Shr</b>	382.7	338.4	392.5	337.3	429.6	561.8		858.2	
<b>Tangible Book Value/Shr</b>	1125.3	1177.9	1291.5	1457.6	1573.6	1815.3		1981.9	

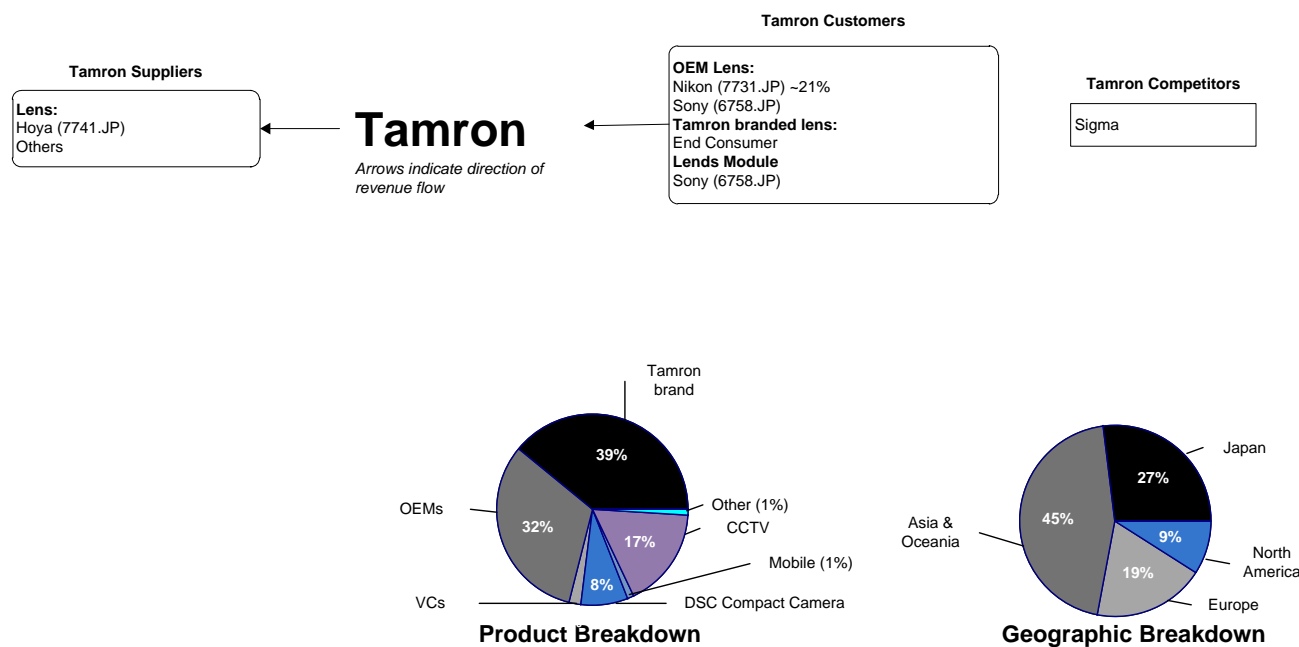
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 579. Tamron Co Ltd (7740.JP)

Sector: Hardware

## Tamron Co Ltd (7740.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## TDK

Citi Analyst: Yuta Fukasawa

TDK is a comprehensive electronic component firm producing products like passive components, HDD heads, and lithium-ion polymer batteries.

The company has three core businesses: passive components (capacitors, inductive devices, other passive components); applied magnetic products (recording devices, other magnetic devices), and applied film products.

The decline in passive component margins is an issue, and margins for ceramic capacitors have seen a notable decline as the external environment deteriorated and slow technological development resulted in a smaller presence in the market for TDK. TDK began major restructuring in this area in 2011 in an effort to boost margins.

HDD heads are the main product in recording devices, and TDK's market share is about 30%. As the only independent HDD head maker, TDK has top-class technological and development capabilities and boasts high margins (operating margin of about 20%).

In energy devices, earnings from smartphone and tablet PC products are rising, thanks mainly to ATL (acquired in 2005).

We see the key points for the medium term as 1) growth for passive components after restructuring, 2) margins in the HDD head business, and 3) the growth strategy for batteries.

Figure 580. TDK (6762.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	727400.0	808858.0	871943.0	814497.0	851575.0	985775.0	985736.0	1021900.0	1031218.0
- y/y growth	-16.0%	11.2%	7.8%	-6.6%	4.6%	15.8%	15.8%	3.7%	4.6%
<b>Gross Margins</b>	16.7%	23.6%	25.0%	22.1%	20.6%	22.0%		22.6%	
<b>Operating Margins</b>	-7.5%	3.2%	7.4%	2.3%	2.7%	3.8%		5.0%	
<b>EPS</b>	-489.71	104.74	350.57	-20.32	21.87	136.81	149.39	278.20	293.91
- y/y growth	-188.8%	121.4%	234.7%	-105.8%	207.6%	525.6%	583.2%	103.4%	96.7%
<b>Cash</b>	207666.0	223262.0	197630.0	174210.0	224417.0	305419.9		331556.8	
<b>Debt</b>	284629.0	270054.0	244969.0	272840.0	295620.0	305295.0		305295.0	
<b>Net Cash/Shr</b>	-18.7	338.6	828.1	343.8	1007.2	1365.4		1573.2	
<b>Tangible Book Value/Shr</b>	3172.2	3177.1	3210.9	3006.3	3450.3	3885.9		4067.8	

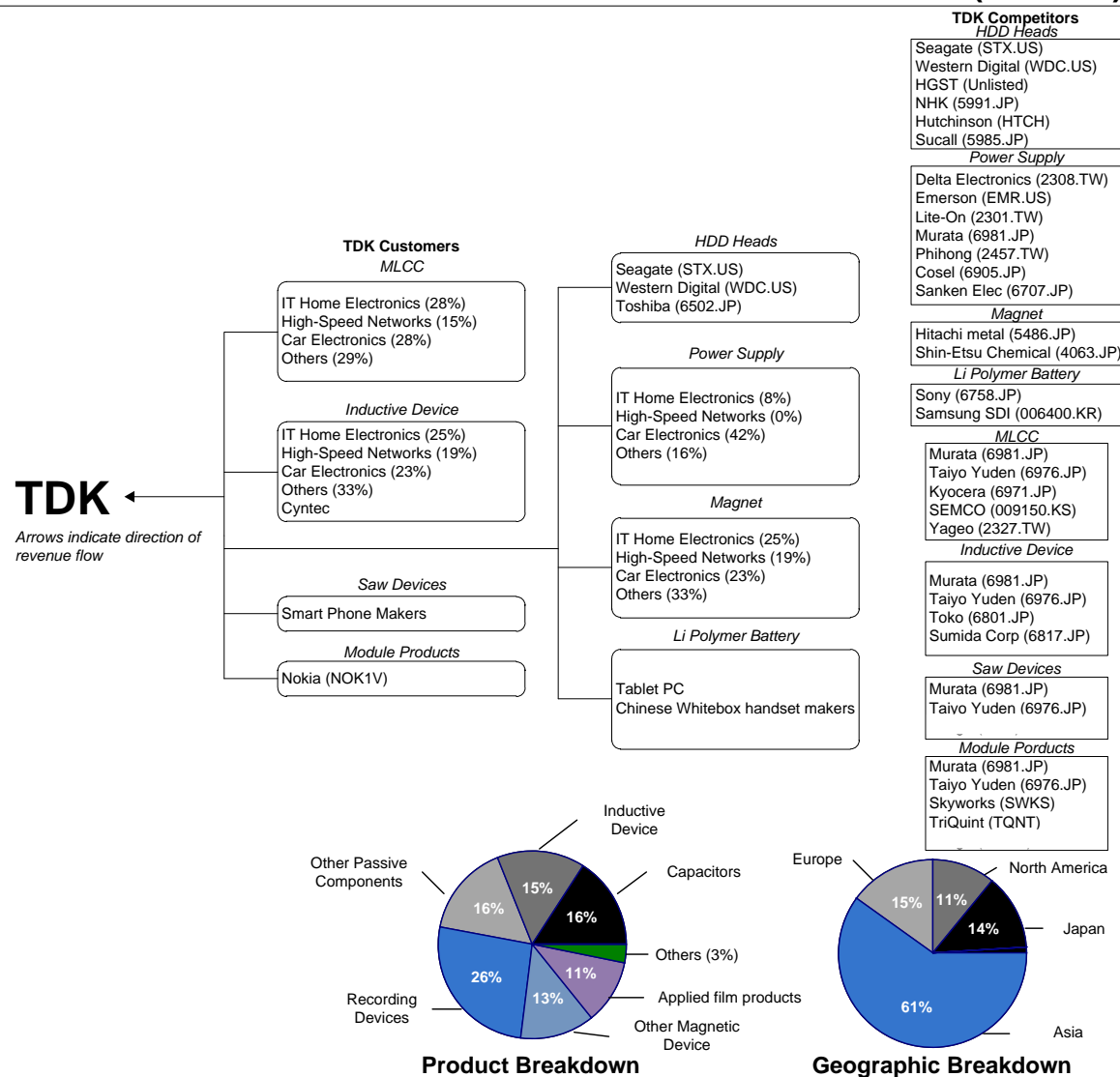
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 581. TDK (6762.JP)

Sector: Electronic Components

## TDK (6762.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## TE Connectivity

Citi Analyst: Jim Suva, CPA

TE Connectivity (TEL) is the world's largest electronics connector company.

TE Connectivity designs, manufactures, and markets about 500,000 different products for consumers within automotive, appliance, and aerospace and defense telecommunications, as well as computer and consumer electronic industries. It stands as a leading global provider of engineered electronic components, network solutions, and wireless systems, serving customers in over 150 countries with no customer accounting for more than 5% of sales (top 25 customers account for 30% of the company's total sales).

TE Connectivity had \$12 billion (+18 y/y) in fiscal 2010, \$14.1b in fiscal 2011 (+19%/y/y), \$13.3b in fiscal 2012 (-6% y/y) and \$13.3b in fiscal 2013 (flat y/y).

Sales by segment include: 43% transportation, 22% network solutions, 23% industrial solutions and 12% consumer solutions. A sample of customers consists of Dell, HP, Cisco, Toyota, IBM, Verizon, Samsung, Sony, Volkswagen, Mercedes-Benz, and Ford.

TE Connectivity supports over 8,000 engineers and 16 manufacturing facilities in 25 countries, creating 76% of operations outside of the United States.

TE Connectivity is a spin-out company (July 2, 2007) of then parent company Tyco International (TYC).

Figure 582. TE Connectivity (TEL) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	10256.0	11879.0	14130.0	13282.0	13280.0	14172.4	14003.2	15519.9	14736.6
- y/y growth		15.8%	18.9%	-6.0%	0.0%	6.7%	5.4%	9.5%	5.2%
<b>Gross Margins</b>	24.7%	30.2%	30.3%	31.0%	32.6%	33.8%		33.2%	
<b>Operating Margins</b>	5.8%	12.3%	12.5%	13.2%	14.2%	15.4%		15.1%	
<b>EPS</b>	0.83	2.12	2.70	2.86	3.23	3.83	3.78	4.28	4.15
- y/y growth		156.6%	27.5%	5.8%	12.9%	18.6%	16.9%	11.6%	10.0%
<b>Cash</b>	1521.0	1990.0	1219.0	1589.0	1403.0	1421.8		1685.6	
<b>Debt</b>	2417.0	2413.0	2669.0	3711.0	3014.0	2998.0		2998.0	
<b>Net Cash/Shr</b>	-1.7	-0.7	-3.3	-2.6	-2.1	-2.9		-2.3	
<b>Tangible Book Value/Shr</b>	7.5	7.6	7.4	5.4	6.7	8.3		9.9	

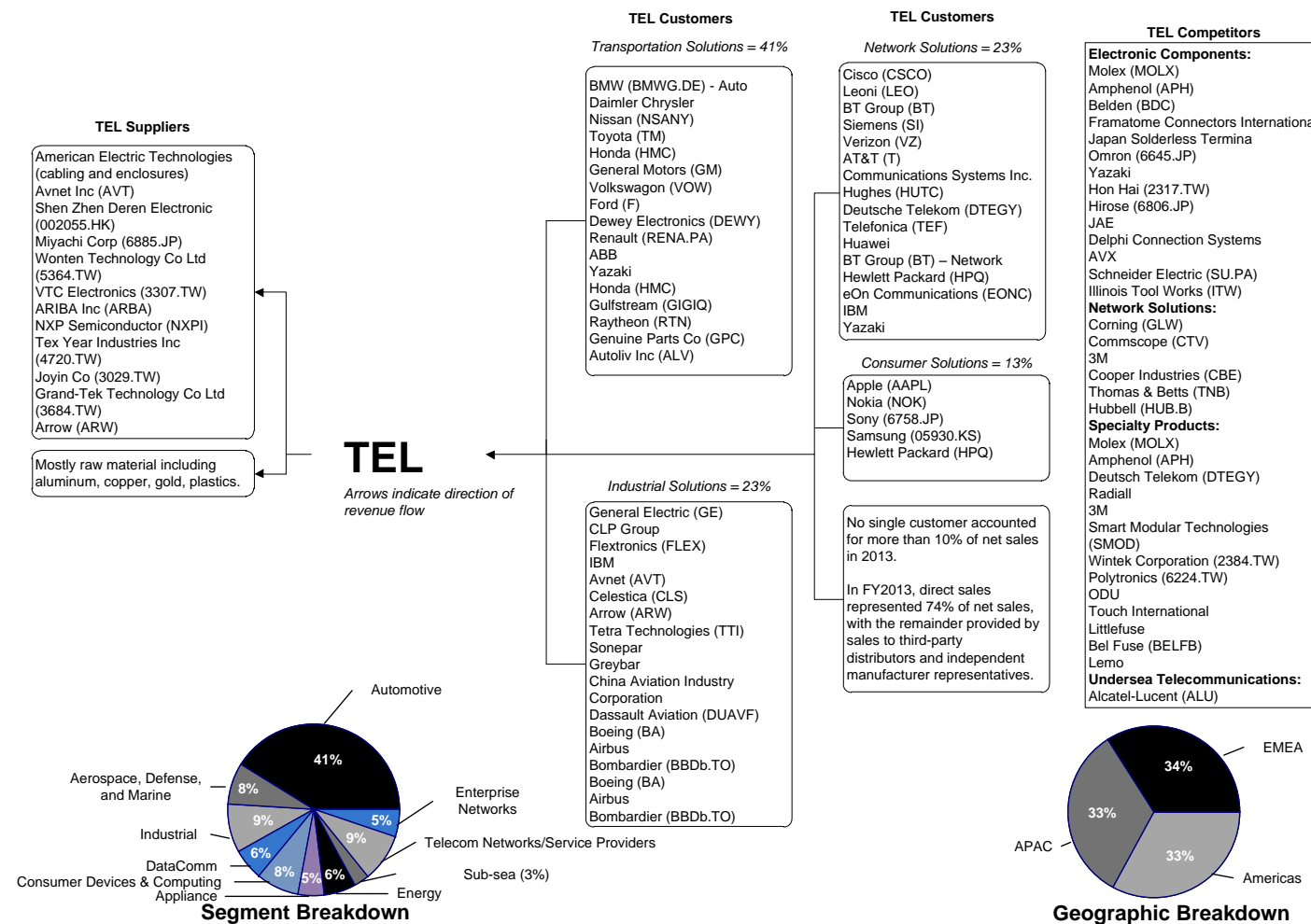
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 583. TE Connectivity (TEL)

Sector: Technology Supply Chain - Connectors

## TE Connectivity (TEL)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Tech Data Corp.

Citi Analyst: Jim Suva, CPA

Tech Data is the second largest (in terms of revenues) wholesale distributor of IT products, logistics management, and other value-added services worldwide.

Tech Data does not sell any products or services directly to end users, but rather it distributes more than 100,000 IT products from 1,500 vendors to approximately 90,000 value-added resellers (VARs), direct marketers, retailers, and corporate resellers that generate demand for the products and manage the end-user relationship.

Tech Data also provides services including training and technical support, financing, product configuration, marketing assistance, and e-commerce.

In FY13 (ending January 2013), the company generated revenues of \$25.4 billion, and derived over 60% of total revenues from operations in Europe. Tech Data manages the business in two geographic segments: EMEA and the Americas (US, Canada, Latin America, Caribbean), which produced 61% and 39% of FY13 sales, respectively.

Tech Data's primary competitors include Ingram Micro and Synnex.

Figure 584. Tech Data (TECD) Results and Forecasts

	2010	2011	2012	2013	2014	CIR 2015E	Street 2015E	CIR 2015E	Street 2015E
<b>Revenues</b>	22099.9	24376.0	26488.1	25358.3	26885.0	28062.4	28272.9	28062.4	28272.9
- y/y growth	-8.2%	10.3%	8.7%	-4.3%	6.0%	4.4%	5.2%	0.0%	0.0%
<b>Gross Margins</b>	5.2%	5.3%	5.3%	5.1%	5.1%	5.2%		5.2%	
<b>Operating Margins</b>	1.2%	1.4%	1.3%	1.2%	1.0%	1.1%		1.1%	
<b>EPS</b>	3.43	4.36	4.65	5.04	4.34	5.45	5.54	5.45	5.54
- y/y growth	42.9%	27.2%	6.7%	8.3%	-13.9%	25.6%	27.7%	0.0%	0.0%
<b>Cash</b>	1116.6	839.9	505.2	340.6	256.9	381.6		381.6	
<b>Debt</b>	403.5	494.5	105.7	522.0	400.4	400.4		400.4	
<b>Net Cash/Shr</b>	15.3	15.9	10.1	-0.4	-2.5	0.7		0.7	
<b>Tangible Book Value/Shr</b>	39.1	41.4	41.9	37.0	40.7	44.6		44.6	

(Revenues, Cash and Debt in Millions in Local Currency)

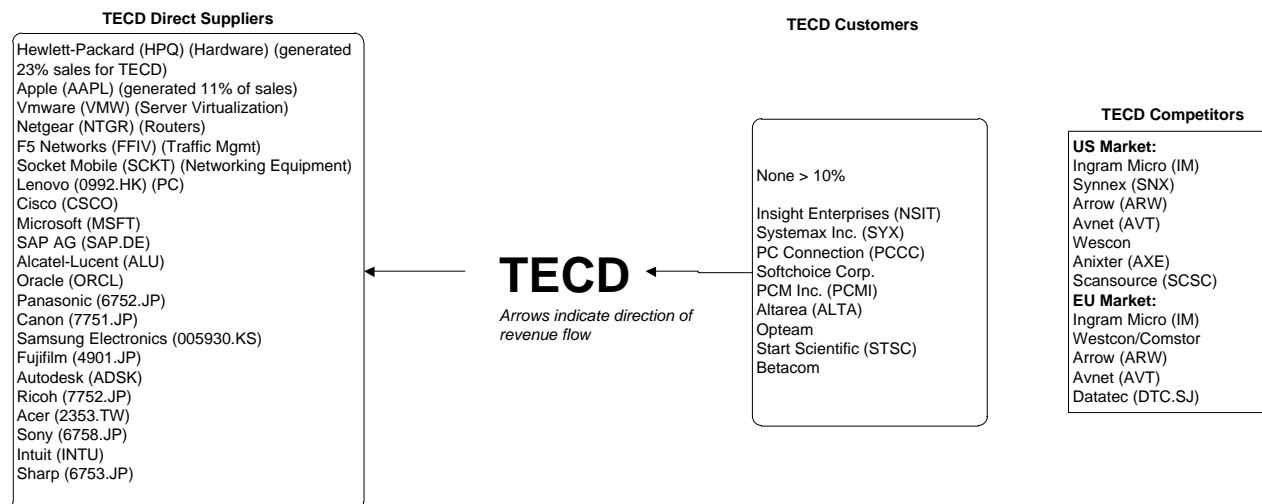
Source: Citi Research, Company Reports, FirstCall



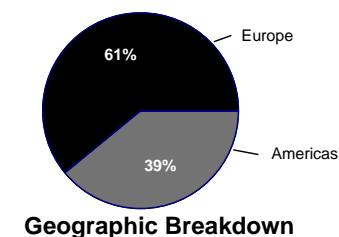
Figure 585. Tech Data (TECD)

Sector: Wholesale IT Distribution

## Tech Data (TECD)



Segment Breakdown – 100% IT Products



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Teradyne Inc.

Citi Analyst: Terence Whalen

Silicon Labs is a non-traditional mixed-signal vendor that: a) is totally fabless so it uses TSMC for foundry and ASE / Amkor for backend and b) designs products with complementary metal oxide silicon (CMOS) which is a difficult process for analog mixed-signal designs but offers cost/size/performance advantages if successfully implemented.

Sales are spread across consumer audio (12%), handset FM tuners (3%), video tuners & demodulators (17%), embedded MCU/wireless (29%), timing (13%), touch (5%), access (19%) and mature products (1%).

Two distributors, Edom Technology and Avnet, represented 22% and 11% of CY12 sales. Samsung represented 19% of sales in 2012 with Cisco, Huawei, LG Electronics, Pace, Panasonic, Sagem, Samsung, Technicolor, Varian Medical Systems and ZTE as other major customers. SLAB is headquartered in Austin TX, and its fiscal year ends in December.

Figure 586. Teradyne (TER) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	819.4	1566.2	1429.1	1656.8	1427.9	1621.2	1655.5	1716.4	1828.1
- <i>y/y growth</i>	-26.0%	91.1%	-8.8%	15.9%	-13.8%	13.5%	15.9%	5.9%	10.4%
<b>Gross Margins</b>	38.0%	54.7%	49.9%	53.5%	56.6%	54.0%		55.1%	
<b>Operating Margins</b>	-6.5%	27.8%	19.9%	21.3%	18.6%	19.2%		22.5%	
<b>EPS</b>	-0.33	1.91	1.92	1.36	0.93	1.30	1.34	1.49	1.56
- <i>y/y growth</i>	81.8%	676.5%	0.6%	-29.0%	-31.5%	39.7%	43.7%	14.5%	16.2%
<b>Cash</b>	463.7	806.8	670.2	770.4	928.5	1091.7		1477.4	
<b>Debt</b>	143.3	152.6	162.5	173.4	186.7	186.7		186.7	
<b>Net Cash/Shr</b>	1.9	2.9	2.2	2.7	3.9	5.6		7.5	
<b>Tangible Book Value/Shr</b>	2.9	5.5	4.1	5.9	7.3	8.6		10.4	

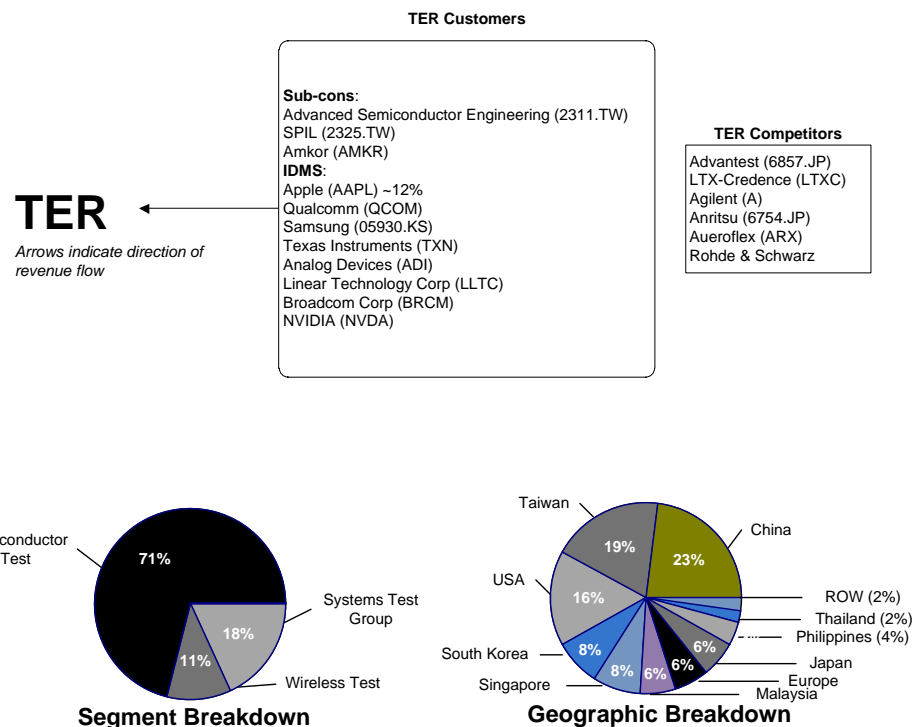
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 587. Teradyne (TER)

Sector: Semiconductor Equipment: Back End

## Teradyne (TER)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Texas Instruments

Citi Analyst: Glen Yeung

Texas Instruments (TXN) is the largest supplier of digital signal processors (DSPs), which are microprocessors used to process signals in real time. In addition, Texas Instruments is one of the largest suppliers of analog/mixed signal semiconductors.

With the acquisition of National Semiconductor, we estimate in 2012 about 53% of the company's sales are Analog (HPA, HVA, Power, SVA); 14% Embedded Processing (catalog, communications infrastructure, automotive), 15% Wireless (baseband, OMAP, connectivity), and 18% Other (DLP, Education & Productivity, RISC, ASIC, royalties).

Figure 588. Texas Instruments (TXN) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	10428.0	13966.0	13736.0	12825.0	12204.0	12577.9	12597.2	13123.0	13220.7
- <i>y/y growth</i>	-16.6%	33.9%	-1.6%	-6.6%	-4.8%	3.1%	3.2%	4.3%	4.9%
<b>Gross Margins</b>	47.9%	53.6%	49.3%	49.6%	52.1%	54.5%		55.5%	
<b>Operating Margins</b>	19.1%	31.3%	21.8%	15.4%	23.2%	26.0%		28.9%	
<b>EPS</b>	1.14	2.63	2.28	1.53	1.90	2.30	2.11	2.65	2.42
- <i>y/y growth</i>	-31.1%	130.5%	-13.3%	-33.0%	24.2%	21.0%	10.9%	15.3%	15.0%
<b>Cash</b>	2925.0	3072.0	2935.0	3965.0	3829.0	3603.0		3481.3	
<b>Debt</b>	0.0	0.0	5592.0	5686.0	5158.0	5158.0		5158.0	
<b>Net Cash/Shr</b>	2.3	2.5	-1.1	-0.2	-0.3	-0.5		-0.6	
<b>Tangible Book Value/Shr</b>	6.0	6.9	2.6	2.9	3.2	2.6		2.0	

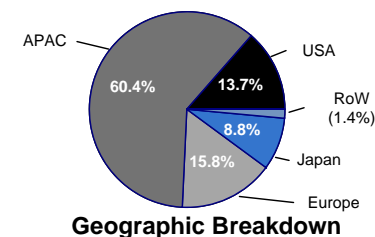
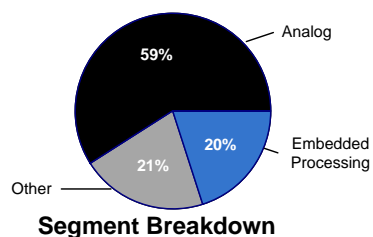
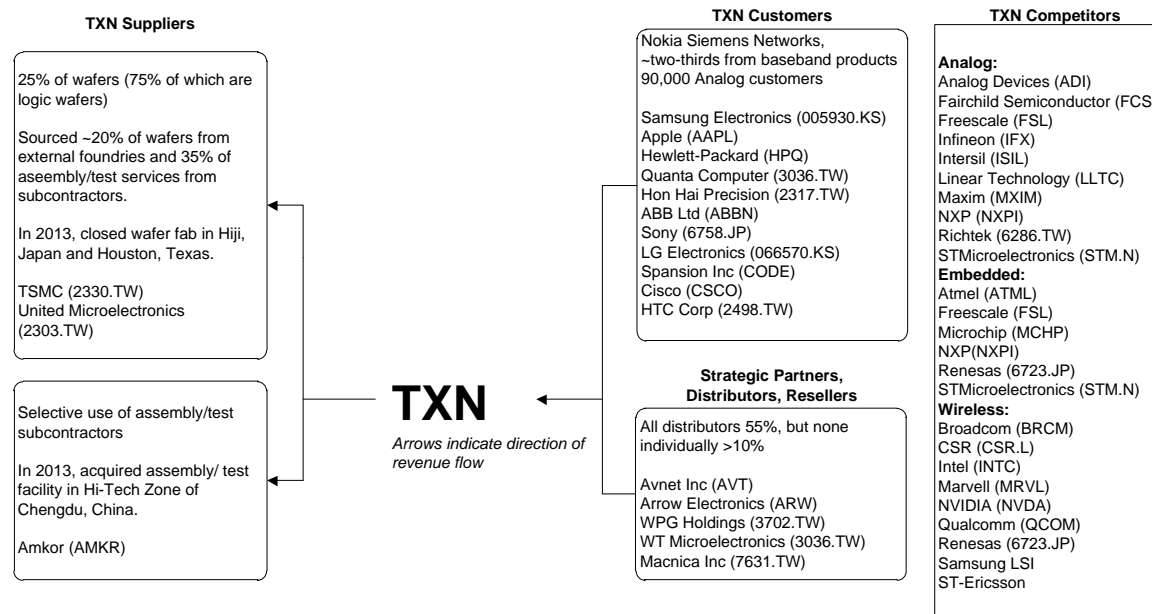
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 589. Texas Instruments (TXN)

Sector: Semiconductors

## Texas Instruments (TXN)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Tokyo Electron

Citi Analyst: Masahiro Shibano

Tokyo Electron Ltd. engages in the development, manufacture, and sale of semiconductor production equipment, flat panel display, and telecommunications equipment.

The company's operations are carried out through the following segments: Semiconductor Production Equipment (SPE), Flat Panel Display and Photovoltaic Production Equipment (FPD/PV), Electronic Components and Computer Networks, and Others.

- The SPE segment provides the development, manufacture, service, and distribution of coaters/developers, plasma etch systems, thermal processing systems, single wafer deposition systems, cleaning systems, wafer probers, and other semiconductor production equipment.
- The FPD Production Equipment segment handles the development, manufacture, service, and distribution of coaters/developers, plasma etch/ash system used in the manufacture of flat panel displays, and plasma CVD (Chemical Vapor Deposition) systems used in the manufacture of thin film silicon PV cells.
- The Electronic Components and Computer Networks segment manages the design, development, procurement, and distribution of semiconductor products centering on integrated circuits (IC), other electronic components, computer networks and software.
- The Others segment includes logistics, facilities management, and insurance businesses.

The company was founded in November 11, 1963 and is headquartered in Tokyo, Japan.

Figure 590. Tokyo Electron (8035.JP) Results and Forecasts

	2008	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	906091.0	508082.0	418636.0	668722.0	633091.0	497299.0	602000.0	607272.0	642000.0	684984.0
– y/y growth	0.0%	-43.9%	-17.6%	59.7%	-5.3%	-21.4%	21.1%	22.1%	6.6%	12.8%
<b>Gross Margins</b>	34.4%	27.0%	25.9%	35.1%	33.4%	31.9%	33.2%		35.9%	
<b>Operating Margins</b>	18.6%	2.9%	-0.5%	14.6%	9.5%	2.5%	5.8%		10.1%	
<b>EPS</b>	594.14	42.15	-50.46	401.75	205.04	33.91	-108.83	-99.44	255.60	288.47
– y/y growth	0.0%	-92.9%	-219.7%	896.1%	-49.0%	-83.5%	-420.9%	-393.2%	334.9%	390.1%
<b>Cash</b>	115420.0	210157.0	243939.0	285049.0	247624.0	240129.0	227181.2		274582.9	
<b>Debt</b>	99451.0	0.0	0.0	0.0	0.0	0.0	12000.0		12000.0	
<b>Net Cash/Shr</b>	293.9	1174.4	1362.9	1592.2	1382.5	1340.2	1267.8		1532.4	
<b>Tangible Book Value/Shr</b>	1865.2	2903.0	2868.2	3207.0	3281.6	3317.2	3218.9		3419.8	

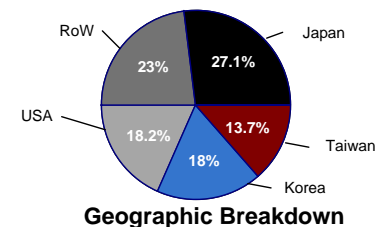
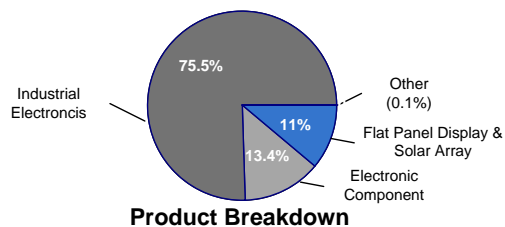
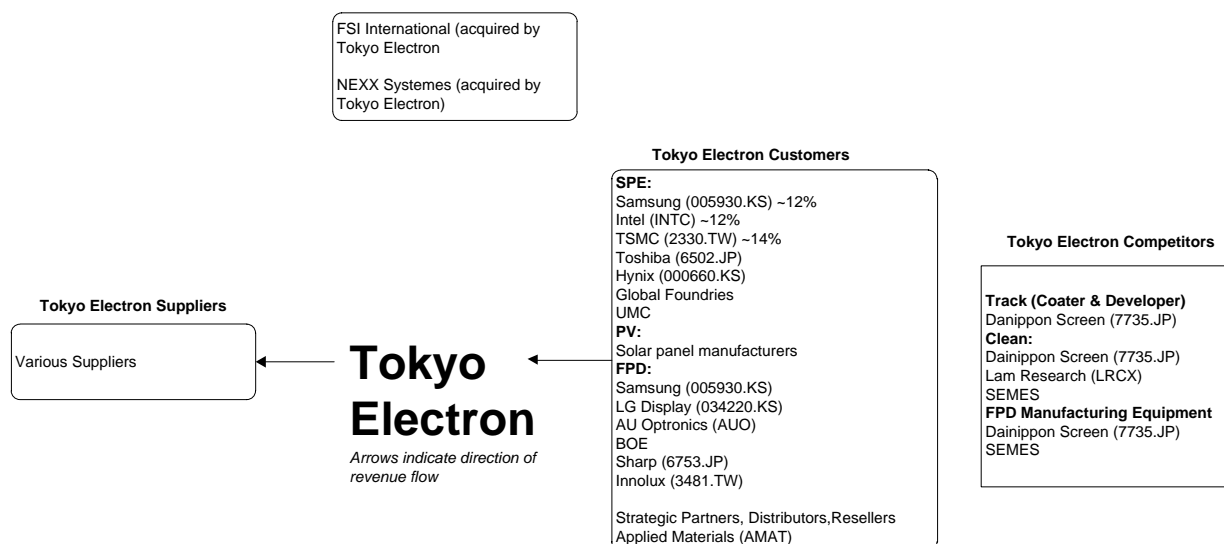
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 591. Tokyo Electron (8035.JP)

Sector: Hardware

## Tokyo Electron (8035.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Toshiba

Citi Analyst: Kota Ezawa

Toshiba is an integrated electronics manufacturer, with a broad portfolio of businesses ranging from semiconductors, digital products (PCs, TVs, HDDs), and consumer electronics to social infrastructure. It has a high share globally in the NAND and nuclear power businesses, and while both should see growth it has become difficult to hold the same level of expectations as in the past: for NAND, the outlook for miniaturization is uncertain, while for nuclear power growth in Japan seems unlikely.

At the same time, Toshiba is No. 3 globally in HDDs thanks to M&A, and we expect better profitability as oligopolization progresses. We also expect growth in the thermal power and transmission and distribution areas, so the number of businesses that can generate profits has widened. Although improving its finances is a major task, the greater number of businesses that can generate stable profits means rescue financing like that secured during the global financial crisis should not be necessary

Figure 592. Toshiba (6502.JP) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	6654518.0	6291208.0	6398505.0	6100262.0	5800281.0	6393000.0	6395302.0	6604000.0	6565160.0
- y/y growth	-13.2%	-5.5%	1.7%	-4.7%	-4.9%	10.2%	10.3%	3.3%	2.7%
<b>Gross Margins</b>	19.4%	22.9%	23.5%	24.0%	24.4%	24.6%		25.2%	
<b>Operating Margins</b>	-3.8%	2.0%	3.8%	3.4%	3.4%	4.8%		5.4%	
<b>EPS</b>	-98.68	-4.48	31.25	17.17	18.31	27.87	26.79	37.76	39.35
- y/y growth	-369.7%	95.5%	798.3%	-45.1%	6.6%	52.2%	46.3%	35.5%	46.9%
<b>Cash</b>	343793.0	267449.0	258840.0	214305.0	209200.0	264000.0		265000.0	
<b>Debt</b>	1810652.0	1218302.0	1081306.0	1235761.0	1471500.0	1431600.0		1752600.0	
<b>Net Cash/Shr</b>	-124.4	-157.2	-115.8	-162.0	-195.8	-203.3		-252.4	
<b>Tangible Book Value/Shr</b>	-56.4	42.2	72.9	36.7	41.2	101.5		129.2	

(Revenues, Cash and Debt in Millions in Local Currency)

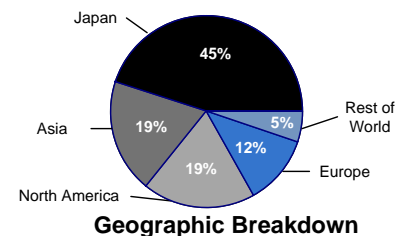
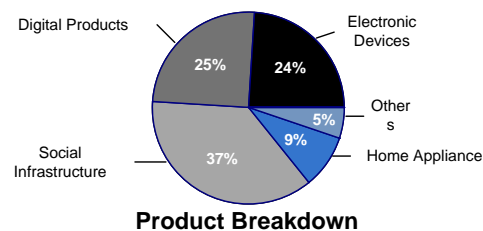
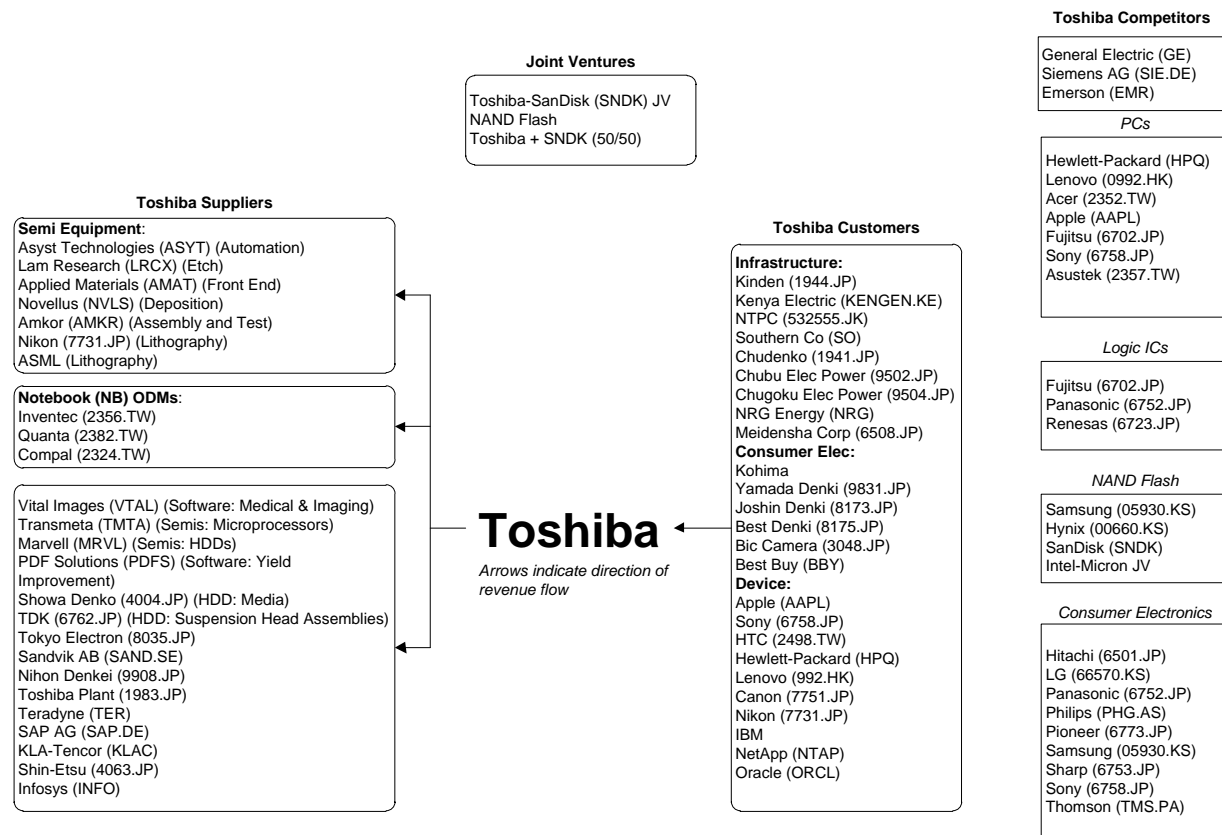
Source: Citi Research, Company Reports, FirstCall



Figure 593. Toshiba (6502.JP)

Sector: Diversified Technology

## Toshiba (6502.JP)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## TPK

Citi Analyst: Winnie Hong, CFA

TPK is one of the world's leading touch module suppliers and is particularly renowned for its early development in Apple's products.

The company's product lines range from cover glass to touch sensors and modules, providing touch solutions for a variety of mobile applications including smartphones, tablets, e-books, and industrial displays.

The company runs production facilities in Xiamen City in Fujian, China. TPK was established in 2003.

Figure 594. TPK (3673.TW) Results and Forecasts

	2009	2010	2011	2012	2013	Street 2014E	Street 2015E
<b>Revenues</b>	18708.8	59598.8	143371.6	173659.4	159067.3	141959.9	157849.4
- <i>y/y growth</i>	44.6%	218.6%	140.6%	21.1%	-8.4%	-10.8%	11.2%
<b>Gross Margins</b>	22.6%	16.8%	16.9%	17.1%	13.2%		
<b>Operating Margins</b>	14.0%	10.5%	11.4%	11.6%	6.3%		
<b>EPS</b>	12.87	17.62	37.21	44.34	21.91	13.49	16.50
- <i>y/y growth</i>	496.4%	36.9%	111.2%	19.2%	-50.6%	-38.4%	22.4%
<b>Cash</b>	1670.9	5564.0	10382.7	23237.9	38299.0		
<b>Debt</b>	2244.8	7261.1	24681.9	37233.4	69874.0		
<b>Net Cash/Shr</b>	6.0	7.3	-29.0	-4.7	68.7		
<b>Tangible Book Value/Shr</b>	29.5	48.5	95.8	139.3	133.5		

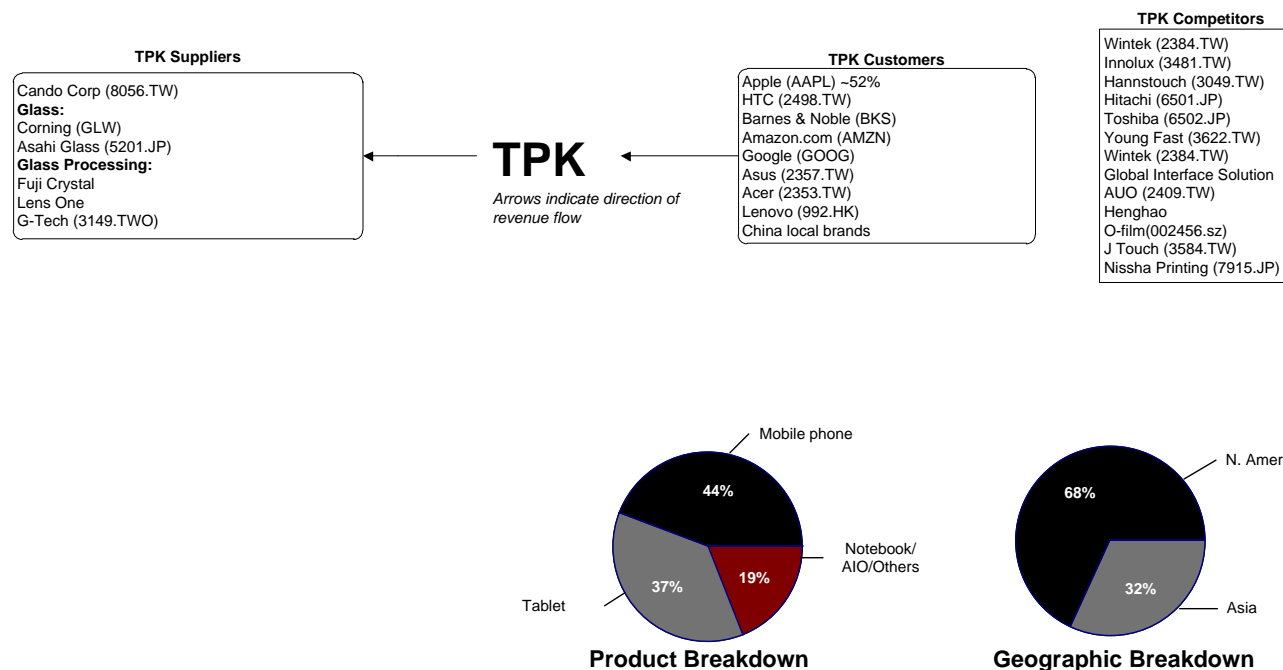
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 595. TPK (3673.TW)

Sector: Semiconductors and Components

TPK (3673.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Trina Solar Limited

Citi Analyst: **Shahriar Pourreza, CFA**

Based in China, Trina Solar is a vertically-integrated manufacturer of silicon-based solar modules for the photovoltaic (PV) industry.

From ingot to module, Trina's manufacturing operations cover nearly every portion of the solar value chain while its growing systems business also provides direct exposure to the project development and installation segment.

Trina markets its products in key solar regions across the globe including Germany, U.S., and China through wholesalers, distributors, as well as direct sales to PV system integrators primarily targeting applications in the traditional rooftop and ground-mount end markets.

Figure 596. Trina Solar Limited (TSL) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	845.1	1857.7	2047.9	1296.7	2138.9	2986.0	2488.3	3130.9	3045.2
- y/y growth	1.6%	119.8%	10.2%	-36.7%	65.0%	39.6%	16.3%	4.9%	22.4%
<b>Gross Margins</b>	28.1%	31.5%	16.4%	8.5%	13.5%	16.4%		17.3%	
<b>Operating Margins</b>	16.5%	22.7%	3.3%	-10.2%	0.5%	3.9%		4.8%	
<b>EPS</b>	1.56	4.13	-0.18	-2.25	-0.64	0.46	0.83	0.71	1.67
- y/y growth	31.8%	164.8%	NM	NM	NM	172.4%	230.0%	54.7%	102.1%
<b>Cash</b>	410.1	753.0	816.8	807.3	406.7	505.9		470.5	
<b>Debt</b>	583.0	594.9	1037.4	1291.0	1277.5	1527.5		1727.5	
<b>Net Cash/Shr</b>	1.5	4.1	2.3	5.5	1.3	-0.8		-3.9	
<b>Tangible Book Value/Shr</b>	11.5	14.4	15.7	12.4	11.2	11.3		11.7	

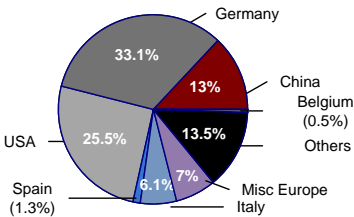
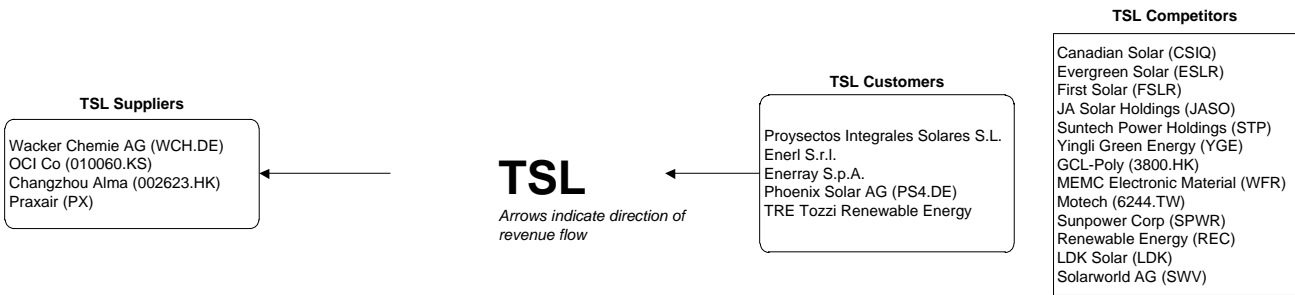
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 597. Trina Solar Limited (TSL)

Sector: Alternative Energy

Trina Solar Limited (TSL)



Segment Breakdown – 100% Solar Modules

Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Tripod Technology

Citi Analyst: Roland Shu

Established in 1997, Tripod is a major Printed Circuit Board (PCB) supplier, ranked as the global No. 6 PCB maker, and No. 1 PCB maker in China, according to Prismark.

The company has a diversified product portfolio including DRAM, TFT-LCD, HDD, HDI, PC, server and automotive.

Tripod has manufacturing sites in Taiwan and Wuxi, China.

Figure 598. Tripod Technology (3044.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	33423.6	43015.9	40898.6	39120.5	40771.7	42699.5	43064.9	45018.3	46291.8
- <i>y/y growth</i>	10.2%	28.7%	-4.9%	-4.3%	4.2%	4.7%	5.6%	5.4%	7.5%
<b>Gross Margins</b>	20.1%	22.0%	19.7%	17.0%	14.5%	15.3%		16.1%	
<b>Operating Margins</b>	11.5%	13.5%	11.4%	8.3%	6.2%	7.6%		8.4%	
<b>EPS</b>	6.10	9.67	8.00	5.58	4.52	5.26	5.17	5.84	5.83
- <i>y/y growth</i>	11.4%	58.6%	-17.3%	-30.3%	-19.0%	16.4%	14.5%	11.0%	12.7%
<b>Cash</b>	7576.6	13284.7	11233.2	10152.6	13352.9	16490.2		18245.8	
<b>Debt</b>	6453.9	8194.2	5039.0	7567.0	9980.4	8840.7		8781.3	
<b>Net Cash/Shr</b>	6.1	24.3	21.4	19.3	25.4	31.4		34.7	
<b>Tangible Book Value/Shr</b>	33.7	37.7	44.8	45.6	49.3	52.3		55.6	

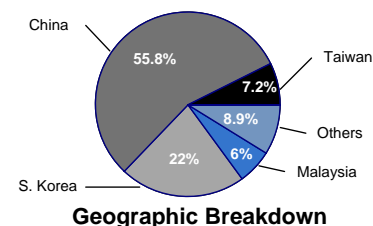
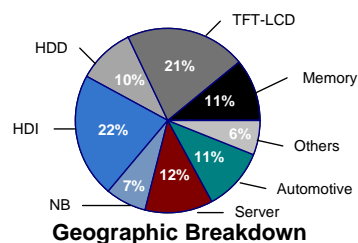
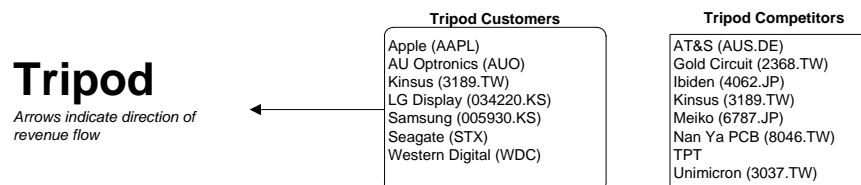
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 599. Tripod Technology (3044.TW)

Sector: Electronic Components

## Tripod Technology (3044.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## TSMC

Citi Analyst: Roland Shu

Taiwan Semiconductor Manufacturing Company (TSMC) manufactures and markets integrated circuits. It provides wafer manufacturing, wafer probing, assembly and testing, mask production, and design services.

TSMC's ICs are used in computer, communication, consumer electronics, automotive, and industrial equipment.

Figure 600. TSMC (2330.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	295742.2	419537.9	427080.6	506248.6	597024.2	707292.7	691506.6	804843.6	783745.7
- <i>y/y growth</i>	-11.2%	41.9%	1.8%	18.5%	17.9%	18.5%	15.8%	13.8%	13.3%
<b>Gross Margins</b>	43.7%	49.4%	45.4%	48.1%	47.1%	47.8%		48.2%	
<b>Operating Margins</b>	31.1%	37.9%	33.1%	35.8%	35.1%	35.8%		35.6%	
<b>EPS</b>	3.45	6.24	5.18	6.41	7.26	8.47	8.27	9.40	9.18
- <i>y/y growth</i>	-9.9%	80.6%	-17.0%	23.8%	13.3%	16.7%	13.9%	11.0%	11.1%
<b>Cash</b>	195797.2	181574.2	150622.1	150917.8	245342.5	264003.1		359045.8	
<b>Debt</b>	16343.1	44912.7	54347.4	117918.0	227228.9	229555.4		230893.4	
<b>Net Cash/Shr</b>	7.1	6.5	5.0	2.7	1.3	2.0		5.7	
<b>Tangible Book Value/Shr</b>	19.3	22.3	24.4	28.0	32.7	38.2		44.6	

(Revenues, Cash and Debt in Millions in Local Currency)

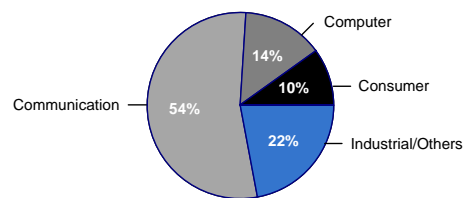
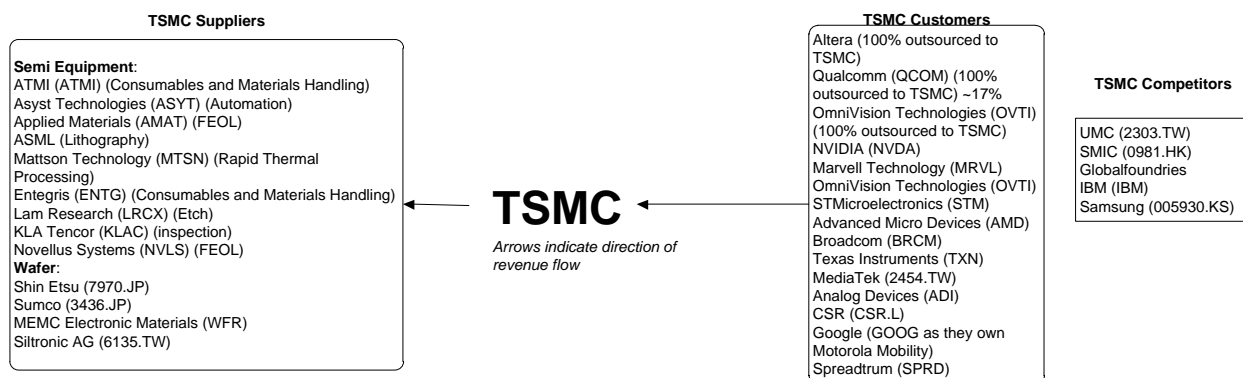
Source: Citi Research, Company Reports, FirstCall



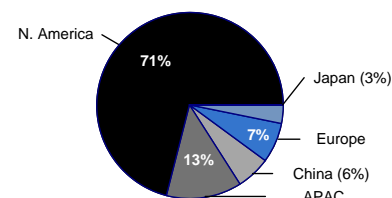
Figure 601. TSMC (2330.TW)

Sector: Semiconductors

## Taiwan Semi (2330.TW; TSMC)



Segment Breakdown



Geographic Breakdown

Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## UMC

Citi Analyst: Roland Shu

United Microelectronics Corporation (UMC) designs, manufactures, and markets integrated circuits (ICs) and related electronic products. The company's main products are consumer electronic ICs, memory ICs, personal computer peripheral ICs, and communication ICs.

Figure 602. UMC (2303.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	88617.6	120430.7	105879.7	105998.2	123811.9	136067.0	133794.8	147539.5	142915.9
- y/y growth	-4.2%	35.9%	-12.1%	0.1%	16.8%	9.9%	8.1%	8.4%	6.8%
<b>Gross Margins</b>	17.9%	29.9%	22.7%	21.2%	19.0%	19.7%		20.2%	
<b>Operating Margins</b>	3.8%	18.8%	9.6%	8.6%	3.3%	2.6%		3.6%	
<b>EPS</b>	0.31	1.91	0.84	0.62	1.00	0.48	0.63	0.58	0.72
- y/y growth	118.2%	527.1%	-55.9%	-26.9%	62.3%	-52.3%	-37.5%	21.2%	14.2%
<b>Cash</b>	61138.9	41119.3	36650.1	36744.3	53598.0	49568.6		54126.8	
<b>Debt</b>	13567.1	8884.0	25630.5	37038.9	49606.0	49798.0		49705.5	
<b>Net Cash/Shr</b>	4.8	3.2	1.7	0.6	2.0	1.7		2.0	
<b>Tangible Book Value/Shr</b>	16.8	17.5	16.5	16.0	16.7	16.6		16.8	

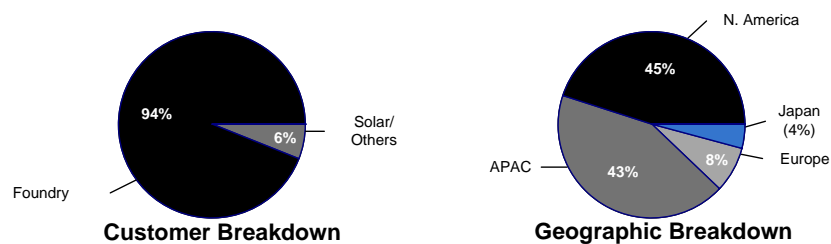
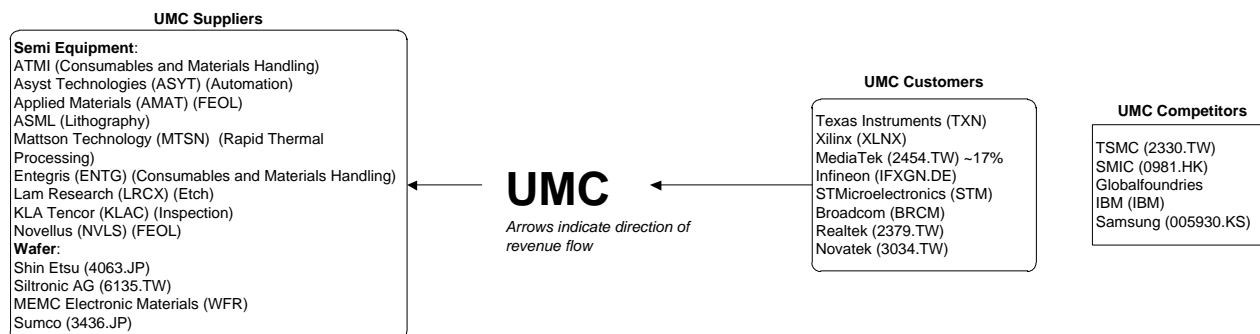
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 603. UMC (2303.TW)

Sector: Semiconductors: Foundry

## United Micro Electronics (2303.TW; UMC)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Unimicron

Citi Analyst: Roland Shu

Established in 1990, Unimicron is the world's No.1 PCB maker and HDI board maker.

After the acquisition of PPT in late 2009, its revenue exposure to substrate has surpassed 40%, with the rest almost equally shared by conventional PCB and HDI.

Unimicron has manufacturing sites in Taiwan and China (Suzhou, Kunshan, Shenzhen). UMC is the largest shareholder with ~13% shareholding.

Figure 604. Unimicron (3037.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	43697.1	65047.9	66147.0	67490.2	59934.1	62414.7	61754.0	67120.6	67440.6
- <i>y/y growth</i>	-4.3%	48.9%	1.7%	2.0%	-11.2%	4.1%	3.0%	7.5%	9.2%
<b>Gross Margins</b>	16.1%	18.1%	15.8%	14.5%	10.9%	10.3%		10.8%	
<b>Operating Margins</b>	9.4%	12.1%	9.0%	6.6%	2.6%	3.0%		4.1%	
<b>EPS</b>	3.10	4.60	3.25	2.25	0.76	1.20	0.90	1.68	1.41
- <i>y/y growth</i>	37.5%	48.4%	-29.2%	-31.0%	-66.1%	56.8%	18.5%	40.4%	55.8%
<b>Cash</b>	22205.0	19524.1	23458.0	27901.4	23777.0	22752.9		26673.1	
<b>Debt</b>	27423.7	23667.9	29646.3	33190.5	32589.0	33161.3		32503.3	
<b>Net Cash/Shr</b>	3.5	3.3	1.1	6.3	2.7	2.1		4.6	
<b>Tangible Book Value/Shr</b>	25.8	28.2	29.4	29.7	29.6	30.5		31.6	

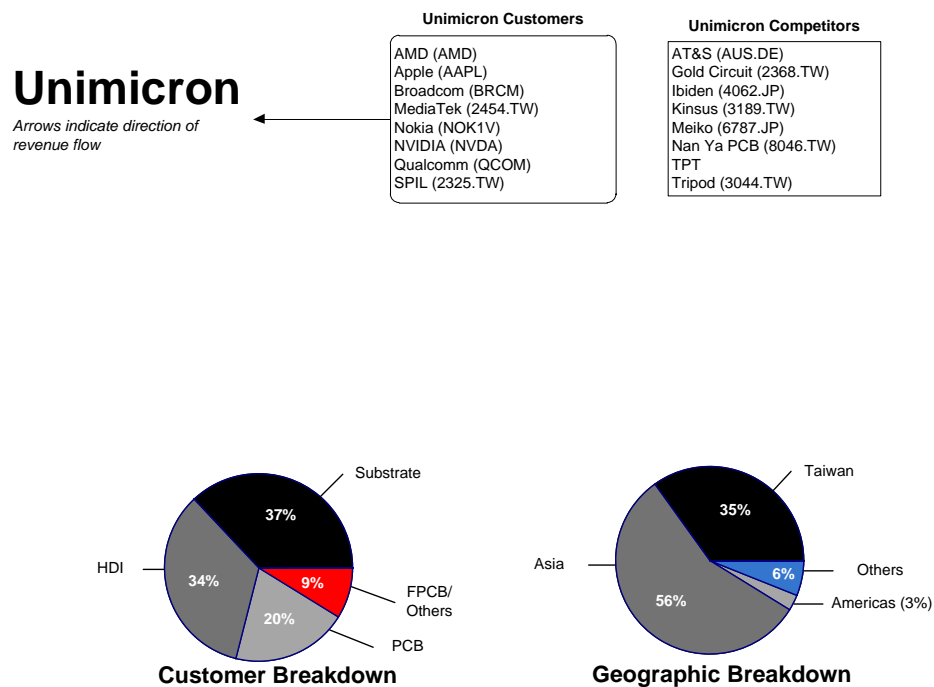
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 605. Unimicron (3037.TW)

Sector: Electronic Components

## Unimicron (3037.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Vanguard International Semiconductor

Citi Analyst: Roland Shu

Vanguard International Semiconductor Corporation (VIS) is a leading specialty IC foundry service provider. VIS offers a wide range of process technologies, including 0.18um Logic, Mixed-Signal, Analog, High Voltage, Low Power, CMOS RF, Flash, Embedded Memory, and Bipolar CMOS DMOS (BCD).

Figure 606. Vanguard International Semiconductor (5347.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	12588.0	16033.9	15190.4	17162.5	21135.1	22618.7	22902.2	23011.3	26377.6
- <i>y/y growth</i>	-21.9%	27.4%	-5.3%	13.0%	23.1%	7.0%	8.4%	1.7%	15.2%
<b>Gross Margins</b>	9.9%	20.2%	14.8%	23.8%	32.5%	33.2%		30.7%	
<b>Operating Margins</b>	-0.4%	11.3%	6.0%	13.9%	22.9%	23.1%		20.6%	
<b>EPS</b>	0.05	1.17	0.53	1.48	2.75	2.93	3.11	2.70	3.50
- <i>y/y growth</i>	-91.3%	2097.7%	-54.2%	177.5%	85.6%	6.7%	13.1%	-8.1%	12.6%
<b>Cash</b>	7188.4	8419.2	8210.6	11239.2	16238.2	19139.3		24673.5	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	4.3	5.0	5.0	7.1	10.2	11.9		15.4	
<b>Tangible Book Value/Shr</b>	11.9	12.6	12.5	12.9	14.9	17.8		20.4	

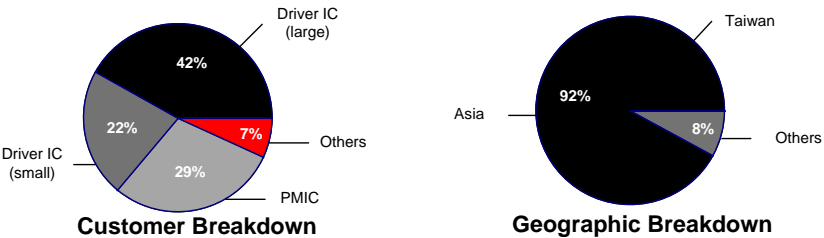
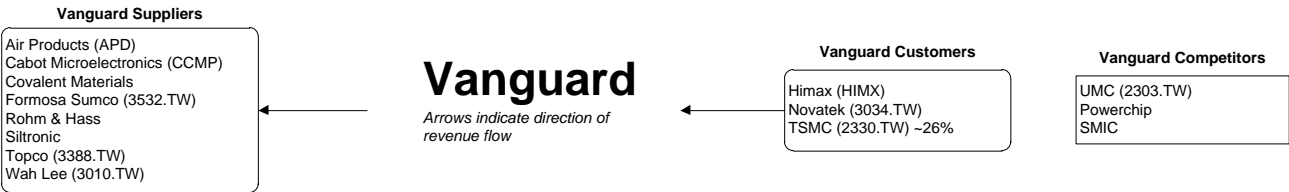
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 607. Vanguard International Semiconductor (5347.TW)

Sector: Semiconductors

Vanguard International Semiconductor (5347.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Venture Corp.

Citi Analyst: Patrick Yau, CFA

Venture Corp. Ltd. (listed on the SGX) is a global electronics services provider.

We believe the company offers a combination of strong management, world-class technical capability, innovative manufacturing technology, reliable testing capability and ultra-modern facilities.

Founded in 1984, the Venture group comprises more than 20 companies with operations in Asia, North America and Europe.

Figure 608. Venture Corp. (VENM.SI) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	3412.2	2675.8	2432.4	2387.7	2329.6	2529.2	2445.6	2688.7	2579.6
- <i>y/y growth</i>	-9.8%	-21.6%	-9.1%	-1.8%	-2.4%	8.6%	5.0%	6.3%	5.5%
<b>Gross Margins</b>	16.0%	22.9%	23.6%	22.2%	23.0%	22.8%		22.8%	
<b>Operating Margins</b>	4.6%	7.2%	6.2%	5.6%	5.6%	5.8%		5.9%	
<b>EPS</b>	0.59	0.69	0.57	0.51	0.48	0.54	0.53	0.59	0.58
- <i>y/y growth</i>	-43.4%	16.3%	-16.9%	-10.7%	-6.2%	13.1%	11.6%	9.2%	9.4%
<b>Cash</b>	567.1	441.7	513.2	453.4	390.9	424.7		330.6	
<b>Debt</b>	223.7	203.2	204.1	167.4	161.8	151.8		141.8	
<b>Net Cash/Shr</b>	2.1	1.2	1.4	1.7	1.4	1.5		1.2	
<b>Tangible Book Value/Shr</b>	4.0	4.0	4.1	3.9	4.1	4.1		4.2	

(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall



Figure 609. Venture Corp. (VENM.SI)

Sector: Electronic Manufacturing Services

## Venture Corp. (VENM.SI)

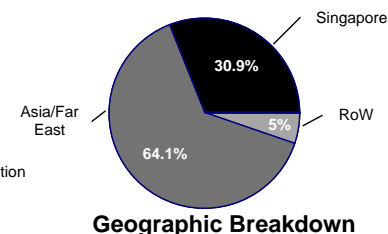
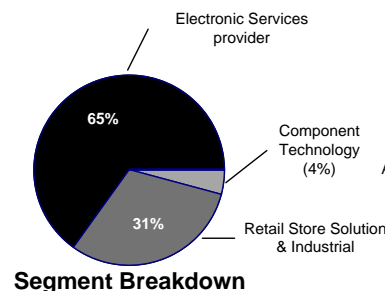
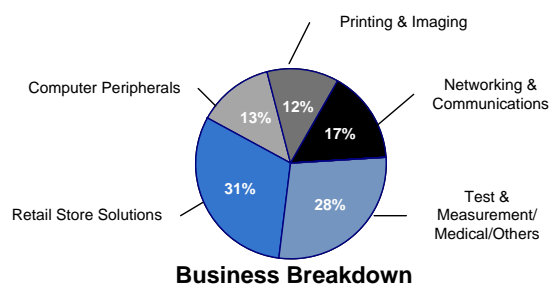
**VENM.SI**  
Arrows indicate direction of revenue flow

### VENM Customers

Hypercom (HYC)  
Agilent Technologies (A)  
Hewlett Packard (HPQ)  
Radiant Systems (RDS)  
Intermec (IN)  
VeriFone (PAY)  
Oclaro (OCLR)  
NCR (NCR)  
Toshiba (6502.JP)

### VENM Competitors

Celestica (CLS)  
Flextronics (FLEX)  
Plexus (PLXS)  
Sanmina – SCI (SANM)  
Hon Hai (2317.TW)  
Quanta (2382.TW)  
Compal (2324.TW)  
Jabil (JBL)  
Foxconn Tech (2354.TW)  
Foxconn Intl (2038.HK)  
Pagatron (4938.TW)  
Wistron (3231.TW)  
Inventec (2356.TW)  
Shenzhen (000021.HK)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Vishay Intertechnology, Inc.

Citi Analyst: Jim Suva, CPA

Vishay Intertechnology, Inc. is a leading manufacturer of a broad line of passive and active electronic components, including discrete active electronic components, resistors, capacitors, inductors, diodes, and transistors.

Sales by end market are 29% industrial (factories, power plants, transit systems); 13% computer (server, desktop, notebooks); 21% automotive (electronic control systems, airbags, sensors); 11% telecommunications (base stations, cell phones, PDAs); 8% power supplies; 8% consumer products (digital cameras, MP3 players, video game consoles, white goods or microwaves, refrigerators, washers/dryers); 6% military/aerospace (commercial and military airplanes, space programs); and 4% medical (hearing aids, pacemakers, medical equipment such as MRI, X-ray, CAT scan equipment).

The company has 63 manufacturing facilities worldwide, with about 76% of its employees in low-cost countries vs. 57% in 2000.

Vishay has a diversified customer base with no customer greater than 6% of revenue.

Figure 610. Vishay (VSH) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	2042.0	2725.1	2594.0	2230.1	2371.0	2494.4	2528.7	2558.9	2669.5
- y/y growth	-27.6%	33.4%	-4.8%	-14.0%	6.3%	5.2%	6.7%	2.6%	5.6%
<b>Gross Margins</b>	19.0%	29.6%	27.8%	23.6%	23.9%	24.6%		25.5%	
<b>Operating Margins</b>	1.4%	15.3%	13.6%	7.9%	8.4%	9.1%		10.2%	
<b>EPS</b>	0.02	1.58	1.45	0.70	0.79	0.92	0.95	1.07	1.20
- y/y growth	-96.4%	8323.1%	-8.6%	-51.3%	12.3%	16.3%	20.3%	16.6%	26.1%
<b>Cash</b>	579.2	897.3	998.2	992.5	1151.6	1248.9		1375.2	
<b>Debt</b>	336.1	431.7	399.1	392.9	364.9	364.9		364.9	
<b>Net Cash/Shr</b>	1.4	2.4	3.6	3.8	5.2	5.8		6.7	
<b>Tangible Book Value/Shr</b>	7.3	7.5	10.0	10.7	12.6	13.1		14.0	

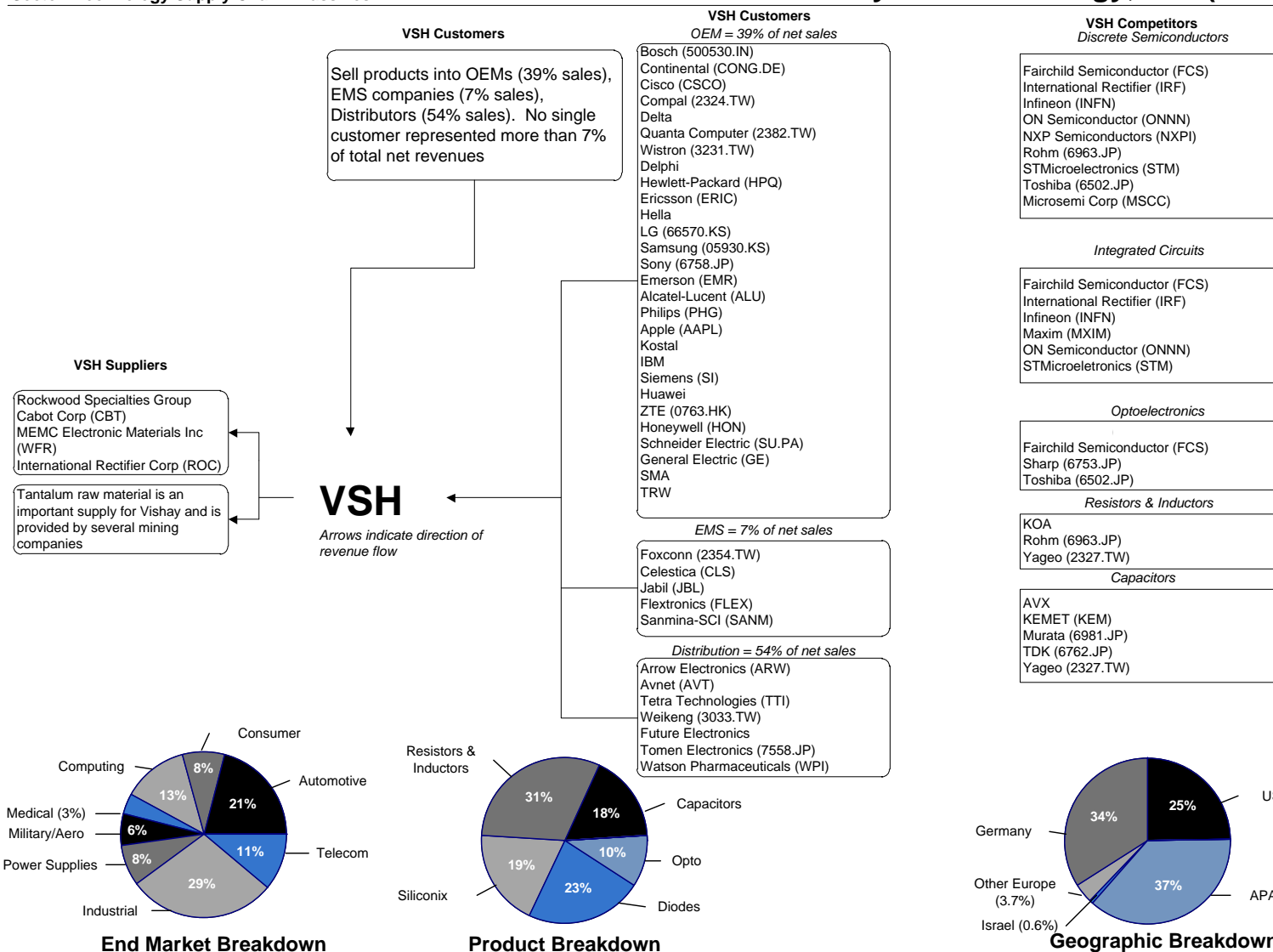
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 611. Vishay (VSH)

Sector: Technology Supply Chain - Passives

## Vishay Intertechnology, Inc. (VSH)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Vtech Holdings

Citi Analyst: Eric Lau

VTech is the world's largest cordless phone company on an ODM and OBM basis. It has 20% global share under brands VTech and AT&T and c50% share in the US. Additionally, we estimate VTech is the largest player in the electronic toys product (ELP) industry based on turnover.

Revenue breakdown for cordless phone, ELP and Contract Manufacturing Services (CMS) was 40%, 37% and 23% in FY12.

Revenues from America, Europe, Asia and other regions were 51%, 40%, 5% and 4% of the total, respectively, in FY12.

Mr Allan Wong is co-founder and chairman, and is the largest shareholder with a 35% stake. Templeton Asset Management is the largest independent shareholder with a 16% stake.

Figure 612. Vtech Holding (0303.HK) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	11261.7	11881.3	13316.4	13878.9	14410.7	15096.6	15062.2	15955.0	15993.0
- <i>y/y growth</i>	-7.0%	5.5%	12.1%	4.2%	3.8%	4.8%	4.5%	5.7%	6.2%
<b>Gross Margins</b>	36.4%	36.5%	33.1%	32.0%	32.2%	32.9%		33.5%	
<b>Operating Margins</b>	10.7%	14.6%	12.8%	11.7%	12.1%	12.1%		12.3%	
<b>EPS</b>	4.54	6.46	6.31	5.98	6.27	6.63	6.62	7.16	7.11
- <i>y/y growth</i>	-34.0%	42.4%	-2.4%	-5.2%	4.8%	5.7%	5.7%	8.0%	7.4%
<b>Cash</b>	2225.9	2970.7	2591.2	2535.6	2395.8	2301.8		2199.2	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	9.1	12.0	10.4	10.2	9.6	9.2		8.8	
<b>Tangible Book Value/Shr</b>	13.9	16.2	17.1	17.4	17.9	16.9		17.4	

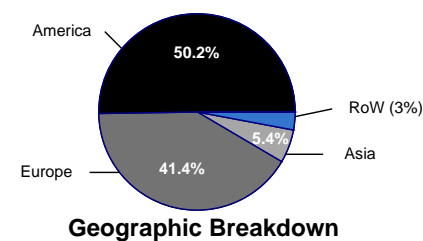
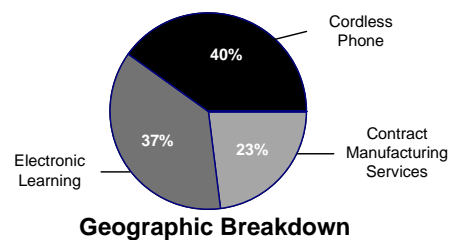
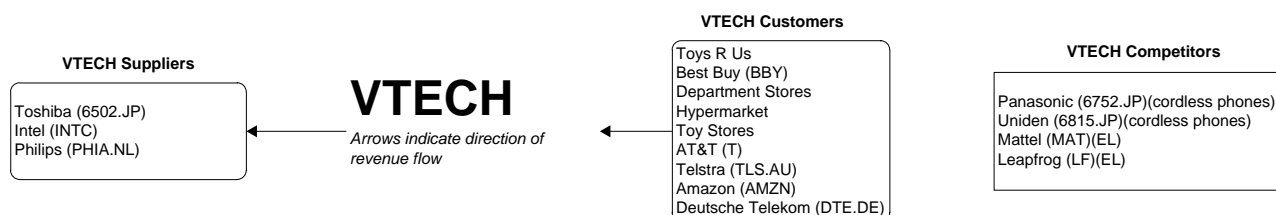
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, Firstcall

Figure 613. VTECH Holding (0303.HK)

Sector: Consumer Electronics

## VTECH Holdings (0303.HK)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Western Digital Corp

Citi Analyst: Joe Yoo

Headquartered in Lake Forest, CA, Western Digital is the largest global manufacturer of hard disk drives.

While the company was mostly a supplier to the desktop market until 2004, WD has successfully expanded into the notebook segment and currently holds the #1 share in the 2.5" HDD market. The company also serves the consumer electronics segment (DVR, game console, auto navigation) and is currently the leading supplier of branded external drives.

Meanwhile, WD has quickly evolved into a vertically integrated company with acquisition of Read-Rite (heads), Komag (substrates and media), and Hoya (media), which has allowed them to dramatically lower their dependency on merchant vendors for critical components while structurally improving margins.

Following the acquisition of #3 vendor HGST in 2012, WD is now able to fully serve the entire enterprise market including mission critical drives and enterprise SSDs.

Figure 614. Western Digital Corp (WDC) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	7452.0	9850.0	9526.0	12478.0	15351.0	15143.8	15260.3	15202.9	15453.8
- <i>y/y growth</i>	-7.7%	32.2%	-3.3%	31.0%	23.0%	-1.3%	-0.6%	0.4%	1.3%
<b>Gross Margins</b>	17.9%	24.4%	18.8%	30.3%	29.4%	29.9%		30.5%	
<b>Operating Margins</b>	8.4%	15.8%	8.7%	18.2%	15.0%	14.1%		15.3%	
<b>EPS</b>	2.56	6.05	3.27	8.48	8.50	8.02	8.10	8.78	8.61
- <i>y/y growth</i>	-36.7%	136.1%	-46.0%	159.2%	0.3%	-5.7%	-4.7%	9.4%	6.3%
<b>Cash</b>	1794.0	2734.0	3490.0	3208.0	4309.0	5285.8		6318.0	
<b>Debt</b>	482.0	400.0	294.0	2185.0	1955.0	2225.0		1995.0	
<b>Net Cash/Shr</b>	6.2	10.5	14.2	5.1	10.5	15.6		21.1	
<b>Tangible Book Value/Shr</b>	13.3	19.7	22.8	20.4	25.0	24.0		28.1	

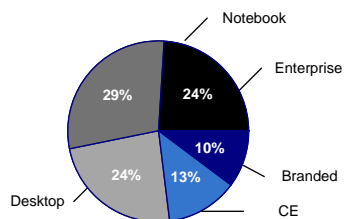
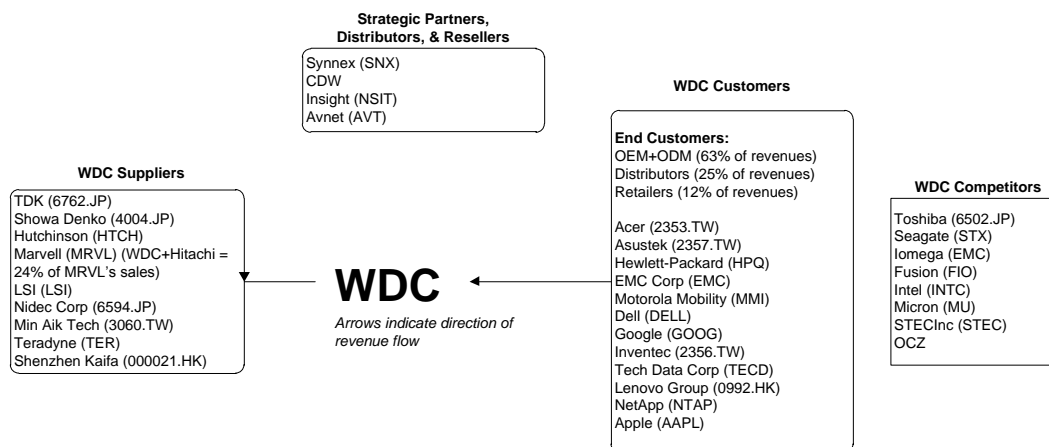
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

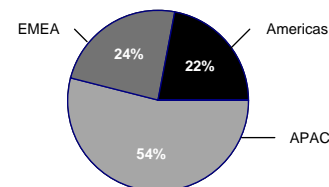
Figure 615. Western Digital Corp (WDC)

Sector: Storage – Hard Disk Drive

## Western Digital Corp (WDC)



Segment Breakdown



Geographic Breakdown

Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Wistron

Citi Analyst: Wei Chen

Wistron is a major Original Design Manufacturer (ODM) for notebook (NB) PCs in Taiwan. Besides NBs, Wistron also makes desktop PCs, servers, LCD TVs, and handheld devices.

The company was the manufacturing arm of Acer before being spun off in 2002. While Acer is still a major customer, Wistron has diversified its customer base to other NB PC brands including Dell, Lenovo, and HPQ.

Figure 616. Wistron (3231.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	546665.7	615184.8	658366.7	657844.6	621293.8	554987.5	617175.5	551109.2	656227.7
- y/y growth	22.8%	12.5%	7.0%	-0.1%	-5.6%	-10.7%	-0.7%	-0.7%	6.3%
<b>Gross Margins</b>	5.5%	5.6%	4.9%	4.9%	4.8%	4.8%		4.7%	
<b>Operating Margins</b>	2.0%	2.2%	1.6%	1.2%	1.1%	1.2%		1.1%	
<b>EPS</b>	4.29	5.30	3.95	2.89	2.65	2.29	2.56	2.31	2.90
- y/y growth	22.1%	23.6%	-25.5%	-26.8%	-8.4%	-13.7%	-3.3%	1.2%	13.2%
<b>Cash</b>	20795.5	40764.3	45568.7	72589.3	74764.1	66338.0		65666.7	
<b>Debt</b>	7650.4	41989.6	56502.5	88656.9	94979.0	85732.0		85732.0	
<b>Net Cash/Shr</b>	7.1	17.9	19.6	26.4	20.2	16.2		16.0	
<b>Tangible Book Value/Shr</b>	23.4	24.8	26.8	26.9	27.7	28.7		29.9	

(Revenues, Cash and Debt in Millions in Local Currency)

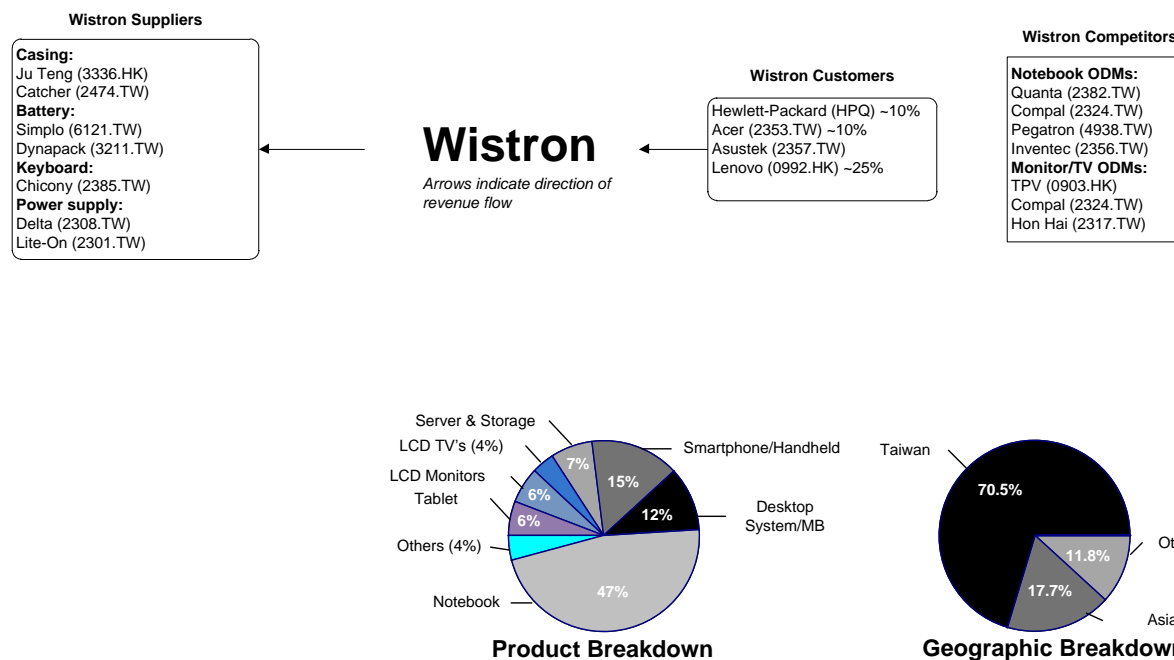
Source: Citi Research, Company Reports, FirstCall



Figure 617. Wistron (3231.TW)

Sector: PC & Enterprise Hardware

Wistron (3231.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Wolfson

Citi Analyst: Amit Harchandani

Wolfson is a mixed signal, fabless semi company that sells integrated circuits into the consumer electronics market.

The company focuses on three major end markets - consumer, portable and imaging.

Wolfson was founded in 1985 as a spin-off from Edinburgh University. The company was listed on the LSE in Oct 2003.

**Most Relevant Relationships:** Samsung

Figure 618. Wolfson (WLF.L) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	77.7	101.9	97.9	113.4	114.7	115.9	116.0	128.6	135.9
- <i>y/y growth</i>	N/A		-3.9%	15.8%	1.2%	1.0%	1.1%	10.9%	17.1%
<b>Gross Margins</b>	50.7%	49.5%	48.5%	46.9%	42.3%	45.6%		46.2%	
<b>Operating Margins</b>	-6.3%	-1.0%	-4.8%	-1.6%	-7.0%	3.8%		7.3%	
<b>EPS</b>	-0.02	0.00	-0.03	-0.01	-0.06	0.03	0.02	0.07	0.08
- <i>y/y growth</i>	N/A		-534.0%	78.5%	-787.2%	155.9%	139.7%	107.4%	259.7%
<b>Cash</b>	60.5	62.2	34.4	29.5	15.6	17.7		25.5	
<b>Debt</b>	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
<b>Net Cash/Shr</b>	0.5	0.5	0.3	0.3	0.1	0.2		0.2	
<b>Tangible Book Value/Shr</b>	0.7	0.8	0.6	0.6	0.5	0.5		0.6	

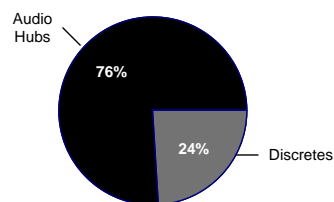
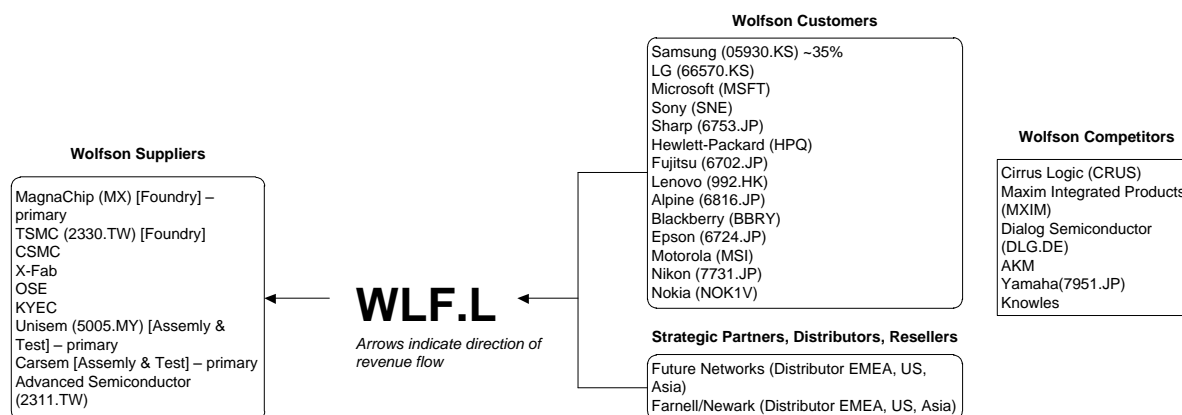
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

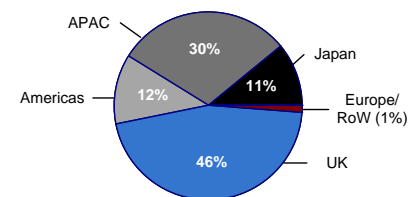
Figure 619. Wolfson (WLF.L)

Sector: Semiconductors

## Wolfson (WLF.L)



Segment Breakdown



Geographic Breakdown

Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## WPG Holding

Citi Analyst: Roland Shu

WPI was founded in 1981, and is a leading semiconductor component vendor in Asia. WPG Holdings was formed with the merger of WPI group, SAC group and RichPower.

Figure 620. WPG Holding (3702.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	196773.5	257217.2	332322.6	360614.2	393740.7	420140.7	443389.7	439536.5	480843.8
- <i>y/y growth</i>	37.4%	30.7%	29.2%	8.5%	9.2%	6.7%	12.6%	4.6%	8.4%
<b>Gross Margins</b>	5.6%	5.7%	5.4%	5.0%	4.7%	4.5%		4.4%	
<b>Operating Margins</b>	2.3%	2.3%	2.0%	1.7%	1.6%	1.6%		1.6%	
<b>EPS</b>	3.16	4.12	3.21	2.71	2.88	3.02	3.21	3.27	3.57
- <i>y/y growth</i>	66.6%	30.5%	-22.2%	-15.5%	6.3%	4.7%	11.5%	8.4%	11.0%
<b>Cash</b>	6838.7	7768.7	7952.8	8952.1	15123.6	14662.6		34011.3	
<b>Debt</b>	16837.6	26907.6	35917.9	42550.1	51758.0	56758.0		61758.0	
<b>Net Cash/Shr</b>	2.0	4.9	2.5	1.5	6.9	3.6		12.2	
<b>Tangible Book Value/Shr</b>	18.0	28.1	23.4	23.2	23.9	24.3		24.9	

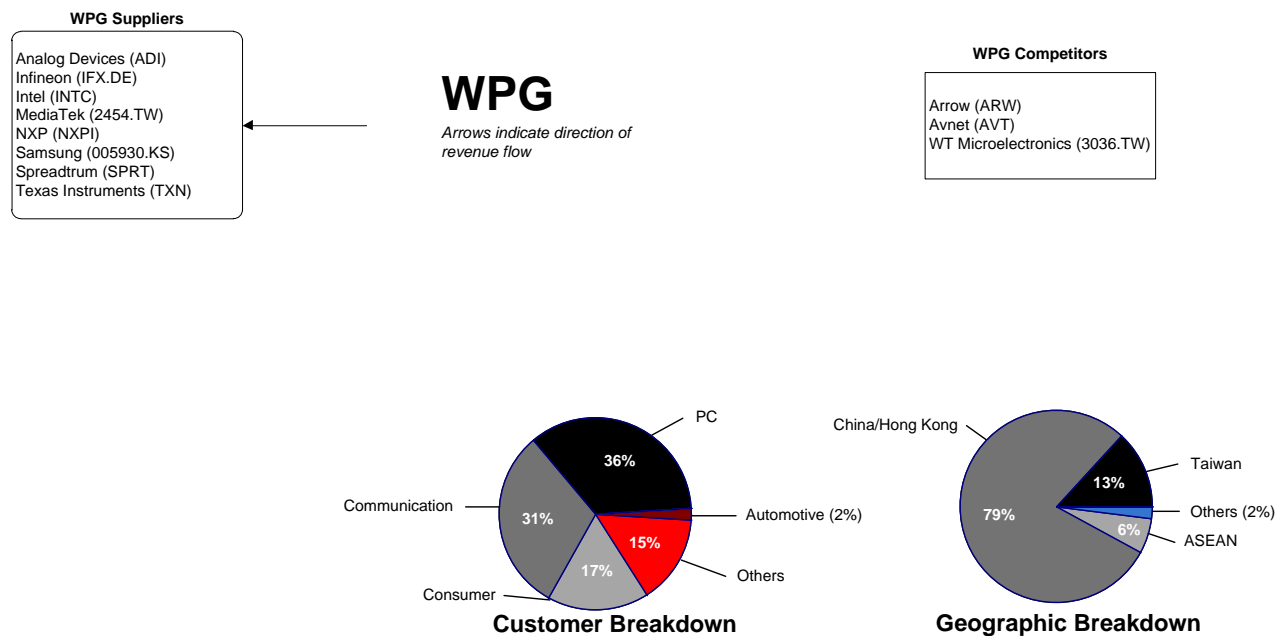
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 621. WPG Holding (3702.TW)

Sector: Technology Distributors

## WPG Holdings (3702.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Xerox Corp.

Citi Analyst: Jim Suva, CPA

Xerox (XRX) is one of the largest global providers of copiers, printers and related supplies, services and financing to Office and Production printing environments. With the acquisition of ACS in 2010, the company is one of the largest Business Process Outsourcing (BPO) companies in the world.

The company operates through two key segments: Technology (42% of total sales in 2013) and Services (55% of total sales in 2013).

- The Services segment is comprised of business process outsourcing, information technology outsourcing and document outsourcing. The Business Process Outsourcing services include human resources services; finance and accounting services; healthcare payers and pharma; customer management solutions; government healthcare provider solutions; technology-based transactional services for retail, travel, and non-healthcare insurance companies; programs for federal, state, county, and town governments; transportation solutions; and government healthcare solutions. The Information Technology Outsourcing specializes in designing, developing and delivering effective IT solutions. Its services include mainframe server outsourcing, network outsourcing, desktop outsourcing. In addition, it provides remote infrastructure management, help desk/service desk management, managed storage, utility computing, disaster recovery and security services. Document Outsourcing includes the sale and support of a broad range of document systems from entry level to high-end.
- The Technology segment is comprised of document technology and related supplies, technical service and equipment financing. Its strategic product groups within this segment include entry, mid-range and high-end products.
- The remainder of the sales (3% of 2013 revenues) falls into the Other category which comprises of paper supplies, wide format systems, licensing revenues, GIS network integration solutions and electronic presentation systems and non-allocated corporate items.

The company was founded in 1906 and is headquartered in Norwalk, CT. It employs 143,000 globally.

Figure 622. Xerox (XRX) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	15179.0	21633.0	21900.0	21737.0	21435.0	21431.7	21482.5	21789.3	21687.6
– <i>y/y growth</i>	-13.8%	42.5%	1.2%	-0.7%	-1.4%	0.0%	0.2%	1.7%	1.0%
<b>Gross Margins</b>	39.7%	34.4%	33.4%	32.0%	31.0%	29.8%		29.5%	
<b>Operating Margins</b>	6.8%	9.6%	10.0%	9.5%	8.9%	9.4%		10.0%	
<b>EPS</b>	0.60	0.94	1.06	1.02	1.09	1.14	1.13	1.29	1.22
– <i>y/y growth</i>	-45.8%	58.2%	12.5%	-3.5%	6.6%	4.6%	3.4%	12.7%	7.9%
<b>Cash</b>	3799.0	1211.0	902.0	1246.0	1764.0	1924.7		2235.2	
<b>Debt</b>	9264.0	8607.0	8633.0	8489.0	8021.0	7821.0		7721.0	
<b>Net Cash/Shr</b>	-5.1	-4.4	-4.3	-4.6	-4.0	-4.1		-3.9	
<b>Tangible Book Value/Shr</b>	2.3	0.1	0.1	-0.1	0.6	1.2		1.9	

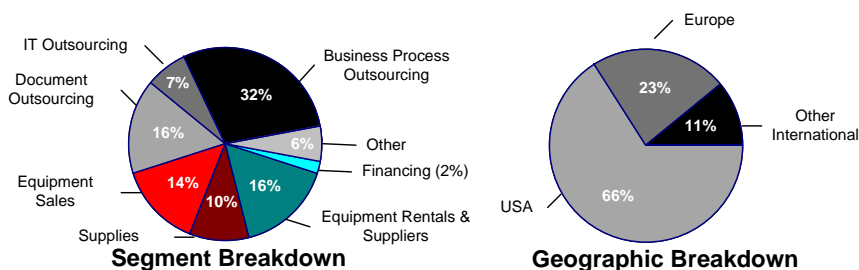
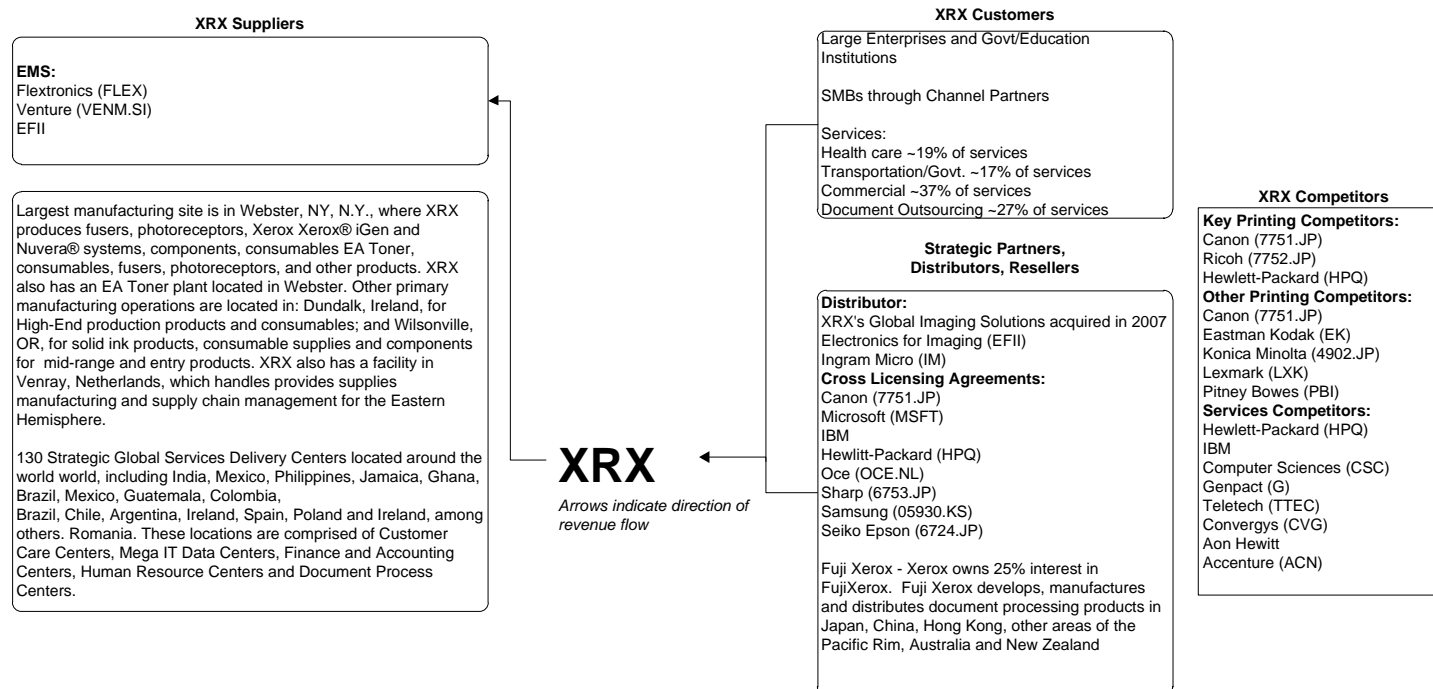
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 623. Xerox (XRX)

Sector: Data Processing & Outsourced Services

## Xerox Corp. (XRX)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Xilinx Corp.

Citi Analyst: Glen Yeung

Xilinx (XLNX) is a leading supplier of Programmable Logic Devices (PLD). The company supplies PLDs for communications, storage and server systems, wireless base stations, and industrial products. Major product lines include Spartan, Artix, Kintex, Virtex, and Zynq device families.

The communications market is the largest segment of the company's revenues, followed by industrial/other, consumer/automotive, and data processing.

Xilinx's customers include the majority of the major networking, server, and storage companies.

Figure 624. Xilinx (XLNX) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1825.2	1833.6	2369.4	2240.7	2168.7	2375.1	2388.2	2599.6	2607.3
- <i>y/y growth</i>	-0.9%	0.5%	29.2%	-5.4%	-3.2%	9.5%	10.1%	9.5%	9.2%
<b>Gross Margins</b>	63.3%	63.4%	65.4%	64.9%	66.0%	68.9%		68.8%	
<b>Operating Margins</b>	23.5%	23.6%	33.6%	28.7%	26.8%	31.5%		32.6%	
<b>EPS</b>	1.36	1.29	2.39	1.99	1.78	2.20	2.21	2.42	2.44
- <i>y/y growth</i>	7.3%	-5.1%	85.5%	-16.7%	-10.4%	23.5%	24.1%	9.9%	10.3%
<b>Cash</b>	1324.9	1386.6	1926.4	1917.6	1714.7	2547.0		3058.9	
<b>Debt</b>	690.1	354.8	891.0	906.6	922.7	934.4		934.4	
<b>Net Cash/Shr</b>	2.3	3.7	3.9	3.7	2.9	8.9		10.5	
<b>Tangible Book Value/Shr</b>	5.9	7.3	8.6	9.6	10.6	12.1		13.9	

(Revenues, Cash and Debt in Millions in Local Currency)

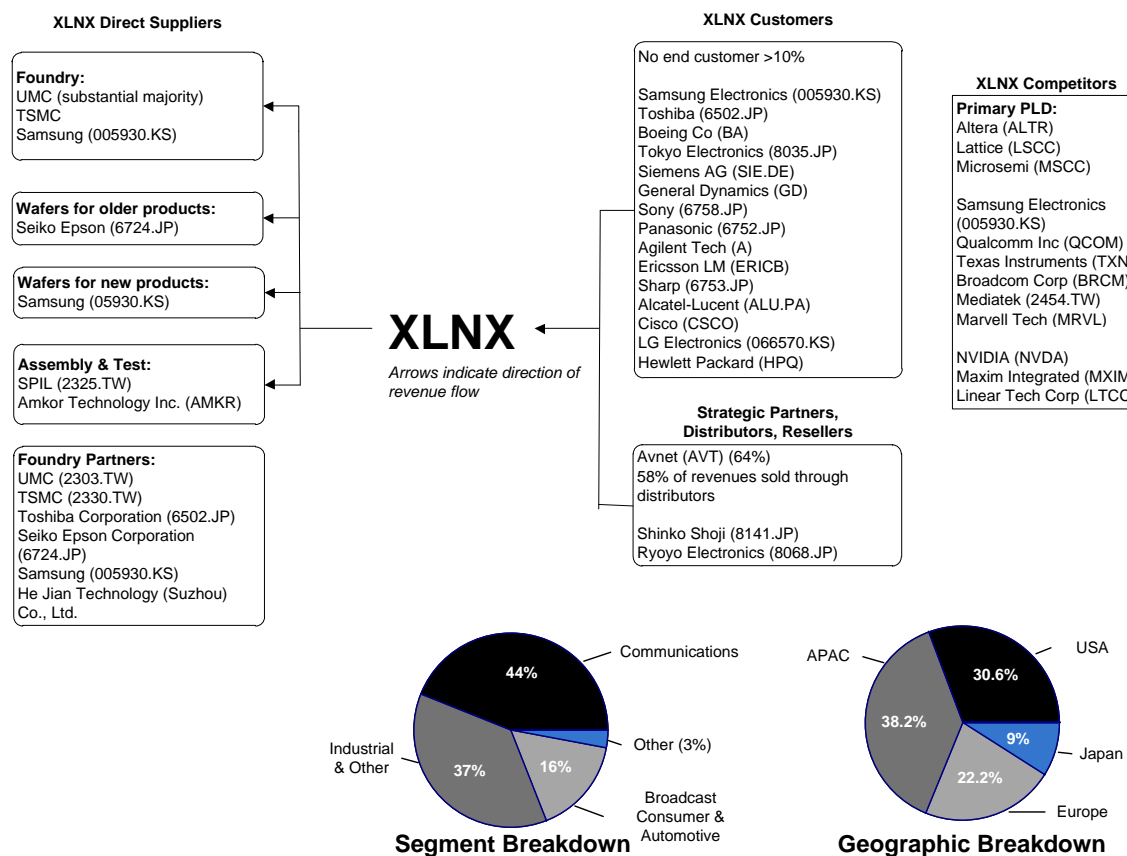
Source: Citi Research, Company Reports, FirstCall



Figure 625. Xilinx Corp. (XLNX)

Sector: Semiconductors

## Xilinx Corp. (XLNX)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Yingli Green Energy

Citi Analyst: **Shahriar Pourreza, CFA**

Based in China, Yingli Green Energy is a vertically-integrated manufacturer of raw materials and end products for the photovoltaic (PV) industry.

The company's operations cover every aspect of the solar value chain including raw material production of polysilicon, ingots, and wafers to the manufacture and installation of silicon-based solar modules/systems.

Yingli markets its products in key solar regions across the globe including Germany, U.S., and China through value-added resellers, distributors, and direct sales primarily targeting applications in the traditional rooftop and ground-mount end markets.

Figure 626. Yingli Green Energy Hold. Co. Ltd. (YGE) Results and Forecasts

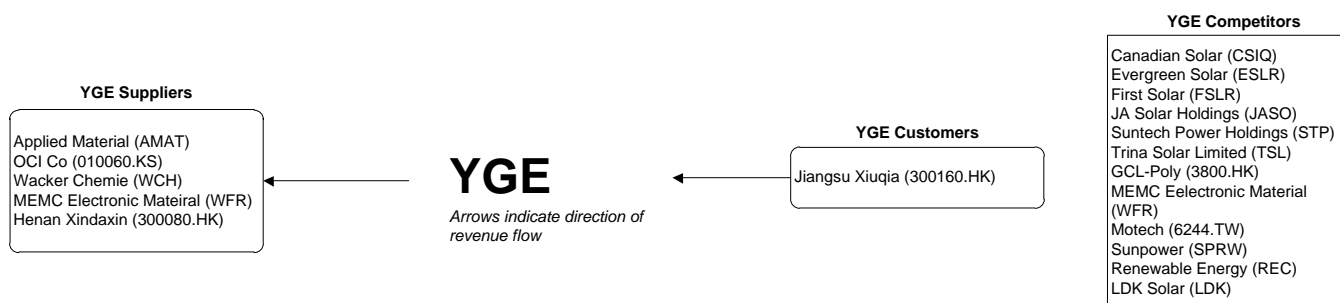
	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	1062.5	1864.0	2283.5	1810.4	2065.0	2415.4	2679.2	2808.1	3365.2
- <i>y/y growth</i>	-4.0%	75.4%	22.5%	-20.7%	14.1%	17.0%	29.7%	16.3%	25.6%
<b>Gross Margins</b>	22.6%	33.3%	18.1%	3.7%	10.9%	12.8%		14.6%	
<b>Operating Margins</b>	9.3%	22.8%	6.6%	-12.7%	-1.2%	2.5%		3.4%	
<b>EPS</b>	-0.35	1.36	0.38	-2.08	-1.32	-0.71	-0.43	-0.47	0.12
- <i>y/y growth</i>	-144.9%	492.8%	-71.9%	-644.3%	36.4%	46.4%	67.7%	33.7%	127.6%
<b>Cash</b>	507.4	985.0	891.9	489.8	598.7	517.5		639.2	
<b>Debt</b>	827.1	1385.9	2259.8	2490.2	2620.7	2771.3		3072.4	
<b>Net Cash/Shr</b>	2.8	2.8	-0.2	-5.1	-3.9	-5.3		-6.3	
<b>Tangible Book Value/Shr</b>	5.4	7.4	5.2	2.3	1.2	0.5		0.1	

Source: Citi Research, Company Reports, FirstCall

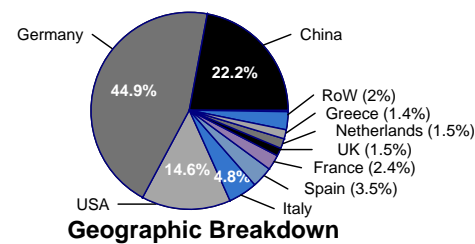
Figure 627. Yingli Green Energy Hold. Co. Ltd. (YGE)

Sector: Alternative Energy

## Yingli Green Energy Hold. Co. Ltd. (YGE)



Segment Breakdown – 100% PV Modules



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Zhen Ding

Citi Analyst: Roland Shu

Zhen Ding Technology (ZDT) is one of the world's key flexible PCB makers with an estimated 10% global market share in 2012.

ZDT manufactures flexible PCB, HDI, conventional PCB and substrates. FPCB accounts for >50% of revenue, HDI for around 20%, and conventional PCB for the rest.

ZDT's manufacturing sites are all in China: Shenzhen, Qinhuangdao, Yingkou and Huai'an.

The company was established in 2006 and headquartered in Shenzhen China,

Figure 628. Zhen Ding (4958.TW) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	22987.7	34696.1	44279.7	55368.8	60572.9	69179.0	70925.5	74480.5	77381.8
- <i>y/y growth</i>	36.6%	50.9%	27.6%	25.0%	9.4%	14.2%	17.1%	7.7%	9.1%
<b>Gross Margins</b>	18.6%	13.4%	15.8%	19.5%	19.4%	19.0%		18.8%	
<b>Operating Margins</b>	6.2%	2.6%	5.8%	9.6%	9.0%	8.7%		8.5%	
<b>EPS</b>	1.79	1.20	3.29	5.34	6.33	6.71	7.59	7.38	8.26
- <i>y/y growth</i>	167.3%	-33.0%	174.7%	62.4%	18.5%	6.0%	19.8%	10.0%	8.8%
<b>Cash</b>	1291.1	1797.3	4084.0	8756.5	11215.1	15944.5		16246.2	
<b>Debt</b>	17623.5	18922.3	22453.4	23726.8	22381.7	21956.2		17180.7	
<b>Net Cash/Shr</b>	-4.3	-16.3	-5.9	1.4	0.2	6.2		12.6	
<b>Tangible Book Value/Shr</b>	17.5	18.1	24.1	27.6	34.2	39.3		44.8	

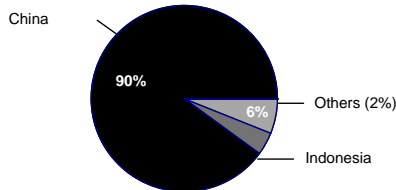
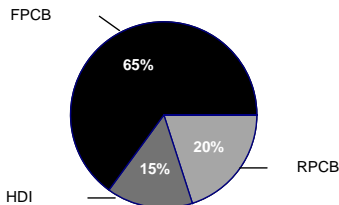
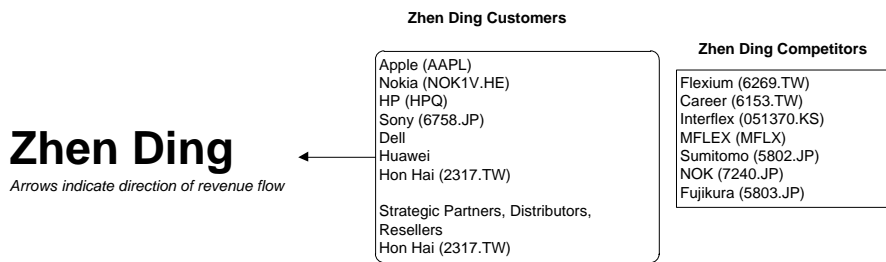
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 629. Zhen Ding (4958.TW)

Sector: Electronic Components

Zhen Ding (4958.TW)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## ZTE Corp.

Citi Analyst: Bin Liu

ZTE is a leading provider of telecommunications equipment and mobile telecoms handsets in China.

Products cover second-generation wireless telecoms equipment on the GSM and CDMA standards, as well as third-generation wireless equipment such as WCDMA, CDMA2000 and China's home-grown TD-SCDMA standard. The company also has a significant presence in fixed-line switching and access networks, fiber-optic transmission and NGN networks.

Besides sales in China, ZTE has expanded its footprint aggressively in Africa, North Europe and Asia.

Figure 630. ZTE Corp (0763.HK) Results and Forecasts

	2009	2010	2011	2012	2013	CIR 2014E	Street 2014E	CIR 2015E	Street 2015E
<b>Revenues</b>	68395.4	80248.1	103903.2	103550.6	107981.1	126686.0	124234.8	139115.4	136916.3
- y/y growth	37.8%	17.3%	29.5%	-0.3%	4.3%	17.3%	15.1%	9.8%	10.2%
<b>Gross Margins</b>	30.9%	31.0%	28.0%	22.2%	26.4%	27.2%		27.6%	
<b>Operating Margins</b>	6.5%	7.1%	4.2%	-0.3%	4.3%	5.2%		5.4%	
<b>EPS</b>	0.85	1.10	0.73	-1.02	0.53	0.96	0.94	1.14	1.12
- y/y growth	47.5%	29.2%	-33.5%	-239.4%	152.3%	79.7%	75.7%	19.1%	19.6%
<b>Cash</b>	16464.6	18059.8	26391.1	29904.6	30160.1	30395.5		33055.5	
<b>Debt</b>	21254.7	25199.6	37817.9	41940.5	43182.8	42214.0		42214.0	
<b>Net Cash/Shr</b>	1.9	1.7	2.3	4.7	4.6	4.8		5.6	
<b>Tangible Book Value/Shr</b>	5.7	7.6	8.0	6.8	8.0	8.9		10.0	

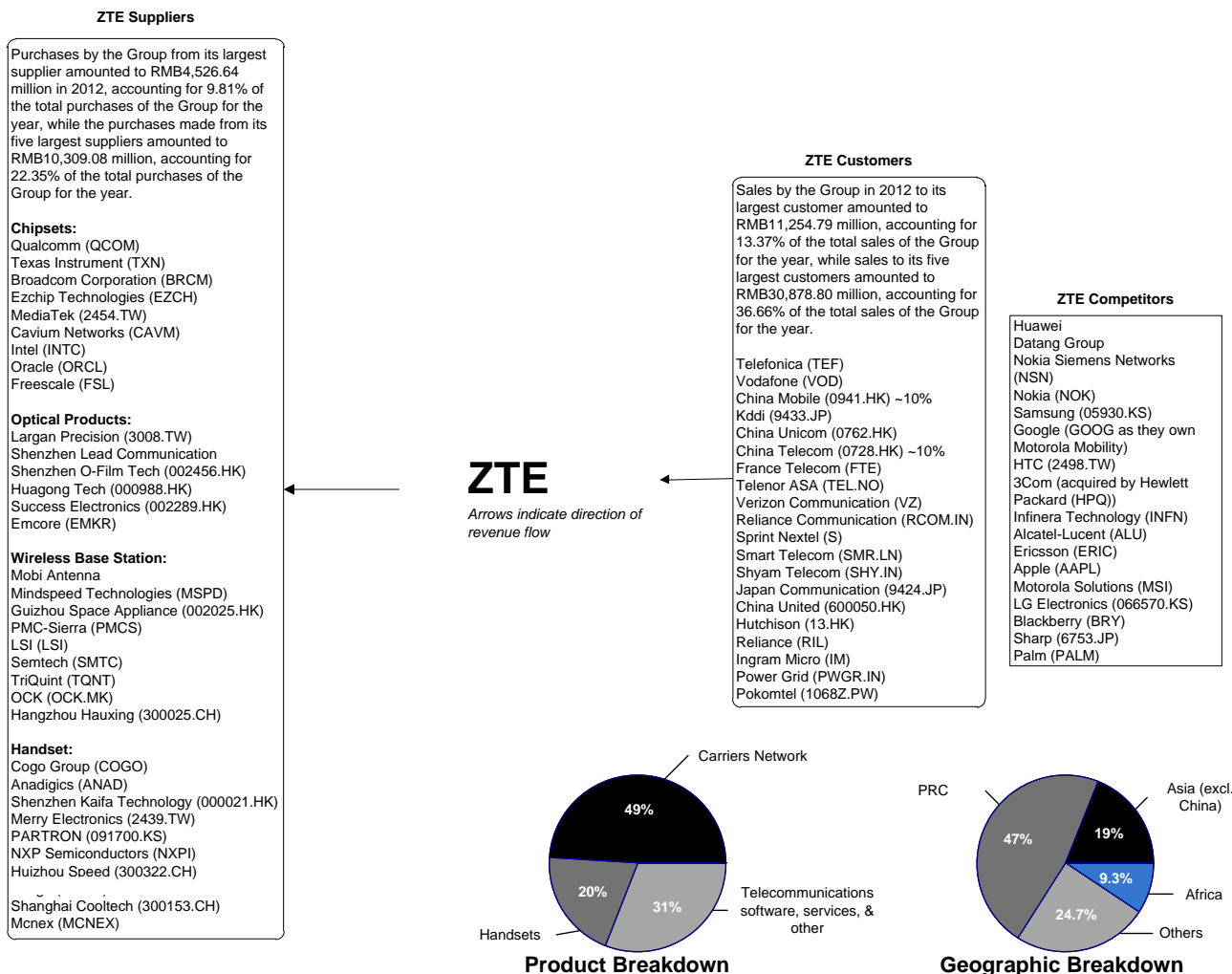
(Revenues, Cash and Debt in Millions in Local Currency)

Source: Citi Research, Company Reports, FirstCall

Figure 631. ZTE Corp (0763.HK)

Sector: Telecom Equipment

## ZTE Corp. (0763.HK)



Source: Company reports, Citi Research estimates. This list is not exhaustive, and percentage relationships may be approximate in some cases.

Source: Citi Research

## Appendix1: Facility Locations By Companies

Figure 632. 3D Systems Corp.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia				
China				
France		Le Mans	21000	office and printed parts service facilities
Germany				
India				
Italy		Pinerolo	22000	office and printed parts service facilities
Japan				
Netherlands				
South Korea		Seoul	11000	development, marketing sales and service
Switzerland			13000	general-purpose facility
UK				
USA	South Carolina	Rock Hill	80000	headquarters, research and development and manufacturing facility
USA	Tennessee	Lawrenceburg	35000	office and printed parts service facilities
USA	Massachusetts	Andover	57000	office and assembly space
USA	Virginia	Herndon	36000	office and assembly space
USA	Washington	Seattle	30000	office and printed parts service facilities
USA	Pennsylvania	Langhorne	19000	office and service space
USA	Georgia	Atlanta	17000	on-demand parts services
USA	Texas	Richardson	14000	consumer solutions services and software products
USA	California	Valencia	11000	advanced research and development facility
USA	California	San Francisco	8000	personalized medical devices development and Cubify development

Source: Citi Research

Figure 633. AAC Technologies Holding

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada		Toronto		Office
China	Nanshan	Shenzhen		Headquarter
China	Central Pudong	Shanghai		Creative Center
China	Chaoyang	Beijing		Sales office China Mainland - North China Branch
China	Pudong	Shanghai		Sales office China Mainland - East China Branch
Finland		Turku		Office
Japan		Tokyo		Office
South Korea	Gyeonggi-do	Suwon		Office
Taiwan		Taipei		Office
USA	California	Walnut		Office
USA	California	San Jose		Office
USA	Massachusetts	Newton		Office
USA		Chicago		Office
USA	Florida	Fort Lauderdale		Office
USA	Texas			Office

Source: Citi Research

Figure 634. Acer Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South Wales	Wentworth Point		Acer Computer Australia Pty. Ltd. (Oceania Regional Office)
Australia				Tech Support
Austria		Brunn am Gebirge		Acer Austria GmbH
Brazil	Cidade Monções	São Paulo		AGP Tecnologia em Informática do Brasil Ltda
Canada	Ontario	Mississauga		Acer America Corp. (Canada)
Canada	Ontario	Mississauga		Tech Support
China		Shanghai		Acer Computer (Shanghai) Ltd. - China (Regional Headquarters)
China	Hong Kong			Acer Computer (Far East) Ltd.
Czech Republic		Praha		Acer Czech Republic s.r.o.
Denmark		Naerum		Acer Denmark A/S
Denmark		Naerum		Tech Support
Finland		Helsinki		Acer Finland Oy
France	Roissy-en-France			Acer Computer France SAS
Germany	Ahrensburg			Acer Eastern Europe
Germany	Hamburg			Acer Computer GmbH
Germany	Ahrensburg			Tech Support
Greece		Athens		Acer Hellas LTD
Hungary		Budapest		Acer Magyarorszag
India	Karnataka	Bangalore		Acer India (Pvt) Ltd.
India		Bangalore		Head Office
India		Kochi		Branch Office
India		Ahmedabad		Branch Office
India		Bangalore		Branch Office
India		New Delhi		Branch Office
India		Mumbai		Branch Office
India		Chennai		Branch Office
India		Hyderabad		Branch Office
India		Kolkata		Branch Office
India		Guwahati		Branch Office
India		Nagpur		Branch Office
India		Chandigarh		Branch Office
India		Pune		Branch Office
India		Lucknow		Branch Office
Indonesia		Jakarta		PT Acer Indonesia
Indonesia		Jakarta		Head Office
Italy	Lombardy	Milan		Acer Italy s.r.l
Japan		Tokyo		Acer Japan Corp

Source: Citi Research

Figure 635. Acer Inc. (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Malaysia		Kuala Lumpur		Acer Sales & Services Sdn Bhd.
Malaysia		Kuala Lumpur		Acer KL Headquarters
Malaysia	Perak	Ipoh		Tech Support - Acer Ipoh
Malaysia		Johor Bahru		Tech Support - Acer Johor Bahru
Malaysia	Johor	Kluang		Tech Support - Acer Kluang
Malaysia	Kelantan	Kota Bharu		Tech Support - Acer Kota Bharu
Malaysia	Sabah	Kota Kinabalu		Tech Support - Acer Kota Kinabalu
Malaysia	Pahang	Kuantan		Tech Support - Acer Kuantan
Malaysia		Kuching		Tech Support - Acer Kuching
Malaysia	Melaka			Tech Support - Acer Melaka
Malaysia	Sarawak	Miri		Tech Support - Acer Miri
Malaysia	Penang	George Town		Tech Support - Acer Penang
Malaysia		Sandakan		Tech Support - Acer Sandakan
Malaysia	Negeri Sembilan	Seremban		Tech Support - Acer Seremban
Malaysia	Sarawak	Sibu		Tech Support - Acer Sibu
Malaysia	Sabah	Tawau		Tech Support - Acer Tawau
Mexico		Mexico City		Acer Computec México, S.A. de C.V.
Netherlands		s-Hertogenbosch		Acer Computer BV
New Zealand		Auckland		Acer Computer New Zealand Ltd.
New Zealand		Auckland		Tech Support
Norway		Tranby		Acer Computer Norway AS
Philippines	Manila	Taguig		Acer Philippines, Inc.
Philippines		Makati		Tech Support
Poland		Warsaw		Acer Polska
Russia		Moscow		Acer Marketing Services LLC
Singapore				Acer Computer (Singapore) Pte. Ltd.
Singapore				Acer Computer (Singapore) Pte Ltd
Slovakia		Bratislava		Acer Slovakia s.r.o.
South Africa		Sandton		Acer Africa (Pty) Ltd.
South Africa		Johannesburg		Tech Support
South Korea		Seoul		Acer Asia Pacific
Spain		Barcelona		Acer Computer Ibérica
Sweden		Bromma		Acer Sweden AB
Sweden		Bromma		Tech Support
Switzerland		Bioggio		Acer Europe SA - Regional Headquarters
Switzerland		Dietikon		Acer Computer (Switzerland) AG
Taiwan		Taipei		Acer Inc. - Taiwan (World & Regional Headquarters)
Thailand		Bangkok		Acer Computer Co., Ltd.
Turkey		Istanbul		Acer Bilisim Teknolojileri Limited Şirketi
UK	England			Acer UK Ltd.
UK	Middlesex			Tech Support
Ukraine		Kiev		Acer BSEC Inc.
United Arab Emirates		Dubai		Acer Computer (M.E.) Ltd
United Arab Emirates		Dubai		Tech Support
USA	California	San Jose		Acer America Corp. (Regional Headquarters)
USA	Florida	Doral		Acer Latin America, Inc. (Regional Office)
USA	California	San Jose		Tech Support
Vietnam		Ho Chi Minh City		Acer Vietnam Co., Ltd.

Source: Citi Research



Figure 636. Adtran

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	Victoria	Melbourne		
Australia	New South Wales	Sydney		
Brazil				
Canada	Ontario	Ottawa		
Canada	Ontario	Toronto		
Canada	Quebec	Montreal		
China		Beijing		
Germany		Munich		
Hong Kong				
India	Andhra Pradesh	Madhapur		
Mexico				
Singapore				
USA	Alabama	Huntsville		
USA	Massachusetts	Burlington		

Source: Citi Research

Figure 637. Advanced Energy Industries

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada	Ontario	Mississauga		AEI Canada, Inc.
China		Shanghai		Advanced Energy Industries, Inc., Shanghai
China	Guangdong	Shenzhen		Advanced Energy Industries (Shenzhen) Co., Ltd.
Germany	Baden-Württemberg	Metzingen		Advanced Energy Industries GmbH
India	Maharashtra	Pune		REFUsoI Solar Electronics Pvt., Ltd., India
Japan	Kanagawa	Fujisawa-shi		Advanced Energy Japan K.K.
Japan		Tokyo		REFUsoI Japan K.K.
Singapore				Advanced Energy Singapore PTE, Ltd.
South Korea	Kyunggi	Sungnam-Si		AE Korea, Ltd.
Switzerland	Canton	Villaz-St-Pierre		Solvix GmbH Switzerland
Taiwan		Taipei		Advanced Energy Taiwan, Ltd.
USA	Colorado	Fort Collins		Advanced Energy Industries, Inc. - Headquarters
USA	California	San Jose		Advanced Solar Energy - Headquarters
USA	Oregon	Brinson Blvd		AE Solar Energy
USA	Washington	Vancouver		Advanced Energy Industries, Inc.

Source: Citi Research

Figure 638. Advanced Micro Devices

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		
Australia	New South Wales	Sydney		
Brazil		São Paulo		
Canada	Ontario	Markham	240,000	
Canada	Ontario	Markham	215,000	
Canada	Ontario	Markham	65,000	
China		Beijing		
China	Hong Kong			
China		Shanghai		
China		Shenzhen		
China		Suzhou	422000	
France		Issy-les-Moulineaux		
Germany	Bavaria	Munich		
India		New Delhi		
India	Maharashtra	Mumbai		
India	Karnataka	Bangalore		
India	Andhra Pradesh	Hyderabad		
Indonesia		Jakarta		
Israel		Tel Aviv		
Italy	Lombardy	Milan		
Japan		Tokyo		
Malaysia	Penang	Bayan Lepas		
Malaysia	Selangor	Cyberjaya		
Mexico		Mexico City		
Poland		Warsaw		
Russia		Moscow		
Singapore				
South Korea		Seoul		
Taiwan		Hsinchu		
Taiwan		Kaohsiung		
Taiwan		Taipei		
Thailand		Bangkok		
Turkey		Istanbul		
UK	Hampshire	Fleet		
United Arab Emirates		Dubai		
USA	California	Sunnyvale		
USA	Colorado	Fort Collins		
USA	Florida	Orlando		
USA	Massachusetts	Boxborough		
USA	New Hampshire	Nashua		
USA	Texas	Austin		
USA	Texas	Houston		
USA	Washington	Bellevue		
USA	Oregon	Portland		

Source: Citi Research

Figure 639. Aixtron

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Germany		Herzogenrath	134,086	Headquarters
Germany		Herzogenrath	172,223	R&D, Manufacturing
Germany		Herzogenrath	26,038	Administration, sales
Germany		Aachen	2,153	R&D
UK		Cambridge	23,465	Manufacturing, Engineering, & R&D
UK		Cambridge	14,919	Sales, Services, Engineering
Sweden		Lund	4,833	Engineering, Services
USA	California	Sunnyvale	100,513	Manufacturing, Sales, Services, Engineering, & R&D
South Korea		Seoul	11,108	Sales, Services
China		Shanghai	8,127	Sales, Services
China		Suzhou	5,780	Sales, Services
China		Yangzhou	969	Sales, Services
Taiwan		Hsinchu	20,376	Sales, Services
Taiwan		Tainan	2,185	Services
Japan		Tokyo	5,748	Sales, Services

Source: Citi Research

Figure 640. Alcatel Lucent

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		
Armenia		Yerevan		
Australia	Victoria	Melbourne		
Australia	New South Wales	Sydney		
Austria		Vienna		
Belgium		Anvers		
Belgium	Wallonia	Namur		
Belgium		Antwerp		
Brazil		São Paulo		
Brazil		Rio de Janeiro		
Brunei		Bandar Seri Begawan		
Bulgaria		Sofia		
Cambodia		Phnom Penh		
Canada	Ontario	Ottawa		
Canada	British Columbia	Burnaby		
Canada	Alberta	Calgary		
Canada	Alberta	Edmonton		
Canada	Nova Scotia	Halifax		
Canada	Ontario	Markham		
Canada	Quebec	Montreal		
Canada	Halifax	Nova Scotia		
Canada	Manitoba	Winnipeg		
Chile		Santiago		
China		Pudong	142,000 Office and Manufacturing	
China		Songjiang	25,000 Manufacturing	
China		Pudong		
China	Anhui	Hefei		
China		Chongqing		
China	Fujian	Fuzhou		
China	Guangdong	Guangzhou		
China	Guizhou	Guiyang		
China	Hebei	Shijiazhuang		
China	Henan	Zhengzhou		
China	Hubei	Wuhan		
China	Inner Mongolia	Hohhot		
China	Jiangxi	Nanchang		
China	Laoning	Shenyang		
China	Qinghai	Xining		
China	Shanxi	Taiyuan		
China	Shaanxi	Xi'an		
China	Shandong	Qingdao		
China	Yunnan	Kunming		
China		Beijing		
China	Gansu	Lanzhou		
China	Guangxi	Nanning		
China	Hainan	Haikou		
China	Heilongjiang	Haerbin		
China	Hunan	Changsha		
China	Jiangsu	Nanjing		
China	Jilin	Changchun		
China	Ningxia	Yinchuan		
China		Shanghai		
China	Sichuan	Chengdu		
China	Shandong	Jinan		
China	Xinjiang	Urumqi		
China	Zhejiang	Hangzhou		
Colombia		Bogota		
Costa Rica		San José		
Czech Republic	Prague	Hloubětín		
Denmark		Copenhagen		
Dominican Republic		Santo Domingo		
Ecuador		Quito		
Egypt		Giza		
El Salvador		San Salvador		
Finland		Vantaa		
France		Calais	79,000 Manufacturing	
France			31,000 Manufacturing	
France		Villarsceaux		
France		Velizy-Villacoublay		
France		Paris		
France	Brittany	Lannion		
France		Paris		
France	Nantes	Orvault		Headquarters
France		Illkirch-Graffenstaden		
France		Brest		
France		Rennes		
France	Ile-de-France	Velizy-Villacoublay		
France	Toulouse	Colomiers		
France		Sophia-Antipolis		
France	Loire-Atlantique	Trignac		
France		Ormes		
Germany		Stuttgart		
Germany		Nuremberg		
Greece		Athens		
Guatemala		Trafalgar Nivel		
Honduras		Colonia Lomas del Mayab		
Hong Kong		Quarry Bay		
Hungary		Kondorfa		
India	Karnataka	Bangalore		
India	Karnataka	Chennai		
India	Haryana	Gurgaon		
India	Maharashtra	Mumbai		
Indonesia		Jakarta		
Ireland		Dublin		
Israel	Sharon	Kfar Saba		
Italy		Vimercate		
Italy		Vimercate		
Japan		Tokyo		
Kazakhstan		Almaty		
Latvia		Riga		
Malaysia		Kuala Lumpur		

Source: Citi Research

Figure 641. Alcatel Lucent (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Mexico		Cuautitlan Izcalli		
Mexico		Hidalgo		
Mexico	Guadalajara	Jalisco		
Mexico	Nuevo Leon	Monterrey		
Mexico		Puebla		
Netherlands	Haarlemmermeer	Hoofddorp		
New Zealand		Wellington		
New Zealand		Auckland		
New Zealand		Hamilton		
Nicaragua		Managua		
Nigeria	Maitama	Abuja		
Nigeria		Lagos		
Nigeria		Port Harcourt		
Norway		Fornebu		
Panama				
Peru				
Philippines	Manila	Makati		
Poland		Bydgoszcz		
Poland		Poznań		
Poland		Bydgoszcz		
Poland		Katowice		
Poland		Warsaw		
Poland		Gdańsk		
Poland		Wrocław		
Portugal		Cascais		
Romania		Timisoara		
Romania		Timisoara		
Romania		Bucharest		
Russia		Moscow		
Russia		St Petersburg		
Saudi Arabia		Riyadh		
Saudi Arabia		Al-Khobar		
Serbia		Belgrade		
Singapore				
Singapore		Chai Chee		
Slovakia		Bratislava		
South Africa	Gauteng	Centurion		
South Africa		Cape Town		
South Korea		Seoul		
South Korea		Seoul		
Spain		Madrid		
Spain		Barcelona		
Sweden		Stockholm		
Switzerland		Zurich		
Switzerland	Romandy	Geneva		
Taiwan		Taipei		
Thailand		Bangkok		
Turkey		Istanbul		
Turkey		Ankara		
Turkey		Baku		
UK		Greenwich	34,000 Manufacturing	
UK		Swindon		
UK		London		
UK		Berkshire		
UK		Wiltshire		
UK		Newbury		
Ukraine		Kiev		
United Arab Emirates		Abu Dhabi		
United Arab Emirates		Dubai		
Uruguay		Montevideo		
USA		Meriden	45,000 Manufacturing	
USA	Texas	Plano		
USA	Illinois	Naperville		
USA	New Jersey	Murray Hill		
USA		San Juan		
USA	Georgia	Alpharetta		
USA	California	Calabasas		
USA	California	Daly City		
USA	Colorado	Highlands Ranch		
USA	Connecticut	Meriden		
USA	Florida	Miramar		
USA	California	Mountain View		
USA	Kansas	Overland Park		
USA	California	Petaluma		
USA	North Carolina	Raleigh		
USA	Texas	San Antonio		
USA	California	San Diego		
USA	Virginia	Herndon		
USA	New Jersey	Whippany		
Venezuela		Caracas		
Vietnam		Hanoi		

Source: Citi Research

Figure 642. Alps Electric

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Beijing		Head Office
China		Dalian		Dalian Branch
China		Shanghai		Shanghai Branch
China	Jiangsu	Suzhou		Suzhou Branch
China	Zhejiang	Hangzhou		Hangzhou Branch
China	Guangdong	Guangzhou		Guangzhou Branch
China		Shenzhen		Shenzhen Branch
France		Charles de Gaulle		Paris Office
Germany	Bavaria	Unterschleissheim		Head Office
Germany		Duesseldorf		Duesseldorf Office
Hong Kong		Kowloon		Head Office
India	Haryana	Gurgaon		Head Office
Italy		Milan		Milan Office
Japan		Tokyo		Head Office
Japan		Osaka		Kansai Branch
Japan	Fukushima	Iwaki-city		Iwaki Office
Japan	Tochigi	Utsunomiya		Utsunomiya Office
Japan	Kanagawa	Atsugi		Atsugi Office
Japan	Shizuoka	Hamamatsu		Hamamatsu Office
Japan	Aichi	Nagoya		Nagoya Office
Japan	Hiroshima	Hiroshima		Hiroshima Office
Japan	Fukuoka	Fukuoka-city		Fukuoka Office
Malaysia		Negeri Sembilan		Head Office
Malaysia		Penang		Penang Office
Singapore				Head Office
South Korea		Gwangju		Head Office
South Korea		Seoul		Seoul Office
South Korea		Busan		Busan Office
South Korea		Suwon-si		Suwon-si Office
Sweden		Gothenburg		Gothenburg Office
Taiwan		Taipei		Head Office
Thailand		Bangkok		Head Office
UK	Buckinghamshire	Milton Keynes		Milton Office
USA	California	Santa Clara		Head Office
USA	Michigan	Auburn Hills		Detroit Office
USA	Texas	McAllen		McAllen Office
USA	Ohio	Dublin		Ohio Office
USA	California	San Diego		San Diego Office

Source: Citi Research

Figure 643. Altera Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada	Ontario	Ottawa		
Canada	Ontario	Toronto		
China	Sichuan	Chengdu		
China		Beijing		
China		Shenzhen		
China		Shanghai		
Finland		Espoo		
France		Velizy-Villacoublay		
Germany		Unterschleissheim		
Hong Kong		Kowloon		
India	Karnataka	Bangalore		
Italy	Turin	San Mauro Torinese		
Japan		Tokyo		
Japan		Osaka		
Malaysia		Penang	470,000	
Singapore				
South Korea		Seoul		
Sweden		Kista		
Taiwan		Taipei		
UK	Buckinghamshire	Wycombe		
USA	California	San Jose	505,000	Headquarters
USA	Washington	Kirkland		
USA	California	San Diego		
USA	Illinois	Schaumburg		
USA	Maryland	Ellicott City		
USA	Massachusetts	Chelmsford		
USA	Minnesota	Minnetonka		
USA	North Carolina	Raleigh		
USA	Ohio	Hudson		
USA	Colorado	Broomfield		
USA	Texas	Richardson		
USA	New Jersey	Roseland		
USA	Wisconsin	Sussex		
USA	Texas	Austin		

Source: Citi Research

Figure 644. American Superconductor Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Austria		Klagenfurt	38880	Wind Segment
China		Suzhou	165000	Wind Segment
USA	Massachusetts	Devens	355000	Corporate & Grid Segments
USA	Wisconsin	Middleton	62000	Grid Segment
USA	Wisconsin	New Berlin	50000	Wind & Grid Segments

Source: Citi Research

Figure 645. Amkor Technology Inc

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Pudong	Shanghai	993,000	Packaging and test services; wafer bump services
France	Rhone-Alpes	Archamps		Sales Office
Japan	Iwate	Kitakami	211,000	Packaging and test services
Japan		Tokyo		Sales Office
Malaysia	Kuala Langat	Selangor		Sales Office
Philippines		Muntinlupa	749,000	Packaging and test services; package and process development
Philippines		Laguna	625,000	Packaging and test services
Singapore				Sales Office
South Korea		Gwangju	1,218,000	Packaging and test services; wafer bump services
South Korea		Seoul	698,000	Packaging services; package and process development
South Korea		Puypyeong	404,000	Packaging and test services
South Korea		Incheon	432,000	Sales Office
Taiwan		Hsinchu	496,000	Packaging and test services; wafer bump services
Taiwan		Lung Tan	353,000	Packaging and test services; wafer bump services
USA	Arizona	Chandler	6,000	Package and process development
USA	California	Santa Clara		Sales Office
USA	California	Irvine		Sales Office
USA	California	San Diego		Sales Office
USA	Massachusetts	Boston		Sales Office
USA	Texas	Dallas		Sales Office
USA	North Carolina	Research Triangle Park		Sales Office

Source: Citi Research

Figure 646. Amphenol

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		Amphenol Argentina
Argentina		Corrientes		TFC South America S.A.
Australia	Victoria	Carrum Downs		Amphenol Australia Pty Ltd
Brazil	São Paulo	San Jose Dos Campos		Amphenol do Brasil Ltda
Brazil		Sao Paulo		Amphenol do Brasil Ltda
Brazil		Sao Paulo		Amphenol TFC do Brasil Ltda.
Canada	Quebec	Saint Hubert		Amphenol Air LB- NA
Canada	Ontario	Toronto		Amphenol Canada Corporation
Canada		Quebec		Amphenol TAT Technologies
Canada	Manitoba	Winnipeg		Amphenol Technical Products International
Canada	Ontario	Renfrew		Times Fiber Canada Ltd.
China	Jiangsu	Changzhou	90,000	Amphenol (Changzhou) Connector Systems Co., Ltd.
China	Yunnan	Qujing		Amphenol (Qujing) Technologies Co. Ltd.
China	Fujian	Xiamen	50,000	Amphenol AssembleTech (Xiamen) Co., Ltd.
China	Shaanxi	Xi'an		Amphenol CNT (Xi'an) Technology Co., Ltd.
China		Chengdu		Amphenol Commercial Products (Chengdu) Co. Ltd.
China		Shenzhen		Amphenol East Asia Elect. Tech. Shenzhen Co., Ltd.
China		Shenzhen		Amphenol Fiber Optic China
China		Tianjin		Amphenol HTEC Tianjin Ltd
China		Shenzhen		Amphenol Kai Jack (Shenzhen) Co., Ltd.
China		Shenzhen		Amphenol PCD Shenzhen Co., Ltd.
China		Shenzhen		Amphenol RF Asia
China		Shenzhen		Amphenol Shouh Min Industry Company
China		Shenzhen		Amphenol Sine Systems - China
China		Taoyuan		Amphenol Taiwan Corp.
China	Jiangsu	Changzhou		Amphenol TCS - Changzhou
China		Shanghai		Amphenol TCS - Shanghai
China	Guangdong	Zhuhai		Amphenol Tech Co., Ltd. Ind. Ops.
China		Shenzhen		Amphenol Technology (Shenzhen) Co. Ltd.
China				Amphenol TFC (Changzhou Communications Equipment Co., Ltd.)
China		Jiangsu		Amphenol Times Microwave Shanghai
China		Shanghai		Amphenol Tuchel Electronics - China
China		Jiangsu		Changzhou Amphenol Fuyang Communication
China		Jiangsu		Equip Co., Ltd
China		Shanghai		East Asia Connector Services Ltd.
China		Shenzhen		ETD Amphenol Fiber Technology (Shenzhen) Co., Ltd.
China		Guangzhou		Guangzhou Amphenol Electronics Communications Co., Ltd.
China		Guangzhou		Guangzhou Amphenol Sincere Flex Circuits Co. Ltd.
China		Guangzhou		Guangzhou FEP Automotive Electric Co., Ltd.
China		Hangzhou		Hangzhou Amphenol Phoenix Telecom Parts Co., Ltd.
China		Kunshan		Kunshan Amphenol Zhengri Electronics Co., Ltd.
China		Shanghai		Shanghai Amphenol Airwave
China		Tianjin		Tianjin Amphenol Kae Co., Ltd
Czech Republic		Ostrov		Amphenol Tuchel Electronics GmbH - Czechia
Czech Republic		Smirice		Filec Europe Centrale
Czech Republic				KE Ostrov-Elektrik s.r.o.
Czech Republic				KE Ostrov-Elektrik s.r.o.
Czech Republic		Ostrov		Konfektion E CZ s.r.o
Czech Republic				Amphenol ConneXus AEQU
Estonia		Tallinn		Amphenol Air LB SAS
France		Blagny		Amphenol Antenna Solutions Europe
France		Amboise		Amphenol European Design Center
France		Dole Cedex		Amphenol Filec, S.A.S.
France		Espoo		Amphenol International Military Aerospace & Industrial Operations
France		Courbevoie		Amphenol Provens S.A.S.
France		Thyez		Amphenol Socapex S.A.S.
France		Thyez		Jaybeam Wireless - France
France		Amboise		Sefee
France		Cedex		Amphenol Air LB GmbH
Germany		Saarlouis		Amphenol Tuchel Electronics GmbH
Germany		Heilbronn		Deutgen Kunststofftechnik GmbH
Germany		Hermannsburg		FEP Fahrzeugelektrik Pirna GmbH
Germany		Pirna		Konfektion E Elektronik GmbH
Germany		Kressberg-Marktstutenau		Amphenol Greater China and Japan Sales
Hong Kong		Kowloon		Amphenol Mobile Consumer Products Group HQ
Hong Kong		Pune		Amphenol Interconnect India
India	Andhra	Prad Satyavedu		Amphenol MCP India Pvt. Ltd.
India	Tamil Nadu	Kancheepuram		Amphenol Omniconnect India Private Limited
Ireland	Co Louth	Drogheda		Amphenol Backplane Assembly & Integration
Ireland	Co Louth	Drogheda		Amphenol TCS Ireland Ltd.
Israel		Kfar Saba		Bar-Tec Ltd.
Israel		Kfar Saba		Tel-Ad Electronics Ltd.
Italy	Lombardy	Milan		Amphenol Italia
Italy	Lombardy	Milan		European Sales Operations
Japan		Shiga		Amphenol Japan, Ltd.
Japan		Kanagawa		Amphenol Japan-Infocom
Japan		Yokohama		Amphenol TCS Japan

Source: Citi Research

Figure 647. Amphenol (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Malaysia		Penang		Amphenol Malaysia Sdn Bhd
Malaysia		Penang	70,535	Amphenol TCS (A-Amseiko)
Malaysia		Pulau Pinang		Amphenol TCS P3 (Malaysia)
Malaysia		Penang	73,080	Amphenol TCS Sdn Bhd (Malaysia)
Mexico		Paseo de las lomas		Amphenol Mexico
Mexico		Nogales		Amphenol Optimize Mexico
Mexico		Nogales		Amphenol Sine Systems - Mexico
Mexico		Mexicali	110,000	Amphenol TCS de Mexico S.A. de C.V.
Mexico		Guadalupe		Cerm Mex, S.A. de C.V.
Morocco		Casablanca		Amphenol Morocco
Netherlands		Houten		Amphenol Infocom Europe
Netherlands		Houten		Amphenol RF - Europe
Russia		Moscow		Amphenol Russia
Singapore		Luzerne		Asia Pacific Sales Operations
Slovakia		Presov		CEMM THOME SK, spol. s r. o.
Slovakia		Presov		Konfektion E-SK s.r.o.
South Africa	Gauteng	Sandton		Amphenol South Africa
South Korea		Gyeonggi-do Suwon-si		Amphenol Commercial Interconnect Korea Co., Ltd.
South Korea		Bucheon		Amphenol DaeShin Elect and Precision Co., Ltd
South Korea		Ansan		Amphenol Korea Air Electronics 119-69 Sasa-Dong
South Korea	Kyunggi	Hwasung		Amphenol MPC Korea Limited
South Korea		Chung Nam-do		U-JIN Cable Industrial Co. Ltd.
Spain		Las Rozas (Madrid)		Amphenol Espana
Sweden		Stockholm		Amphenol ConneXus AB
Sweden		Stockholm		Amphenol Finland Oy
Sweden		Stockholm		Amphenol TCS Sweden
Taiwan		Taoyuan		Amphenol East Asia Limited-Taiwan
Taiwan		New Taipei		Amphenol LTW Technology Co., Ltd.
Taiwan		Taoyuan		SAA Taiwan
Tunisia		El Fahs		Amphenol Tunisia SARL
Tunisia		El Fahs		Filec-Lectric SARL
Turkey		Istanbul		Amphenol Middle East
Turkey		Istanbul		Amphenol Turkey
UK		Whitstable		Amphenol Limited
UK	Northamptonshire			Jaybeam Wireless - UK
UK	Hampshire			Spectra Strip Ltd.
United Arab Emirates		Ajman		Amphenol Middle East Enterprises FZE
USA	Kansas	Hays	30,000	Amphenol Adronics, Inc.
USA	New York	Sidney	675,000	Amphenol Aerospace Operations
USA	Massachusetts	Brockton		Amphenol Alden
USA	Illinois	Rockford		Amphenol Antenna Solutions
USA	Texas	Houston	40,000	Amphenol AssembleTech (Texas)
USA	New Hampshire	Nashua	35,000	Amphenol Backplane Systems
USA	Michigan	Grand Rapids		Amphenol Borisch Technology
USA	New York	Endicott		Amphenol Cables on Demand
USA	Colorado	Bloomfield		Amphenol Commercial Products - North America
USA	California	Moorpark		Amphenol Connex Corporation
USA	Illinois	Lisle		Amphenol Fiber Optic Products
USA	Texas	Allen	50,000	Amphenol Fiber Systems International
USA	New Hampshire	Nashua		Amphenol Global Interconnect Systems
USA	Arizona	Cottonwood		Amphenol Griffith Enterprises
USA	New York	Endicott		Amphenol High Speed Interconnects
USA	New York	Sidney	675,000	Amphenol Industrial Operations
USA	Pennsylvania	Harrisburg	35,000	Amphenol InterCon System
USA	New York	Endicott		Amphenol Interconnect Products Corporation
USA	Illinois	Lincolnshire		Amphenol Mechconnect, Inc.
USA	California	Cerritos		Amphenol Nelson Dunn Technologies
USA	Connecticut	Stamford		Amphenol Nexus Technologies Division
USA	Arizona	Nogales		Amphenol Optimize Mfg Company
USA	Massachusetts	Beverly		Amphenol PCD, Inc.
USA	New Hampshire	Nashua		Amphenol Printed Circuits, Inc.
USA	Michigan	Fraser		Amphenol Radsok Solutions
USA	Connecticut	Danbury		Amphenol RF
USA	Michigan			Amphenol Sine Systems - US Headquarters
USA	Texas	Midland		Amphenol Steward Enterprises
USA	Illinois	Lincolnshire		Amphenol T&M Antennas, Inc.
USA	New Hampshire	Nashua	80,000	Amphenol TCS
USA	California	Milpitas		Amphenol TCS Integrated Systems
USA				Amphenol TCS Precision Metal Stamping & Insert
USA	North Carolina	Winston Salem	54,000	Molding
USA	Connecticut	Wallingford		Amphenol Times Microwave, Inc.
USA	Michigan	Canton		Amphenol Tuchel Electronics-North America
USA	North Carolina	Hickory		C&S Antennas, Inc.
USA	California	Ventura		Holland Electronics
USA	Illinois	Rockford		Jaybeam Wireless - USA
USA	New Hampshire	Nashua		North American Commercial Products
USA	Connecticut	Hamden		Spectra Strip
USA	Florida	W Palm Beach		SV Microwave, Inc.
USA	Arizona	Nogales		TFC Broadband Solutions Division
USA	Virginia	Chatham		Times Fiber Communications Inc.
USA	Connecticut	Wallingford		Times Fiber Communications, Inc.
Vietnam		Ho Chi Minh City		Amphenol Air LB Vietnam

Source: Citi Research

Figure 648. Analog Devices Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai	42500	Engineering
China		Beijing	33000	Engineering
India	Karnataka	Bangalore	54000	Engineering
				Wafer fabrication, wafer probe and testing,
Ireland		Limerick	66000	engineering and administrative offices
				Wafer fabrication, wafer probe and testing,
Ireland		Limerick	351500	engineering and administrative offices
Japan		Tokyo	36000	Engineering
				Wafer probe and testing, warehouse, engineering
Philippines		Cavite	605000	and administrative offices
				Corporate Headquarters, engineering,
				components
USA	Massachuse	Norwood	130000	testing, sales and marketing offices
USA	North Caroli	Greensboro	47600	Engineering and administrative offices
				Wafer fabrication, testing, engineering, marketing
USA	Massachuse	Wilmington	586200	and administrative offices
				Product testing, engineering and administrative
USA	North Caroli	Greensboro	98700	offices
USA	California	San Jose	76700	Engineering, administrative offices

Source: Citi Research

Figure 649. Apple Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	Australian Capital Territory	Canberra		Retail Store
Australia	New South Wales	Bondi		Retail Store
Australia	New South Wales	Broadway		Retail Store
Australia	New South Wales	Castle Hill		Retail Store
Australia	New South Wales	Charlestown		Retail Store
Australia	New South Wales	Chatswood		Retail Store
Australia	New South Wales	Hornsby		Retail Store
Australia	New South Wales	Penrith		Retail Store
Australia	New South Wales	Sydney		Retail Store
Australia	Queensland	Carindale		Retail Store
Australia	Queensland	Chermside		Retail Store
Australia	Queensland	Robina		Retail Store
Australia		Adelaide		Retail Store
Australia	Victoria	Chadstone		Retail Store
Australia	Victoria	Cheltenham		Retail Store
Australia	Victoria	Doncaster		Retail Store
Australia	Victoria	Fountain Gate		Retail Store
Australia	Victoria	Maribymong		Retail Store
Australia	Western Australia	Booragoon		Retail Store
Australia	Western Australia	Perth		Retail Store
Australia		Sydney		Office

Source: Citi Research

Figure 650. Apple Inc. (Continued)

Country	State	City	Size (sq	Description Comments (manufacturing, office)
Belgium		Brussels		Office
Brazil		Sao Paulo		Office
Canada		Brossard		Retail Store
Canada		Burlington		Retail Store
Canada		Burnaby		Retail Store
Canada		Calgary		Retail Store
Canada		Coquitlam		Retail Store
Canada		Edmonton		Retail Store
Canada		Halifax		Retail Store
Canada		Laval		Retail Store
Canada		London		Retail Store
Canada		Markham		Retail Store
Canada	Ontario	Mississauga		Retail Store
Canada		Montreal		Retail Store
Canada		Newmarket		Retail Store
Canada		Ottawa		Retail Store
Canada		Pointe-Claire		Retail Store
Canada		Quebec		Retail Store
Canada		Richmond		Retail Store
Canada		Surrey		Retail Store
Canada		Toronto		Retail Store
Canada		Vancouver		Retail Store
Canada		Waterloo		Retail Store
Canada		Winnipeg		Retail Store
Canada	Ontario	Markham		Office
China		Chengdu		Retail Store
China		Shanghai		Retail Store
China		Shanghai		Retail Store
China		Beijing		Retail Store
China		Beijing		Retail Store
China		Shanghai		Retail Store
China		Beijing		Retail Store
China		Shenzhen		Retail Store
China		Beijing		Office
China		Shanghai		Office
Finland		Helsinki		Office
France		Bordeaux		Retail Store
France		Dijon		Retail Store
France		Le Chesnay		Retail Store
France		Lieusaint		Retail Store
France		Lyon		Retail Store
France		Marne La Vallee		Retail Store
France		Montpellier		Retail Store
France		Nice		Retail Store
France		Paris		Retail Store
France		Puteaux - la Defense		Retail Store
France		Rosny-Sous-Bois		Retail Store
France		Saint Herblain		Retail Store
France		Strasbourg		Retail Store
France		Velizy-Villacoublay		Retail Store
France		Paris		Office

Source: Citi Research

Figure 651. Apple Inc. (Continued)

Country	State	City	Size (sq	Description Comments (manufacturing, office)
Germany		Augsburg		Retail Store
Germany		Berlin		Retail Store
Germany		Cologne		Retail Store
Germany		Dresden		Retail Store
Germany		Düsseldorf		Retail Store
Germany		Frankfurt		Retail Store
Germany		Hamburg		Retail Store
Germany		Munich		Retail Store
Germany		Oberhausen		Retail Store
Germany		Sindelfingen		Retail Store
Germany		Sulzbach		Retail Store
Germany		Munich		Office
Hong Kong		Kowloon Tong		Retail Store
Hong Kong				Office
India		Bangalore		Office
Italy		Bologna		Retail Store
Italy		Contrada Cubba		Retail Store
Italy		Porta di Roma		Retail Store
Italy		Grugliasco		Retail Store
Italy		Lonato		Retail Store
Italy		Marcianise		Retail Store
Italy		Misterbianco		Retail Store
Italy		Orio al Serio		Retail Store
Italy		Rimini		Retail Store
Italy		Rome		Retail Store
Italy		Rome		Retail Store
Italy		Rozzano		Retail Store
Italy		Torino		Retail Store
Italy		Campi Bisenzio		Retail Store
Italy		Carugate		Retail Store
Japan	Aichi			Retail Store
Japan		Fukuoka		Retail Store
Japan		Hokkaido		Retail Store
Japan		Miyagi		Retail Store
Japan		Osaka		Retail Store
Japan		Tokyo		Retail Store
Japan		Tokyo		Office
Netherlands		Amsterdam		Retail Store
Netherlands		Haarlem		Retail Store
Netherlands		Amsterdam		Office
Norway		Oslo		Office
Russia		Moscow		Office
Singapore				Office
Spain		Arroyo de la Encomienda		Retail Store
Spain		Arroyomolinos		Retail Store
Spain		Barcelona		Retail Store
Spain		Churra		Retail Store
Spain		Leganés		Retail Store
Spain		Majadahonda		Retail Store

Source: Citi Research

Figure 652. Apple Inc. (Continued)

Country	State	City	Size (sq	Description Comments (manufacturing, office)
Spain		Zaragoza		Retail Store
Spain		Valencia		Retail Store
Spain		Marbella		Retail Store
Spain		Madrid		Office
Sweden		Helsingborg		Retail Store
Sweden		Malmö		Retail Store
Sweden		Täby		Retail Store
Sweden		Stockholm		Office
Switzerland		Geneva		Retail Store
Switzerland		Glatzentrum bei Wallise		Retail Store
Switzerland		Zurich		Retail Store
Switzerland		Zurich		Office
UK		Aberdeen		Retail Store
UK		Albion Street		Retail Store
UK		Barnet		Retail Store
UK		Basingstoke		Retail Store
UK		Bath		Retail Store
UK		Belfast		Retail Store
UK		Birmingham		Retail Store
UK		Brighton		Retail Store
UK		Bristol		Retail Store
UK		Bromley		Retail Store
UK		Cambridge		Retail Store
UK		Cardiff		Retail Store
UK		Central London		Retail Store
UK		Exeter		Retail Store
UK		Gateshead		Retail Store
UK		Glasgow		Retail Store
UK		Kingston		Retail Store
UK		Leeds		Retail Store
UK		Leicester		Retail Store
UK		Liverpool		Retail Store
UK		London		Retail Store
UK		Manchester		Retail Store
UK		Newcastle upon Tyne		Retail Store
UK		Norwich		Retail Store
UK		Plymouth		Retail Store
UK		Reading		Retail Store
UK		Sheffield		Retail Store
UK		Solihull		Retail Store
UK		Southampton		Retail Store
UK		Stratford		Retail Store
UK		Watford		Retail Store
UK		Central London		Retail Store
UK		Milton Keynes		Retail Store
UK		London		Office
UK				Office
United Arab Emirates		Abu Dhabi		Office
USA	California	Cupertino	2.6 milli	Office
USA	Alabama	Birmingham		Retail Store
USA	Alabama	Huntsville		Retail Store
USA	Alaska	Anchorage		Retail Store
USA	Arizona	Chandler		Retail Store
USA	Arizona	Gilbert		Retail Store
USA	Arizona	Glendale		Retail Store
USA	Arizona	Phoenix		Retail Store
USA	Arizona	Scottsdale		Retail Store
USA	Arizona	Tucson		Retail Store
USA	Arkansas	Little Rock		Retail Store
USA	California	Bakersfield		Retail Store
USA	California	Berkeley		Retail Store
USA	California	Brea		Retail Store
USA	California	Burlingame		Retail Store
USA	California	Canoga Park		Retail Store
USA	California	Carlsbad		Retail Store
USA	California	Cerritos		Retail Store
USA	California	Chula Vista		Retail Store
USA	California	Corte Madera		Retail Store
USA	California	Costa Mesa		Retail Store
USA	California	Emeryville		Retail Store
USA	California	Escondido		Retail Store
USA	California	Fresno		Retail Store
USA	California	Glendale		Retail Store
USA	California	Glendale		Retail Store
USA	California	Irvine		Retail Store
USA	California	Los Angeles		Retail Store
USA	California	Los Angeles		Retail Store
USA	California	Los Angeles		Retail Store
USA	California	Los Gatos		Retail Store
USA	California	Manhattan Beach		Retail Store

Source: Citi Research

Figure 653. Apple Inc. (Continued)

Country	State	City	Size (sq	Description Comments (manufacturing, office)
USA	California	Mission Viejo		Retail Store
USA	California	Modesto		Retail Store
USA	California	Monterey		Retail Store
USA	California	Newport Beach		Retail Store
USA	California	Northridge		Retail Store
USA	California	Palm Desert		Retail Store
USA	California	Palo Alto		Retail Store
USA	California	Palo Alto		Retail Store
USA	California	Pasadena		Retail Store
USA	California	Pleasanton		Retail Store
USA	California	Rancho Cucamonga		Retail Store
USA	California	Roseville		Retail Store
USA	California	Sacramento		Retail Store
USA	California	San Diego		Retail Store
USA	California	San Diego		Retail Store
USA	California	San Francisco		Retail Store
USA	California	San Francisco		Retail Store
USA	California	San Jose		Retail Store
USA	California	San Luis Obispo		Retail Store
USA	California	San Mateo		Retail Store
USA	California	Santa Barbara		Retail Store
USA	California	Santa Clara		Retail Store
USA	California	Santa Monica		Retail Store
USA	California	Santa Rosa		Retail Store
USA	California	Los Angeles		Retail Store
USA	California	Simi Valley		Retail Store
USA	California	Temecula		Retail Store
USA	California	Thousand Oaks		Retail Store
USA	California	Valencia		Retail Store
USA	California	Walnut Creek		Retail Store
USA	Colorado	Boulder		Retail Store
USA	Colorado	Broomfield		Retail Store
USA	Colorado	Colorado Springs		Retail Store
USA	Colorado	Denver		Retail Store
USA	Colorado	Littleton		Retail Store
USA	Colorado	Lone Tree		Retail Store
USA	Connecticut	Danbury		Retail Store
USA	Connecticut	Farmington		Retail Store
USA	Connecticut	Greenwich		Retail Store
USA	Connecticut	New Haven		Retail Store
USA	Connecticut	Stamford		Retail Store
USA	Delaware	Newark		Retail Store
USA	District of Columbia	Washington		Retail Store
USA	Florida	Altamonte Springs		Retail Store
USA	Florida	Aventura		Retail Store
USA	Florida	Boca Raton		Retail Store
USA	Florida	Brandon		Retail Store
USA	Florida	Estero		Retail Store
USA	Florida	Fort Lauderdale		Retail Store
USA	Florida	Jacksonville		Retail Store
USA	Florida	Miami		Retail Store
USA	Florida	Miami		Retail Store
USA	Florida	Miami Beach		Retail Store
USA	Florida	Naples		Retail Store
USA	Florida	Orlando		Retail Store
USA	Florida	Orlando		Retail Store
USA	Florida	Palm Beach Gardens		Retail Store
USA	Florida	Tampa		Retail Store
USA	Florida	Wellington		Retail Store
USA	Georgia	Alpharetta		Retail Store
USA	Georgia	Atlanta		Retail Store
USA	Georgia	Atlanta		Retail Store
USA	Georgia	Augusta		Retail Store
USA	Georgia	Buford		Retail Store
USA	Hawaii	Honolulu		Retail Store
USA	Hawaii	Honolulu		Retail Store
USA	Hawaii	Honolulu		Retail Store
USA	Idaho	Boise		Retail Store
USA	Illinois	Chicago		Retail Store
USA	Illinois	Chicago		Retail Store
USA	Illinois	Deer Park		Retail Store
USA	Illinois	Naperville		Retail Store
USA	Illinois	Northbrook		Retail Store
USA	Illinois	Oak Brook		Retail Store
USA	Illinois	Orland Park		Retail Store
USA	Illinois	Schaumburg		Retail Store

Source: Citi Research

Figure 654. Apple Inc. (Continued)

Country	State	City	Size (sq	Description Comments (manufacturing, office)
USA	Illinois	Skokie		Retail Store
USA	Indiana	Indianapolis		Retail Store
USA	Indiana	Mishawaka		Retail Store
USA	Iowa	West Des Moines		Retail Store
USA	Kansas	Leawood		Retail Store
USA	Kentucky	Lexington		Retail Store
USA	Kentucky	Louisville		Retail Store
USA	Louisiana	Baton Rouge		Retail Store
USA	Louisiana	Metairie		Retail Store
USA	Maine	South Portland		Retail Store
USA	Maryland	Annapolis		Retail Store
USA	Maryland	Bethesda		Retail Store
USA	Maryland	Bethesda		Retail Store
USA	Maryland	Columbia		Retail Store
USA	Maryland	Towson		Retail Store
USA	Massachus	Boston		Retail Store
USA	Massachus	Braintree		Retail Store
USA	Massachus	Burlington		Retail Store
USA	Massachus	Cambridge		Retail Store
USA	Massachus	Chestnut Hill		Retail Store
USA	Massachus	Dedham		Retail Store
USA	Massachus	Hingham		Retail Store
USA	Massachus	Holyoke		Retail Store
USA	Massachus	Natick		Retail Store
USA	Massachus	Peabody		Retail Store
USA	Michigan	Ann Arbor		Retail Store
USA	Michigan			Retail Store
USA	Michigan	Grand Rapids		Retail Store
USA	Michigan	Novi		Retail Store
USA	Michigan	Troy		Retail Store
USA	Minnesota	Bloomington		Retail Store
USA	Minnesota	Edina		Retail Store
USA	Minnesota	Minneapolis		Retail Store
USA	Minnesota	Minnetonka		Retail Store
USA	Minnesota	Roseville		Retail Store
USA	Mississippi	Ridgeland		Retail Store
USA	Missouri	Kansas City		Retail Store
USA	Missouri	St. Louis		Retail Store
USA	Missouri	St. Louis		Retail Store
USA	Nebraska	Omaha		Retail Store
USA	Nevada	Las Vegas		Retail Store
USA	Nevada	Las Vegas		Retail Store
USA	Nevada	Las Vegas		Retail Store
USA	Nevada	Reno		Retail Store
USA	New Hamp	Nashua		Retail Store
USA	New Hamp	Salem		Retail Store
USA	New Jersey	Atlantic City		Retail Store
USA	New Jersey	Bridgewater		Retail Store
USA	New Jersey	Cherry Hill		Retail Store
USA	New Jersey	Edison		Retail Store
USA	New Jersey	Freehold		Retail Store
USA	New Jersey	Lawrence Township		Retail Store
USA	New Jersey	Marlton		Retail Store
USA	New Jersey	Paramus		Retail Store
USA	New Jersey	Rockaway		Retail Store
USA	New Jersey	Short Hills		Retail Store
USA	New Jersey	Wayne		Retail Store
USA	New Jersey	Woodcliff Lake		Retail Store
USA	New Mexic	Albuquerque		Retail Store
USA	New York	Albany		Retail Store
USA	New York	Buffalo		Retail Store
USA	New York	Garden City		Retail Store
USA	New York	Huntington Station		Retail Store
USA	New York	Lake Grove		Retail Store
USA	New York	Manhasset		Retail Store
USA	New York	Nanuet		Retail Store
USA	New York	New York		Retail Store
USA	New York	New York		Retail Store
USA	New York	New York		Retail Store
USA	New York	New York		Retail Store
USA	New York	New York		Retail Store
USA	New York	Syracuse		Retail Store

Source: Citi Research

Figure 655. Apple Inc. (Continued)

Country	State	City	Size (sq	Description Comments (manufacturing, office)
USA	New York	Victor		Retail Store
USA	New York	White Plains		Retail Store
USA	New York	Yonkers		Retail Store
USA	North Caro	Charlotte		Retail Store
USA	North Caro	Charlotte		Retail Store
USA	North Caro	Durham		Retail Store
USA	North Caro	Greensboro		Retail Store
USA	North Caro	Raleigh		Retail Store
USA	Ohio	Akron		Retail Store
USA	Ohio	Cincinnati		Retail Store
USA	Ohio	Columbus		Retail Store
USA	Ohio	Columbus		Retail Store
USA	Ohio	Westlake		Retail Store
USA	Ohio	Woodmere		Retail Store
USA	Oklahoma	Oklahoma		Retail Store
USA	Oklahoma	Tulsa		Retail Store
USA	Oregon	Portland		Retail Store
USA	Oregon	Tigard		Retail Store
USA	Oregon	Tigard		Retail Store
USA	Pennsylvan	Ardmore		Retail Store
USA	Pennsylvan	King of Prussia		Retail Store
USA	Pennsylvan	Lancaster		Retail Store
USA	Pennsylvan	Philadelphia		Retail Store
USA	Pennsylvan	Pittsburgh		Retail Store
USA	Pennsylvan	Pittsburgh		Retail Store
USA	Pennsylvan	Pittsburgh		Retail Store
USA	Pennsylvan	Whitehall		Retail Store
USA	Pennsylvan	Willow Grove		Retail Store
USA	Rhode Isl	Providence		Retail Store
USA	South Caro	Charleston		Retail Store
USA	South Caro	Greenville		Retail Store
USA	Tennessee	Franklin		Retail Store
USA	Tennessee	Germantown		Retail Store
USA	Tennessee	Knoxville		Retail Store
USA	Tennessee	Nashville		Retail Store
USA	Texas	Austin		Retail Store
USA	Texas	Austin		Retail Store
USA	Texas	Dallas		Retail Store
USA	Texas	Dallas		Retail Store
USA	Texas	El Paso		Retail Store
USA	Texas	Fort Worth		Retail Store
USA	Texas	Friendswood		Retail Store
USA	Texas	Frisco		Retail Store
USA	Texas	Houston		Retail Store
USA	Texas	Houston		Retail Store
USA	Texas	Houston		Retail Store
USA	Texas	Houston		Retail Store
USA	Texas	Plano		Retail Store
USA	Texas	San Antonio		Retail Store
USA	Texas	San Antonio		Retail Store
USA	Texas	Southlake		Retail Store
USA	Texas	Sugar Land		Retail Store
USA	Texas	The Woodlands		Retail Store
USA	Utah	Farmington		Retail Store
USA	Utah	Murray		Retail Store
USA	Utah	Salt Lake City		Retail Store
USA	Virginia	Arlington		Retail Store
USA	Virginia	Fairfax		Retail Store
USA	Virginia	McLean		Retail Store
USA	Virginia	Norfolk		Retail Store
USA	Virginia	Reston		Retail Store
USA	Virginia	Richmond		Retail Store
USA	Virginia	Woodbridge		Retail Store
USA	Washingto	Bellevue		Retail Store
USA	Washingto	Lynnwood		Retail Store
USA	Washingto	Seattle		Retail Store
USA	Washingto	Spokane		Retail Store
USA	Washingto	Tacoma		Retail Store
USA	Washingto	Tukwila		Retail Store
USA	Wisconsin	Glendale		Retail Store
USA	Wisconsin	Madison		Retail Store
USA	Wisconsin	Wauwatosa		Retail Store

Source: Citi Research

Figure 656. Applied Materials Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada	Ontario	Toronto		Research & Development
China		Shanghai		Main Office
China	Shaanxi	Xi'an		Engineering and Development Center
China		Beijing		Sales and Services
China	Hexi	Tianjin		Sales and Services
China	Jiangsu	Wuxi		Sales and Services
China		Suzhou		Sales and Services
France		Meylan		Business Center
France		Corbeil - Essonnes		Sales and Services
France		Rousset		Sales and Services
Germany		Dresden		Business Center
Germany		Alzenau		Research, Development and Manufacturing
Germany		Ammerthal		Research, Development and Manufacturing
Germany		Feldkirchen		Sales and Services
Germany		Heimstetten		Sales and Services
India	Karnataka	Bangalore		
India	Tamil Nadu	Chennai		
India	Uttar Pradesh	Noida		
Indonesia		Jakarta		Sales and Services
Ireland		County Kildare		Sales and Services
				Manufacturing; Research, Development,
				Engineering; Customer Support
Israel		Rehovot	422,000	
Israel		Rehovot		
Israel		Kiryat Gat		
Italy	Veneto	Treviso		Research, Development and Manufacturing
Italy		Milan		Sales and Services
Italy	L'Aquila	Avezzano		Sales and Services
Italy		Catania		Sales and Services
Japan		Tokyo		Main Office
Japan		Kyoto		Sales and Services
Japan	Yamagata	Tsuruoka		Sales and Services
Japan	Mie	Yokkaichi-shi		Sales and Services
Japan	Hiroshima	Hiroshima		Sales and Services
Japan	Kamimashiki	Kumamoto		Sales and Services
Japan	Honshu	Osaka		Sales and Services
Malaysia	Sarawak	Kuching		Sales and Services
Malaysia		Kedah Darul Aman		Sales and Services
Netherlands		Haarlemmer Hoofddorp		Business Center
Netherlands		Nijmegen		Sales and Services
Philippines		Clark Freeport Zone		Sales and Services
Singapore			402,000	Manufacturing and Customer Support
Singapore		Upper Changi		Main Office
Singapore		Science Park II		Asia Product Development
South Korea	Gyeonggi-dc	Seongnam-si		Main Office
South Korea	Gyeonggi-dc	Hwaseong		Sales and Services
South Korea	Gyeonggi-dc	Icheon		Sales and Services
South Korea	Chungcheon	Cheongju		Sales and Services
South Korea	Chungcheon	Cheonan		Sales and Services
South Korea	Gyeonggi-dc	Paju-si		Sales and Services
South Korea	Gyeongsang	Gumi		Sales and Services
Switzerland	Lausanne	Cheseaux		Research, Development and Manufacturing
Taiwan		Tainan	320,000	Manufacturing and Customer Support
Taiwan		Hsinchu		Main Office
Taiwan		Taichung		Sales and Services
Taiwan		Tainan		Sales and Services
Taiwan		Taoyuan City		Sales and Services
Taiwan		Tainan		Manufacturing
UK		Berkshire		Sales and Services
				Headquarters; Marketing; Manufacturing;
				Distribution; Research, Development, Engineering;
USA	California	Santa Clara	1,626,000	Customer Support
USA	Texas	Austin	1,864,000	Manufacturing
				Manufacturing; Research, Development,
USA	Massachusetts	Gloucester	446,000	Engineering; Customer Support
USA	California	Sunnyvale		Maydan Technology Center
USA	Montana	Kalispell		Research, Development and Manufacturing
USA	Utah	Salt Lake City		Research, Development and Manufacturing
USA	Massachusetts	Gloucester		Research, Development and Manufacturing

Source: Citi Research

Figure 657. ARM Holdings

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai		
China		Beijing		
China		Shenzhen		
Finland		Oulu		
France		Grenoble		
France		Paris		
France		Sophia Antipolis		
Germany		Grasbrunn		
India		Bangalore		
India		Noida		
Israel		Kfar Saba		
Japan		Yokohama		
Norway		Trondheim		
Slovenia		Sentjerne		
South Korea		Seoul		
Sweden		Lund		
Taiwan		Taipei		
Taiwan		Hsinchu		
UK		Cambridge		Global HQ
UK		Blackburn		
UK		Maidenhead		
UK		Sheffield		
USA	California	San Jose		Main Regional Office
USA	California	Irvine		
USA	California	San Diego		
USA	Massachusetts	Boston		Sales Office
USA	Texas	Austin		
USA	Texas	Keil		
USA	Washington	Olympia		
USA	Washington	Seattle		

Source: Citi Research



Figure 658. Arris Enterprises

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil		São Paulo		
Chile		Santiago		
China	Guangdong	Shenzhen	29,078	Office space
China		Beijing		
China		Shanghai		
India	Karnataka	Bangalore		
India	Haryana	Gurgaon		
Ireland	Munster	Cork	11,135	Office space
Israel		Tel Aviv	55,391	Office/Warehouse space
Japan		Tokyo		
Mexico		Tijuana	83,124	Manufacturing
Mexico		Mexico City		
Netherlands		Amsterdam		
South Korea		Seoul		
Spain		Barcelona		
Sweden		Linköping		
USA	Georgia	Suwanee	129,403	Office space
USA	Massachusetts	Westborough	87,319	Office
USA	Connecticut	Wallingford	82,155	Office space
USA	Illinois	Lisle	63,922	Office space
USA	Oregon	Beaverton	60,389	Office space/Manufacturing
USA	California	Ontario	59,269	Warehouse
USA	Washington	Kirkland	37,413	Office space
USA	Colorado	Englewood	32,240	Office space
USA	California	Ontario	17,400	Warehouse
USA	California	Redwood City	15,736	Office
USA	North Carolina	Cary	151,500	Warehouse
USA	Pennsylvania	State College	133,000	Office space
USA	Illinois	Chicago		
USA	Colorado	Denver		
USA	Pennsylvania	Horsham		
USA	Pennsylvania	Philadelphia		

Source: Citi Research

Figure 659. Arrow Electronics

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		Office
Australia		Adelaide		Office
Australia		Brisbane		Office
Australia		Melbourne		Office
Australia		Sydney		Office
Austria		Linz		Office
Austria		Vienna		Office
Austria		Vienna		Office
Belgium		Sint-Stevens-Woluwe		Office
Brazil		Sao Paulo		Office
Brazil	Rio Grande do Sul	Porto Alegre		Office
Bulgaria		Sofia		Office
Canada	Ontario	Toronto	264717	Office
Canada	Ontario	Concord		Office
Canada	Quebec			Office
Canada	Calgary	Alberta		Office
Canada	British Columbia	Burnaby		Office
Canada	Ontario	Kanata		Office
Canada	Ontario	Mississauga		Office
Canada	Quebec	Dorval		Office
China		Shanghai		Office
China		Beijing		Office
China		Changchun		Office
China		Chengdu		Office
China		Chongqing		Office
China		Fuzhou		Office
China		Guangzhou		Office
China		Nanjing		Office
China		Ningbo		Office
China		Qingdao		Office
China		Shenyang		Office
China		Shenzhen		Office

Source: Citi Research

Figure 660. Arrow Electronics (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Suzhou		Office
China		Tianjin		Office
China		Wuhan		Office
China		Xiamen		Office
China		Xi'an		Office
China		Zhengzhou		Office
China	Guangdong	Zhuhai		Office
Croatia		Zagreb		Office
Czech Republic		Prague		Office
Czech Republic		Ostrava		Office
Denmark		Aarhus		Office
Denmark		Ballerup		Office
Denmark		Herlev		Office
Denmark		Silkeborg		Office
Estonia		Tallinn		Office
Finland		Espoo		Office
Finland		Oulu		Office
Finland		Turku		Office
France		Courbevoie		Office
France		Bordeaux		Office
France	Haute-Garonne	Toulouse		Office
France		Paris		Office
France		Strasbourg		Office
France		Rennes		Office
Germany		Fürstentfeldbruck		Office
Germany		Ettlingen		Office
Germany		Oberhausen		Office
Germany		Aachen		Office
Germany		Berlin		Office
Germany		Dortmund		Office
Germany		Frankfurt		Office
Germany		Erfurt		Office
Germany		Freiburg		Office
Germany		Göttingen		Office
Germany		Karlsruhe		Office
Germany		Hamburg		Office
Germany		Leipzig		Office
Germany		München		Office
Germany		Ravensburg		Office
Germany		Nuremberg		Office
Germany		Stuttgart		Office

Source: Citi Research

Figure 661. Arrow Electronics (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Greece		Athens		Office
Hong Kong				Office
Hungary		Budapest		Office
Iceland		Reykjavik		Office
India		Bangalore		Office
India		Chennai		Office
India		Cochin		Office
India		Hyderabad		Office
India		Mumbai		Office
India		New Delhi		Office
India		Pune		Office
Indonesia		Jakarta		Office
Israel		Kfar Saba		Office
Israel		Peteach Tikva		Office
Italy	Lombardy	Milan		Office
Italy		Torino		Office
Italy		Firenze		Office
Italy		Bologna		Office
Italy		Rome		Office
Italy		Padova		Office
Italy		Senigallia		Office
Japan		Tokyo		Office
Luxembourg		Windhof		Office
Malaysia		Kuala Lumpur		Office
Malaysia		Penang		Office
Mexico	Cuauhtémoc	Deleg		Office
Morocco		Casablanca		Office
Netherlands		Emmen		Office
Netherlands		Hilversum		Office
Netherlands		Houten		Office
New Zealand		Auckland		Office
New Zealand		Christchurch		Office
Norway		Oslo		Office
Norway		Nedre Vats		Office
Philippines		Muntinlupa City		Office
Poland		Krakow		Office
Poland		Warsaw		Office
Poland		Katowice		Office
Portugal		Lisbon		Office
Romania		Cluj-Napoca		Office

Source: Citi Research

Figure 662. Arrow Electronics (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Russia		Moscow		Office
Russia		Saint - Petersburg		Office
Russia		Ekaterinburg		Office
Serbia		Belgrade		Office
Singapore				Office
Slovakia		Bratislava		Office
Slovenia		Ljubljana		Office
South Africa		Cape Town		Office
South Africa		Durban		Office
South Africa		Johannesburg		Office
South Korea		Seoul		Office
South Korea		Guro		Office
Spain		Madrid		Office
Spain		Barcelona		Office
Spain		Las Arenas		Office
Spain		Lasarte - Guipuzcoa		Office
Spain		Valencia		Office
Spain		Zaragoza		Office
Sweden		Kista		Office
Sweden		Vastra Frölunda		Office
Switzerland		Wallisellenstrasse		Office
Switzerland		Neuchâtel		Office
Switzerland		Yverdon		Office
Switzerland		Zurich		Office
Taiwan		Kaohsiung		Office
Taiwan		Hsinchu		Office
Taiwan		Taipei		Office
Thailand		Bangkok		Office
Turkey		Istanbul		Office
UK		Harrogate		Office
UK		London		Office
UK		Reading		Office
UK		Nottingham		Office
UK		Stockport		Office
UK		Manchester		Office
UK		Bedford		Office
Ukraine		Kiev		Office
USA	Colorado	Englewood	115000	
USA	Georgia	Atlanta		Office
USA	Massachusetts	Boston		Office
USA	Ohio	Cleveland		Office
USA	Colorado	Denver		Office
USA	Minnesota	Minneapolis		Office
USA	Alabama	Huntsville		Office
USA	Arizona	Phoenix	60000	
USA	California	Foot Hill Ranch		Office
USA	California	Roseville		Office
USA	California	San Diego		Office
USA	California	Santa Clara		Office
USA	California	WoodlandHills		Office
USA	Colorado	Westminster		Office
USA	Connecticut	Wallingford		Office
USA	Florida	Deerfield Beach		Office
USA	Georgia	Duluth		Office
USA	Indiana	Indianapolis	100000	
USA	Illinois	Itasca		Office
USA	Kansas	Overland Park		Office
USA	Massachusetts	Wilmington		Office
USA	Maryland	Columbia		Office
USA	Michigan	Plymouth		Office
USA	Minnesota	Eden Prairie		Office
USA	Missouri	Earth City		Office
USA	North Carolina	Morrisville		Office
USA	New Jersey	Parsippany		Office
USA	New York	Islandia		Office
USA	New York	Rochester		Office
USA	Ohio	Dayton		Office
USA	Ohio	Solon	224000	
USA	Oklahoma	Tulsa		Office
USA	Oregon	Beaverton		Office
USA	Pennsylvania	Horsham		Office
USA	Pennsylvania	Pittsburgh		Office
USA	Texas	Austin		Office
USA	Texas	El Paso		Office
USA	Texas	Houston		Office
USA	Texas	Plano		Office
USA	Utah	Salt Lake City		Office
USA	Washington	Bellevue		Office
USA	Wisconsin	Brookfield		Office
Vietnam		Ho Chi Minh City		Office

Source: Citi Research

Figure 663. Asahi Glass

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Belgium		Brussels		Float glass, figured glass, double-glazing units
Belgium		Louvain-la-Neuve		Automotive glass
Brazil		Sao Paulo		Float glass, Automotive glass, and Mirror
Canada	Ontario			Automotive glass assembly
				Glass related plant engineering and miscellaneous procurement,sales etc
China	Jiangsu	Kunshan		Glass substrates for TFT-LCDs
China	Jiangsu	Kunshan		Glass substrates for TFT-LCDs
China	Jiangsu	Shenzhen		Providing AGC Group companies with functional services
China	Huangpu	Shanghai		Automotive glass fabrication and sales
China	Guangdong	Foshan		Automotive glass fabrication and sales
China	Hebei	Qinhuangdao		Sales of Flat Glass products
China	Hong Kong			Import and sales
China		Shanghai		Manufacturing and sales
China				Manufacturing and sales
China		Shenzhen		Processing of ultra thin soda lime glass
China	Shandong			
China	Guangdong	Guangzhou		Glass substrates for HDD
China		Beijing		Activity for AGC Group expansion in China
Czech Republic		Temple		Float glass/double-glazing units/automotive
France				Float glass, automotive glass
India	Haryana	Gurgaon		Manufacturing and sales
Indonesia		Jakarta		Manufacturing and sales
Indonesia		Jakarta		Caustic Soda, EDC, VCM, PVC
Italy				Float glass, automotive glass
Japan		Tokyo		Head Office
Japan		Tokyo		Information technology application service
Japan		Tokyo		Sales of various refractories and fine ceramics
Japan		Tokyo		Fluorinated coatings
Japan		Yonezawa		Glass substrates for flat-panel displays[FPD]
				Glass frit and paste for electronics, optoelectronics products for components
Japan		Koriyama		Plant engineering
Japan		Chiba City		Sales of processed glass products
Japan		Tokyo		Factoring, loan to group companies
Japan		Tokyo		Sales and installation
Japan		Tokyo		ETFE films for greenhouse
Japan		Tokyo		Accident insurance brokerage
Japan		Tokyo		Arranging the delivery service
Japan		Sagamihara City		Glass-fiber-reinforced plastics
Japan		Fukuoka		Manufacturing
Japan		Taketoyo		Manufacturing and sales
Japan		Tokyo		Polyurethane waterproofing materials
Japan		Tokyo		R&D
				Liquid crystal materials, Cathode materials for batteries
Japan		Chigasaki City		
Japan		Kitakyushu		Fine silica, Sodium silicate, Methyl bromide
Japan		Yokohama-shi		Cleaning of buildings
Japan		Shizuoka		Glass products
Japan		Kawasaki		Glass-related plant engineering
Japan		Obama		Pharmaceutical intermediates
Mexico				Automotive glass assembly
Netherlands				Float glass, double-glazing units and other
Philippines		Pasig City		Manufacturing and sales
Philippines	Laguna			Assembly and delivery service
Russia				Float/automotive/architectural glass
				Sales promotion,sales,and physical distribution of Flat glass
Singapore				Glass substrates for TFT-LCDs
South Korea: Chungcheong	Cheongju			Glass substrates for TFT-LCDs
South Korea: Gyeongsang	Gumi			Glass substrates for PDP
South Korea		Gumi		
Spain		Barcelona		joint-venture manufacturing company
Taiwan	Hsinchu	Zhubei		Sales of electronics materials
Taiwan		Douliu city		Glass substrates for TFT-LCDs
Thailand	Lamphun			Manufacturing
Thailand	Samutprakarn			
Thailand	Chonburi			Manufacturing of heat-resistant glass.
Thailand	Samutprakarn			Manufacturing and sales
Thailand	Chonburi			Automotive glass fabrication and sales
Thailand		Bangkok		Sales & Marketing of AGC Chemicals Products
UK				Automotive glass assembly
				Fluoropolymers (PTFE/ETFE), Sales & Marketing of AGC Chemicals Products
UK	Lancashire			Regional headquarter and representative office, holding company
USA	Georgia	Alpharetta		Automotive glass
USA	Kentucky			Automotive glass assembly
USA	Ohio			Automotive glass parts (sales)
USA	California			R&D
USA	Michigan			Soda ash (sales)
USA	Tennessee	Kingsport		Fluoropolymers (PTFE/ETFE), Sales & Marketing of AGC Chemicals Products
USA	Pennsylvania			SIC Products, CMP Slurry
USA	Oregon			Finance of group companies
USA	Georgia			

Source: Citi Research

Figure 664. ASE

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Belgium		Waterloo		
China		Shanghai	1431000	Design and production/Manufacturing
China		Suzhou	433000	Packaging and testing
China	Shandong		446000	Packaging and testing
China		Kunshan	1489000	Packaging and testing
China		Shenzhen	611000	Manufacturing
China		Shanghai	680000	Manufacturing
China		Shanghai	909000	Packaging and testing
China		Kunshan	388000	
China		Nantou	383000	
China	Jiangsu	Kunshan		
China		Suzhou		
Germany		Munchen		
Japan	Chiba		415000	Packaging and testing
Japan	Yamagata			
Japan		Yokohama		
Malaysia	Penang		828000	Packaging and Testing
Mexico		Guadalajara	164000	Manufacturing
Singapore			282000	Packaging and testing
South Korea	Gyeonggi-do	Paju	810000	Packaging and Testing
South Korea	Kyunggi			
South Korea		Seoul		
Taiwan		Kaohsiung	3946000	Packaging facility
Taiwan	Taoyuan	Chungli	1842000	Packaging and Testing
Taiwan	Nantou		110000	Packaging services
Taiwan		Kaohsiung	864000	Testing
Taiwan		Chungli	62000	Wafer probing testing
Taiwan		Taichung	161000	Packaging and testing
Taiwan	Nantou		1009000	
Taiwan		Hsinchu		
USA	California		96000	Engineering and Final testing
USA	California	Sunnyvale		
USA	California	Irvine		
USA	California	San Diego		
USA	Texas	Austin		
USA	Massachusetts	Woburn		
USA	Arizona	Tempe		
USA	North Carolina	Hillsborough		

Source: Citi Research

Figure 665. ASML Holdings NV

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Hong Kong		4575	
China		Tianjin		
China		Shanghai		
France				
Germany		Dresden		
Ireland	Kildare	Leixlip		
Israel		Qiryat Gat		
Italy		Avezzano		
Italy		Milan		
Japan		Tokyo		
Malaysia	Kedah	Kulim		
Netherlands		Veldhoven	1356253	Headquarters
Netherlands		Oirschot		
Singapore				
South Korea	Gyeonggi-Do	Hwasung		
South Korea	Gyeonggi-Do	Ichon		
South Korea	Kyungki-Do			
Taiwan		Hsinchu		Head Office
Taiwan	Taoyuan		96875	
Taiwan	Hsin-shih	Tainan		
USA	Arizona	Chandler	96875	
USA	Connecticut	Wilton	290625	
USA	California	San Jose		
USA	California	Santa Clara	53820	
USA	California	Irvine		
USA	Idaho	Boise		
USA	Maine	Westbrook		
USA	New Mexico	Albuquerque		
USA	Oregon	Hillsboro		
USA	Texas	Austin		
USA	Texas	Richardson		
USA	Virginia	Manassas		
USA	New York	Ballston Lake		
USA	Utah	Lehi		
USA	Minnesota	Eagan		
USA	New York	Fishkill		

Source: Citi Research

Figure 666. AsusTek Computer Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South W	North Ryde		ASUSTek Computer (Aust) Pty. Ltd.
Bangladesh		Dhaka		AsusTek Computer Inc.
Canada	Ontario	Markham		Canada Branch Office
China	Hong Kong			ASUS Technology(Hong Kong) Limited
Czech Republic				ASUS Computer Czech Republic S.R.O
France				ASUS France S.A.R.L.
Germany				ASUS COMPUTER GmbH (Germany)
India	Maharashtra	Mumbai		Asus Technology Pvt Ltd.
Indonesia		Jakarta		PT. ASUS Indonesia
Italy				ASUSTek Italy srl
Malaysia		Kuala Lumpur		ASUSTek Computer Sdn Bhd
Netherlands				ASUS Computer Benelux B.V.
Poland		Warsaw		ASUS Polska SP. Z.O.O.
Singapore				ASUS Technology Pte Ltd
South Africa	Gauteng	Johannesburg		Asustek Computers (Pty) Ltd
Spain		Barcelona		ASUS IBERICA S.L.
Sri Lanka		Colombo		Asus Centre
Sweden	Kista			ASUS Nordic AB
Taiwan		Taipei		Headquarters
Thailand		Bangkok		ASUSTek Computer (Thailand) Co., Ltd.
Turkey				Asus Bilgisayar Sistemleri
UK				ASUSTek UK Ltd.
United Arab Emirates		Dubai		ASUS COMPUTER ME
USA	California	Fremont		US Headquarters
Vietnam				ASUS Technology (Vietnam) Co., Ltd.

Source: Citi Research

Figure 667. ATMI Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
USA	Connecticut	Danbury		Headquarters
USA	Arizona	Tempe		Sales & Marketing
USA	Minnesota	Bloomington		Manufacturing & Operations
USA	Texas			Sales & Customer Service
USA	Texas	Burnet		Materials Manufacturing
Belgium		Hoegaarden		Manufacturing
Belgium		Brussels		Cell Culture Technologies
Germany		Unterhaching		Sales & Customer Service
China		Shanghai		Sales & Customer Service
Japan		Tokyo		Sales & Customer Service
Malaysia		Kuala Lumpur		Office
Singapore				Sales & Customer Service
South Korea		Gyeonggi-do		Sales & Customer Service
Taiwan		Hsinchu		Sales & Customer Service
Taiwan		Hsinchu		Technology Development Center

Source: Citi Research

Figure 668. Au Optronics

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Fujian	Xiamen		Office
China	Jiangsu	Suzhou		Office
China		Shanghai		Office
Czech Republic	Margraviate of Mo Brno			Office
Czech Republic	Margraviate of Mo Brno			Office
Germany		Oberhausen		Office
Japan	Honshu	Osaka		Office
Japan		Tokyo		Office

Source: Citi Research

Figure 669. Au Optronics (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Netherlands		Amsterdam		Office
Singapore				Office
Slovakia				Office
Slovakia		Trencin		Office
South Korea		Seoul		Office
Taiwan		Hsinchu		Headquarters
Taiwan	Taoyuan			Offices
Taiwan		Taichung		Offices
USA	California	Milpitas		Office

Source: Citi Research

Figure 670. Avnet

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Belgium		Tongeren	388,000	EM and TS warehousing and value-added operations
China	Hong Kong		181,000	EM warehousing and value-added operations
Germany	Bavaria	Poing	423,000	EM warehousing, value-added operations and offices
Germany	Bavaria	Poing	296,000	EM warehousing, value-added operations and offices
Germany	North Rhine-V Nettetel		137,000	EM warehousing, value-added operations and offices
Germany	North Rhine-V Nettetel		126,000	TS warehousing, value-added operations and offices
Mexico		Nogales	124,000	EM warehousing and value-added operations
USA	Arizona	Chandler	399,000	EM warehousing and value-added operations
USA	Ohio	Grove City	297,000	EM warehousing, integration and value-added operations
USA	Ohio	Groveport	266,000	TS warehousing, integration and value-added operations
USA	Arizona	Chandler	231,000	EM warehousing, integration and value-added operations
USA	Georgia	Atlanta	195,000	TS warehousing, integration and value-added operations
USA	Arizona	Phoenix	176,000	Corporate and EM Headquarters
USA	Texas	Coppell	174,000	EM warehousing, integration and value-added operations
USA	Arizona	Tempe	132,000	TS Headquarters

Source: Citi Research

Figure 671. AVX

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Tianjin	520,000	Manufacturing — PC
China		Tianjin	355,000	Manufacturing — PC
China	Hong Kong		30,000	Warehouse/Office — PC — CP
Czech Republic		Lanskroun	500,000	Manufacturing/Warehouse/Research — PC
Czech Republic		Lanskroun	70,000	Manufacturing/Warehouse — PC
Czech Republic		Uherske Hradist	470,000	Manufacturing — PC — CP
Czech Republic		Uherske Hradist	139,000	Manufacturing/Warehouse — CP — PC
Czech Republic		Bzenec	194,000	Manufacturing — CP
El Salvador		San Salvador	420,000	Manufacturing — PC
France		Saint-Apollinaire	322,000	Manufacturing/Research — PC
Germany		Betzdorf	111,000	Manufacturing — CP
Israel		Jerusalem	88,000	Manufacturing/Research — PC
Japan		Adogawa	206,000	Manufacturing — PC
Malaysia		Penang	190,000	Manufacturing — PC
Mexico		Juarez	116,000	Manufacturing — PC — CP
UK	Northern Irela	Coleraine	185,000	Manufacturing/Research — PC
USA	South Carolin	Fountain Inn	300,000	Headquarters/Manufacturing/Warehouse
USA	South Carolin	Myrtle Beach	308,000	Manufacturing/Warehouse/Research — PC — CP
USA	New York	Olean	113,000	Manufacturing — PC
USA	Florida	Jacksonville	100,000	Manufacturing — PC
USA	New York	Huntington Stati	94,000	Manufacturing/Research — PC
USA	Maine	Biddeford	72,000	Manufacturing — PC
USA	South Carolin	Conway	71,000	Manufacturing/Office — PC
USA	California	Sun Valley	25,000	Manufacturing — PC
USA	Colorado	Colorado Spring	15,000	Manufacturing — PC

Source: Citi Research

Figure 672. Belden

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Australia		Victoria		Sales Offices	
Brazil		Sao Paulo		Sales Offices	
Canada	Quebec	Montreal			
Canada		Ontario		Manufacturing Facilities	
China		Beijing		Sales Offices	
China	Hong Kong			Sales Offices	
China		Shanghai		Sales Offices	
China	Jiangsu	Kunshan		Sales Offices	
Czech Republic				Manufacturing Facilities	
Denmark		Gjern		Manufacturing Facilities	
France				Manufacturing Facilities	
France				Manufacturing Facilities	
France		Lyon		Sales Offices	
Germany		Neckartenzlingen		Sales Offices	
Hungary		Budapest		Manufacturing Facilities	
India	Maharashtra	Mumbai		Sales Offices	
Indonesia		Jakarta		Sales Offices	
Italy		Milan		Sales Offices	
Italy		Bagnacavallo		Sales Offices	
Japan		Tokyo		Sales Offices	
Malaysia	Selangor	Subang Jaya		Sales Offices	
Mexico		Tijuana		Manufacturing Facilities	
Mexico	Jalisco	Guadalajara		Sales Offices	
Mexico	Sonora				
Mexico	Nuevo Leon	Monterrey		Sales Offices	
Mexico				Sales Offices	
Mexico	Jalisco	Guadalajara			
Netherlands		Venlo		Sales Offices	
Netherlands		Hilversum		Sales Offices	
New Zealand		Gordon		Sales Offices	
Philippines		Pasig		Sales Offices	
Russia		Moscow		Sales Offices	
South Korea		Seoul		Sales Offices	
Spain		Madrid		Manufacturing Facilities	
Sweden		Malmö		Sales Offices	
Thailand		Bangkok		Sales Offices	
UK		Manchester		Sales Offices	
United Arab Emirates		Dubai		Sales Offices	
USA	Indiana	Indianapolis			
USA	Indiana	Richmond		Corporate Office & Manufacturing Plant	
USA	Missouri	St. Louis		Headquarters	
USA	California	Fremont			
USA	Colorado	Denver			
USA	Florida	Hollywood		Sales Offices	
USA	New York	Whitestone		Sales Offices	
USA	Kentucky	Monticello		Manufacturing Facilities	
USA	New York	Horseheads		Manufacturing Facilities	
USA	Pennsylvania	Washington		Manufacturing Facilities	
Vietnam		Ho Chi Minh City		Sales Offices	

Source: Citi Research

Figure 673. Benchmark Electronics

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Brazil	Campinas		49,000		
China	Suzhou		326,000		
Malaysia	Penang		103,000	The main industrial hub of Penang, Malaysia.	
Malaysia	Penang		190,000		
Mexico	Guadalajara		214,000	Guadalajara Industrial Park	
Mexico	Guaymas		52,000	Precision Technologies Division	
				Large-scale integration, box-build, printed circuit board assemblies (PCBA)	
Mexico	Tijuana		106,000	and cable and harnesses	
Netherlands	Almelo		132,000	Serving high technology companies	
Romania	Brasov		224,000		
Singapore			42,000/71	Materials procurement	
				A high technology facility specializing in System Integration, Box Build, Chip	
Thailand		Ayutthaya	281,000	/ on Board, RF and complex products	
Thailand	Korat		190,000	Hub for technology companies	
USA	Arizona	Tempe	48,000	Benchmark Precision Technologies	
USA	Arizona	Phoenix	100,000	Aerospace and Defense products, opened in 1999	
USA	Minnesota	Winona	181,000		
USA	Texas	Angleton	110,000	Benchmark Angleton Division, first manufacturing facility	
USA	California	Concord	80,000	Benchmark Precision Technologies	
USA	North Dakota	Dunseith	100,000	Dunseith utilizes the Benchmark Design for Excellence	
USA	California	Freemont	52,000	Benchmark Precision Technologies	
				Providing EMS services to commercial, aerospace, defense, networking,	
USA	Alabama	Huntsville	276,000	industrial, test, instrumentation, and computer OEMs.	
USA	New Hampshire	Nashua	155,000	High quality printed circuit assemblies and fully integrated products.	
USA	Minnesota	Rochester	466,000	Minnesota Division, spread across 5 facilities	

Source: Citi Research

Figure 674. Blackberry

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Argentina		Buenos Aires			
Australia	New South W.	North Sydney			
Austria		Vienna			
Belgium		Diegem			
Brazil		Sao Paulo			
Canada	Ontario	Waterloo			
Canada	Ontario	Cambridge			
Canada	Ontario	Mississauga			
Canada	Ontario	Ottawa			
Canada	Ontario	Kanata			
Canada	Ontario	Toronto			
Canada	British Colum	Vancouver			
Canada	New Brunswic	Fredericton			
Canada	Nova Scotia	Bedford			
China	Hong Kong				
China		Beijing			
China		Guangzhou			
China		Shanghai			
China		Shenzhen			
China		Tianjin			
Czech Republic		Prague			
France		Courbevoie			
Germany		Bochum			
Germany		Frankfurt			
Germany		Düsseldorf			
Germany		Munich			
India		Delhi			
India	Maharashtra	Mumbai			
Indonesia		Jakarta			
Indonesia		Bali			
Italy		Milan			
Italy		Rome			
Japan		Tokyo			
Kenya		Nairobi			
Malaysia		Kuala Lumpur			
Mexico		Mexico City			
Netherlands		Amsterdam			
Nigeria		Lagos			
Poland		Warsaw			
Russia		Moscow			
Saudi Arabia		Riyadh			
Scotland		Glasgow			
Singapore					
South Africa		Johannesburg			
South Korea		Seoul			
Spain		Madrid			
Sweden		Gothenburg			
Sweden		Malmö			
Sweden		Stockholm			
Sweden		Göteborg			
Thailand		Pathum Wan			
Turkey		Istanbul			
UK	Berkshire	Slough			
UK	Cambridgeshire	Harston			
UK		Birmingham			
Ukraine		Kharkiv			
United Arab Emirates		Dubai			
Uruguay		Canelones			
USA	California	Campbell			
USA	California	Redwood City			
USA	California	San Diego			
USA	California	Mountain View			
USA	Connecticut	Milford			
USA	Florida	Sunrise			
USA	Georgia	Alpharetta			
USA	Illinois	Rolling Meadows			
USA	New Jersey	Bedminster			
USA	North Carolina	Cary			
USA	Texas	Irving			
USA	Washington	Bellevue			
USA	Washington	Seattle			
USA	Massachusetts	Andover			
USA	Washington				

Source: Citi Research

Figure 675. Broadcom

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Belgium		Mechelen			Office
China		Beijing			Office
China		Shanghai			Office
China		Shanghai			Office
Denmark		Copenhagen			Office
France		Sophia Antipolis			Office
Greece		Alimos			Office
India		Bangalore			Office
India		Hyderabad			Office
India		Mumbai			Office
Israel		Airport City			Office
Israel		Herzliya			Office
Israel		Herzliya			Office
Israel		Raanana			Office
Israel		Ramat Gan			Office
Israel		Tel Aviv			Office
Israel		Tel Aviv			Office
Israel		Yakum			Office
Japan		Tokyo			Office
Netherlands		Bunnik			Office
Singapore					Office
South Korea		Seoul			Office
Taiwan		Hsinchu			Office
Taiwan		Taipei			Office
UK		Bristol			Office
UK		Cambridge			Office
USA	California	Irvine			Headquarters
USA	Massachusetts	Andover			Office
USA	Massachusetts	Andover			Office
USA	Arizona	Chandler			Office
USA	Georgia	Duluth			Office
USA	North Carolina	Durham			Office
USA	New Jersey	Matawan			Office
USA	British Colum	Richmond			Office
USA	California	San Diego			Office
USA	California	San Jose			Office
USA	California	Santa Clara			Office
USA	California	Santa Clara			Office
USA	Washington	Seattle			Office
USA	California	Sunnyvale			Office

Source: Citi Research

Figure 676. Brother

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		Sales Facilities
Australia	New South Wales	Sydney		Sales Facilities
Austria		Vienna		Sales Facilities
Austria		Vienna		Sales Facilities
Belgium		Brussels		Sales Facilities
Brazil		Sao Paulo		Sales Facilities
Canada		Quebec		Sales Facilities
Chile		Santiago		Sales Facilities
China		Guangdong		Production Facilities
China		Xi'an Shaanxi		Production Facilities
China		Longgang District,		Production Facilities
China	Longgang	Shenzhen		Production Facilities
China		Shanghai		Sales Facilities
China		Shanghai		Sales Facilities
China		Hangzhou		others
Czech Republic		Brno		Sales Facilities
Denmark		Ishoej		Sales Facilities
England		Manchester		Sales Facilities
England		Manchester		Sales Facilities
England		Manchester		Others
Finland		Vantaa		Sales Facilities
France				Sales Facilities
Germany		Bad Vilbel		Sales Facilities
Germany		am Rhein, Basel		Sales Facilities
Germany		Bad Vilbel		Sales Facilities
Hong Kong		Tsim Sha Tsui		Sales Facilities
Hong Kong		Kowloon Bay		others
Hungary		Budapest		Sales Facilities
India	Maharashtra	Mumbai		Sales Facilities
Indonesia		Jakarta		Sales Facilities
Ireland		Dublin		Sales Facilities
Ishoej		Oslo		Sales Facilities
Italy		Bologna		Sales Facilities
Italy		Milano		Sales Facilities
Japan	Aichi	Nagoya		Production Facilities
Japan	Mie	Taki-gun		Production Facilities
Japan	Aichi	Nagoya		Sales Facilities
Japan	Aichi	Nagoya		Sales Facilities
Japan	Aichi	Nagoya		others
Malaysia	Johor	Johor Bahru		Production Facilities
Malaysia	Selangor	Petaling Jaya		Sales Facilities
Netherlands		Amstelveen		Sales Facilities
New Zealand		Lower Hutt		Sales Facilities

Source: Citi Research

Figure 677. Brother (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Peru		Lima		Sales Facilities
Philippines	Batangas	Tanauan City		Production Facilities
Philippines		Taguig		Sales Facilities
Poland		Warsaw		Sales Facilities
Portugal		Lisbon		Sales Facilities
Russia		Moscow		Sales Facilities
Singapore		Singapore		Sales Facilities
Slovakia		Krupina		Production Facilities
South Africa	Gauteng	Pretoria		Sales Facilities
South Korea		Seoul		Sales Facilities
Spain		Madrid		Sales Facilities
Sweden		Gothenburg		Sales Facilities
Switzerland		Daettwil-Baden		Sales Facilities
Taiwan		Kaohsiung		Production Facilities
Taiwan		Taipei City		Sales Facilities
Thailand		Bangkok		Sales Facilities
Turkey		Istanbul		Sales Facilities
UAE		Dubai		Sales Facilities
United Kingdom		London		Others
United States	Tennessee	Bartlett		Production Facilities
United States	New Jersey	Bridgewater		Sales Facilities
United States	Mexico	Mexico City		Sales Facilities
United States	Colorado	Broomfield		Sales Facilities
Vietnam		Duong Province		Production Facilities
Vietnam	Dong Nai Province	Dong Nai Province		Production Facilities
Vietnam		Ho Chi Minh City		Sales Facilities
Wrexham		Ruabon		Production Facilities

Source: Citi Research

Figure 678. Brocade Communications

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Australia	Victoria	Melbourne			
Australia	Victoria	Southbank			
Australia	New South W	Sydney			
Australia		Canberra			
Australia	Queensland	Brisbane			
Belgium					
Brazil		Sao Paulo			
Brazil		Brasilia			
Brazil		Rio de Janeiro			
Canada	Alberta	Calgary			
Canada	Ontario				
Canada	Quebec	Montreal			
Canada	Ontario	Toronto			
Chile		Santiago			
China		Beijing			
China		Shanghai			
China		Guangzhou			
China		Shenzhen			
China	Hong Kong				
Denmark					
Finland		Espoo		Brocade Communications	
France		Paris		Brocade Communications France SAS	
Germany				Brocade Communications GmbH	
Germany		Neu-Isenburg		Brocade Communications GmbH	
Greece					
India	Haryana	Gurgaon		Sales office	
India	Maharashtra	Mumbai		Sales office	
India	Karnataka	Bangalore		Sales office	
India	Karnataka	Bangalore		R&D Center	
India	Karnataka	Bangalore		Brocade Communications Systems Pvt. Ltd.	
Indonesia		Jakarta			
Israel		Tel Aviv			
Italy		Milan		Brocade Communications Italy Srl	
Italy		Rome		Brocade Communications Italy Srl	
Japan		Tokyo		Brocade Communications Systems K.K.	
Japan		Osaka			
Malaysia		Kuala Lumpur		Brocade Communications Systems Malaysia Sdn Bhd	
Mexico					
Netherlands					
Poland		Warsaw		Brocade Poland Sp. z o.o.	
Portugal					
Russia		Moscow			
Saudi Arabia		Riyadh			
Singapore				Brocade Communications Singapore Pte. Ltd.	
Singapore					
South Africa					
South Korea		Seoul		Brocade Korea Ltd.	
Spain		Madrid		Brocade Communications Spain S.L.	
Sweden				Brocade Communications	
Switzerland		Geneva		Brocade Communications Switzerland Sàrl	
Switzerland				Brocade Communications Switzerland Sàrl	
Taiwan		Taipei		Brocade Communications Systems Taiwan Ltd.	
Thailand		Bangkok			
Turkey		Istanbul			
UK		Warrington			
UK		Bracknell		Brocade Communications UK Ltd	
United Arab Emirates		Dubai			
USA	Alabama	Birmingham			
USA	Arizona	Phoenix			
USA	California	Irvine			
USA	California	San Bruno			
USA	California	San Jose			
USA	Colorado	Broomfield			
USA	Colorado	Greenwood Village			
USA	Connecticut	West Hartford			
USA	Georgia	Alpharetta			
USA	Illinois	Schaumburg			
USA	Indiana	Indianapolis			
USA	Iowa	Des Moines			
USA	Kansas	Overland Park			
USA	Maryland	Annapolis			
USA	Massachusetts	Waltham			
USA	Michigan	Novi			
USA	Minnesota	Plymouth			
USA	Minnesota	Rochester			
USA	Missouri	Chesterfield			
USA	Nevada	Henderson			
USA	New Mexico	Albuquerque			
USA	New York	New York			
USA	North Carolina	Durham			
USA	Ohio	Columbus			
USA	Pennsylvania	Malvern			
USA	Texas	Austin			
USA	Texas	Frisco			
USA	Texas	The Woodlands			
USA	Virginia	Herndon			
USA	Washington	Redmond			
USA	Wisconsin	Brookfield			

Source: Citi Research

Figure 679. Brooks Automation Inc.

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
China		Shanghai		Office	
France		Meylan		Office	
Germany		Jena	30100	Manufacturing, R&D and sales & support	
Germany		Dresden		Office	
Germany		Mistelgau		Office	
Israel		Kiryat Gat		Office	
Japan		Yokohama		Headquarters	
Japan		Yokohama		Technical Center	
Japan		Yokkaichi		Service Center	
Japan		Osaka		Sales Office	
Japan		Kumamoto		Service Center	
Japan		Hiroshima		Service Center	
Japan	Chiba			Service Center	
Mexico				Office	
Singapore				Office	
South Korea		Yongin	49600	Manufacturing, R&D and sales & support	
Switzerland		Oberdiessbach		Office	
Taiwan	Hsinchu	Zhubei	28600	Sales & support	
Taiwan		Tainan		Office	
UK		Manchester	42000	Manufacturing, R&D and sales & support	
USA	California	Fremont		Office	
USA	California	Poway	67600	Manufacturing and R&D	
USA	California	Petaluma	72300	Manufacturing and R&D	
USA	Colorado	Longmont	60900	Manufacturing and R&D	
USA	Colorado	Colorado Springs		Office	
				Corporate Headquarters, training,	
USA	Massachusetts	Chelmsford	214000	manufacturing and R&D	
USA	Massachusetts	Chelmsford	97000	Manufacturing	
USA	Texas	Austin		Office	

Source: Citi Research



Figure 680. Canon

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Argentina		Buenos Aires		Business machines	
Australia	New South W.	Sydney		Digital imaging technologies, related applications and solutions	
Austria		Vienna		All product segments (with some exceptions)	
Belgium		Diegem		All product segments (with some exceptions)	
Brazil	Amazonas			Digital cameras	
Brazil		Sao Paulo		Business machines, digital cameras, inkjet printers	
Bulgaria		Sofia		All product segments (with some exceptions)	
Canada	Ontario	Mississauga		All product segments	
Chile		Santiago		All product segments (with some exceptions)	
China	Liaoning	Dalian		Design and production of automated labor-saving equipment; processing of parts	
China	Gangnam-gu	Seoul		Business machines, solutions, electronics, sales of industrial and medical equipment	
China	Haidian	Beijing		Language, document and image processing technologies, Asian localization, software development	
China	Jiangsu	Suzhou		Office imaging products related software	
China	Guangdong	Shenzhen		Business machines, business machine peripherals, industrial-use printers, optical equipment	
China		Dalian		Production and recycling of toner cartridges; production of laser printers	
China	Guangdong	Zhuhai		Digital cameras, digital video camcorders, laser printers, contact image sensors	
China	Guangdong	Zhongshan		Laser printers	
China	Jiangsu	Suzhou		Color and monochrome MFPs	
China		Beijing		All product segments	
China		Shanghai		Sales of semiconductor equipment, LCD equipment, components	
Czech Republic		Praha		All product segments (with some exceptions)	
Denmark				All product segments (with some exceptions)	
Finland		Helsinki		All product segments (with some exceptions)	
France		Cesson - Sevigne		Audio-video networking, image connectivity, acoustic and web-related technologies	
France				Chemical products for copying machines and printers, recycling of toner cartridges, after-sales service and others	
France	Liffre Cedex			All product segments (with some exceptions)	
France	Courbevoie			Remanufacturing of copying machines; repair of cameras; service and support for Canon sales companies	
Germany		Giessen		All product segments (with some exceptions)	
Germany		Krefeld		Personal information products and others	
Hong Kong		Kwai Chung		All product segments	
Hong Kong		Kowloon		All product segments	
Hungary		Zahony		All product segments (with some exceptions)	
India	Haryana	Gurgaon		All product segments	
Ireland		Dublin		All product segments (with some exceptions)	
Italy		Milan		All product segments (with some exceptions)	
Japan	Saitama	Chichibu		Magnetic/business machine components, document scanners, portable data terminals	
Japan	Saitama	Misato		Business machines, business machine peripherals, industrial-use printers, chemical products	
Japan	Aomori	Hirosaki		Micromotors, toner cartridges and optical semiconductor sensors	
Japan	Ibaraki	Yuki		Optical crystals (for cameras, telescopes), vapor deposition materials	
Japan	Saitama	Kodama-gun		Contact image sensors, printed wiring boards, inkjet cartridges, medical equipment	
Japan		Tokyo		Development assistance for Canon products (SOC, MFP, imaging and communication)	
Japan	Ibaraki			Semiconductor production-related equipment, design and manufacturing of production equipment	
Japan	Niigata	Chuo-ku		Development for Canon products (software/firmware)	
Japan	Kanagawa	Kawasaki		Semiconductor/electronic equipment, vacuum components	
Japan	Shiga	Kusatsu		Precision automation and semiconductor equipment	
Japan	Niigata	Mitsuke		Manufacturing equipment of OLED panel and thin-film photovoltaic cell, vacuum process equipment	
Japan	Ibaraki	Tsukuba		Toner cartridges and advanced functional polymer components	
Japan		Miyazaki		Digital cameras, electronics packaging	
Japan	Oita	Kunisaki		Digital cameras, digital video camcorders, EF lenses and others	
Japan	Oita	Kitsuki		Chemical products for copying machines and printers	
Japan	Shiga	Nagahama		Toner cartridges, parts for laser printers, a-Si drums	
Japan	Mie	Iga		Chemical products for copying machines and printers	
Japan		Fukushima		Commercial photo printers, print heads and ink tanks; analysis of software	
Japan	Ibaraki	Bando		Recycling of toner cartridges; reuse and recycling of business machines	

Source: Citi Research

Figure 681. Canon (Continued)

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Japan	Ibaraki	Kasama		Design and production of precise plastic molding	
Japan	Oita	Hita City		Advanced functional polymer components for toner cartridges	
Japan	Nagasaki			Digital cameras	
Japan	Oita			Parts for digital cameras and others	
Japan	Virginia	Newport News		Toner cartridges, toner for copying machines, OEM products and molding dies	
Japan		Tokyo		Marketing of Canon products and related solution services in Japan	
Japan		Tokyo		Consultation, sales, support and service of Canon products and related solutions	
Japan		Tokyo		Print-on-demand (POD) service and Canon MDS on-contract service	
Japan		Chiba City		Customer support services for call centers and consumer products	
Japan				Sales of medical devices, healthcare equipment, medical related consumables, medical imaging systems	
Japan		Osaka			
Malaysia		Penang		Magnetic components	
Malaysia	Selangor	Shah Alam		Die bonder	
Malaysia	Selangor			All product segments	
Mexico		Mexico City		All product segments (with some exceptions)	
Netherlands	Amstelveen			All product segments	
Netherlands	North Brabant	S-Hertogenbosch		All product segments (with some exceptions)	
New Zealand		Auckland		All product segments	
Norway		Holmlia		All product segments (with some exceptions)	
Panama				All product segments (with some exceptions)	
Philippines		Quezon		Embedded and application software development and testing, hardware design and verification	
Philippines	Batangas			Laser printers	
Philippines	Manila	Taguig		All product segments	
Poland		Warsaw		All product segments (with some exceptions)	
Portugal		Amadora		All product segments (with some exceptions)	
Russia		Moscow		All product segments (with some exceptions)	
Singapore				All product segments	
Slovakia		Bratislava		All product segments (with some exceptions)	
Slovenia		Ljubljana		All product segments (with some exceptions)	
South Africa				All product segments (with some exceptions)	
Spain		Madrid		All product segments (with some exceptions)	
Sweden				All product segments (with some exceptions)	
Switzerland		Wallisellen		All product segments (with some exceptions)	
Taiwan		Taichung		Digital cameras, network cameras, EF lenses, multimedia projector lenses and other lenses, precision-metal molds	
Taiwan		Taipei		All product segments	
Taiwan		Hsinchu		Industrial equipment, semiconductor equipment	
Thailand	Bang Pa-in			Inkjet printers	
Thailand	Prachinburi			Digital MFPs, service parts	
Thailand		Bangkok		All product segments	
Turkey	Kadiköy	Istanbul		All product segments (with some exceptions)	
UK	Middlesex			All product segments	
UK	Surrey			All product segments (with some exceptions)	
UK	Luxembourg			All product segments (with some exceptions)	
United Arab Emirates		Dubai		All product segments (with some exceptions)	
USA				Life science solutions for use in diagnostics and medical instrumentation	
USA	Maryland	Rockville		All product segments	
USA	Melville	New York			
USA	Virginia	Chesapeake		Commercial lease financing for all Canon products	
USA	Florida	Boca Raton		Diagnostic imaging solutions and medical systems integrator	
USA	New York	New York		Digital document technology and business process consulting services	
Vietnam	Dong Anh	Dist Hanoi		Inkjet printers, laser printers, scanners, toner cartridges	
Vietnam	Hung Yen			Electronics devices and others	
Vietnam		Ho Chi Minh City		All product segments (with some exceptions)	

Source: Citi Research

Figure 682. Casio

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada	Ontario	Markham		CASIO CANADA LTD.
India		New Delhi		Corporate Office
India	Maharashtra	Mumbai		Regional Office
India	Karnataka	Bangalore		Regional Office
India	Tamil Nadu	Chennai		Regional Office
India	Andhra Pradesh	Hyderabad		Regional Office

Source: Citi Research

Figure 683. Casio (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
India	West Bengal	Kolkata		Regional Office
India	Punjab	Chandigarh		Regional Office
India	Gujrat	Ahmedabad		Regional Office
Mexico				CASIO MEXICO MARKETING S. de R.L de C.V.
Singapore				Casio Singapore Pte., Ltd., Corporate Office

Source: Citi Research

Figure 684. Catcher Technology

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Suzhou	1291669	Catcher (Suzhou, China)
China		Suqian	4975079	Catcher SQ (Suqian, China)
Taiwan		Tainan	52645	Catcher (Tainan Technology Based Industrial Park)
Taiwan		Tainan	785765	Catcher Headquarters

Source: Citi Research

Figure 685. Celestica

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Austria		Salzburg	54,000	
Canada	Ontario	Toronto	888,000	
China		Multiple Locations	1,198,000	
Ireland		Galway	241,000	
Japan		Multiple Locations	274,000	
Malaysia		Multiple Locations	1,549,000	Electronics Manufacturing Operations & Automated Manufacturing Operations
Mexico	Nuevo Leon	Monterrey	504,000	
Romania		Oradea	186,000	
Scotland		Gourock	58,000	
Singapore		Multiple Locations	260,000	
South Korea		Seoul		
Spain		Valencia	100,000	
Switzerland		Zurich		
Taiwan		Taipei		
Thailand		Laem Chabang	1,085,000	
USA	California		428,000	
USA	Texas		51,000	
USA	Oregon		188,000	

Source: Citi Research

Figure 686. Centrotherm Phontovoltaics

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai		centrotherm photovoltaics Technology Shanghai Co. Ltd.
				centrotherm photovoltaics Technology Shanghai Co. Ltd.
China		Beijing		Beijing Office
Germany	Alb-Donau	Blaubeuren		Headquarters Blaubeuren centrotherm photovoltaics AG
India	Karnataka	Bangalore		centrotherm photovoltaics India Pte. Ltd.
Japan		Tokyo		Sales partner, Hakuto Co. Ltd.
Singapore				centrotherm photovoltaics Asia Pte. Ltd.
South Korea	Gyeonggi-do	Suwon-si		centrotherm photovoltaics Korea Ltd.
Taiwan	Hsinchu	Zhubei		centrotherm photovoltaics Asia Pte. Ltd. Taiwan Branch
USA	Georgia	Atlanta		centrotherm photovoltaics USA Inc.

Source: Citi Research

Figure 687. Cheil Industries

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai		Chemicals/Electronic Materials Division
China		Tianjin		Chemicals/Electronic Materials Division
China	Jiangsu			Chemicals/Electronic Materials Division
China		Shenzhen		Chemicals/Electronic Materials Division
Germany		Dresden		Chemicals/Electronic Materials Division
Hungary				Chemicals/Electronic Materials Division
India	Tamil Nadu	Chennai		Chemicals/Electronic Materials Division
India	Haryana	Gurgaon		Chemicals/Electronic Materials Division
Japan		Tokyo		Chemicals/Electronic Materials Division
Japan		Osaka		Chemicals/Electronic Materials Division
Malaysia		Kuala Lumpur		Chemicals/Electronic Materials Division
Slovakia				Chemicals/Electronic Materials Division
South Korea	Gyeonggi-do	Uiwang-si		Chemicals/Electronic Materials Division
South Korea	Cyungbuk	Gumi		Chemicals/Electronic Materials Division
South Korea	Jeollanamdo	Yeosu-si		Chemicals/Electronic Materials Division
South Korea	Cheongwon-g	Ochang-eub		Chemicals/Electronic Materials Division
Taiwan		Taipei		Chemicals/Electronic Materials Division
Thailand		Bangkok		Chemicals/Electronic Materials Division
Turkey		Istanbul		Chemicals/Electronic Materials Division
United Arab Emirates		Dubai		Chemicals/Electronic Materials Division
USA	California	La Mirada		Chemicals/Electronic Materials Division
USA	California	San Diego		Chemicals/Electronic Materials Division
USA	Illinois	Schaumburg		Chemicals/Electronic Materials Division
USA	Michigan	Auburn Hills		Chemicals/Electronic Materials Division
USA	California	San Jose		Chemicals/Electronic Materials Division

Source: Citi Research

Figure 688. Chicony Electronics

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Dongguan		Chicony Electronics ( Mainland China II ) Co., Ltd.
China		Wujiang		Chicony Electronics ( Mainland China III ) Co., Ltd.
China		Beijing		Chicony Sales Office
China		Chongqing		Chicony Electronics ( Mainland China V ) Co., Ltd.
Czech Republic		Prelouc		CHICONY ELECTRONICS CEZ S.R.O
Japan		Tokyo		Chicony Electronics Japan
Taiwan		New Taipei		Chicony Electronics Co., Ltd.
USA	California	Irvine		Chicony America Inc.

Source: Citi Research

Figure 689. Chipbond Technology

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Taiwan		Hsinchu		
Taiwan		Kaohsiung		

Source: Citi Research

Figure 690. Ciena Corp.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		
Australia	Victoria	Melbourne		
Australia	New South Wales	Sydney		
Brazil		São Paulo		
Canada		Ontario		
Canada	Quebec	Montreal		
China	Guangdong	Shenzhen		
Denmark		Copenhagen		
France		Paris		
Germany	Hesse	Frankfurt		
Hong Kong		North Point		
India	Haryana	Gurgaon		
India	Maharashtra	Mumbai		
Israel		Tel Aviv		
Italy	Lombardy	Milan		
Japan	Chiyoda-ku	Tokyo		
Mexico		Mexico City		
Netherlands	North Holland	Hoofddorp		
New Zealand		Auckland		
Philippines		Manila		
Poland		Warsaw		
Russia		Moscow		
Saudi Arabia		Riyadh		
Singapore		Singapore		
South Korea		Seoul		
Spain		Madrid		
Switzerland		Zurich		
UK	Northern Ireland	Belfast		
UK		London		
United Arab Emirates		Abu Dhabi		
USA	Maryland	Hanover	154,100	Headquarters
USA	Illinois	Ottawa	265,000	
USA	Georgia	Alpharetta		
USA	Massachusetts	Boston		
USA	Colorado	Denver		
USA	Florida	Doral		
USA	Maryland	Glen Burnie		
USA		New York		
USA		Ottawa		
USA	Kansas	Overland Park		
USA	North Carolina	Research Triangle Park		
USA	Texas	Richardson		
USA	California	San Jose		
USA	Washington	Spokane Valley		
Vietnam		Hanoi		

Source: Citi Research

Figure 691. Cisco Systems Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		
Australia	New South Wales	North Sydney		
Australia		Melbourne		
Australia	Australian Capital Territory			
Australia		Adelaide		
Australia		Perth		
Australia	Queensland	Brisbane		
Australia	New South Wales	St Leonards		
Austria		Vienna		
Austria	Salzburg			
Belgium	Machelen	De Kleetlaan		
Brazil		Brasília		
Brazil		Barra da Tijuca		
Brazil		São Paulo		
Bulgaria				
Cameroon		Yaounde		
Canada		Winnipeg		
Chile		Santiago		
China	Chaoyang	Beijing		
China	Shaanxi	Xi'an		
China	Guangzhou			
China	Changning	Shanghai		
China	Xinjiang	Urumqi		
China	Guangdong	Shenzhen		
China	Sichuan	Chengdu		
China	Jiangsu	Nanjing		
China	Hubei	Wuhan		
China	Fujian	Fuzhou		
China	Zhejiang	Hangzhou		
China	Shandong			
China	Chongqing			
China		Shanghai		
China	Hong Kong			
Colombia		Bogota		
Colombia		Medellín		
Costa Rica		Escazú		
Croatia		Zagreb		
Cyprus		Nicosia		
Denmark		Aarhus		
Denmark		Automatikvej		
Dominican Republic		Santo Domingo		
Ecuador	Pichincha	Quito		
Egypt		Heliopolis		
El Salvador		San Salvador		
Estonia		Tallinn		
Finland		Espoo		
France		Paris		
France	Rhone-Alpes	Lyon		
France	Haute-Garonne	Toulouse		
France	Alsace	Strasbourg		
France	Brittany	Rennes		

Source: Citi Research

Figure 692. Cisco Systems Inc. (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Germany		Berlin		
Germany		Hamburg		
Germany	North Rhine-Westphalia	Düsseldorf		
Germany		Eschborn		
Germany	Freising	Hallbergmoos		
Germany	North Rhine-Westphalia	Bonn		
Germany	Baden-Württemberg	Mannheim		
Greece		Marousi		
Hungary		Budapest		
India	Karnataka	Bangalore		Sales office & R&D Office
India	Tamil Nadu	Chennai		Sales Office
India	West Bengal	Kolkata		Sales Office
India	Maharashtra	Mumbai		Sales Office
India	Haryana	Gurgaon		Sales Office
India	Maharashtra	Pune		Sales Office
India	Andhra Pradesh	Hyderabad		Sales Office
Indonesia		Jakarta		
Ireland		Dublin		
Israel		Sapir		
Italy	Monza Brianza	Vimercate		
Italy		Rome		
Italy		Turin		
Italy		Padua		
Italy		Monza		
Japan		Tokyo		
Japan	Hokkaido	Sapporo		
Japan	Miyagi	Sendai		
Japan	Chūbu	Nagoya		
Japan	Kansai	Osaka		
Japan	Hiroshima	Hatohobori		
Japan		Fukuoka		
Kenya		Nairobi		
Latvia		Riga		
Lebanon		Nejmeh Beirut		
Lithuania		Vilnius		
Luxembourg				
Malaysia	Penang	Bayan Lepas		
Malta		Ricasoli		
Mexico		Mexico City		
Mexico	Chihuahua	Colonia Juárez		
Mexico		Jalisco		
Mexico		Nuevo León		
Morocco		Casablanca		
Netherlands		Amsterdam		
Netherlands		Amsterdam		
New Zealand		Auckland		
New Zealand		Wellington		
Nigeria		Lagos		
Norway		Oslo		
Panama				
Peru		Lima		
Philippines		Makati		
Portugal	Oeiras	Porto Salvo		
Russia		Saint Petersburg		
Saudi Arabia		Dhahran		
Saudi Arabia		Riyadh		
Senegal		Dakar		
Singapore				
South Africa	Centurion	Von Willich Avenue		
South Africa	Gauteng	Johannesburg		
South Africa		Cape Town		
South Africa	Gauteng	Pretoria		
South Korea	Gangnam-gu	Seoul		
South Korea	Youngdeungpo-gu	Seoul		
South Korea		Daejeon		
South Korea		Busan		
South Korea	Jung Gu	Incheon		
South Korea		Daegu		
South Korea	Dong			
Spain		Madrid		
Sri Lanka		Colombo		Sales Office
Sweden		Stockholm		
Switzerland		Zurich		
Switzerland	Bundesstadt	Bern		
Switzerland		Vaud		
Taiwan	Xinyi			
Thailand		Bangkok		
UK	Middlesex	Feltham		
UK		Berkshire		
UK		London		
UK		Manchester		
Ukraine		Kiev		
United Arab Emirates		Dubai		
USA	California	San Jose		Headquarters
USA	Massachusetts	Boston		
USA	Texas	Richardson		
USA	Georgia	Lawrenceville		
USA	North Carolina	Research Triangle Park		
USA	Alabama	Birmingham		
USA	Alabama	Montgomery		
USA	Arizona	Tucson		
USA	Arizona	Phoenix		
USA	Alaska	Anchorage		
USA	Arkansas	Little Rock		

Source: Citi Research

Figure 693. Cisco Systems Inc. (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
USA	Arkansas	Bentonville		
USA	California	San Francisco		
USA	California	Gold River		
USA	California	Pleasanton		
USA	California	Los Angeles		
USA	California	Irvine		
USA	California	Clovis		
USA	California	San Diego		
USA	Colorado	Colorado Springs		
USA	Colorado	Centennial		
USA	Connecticut	Farmington		
USA	Connecticut	Norwalk		
USA	Washington D.C			
USA	Florida	Ft. Lauderdale		
USA	Florida	Jacksonville		
USA	Florida	Miami		
USA	Florida	St. Petersburg		
USA	Florida	Orlando		
USA	Florida	Tallahassee		
USA	Florida	Destin		
USA	Georgia	Atlanta		
USA	Hawaii	Honolulu		
USA	Idaho	Boise		
USA	Illinois	Bloomington		
USA	Illinois	Rosemont		
USA	Illinois	Chicago		
USA	Illinois	Rosemont		
USA	Indiana	Carmel		
USA	Iowa			
USA	Iowa	West Des Moines		
USA	Kansas	Overland Park		
USA	Kentucky	Louisville		
USA	Louisville	Metairie		
USA	Louisiana	Baton Rouge		
USA	Maryland	Columbia		
USA	Massachusetts	Boston		
USA	Massachusetts	Boxborough		
USA	Michigan	Southfield		
USA	Michigan	Grand Rapids		
USA	Minnesota	Bloomington		
USA	Mississippi	Ridgeland		
USA	Missouri	Chesterfield		
USA	Missouri	Jefferson City		
USA	Nebraska	Omaha		
USA	Nevada	Las Vegas		
USA	New Jersey	Montvale		
USA	New Jersey	South Iselin		
USA	New Jersey	Moorestown		
USA	New Mexico	Albuquerque		
USA	New York	Albany		
USA	New York	Melville		
USA	New York	Amherst		
USA	New York	New York		
USA	New York	Pittsford		
USA	North Carolina	Greensboro		
USA	North Carolina	Charlotte		
USA	North Dakota	South Fargo		
USA	Ohio	Cincinnati		
USA	Ohio	Dublin		
USA	Ohio	Richfield		
USA	Oklahoma	Oklahoma		
USA	Oklahoma	Tulsa		
USA	Oregon	Lake Oswego		
USA	Pennsylvania	Malvern		
USA	Pennsylvania	Pittsburgh		
USA	Pennsylvania	Camp Hill		
USA	South Carolina	Greenville		
USA	South Carolina	Columbia		
USA	South Dakota	Sioux Falls		
USA	Tennessee	Knoxville		
USA	Tennessee	Brentwood		
USA	Tennessee	Cordova		
USA	Texas	Irving		
USA	Texas	Richardson		
USA	Texas	Houston		
USA	Texas	San Antonio		
USA	Texas	Lubbock		
USA	Utah	Salt Lake City		
USA	Vermont	South Burlington		
USA	Virginia	Herndon		
USA	Virginia	Richmond		
USA	Virginia	Salem		
USA	Virginia	Herndon		
USA	Washington	Bellevue		
USA	Washington	Lacey		
USA	Washington	Spokane		
USA	Wisconsin	Madison		
USA	Puerto Rico	San Juan		
Venezuela		Caracas		
Vietnam		Hanoi		
Vietnam		Ho Chi Minh City		

Source: Citi Research

Figure 694. Compal Communications

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Nanjing		Office
China		Nanjing		Office
Taiwan		Taipei		Headquarter

Source: Citi Research

Figure 695. Compal Electronics

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil		São Paulo		Compalead Eletrônica do Brasil Indústria e Comércio Ltda.
China		Nanjing		Compal Information Research & Development (Nanjing) Co., Ltd.
China		Kunshan		Compal Electronics, (China) Co., Ltd., Compal Electronics Technology (Kunshan) Co., Ltd.
Poland		Lodz		Compal Eurpoe (Poland) Sp.zo.o.
Taiwan		Taipei		Compal Electronics, Inc.
USA	California			Bizcom Electronics, Inc.
USA	Texas	Austin		Auscom Engineering Inc.
Vietnam				Compal (Vietnam) Co., Ltd.

Source: Citi Research

Figure 696. Corning Incorporated

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	Victoria			Office
Australia	New South Wales			Office
Belgium				Office
Brazil				Office
China		Shanghai		Office
China		Beijing		Office
Denmark				Office
France				Office
Germany				Office
India	Haryana			Office
Israel				Office
Italy				Office
Japan		Tokyo		Office
Malaysia				Office
Mexico				Office
Mexico				Manufacturing
Netherlands		Amsterdam		Office
Poland		Strykow		Office
Poland		Warsaw		Office
Russia		Saint-Petersburg		Office
Russia		Moscow		Office
Russia		Samara		Office
Singapore				Office
South Africa		Port Elizabeth		Office
South Korea		Seoul		Office
South Korea	Gyeongsangbuk-do	Gumi		Manufacturing
South Korea	Chungcheongnam-do	Cheonan		Manufacturing
Spain		Madrid		Office
Taiwan		Taipei		Office
Taiwan		Taichung		Manufacturing
Taiwan		Tainan		Manufacturing
Turkey				Office
UK				Office
United Arab Emirates				Office
USA	Arizona			Office
USA	California			Office
USA	California	Palo Alto		Office
USA	Kentucky			Office
USA	Maine			Office
USA	Massachusetts			Office
USA	Michigan			Office
USA	Michigan			Office
USA	New Hampshire	Keene		Office
USA	New Jersey			Office
USA	New York			Office
USA				Office
USA	New York	Diesel Location		Manufacturing
USA	New York	Erwin		Manufacturing
USA	New York	Canton Plant		Manufacturing
USA	New York	Erwin		Manufacturing
USA	New York			Manufacturing
USA	New York			Manufacturing
USA	New York			Office
USA	New York	Corning		Manufacturing
USA	New York			Office
USA	New York			Office
USA	New York			Office
USA	North Carolina	Durham		Office
USA	North Carolina	Winston Salem		Office
USA	North Carolina	Hickory		Office
USA	Pennsylvania	Pittston		Office
USA	Pennsylvania	Pittsburgh		Office
USA	South Carolina			Office
USA	Tennessee			Office
USA	Texas			Office
USA	Utah			Office
USA	Virginia			Office
USA	Columbia			Office

Source: Citi Research

Figure 697. CSR Plc

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada		Toronto	5965	Sublet
China		Beijing	1952	Customer Liaison
China		Shanghai	44447	R&D, Sales and Administration
China		Shenzhen	34444	R&D, Operations, Sales and Administration
Finland		Salo	213	Sales
Germany		Ingolstadt	65116	R&D and Operations
Germany		Freiburg	5317	R&D
India		Bangalore	66127	R&D, Sales and Administration
India		Noida	9200	R&D, Sales and Administration
Israel		Haifa	110653	Operations, R&D, Sales and Administration
Japan		Tokyo	10215	Sales
Singapore			1605	Sales and Customer Support
South Korea	Gyunggi-Do	Seongnam		
South Korea		Gumi	2170	Sales and Customer Support
South Korea		Seoul	17222	Sales and Customer Support
South Korea		Chungli City	4340	Operations
Taiwan	Taoyuan	Taipei	32087	R&D, Sales and Administration
Taiwan		Hsinchu	6121	Sales
UK		Cambridge	53000	Headquarters, R&D, Sales and Administration
UK		Cambridge	33100	Administration
UK		Cambridge	7000	R&D
UK		Bristol	2023	R&D
UK		Manchester	3373	R&D
UK		Belfast	5800	R&D
USA	Michigan	Auburn Hills		
USA	Massachusetts	Burlington	54736	R&D, Sales and Administration
USA	Arizona	Tempe		
USA	Texas	Plano	43680	Operations and Sales
USA	California	Santa Ana	12643	
USA	California	San Jose		
USA	Arizona	Phoenix	52573	R&D
USA	Michigan	Detroit	9400	R&D
USA	California	Sunnyvale	88924	R&D, Sales and Administration

Source: Citi Research

Figure 698. Cypress Semiconductor

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai	29,000	Research and development
China		Beijing		
China		Shanghai		
China		Shenzhen		
Denmark				
France		Paris		
Germany		Munich		
India	Karnataka	Bangalore	193,000	Research and development
Italy				
Japan		Osaka		
Japan		Tokyo		
Norway				
Philippines	Cavite		221,000	Manufacturing, research and development
South Korea	Kyunggi			
Sweden				
Taiwan		Hsinchu		
Taiwan		Taipei		
UK	New Hampshire	Nashua		
UK	Hertfordshire			
USA	Minnesota	Bloomington	337,000	Manufacturing, research and development
USA	California	San Jose	171,000	Administrative offices, research and development
USA	Texas	Round Rock	100,000	Property held for sale
USA	Colorado	Colorado Sprin	70,400	Administrative offices
USA	Washington	Lynnwood	67,000	Administrative offices, research and development
USA	Illinois	Buffalo Grove		
USA	Louisiana			
USA	North Carolina	Raleigh		
USA	New Mexico			
USA	Nevada			
USA		Texas		
USA	Arizona			
USA	Texas	El Paso		
USA	Texas	Austin		
USA	Texas	Houston		
USA	Colorado	Colorado Springs		
USA	Texas	Arlington		

Source: Citi Research

Figure 699. Dainippon Screen

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South Wales	Macquarie Park		Dainippon Screen (Australia) Pty. Ltd.
China		Shanghai		Head Office - Dainippon Screen Electronics (Shanghai)
China		Dalian		Dalian Office
China		Beijing		Beijing Office
China	Inner Mongolia	Ordos		Ordos Office
China		Wuxi		Wuxi Office
China	Hubei	Wuhan		Wuhan Office
China		Shenzhen		Shenzhen Office
China		Shanghai		Head Office
China		Guangzhou		Guang Zhou branch
China	Zhejiang	Hangzhou		Dainippon Screen Mt (Hangzhou) Co., Ltd.
France		Rousset		Rousset Office
France		Crolles		Crolles Office
Germany		Duesseldorf		Head Office - Dainippon Screen (Deutschland) GmbH
Germany		Kirchheim unter Teck		Sales Office
Germany		Feldkirchen		Refurbish Center
Germany		Dresden		Dresden Office
Hong Kong		Hoi Shing Road		Hong Kong Head Office
Ireland				
Israel		Ramat-Gan		Dainippon Screen Israel Ltd.
Italy	Vimercate	Milan		Milan Office
Italy		Catania		Catania Office
Japan		Kyoto		Head Office
Japan		Kyoto		Rakusai Site
Japan		Kyoto		Kumiyama Plant
Japan	Shiga	Yasu		Yasu Plant
Japan	Shiga	Hikone		Hikone Plant
Japan	Shiga			Taga Plant
Japan		Tokyo		Kudan Office
Japan		Tokyo		Monzennakacho Site
Netherlands		Amstelveen		Amstelveen Head Office
Singapore				Dainippon Screen Singapore Pte. Ltd.
South Korea		Seoul		Head Office - Dainippon Screen (Korea) Co., Ltd.
South Korea	Gyeonggi-do	Icheon		Icheon Service Station
South Korea	Chungcheongbuk-do	Cheongju		Cheongju Service Station
South Korea	Gyeonggi-do	Hwaseong		Hwaseong Service Station
South Korea		Cheonan		Cheonan Service Station
Taiwan		Hsinchu		Head Office - Dainippon Screen Electronics (Taiwan)
Taiwan	Taoyuan	Guishan		Linkou Customer Service
Taiwan		Taichung		Taichung Customer Service Center
Taiwan		Tainan		Tainan Customer Service Center
Taiwan		Taipei		Dainippon Screen (Taiwan) Co., Ltd.
UK	Durham	Newton Aycliffe		North England Office
UK	Shire	Bedfordshire		Screen Europe (UK)
USA	Illinois	Rolling Meadows		Dainippon Screen Graphics (Usa), Llc

Source: Citi Research

Figure 700. Delta Electronics

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	Victoria	Melbourne		Melbourne Office
Brazil		Sao Paulo		Sales Office
Brazil	Parana	São José dos Pinhais		Administration & Factory
China		Shanghai		Delta Electronics (Shanghai) Co., Ltd., Headquarters
China		Nanjing		Delta Electronics (Shanghai) Co., Ltd., Nanjing Branch
China		Dongguan		Delta Electronics (Dongguan) Co., Ltd.
China	Jiangsu	Wujiang		Delta Electronics (Jiangsu) Ltd.
China	Anhui			Delta Electronics (Wuhu) Ltd.
China	Hunan	Chenzou		Delta Electronics (Chenzhou) Co., Ltd.
China		Shanghai		Delta Greentech (China) Co., Ltd., Headquarters
China		Tianjin		Delta Green Tianjin Industries Co., Ltd.
China	Hong Kong			Delta Electronics (Hong Kong) Ltd.
Finland		Espoo		Delta Energy Systems (Finland) Oy
Germany		Soest		Germany Office
Germany		Teningen		Delta Energy Systems Germany GmbH
India	Haryana	Gurgaon		Delta India Electronics Pvt. Ltd
India		Pondicherry		Delta Power Solutions (India) Pvt. Ltd
India	Uttarakhand			Delta Power Solutions India Pvt Ltd.
Japan		Tokyo		Tokyo Office
Japan		Tokyo		Nishimagome Office
Japan		Tokyo		Shibaura Office
Japan		Osaka		Osaka Office
Mexico	State of Mexico	Tlalnepantla		Delta Electronics International Mexico S.A. de C.V.
Mexico	Baja California	Tijuana		Tijuana Plant
Mexico	Jalisco	Zapopan		Guadalajara Office
Netherlands		Amsterdam		Amsterdam Office
Netherlands		Eindhoven		Eindhoven Office

Source: Citi Research

Figure 701. Delta Electronics (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Scotland		Glasgow		Glasgow Office
Singapore				Singapore Office
Slovakia		Dubnica nad Váhom		Delta Electronics (Slovakia) s.r.o.
South Korea		Seoul		Seoul Office
Switzerland		Bern		Delta Energy Systems(Switzerland) AG
Taiwan		Taipei		Taipei Headquarters
Taiwan		Taipei		Taipei (Yangguang)
Taiwan		Taoyuan City		Taoyuan Plant 1
Taiwan		Taoyuan City		Taoyuan Plant 2
Taiwan		Taoyuan City		Taoyuan R&D Center
Taiwan		Taoyuan City		Chungli Plant 1
Taiwan		Taoyuan City		Chungli Plant 2
Taiwan		Taichung		Taichung Branch Office
Taiwan		Tainan		Tainan Plant
Thailand	Samutprakarn	Amphur Muang		Bangpoo (Automotive Plant)
Thailand	Samutprakarn	Amphur Muang		Bangpoo (Power Supply Plant)
Thailand	Chachoengsao	Amphur Muang		Wellgrow Plant
USA	California	Fremont		Fremont Office
USA	California	Los Angeles		Los Angeles Office
USA	Massachusetts	Boston		Boston Office
USA	Michigan	Detroit		Detroit Office
USA	North Carolina	Raleigh		Raleigh Office
USA	Oregon	Portland		Portland Office
USA	Texas	Austin		Austin Office
USA	Texas	Houston		Houston Office
USA	Texas	Richardson		Delta Greentech (USA)

Source: Citi Research

Figure 702. E Ink Holdings

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Jiangsu	Yangzhou		Transcend Optronics
China	Guangdong	Shenzhen		E Ink Shenzhen Office
Japan		Tokyo		E Ink / Hydix Japan Office
South Korea	Gyeonggi-do	Icheon		Hydix Technologies
Taiwan		Hsinchu		Headquarters - E Ink Holdings
Taiwan		Taipei		E Ink Taipei Office
Taiwan	Taoyuan			E Ink Linkou Office
USA	Massachusetts	Billerica		E Ink Corporation
USA	California	Fremont		E Ink Fremont Site

Source: Citi Research

Figure 703. Electronics For Imaging Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South Wales	Sydney		office
Australia	Queensland			office
Belgium		Brussels	57	office
Brazil		Sao Paulo		office
Canada	Ontario	Richmond Hill		office
China		Shanghai		office
China		Fushan		office
France		Paris		office
Germany		Ratingen	27	office
Germany		Essen		office
India		Bangalore	76	office
Italy		Assago		office
Japan		Tokyo		office
Mexico				office
Netherlands				office
New Zealand		Auckland		office
Singapore				office
Spain		Castellon	44	office
Sweden				office
UK		Dronfield		office
UK		Colchester		office
UK		Millshaw Beeds		office
USA	California	Foster City	294	office
USA	Arizona	Scottsdale	29	office
USA	Illinois	Chicago		office
USA	Florida	Jacksonville		office
USA	Georgia	Norcross	52	office
USA	Michigan	Ypsilanti	70	office
USA	New Hampshire	Laconia	30	office
USA	New Hampshire	West Lebanon		office
USA	Minnesota	Minneapolis	100	office
USA	New Jersey	Parsippany		office
USA	Pennsylvania	Pittsburgh		office
USA	New Hampshire	Meredith	163	office
USA	Massachusetts	Plymouth		office

Source: Citi Research

Figure 704. EMC Corp.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Algeria	Mohammedia	Algiers		
Algeria	Mohammedia	Algiers		
Argentina		Buenos Aires		
Armenia		Yerevan		
Australia		Adelaide		
Australia		Brisbane		
Australia		Canberra		
Australia		Melbourne		
Australia	New South Wales	North Ryde		
Australia	New South Wales	North Sydney		
Australia		Perth		
Australia	New South Wales	St Leonard		
Australia	New South Wales	Sydney		
Austria	Tyrol	Innsbruck		
Austria		Linz		
Austria	Wien	Vienna		
Bahrain		Manama		
Belgium		Brussels		
Brazil		Rio de Janeiro		
Brazil		Sao Paulo		
Brazil	Minas Gerais	Belo Horizonte		
Brazil		Brasilia		
Brazil	Parana	Curitiba		
Brazil	Rio Grande do Sul	Porto Alegre		
Brazil		Rio de Janeiro		
Brazil		Sao Paulo		
Bulgaria		Sofia		
Canada	Halton	Burlington		
Canada	Alberta	Calgary		
Canada	Alberta	Edmonton		
Canada	Ontario	Kanata		
Canada	Ontario	Mississauga		
Canada	Westmorland	Moncton		
Canada		Montreal		
Canada	Ontario	Ottawa		
Canada	Ontario	Toronto		
Canada	British Columbia	Vancouver		
Canada		Montreal		
Canada	Manitoba	Winnipeg		

Source: Citi Research

Figure 705. EMC Corp (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Chile		Santiago		
China		Beijing		
China	Hunan	Changsha		
China	Sichuan	Chengdu		
China		Chongqing		
China	Fujian	Fuzhou		
China		Guangzhou		
China	Zhejiang	Hangzhou		
China	Anhui	Hefei		
China	Hong Kong			
China	Shandong	Jinan		
China	Yunnan	Kunming		
China	Jiangsu	Nanjing		
China		Qingdao		
China		Shanghai		
China	Liaoning	Shenyang		
China	Guangdong	Shenzhen		
China	Xinjiang	Urumqi		
China	Hubei	Wuhan		
China	Henan	Zhengzhou		
Colombia		Medellin		
Costa Rica		Pavas		
Croatia		Zagreb		
Czech Republic		Prague		
Denmark		Aarhus		
Denmark		Copenhagen		
Denmark		Copenhagen		
Egypt		Cairo		
Estonia		Tallinn		
Finland	Uusimaa	Helsinki		
France		Antony		
France		Bezons Cedex		
France	Garonne	Bordeaux		
France		Grenoble		
France		La Celle St. Cloud		
France	Lille Métropole	Lille		
France		Lognes		
France		Lyon		
France	Rhone-Alpes	Grenoble		

Source: Citi Research

Figure 706. EMC Corp (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
France		Nanterre		
France		Nantes		
France		Orly		
France		Paris		
France	Pyrenees	Pau		
France	Haute-Garonne	Toulouse		
Germany		Berlin		
Germany	North Rhine-Westphalia	Bochum		
Germany	Saxony	Dresden		
Germany	North Rhine-Westphalia	Dusseldorf		
Germany	Hesse	Frankfurt		
Germany		Hamburg		
Germany	Saxony	Hannover		
Germany	Baden-Württemberg	Karlsruhe		
Germany	Bavaria	Munich		
Germany	North Rhine-Westphalia	Neuss		
Germany	Bavaria	Numberg		
Germany		Main-Taunus-Kreis		
Germany	Baden-Württemberg	Stuttgart		
Germany	Rhein-Neckar-Kreis	Waldorf		
Ghana		Accra		
Greece	Athens	Marousi		
Hong Kong	Quarry Ba	Taikoo Shing		
Hungary		Budapest		
Hungary		Budapest		
India	Karnataka	Bangalore		
India	Karnataka	Bangalore		
India	Tamil Nadu	Chennai		
India	Haryana	Gurgaon		
India	Andhra Pradesh	Hyderabad		
India	west Bengal	Kolkata		
India	Maharashtra	Mumbai		
India		New Delhi		
India	Maharashtra	Pune		
India	Andhra Pradesh	Secunderabad		
Indonesia		Jakarta		
Ireland		Belfast		
Ireland		Cork COE-Ovens		
Ireland		Ballincollig		
Ireland		Dublin		
Ireland		Shannon		
Israel	Negev	BeerSheva		
Israel	Haifa	Binyamina		
Israel		Tel Aviv		
Israel		Jerusalem		
Israel	Sharon	Kfar Saba		
Israel		Netanya		
Israel		Tel Aviv		
Italy	Emilia-Romagna	Bologna		
Italy	Lombardy	Milan		
Italy	Veneto	Padua		
Italy	Lazio	Rome		
Italy	Piedmont	Turin		
Japan		Tokyo		
Japan	Kyushu	Fukuoka		
Japan	Chūgoku	Hiroshima		
Japan		Kawasaki		
Japan	Chūbu	Nagoya		
Japan	Kansai	Osaka		
Japan		Shizuoka		
Japan		Tokyo		
Japan		Tokyo		
Japan		Tokyo		
Japan	Aichi	Toyota		
Jordan		Amman		
Kenya		Nairobi		
Kuwait		Kuwait City		
Lithuania		Vilnius		
Luxembourg		Capellen		
Luxembourg		Capellen		
Macedonia		Skopje		
Malaysia		Kuala Lumpur		
Malaysia	Malacca	Penang		
Mexico		Santa Fe		
Mexico		Jalisco		
Mexico		Mexico City		
Mexico	Nuevo Leon	Monterrey		
Mexico		Santa Fe		
Mexico		Tlaquepaque		
Morocco		Casablanca		
Netherlands		Delft		
Netherlands	Haarlemmermeer	Hoofddorp		
Netherlands		Nieuwegein		
Netherlands		Rotterdam		
Netherlands		Utrecht		
New Zealand		Auckland		
New Zealand		Wellington		
Nigeria		Lagos		
Norway		Bergen		
Norway		Oslo		
Pakistan		Islamabad		
Pakistan		Karachi		
Peru		San Isidro		

Source: Citi Research

Figure 707. EMC Corp (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Philippines		Manila		
Poland		Warsaw		
Portugal		Lisbon		
Puerto Rico		Guaynabo		
Qatar		Doha		
Romania		Bucharest		
Russia	Sverdlovsk Oblast	Ekaterinburg		
Russia		Moscow		
Russia		Novosibirsk		
Russia		St. Petersburg		
Russia	Sverdlovsk Oblast	Yekaterinburg		
Saudi Arabia		Al Khobar		
Saudi Arabia		Jeddah		
Saudi Arabia		Riyadh		
Serbia		Belgrade		
Singapore		Changi		
Slovakia		Bratislava		
Slovenia		Ljubljana		
South Africa		Cape Town		
South Africa	KwaZulu-Natal	Durban		
South Africa		Johannesburg		
South Africa		Port Elizabeth		
South Korea		Busan		
South Korea		Seoul		
South Korea		Cheonan		
South Korea		Daejeon		
South Korea		Seoul		
Spain	Catalonia	Barcelona		
Spain		Bilbao		
Spain		Madrid		
Spain		Valencia		
Sri Lanka		Colombo		
Sweden		Gothenburg		
Sweden		Stockholm		
Sweden		Stockholm		
Switzerland		Gland		
Switzerland		Bern		
Switzerland		Geneva		
Switzerland		Zurich		
Taiwan		Taipei		
Thailand		Bangkok		
Thailand	Lumpini	Bangkok		
Turkey		Istanbul		
Turkey		Ankara		
Turkey		Istanbul		
UK		Brentford		
UK		Aberdeen		
UK	Oxfordshire	Abingdon		
UK		Birmingham		
UK		Bracknell		
UK		Brentford		
UK		Bristol		
UK	Surrey	Camberley		
UK		Hertfordshire		
UK	West Yorkshire	Leeds		
UK		Livingston		
UK		London		
UK		Manchester		
UK		Norwich		
UK	Hampshire	Southampton		
UK	Surrey	Frimley		
UK	Hertfordshire	Watford		
UK		Wysdm		
Ukraine		Kiev		
United Arab Emirates		Dubai		
United Arab Emirates		Abu Dhabi		
USA	Massachusetts	Hopkinton	1,681,000	Office
USA	Massachusetts	Franklin	1,210,000	Manufacturing
USA	Massachusetts	Bedford	328,000	Office
USA	North Carolina	Apex	390,000	Manufacturing
USA	California	Palo Alto	1,642,000	Office
USA	Ireland	Cork	724,000	Office
USA	North Carolina	Durham	450,000	Office
USA	Georgia	Atlanta		
USA	Alabama	Hoover		
USA	Arkansas	Bentonville		
USA	Arkansas	Conway		
USA	Arkansas	Little Rock		
USA	Maricopa	Scottsdale		
USA	California	Burbank		
USA	California	Campbell		
USA	California	Carlsbad		
USA	California	El Segundo		
USA	California	Irvine		
USA	California	Long Beach		
USA	California	Menlo Park		
USA	California	Pleasanton		
USA	California	Roseville		
USA	California	San Diego		
USA	California	San Francisco		
USA	California	San Jose		
USA	California	San Mateo		
USA	California	Santa Clara		
USA	California	Santa Monica		
USA	Colorado	Boulder		
USA	Colorado	Colorado Springs		
USA	Colorado	Denver		

Source: Citi Research



Figure 708. EMC Corp (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
USA	Colorado	Englewood		
USA	Colorado	Louisville		
USA	Colorado	Loveland		
USA	Connecticut	Fairfield		
USA	Connecticut	Hamden		
USA	Connecticut	Rocky Hill		
USA	Washington	Washington		
USA	Florida	Boca Raton		
USA	Florida	Coral Gables		
USA	Florida	Jacksonville		
USA	Florida	Maitland		
USA	Florida	Sunrise		
USA	Florida	Tampa		
USA	Georgia	Alpharetta		
USA	Georgia	Atlanta		
USA	Georgia	Duluth		
USA	West	Boise		
USA	Idaho	Boise		
USA	Illinois	Chicago		
USA	Illinois	Lisle		
USA	Indiana	Fort Wayne		
USA	Indiana	Indianapolis		
USA	Indiana	West Lafayette		
USA	Kansas	Overland Park		
USA	Kentucky	Louisville		
USA	Louisiana	Metairie		
USA	Massachusetts	Boston		
USA	Massachusetts	Burlington		
USA	Massachusetts	Cambridge		
USA	Massachusetts	Southborough		
USA	Massachusetts	Marlborough		
USA	Massachusetts	Milford		
USA	Massachusetts	Newton		
USA	Massachusetts	Waltham		
USA	Massachusetts	Wellesley Hills		
USA	Massachusetts	Westwood		
USA	Maryland	Columbia		
USA	Maryland	Rockville		
USA	Michigan	Farmington Hills		
USA	Michigan	Grand Rapids		
USA	Michigan	Troy		
USA	Minnesota	Eden Prairie		
USA	Minnesota	Minneapolis		
USA	Minnesota	New Brighton		
USA	Missouri	Creve Coeur		
USA	Missouri	St. Louis		
USA	Montana	Whitefish		
USA	North Carolina	Charlotte		
USA	North Carolina	Greensboro		
USA	North Carolina	High Point		
USA	North Carolina	Raleigh		
USA	North Carolina	Research Triangle Park		
USA	Nebraska	Omaha		

Source: Citi Research

Figure 709. EMC Corp (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
USA	New Hampshire	Nashua		
USA	New Jersey	Basking Ridge		
USA	New Jersey	Berkeley Heights		
USA	New Jersey	East Brunswick		
USA	New Jersey	Princeton		
USA	New Jersey	South Plainfield		
USA	New Jersey	Warren		
USA	New Jersey	West Windsor		
USA	New Mexico	Los Alamos		
USA	Nevada	Las Vegas		
USA	New York	Amherst		
USA	New York	Colonie		
USA	New York	Melville		
USA	New York			
USA	New York	Pittsford		
USA	New York	White Plains		
USA	Ohio	Cincinnati		
USA	Ohio	Dublin		
USA	Ohio	Independence		
USA	Ohio	Westerville		
USA	Oklahoma	Tulsa		
USA	Oregon	Beaverton		
USA	Oregon	Lake Oswego		
USA	Pennsylvania	Camp Hill		
USA	Pennsylvania	Conshohocken		
USA	Pennsylvania	Pittsburgh		
USA	Pennsylvania	Conshohocken		
USA	South Carolina	Columbia		
USA	Tennessee	Franklin		
USA	Tennessee	Memphis		
USA	Texas	Austin		
USA	Texas	Coppell		
USA	Texas	Dallas		
USA	Texas	Frisco		
USA	Texas	Houston		
USA	Texas	Richardson		
USA	Texas	San Antonio		
USA	Utah	Draper		
USA	Utah	Ogden		
USA	Utah	Orem		
USA	Utah	Park City		
USA	Utah	Pleasant Grove		
USA	Utah	Salt Lake City		
USA	Virginia	Alexandria		
USA	Virginia			
USA	Virginia	Glen Allen		
USA	Virginia	Herndon		
USA	Virginia	McLean		
USA	Virginia	Reston		
USA	Washington	Bellevue		
USA	Washington	Seattle		
USA	Washington	Wenatchee		
USA	Wisconsin	Madison		
USA	Wisconsin	Pewaukee		
USA	Wisconsin	Waukesha		
Venezuela		Caracas		
Vietnam		Hanoi		
Vietnam		Ho Chi Minh City		

Source: Citi Research

Figure 710. Emulex Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South Wales	North Sydney		Office
Brazil		Sao Paulo		Office
China		Beijing		Office
China		Shanghai		Office
France		Paris		Office
Germany		Munich		Office
India	Karnataka	Bangalore		Office
India	Andhra Pradesh	Hyderabad		Office
Ireland		Dublin		Office
Japan		Tokyo		Office
New Zealand		Auckland		Office
New Zealand		Hamilton		Office
Singapore				Office
Taiwan		Taipei		Office
UK	Berkshire			Office
UK	Berkshire	Wokingham		Office
USA	California	Costa Mesa	180,000	Headquarters
USA	Georgia	Kennesaw		Office
USA	Texas	Austin		Office
USA	Massachusetts	Bolton		Office
USA	Washington	Bothell		Office
USA	Virginia	Chantilly		Office
USA	Virginia	Herndon		Office
USA	Colorado	Longmont		Office
USA	California	Roseville		Office
USA	California	San Jose		Office
USA	California	Sunnyvale		Office
USA	New Jersey	Wayne		Office

Source: Citi Research

Figure 711. Entegris Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai		
China		Beijing		
China		Xi'an		
France		Montpellier	53,000	Cleaning Services
France		Moirans		Customer Service Center
France		Limonest		Customer Service Center
Germany		Dresden		
Israel		Kiryat Gat		
Japan		Yonezawa	196,000	Manufacturing
Japan		Tokyo		
Japan	Yodogawa	Osaka		
Japan		Fukuoka		
Japan		Yamagata		
Japan	Yamagata	Yonezawa		
Malaysia	Kedah	Kulim	195,000	Manufacturing
Malaysia	Penang	Bayan Lepas		
Singapore				
South Korea		Wonju	35,000	Manufacturing
South Korea	Kyonggi	Seongnam		
South Korea	Gangwon	Wonju		
Taiwan		Hsinchu	20,000	
Taiwan	Xinshi District	Tainan		
Taiwan		Hsinchu		
Taiwan		Hsinchu		
USA	Massachusetts	Billerica	175,000	Executive Offices, Research & Manufacturing
USA	Massachusetts	Bedford	84,200	Research & Manufacturing
USA	Minnesota	Chaska	192,000	Research & Manufacturing
USA	Colorado	Colorado Sprin	122,000	Manufacturing
USA	Texas	Decatur	359,000	Manufacturing
USA	California	San Diego	13,000	Research & Manufacturing
USA	Minnesota	Fridley	12,000	Research & Manufacturing
USA	Massachusetts	Franklin	31,000	Research & Manufacturing
USA	Massachusetts	Burlington	16,000	
USA	Minnesota	Minneapolis		
USA	California	Pleasant Hill		

Source: Citi Research

Figure 712. Epistar

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Taiwan		Hsinchu		Global Headquarters (Fab N3)
Taiwan		Hsinchu		Fab N1
Taiwan		Hsinchu		Fab N2
Taiwan		Hsinchu		Fab N5
Taiwan		Hsinchu		Fab N8
Taiwan		Hsinchu		Fab N6
Taiwan		Tainan		Fab S1
Taiwan		Tainan		Fab S3

Source: Citi Research

Figure 713. Everlight

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Taiwan		New Taipei		HQ
Germany		Karlsruhe		Sales Office
Sweden		Tranas		Sales Office
Germany		Ismaning		Sales Office
United States	Texas	Carrollton		US HQ/Sales Office
Canada	California	Ontario		Sales Office
China	Jiangsu Province	Suzhou		Sales Office
China	Heping District	Tianjin		Sales Office
China	Panyu	Guangzhou		Sales Office
Hong Kong		Kowloon		Sales Office
Malaysia	Penang			Sales Office
South Korea		Seoul		Sales Office
Taiwan		New Taipei		Taipei Headquarters
India		Bangalore		Sales Office
China		Shenzhen		Shenzhen Office
China	Guangdong	Shenzhen		Sales Office
Singapore				Sales Office
Japan		Tokyo		Sales Office
China	Huli District	Xiamen		Sales Office
China	Jiangsu Province	Suzhou		Sales Office

Source: Citi Research

Figure 714. Ericsson LM

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Albania		Tirana		Office
Algeria	Mohammedia	Algiers		Office
Angola		Lunda Sul		Office
Argentina		Buenos Aires		Office
Australia	Victoria	Melbourne		Office
Austria		Vienna		Office
Azerbaijan		Baku		Office
Bangladesh		Dhaka		Office
Belarus		Minsk		Office
Belgium		Zaventem		Office
Bolivia		Santa Cruz		Office
Bosnia and Herzegovina		Sarajevo		Office
Botswana		Gaborone		Office
Brazil		Sao Paulo		Office
Brazil		Indaiatuba		Office
Brazil		São José dos Campos		Office
Brazil		Rio de Janeiro		Office
Brunei		Jalan Berakas		Office
Bulgaria		Sofia		Office
Cambodia		Phnom Penh		Office
Cameroon		Douala		Office
Canada	Ontario	Mississauga		Office
Canada	Quebec	Montreal		Office
Canada	Ontario	Ottawa		Office
Canada	British Columbia	Burnaby		Office
Canada	Ontario	Mississauga		Office
Chile		Santiago De Chile		Office
China		Beijing		Office

Source: Citi Research

Figure 715. Ericsson LM (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Colombia		Bogota		Office
Costa Rica		San José		Office
Cyprus		Nicosia		Office
Czech Republic		Praha		Office
Denmark		København		Office
Dominican Republic		Santo Domingo		Office
Egypt		Cairo		Office
El Salvador		San Salvador		Office
Estonia		Tallinn		Office
Ethiopia		Addis Ababa		Office
Finland		Jorvas		Office
France		Massy Cedex		Office
Georgia		Tbilisi		Office
Germany		Dusseldorf		Office
Ghana		Accra		Office
Greece		Pearia		Office
Guatemala		Guatemala City		Office
Haiti		Port-Au-Prince		Office
Honduras		Tegucigalpa		Office
Hong Kong		Quarry Bay		Office
Hungary		Budapest		Office
India	Haryana	Gurgaon		Office
Indonesia		Jakarta		Office
Ireland		Dublin		Office
Israel		Rosh HaAyin		Office
Italy		Rome		Office
Japan		Tokyo		Office
Jordan		Amman		Office

Source: Citi Research

Figure 716. Ericsson LM (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Kazakhstan		Almaty		Office
Kenya		Nairobi		Office
Latvia		Riga		Office
Lebanon		Beirut		Office
Liberia		Monrovia		Office
Libya		Tripoli		Office
Luxembourg		Strassen		Office
Macedonia		Skopje		Office
Malaysia	Selangor	Cyberjaya		Office
Malta		Sliema		Office
Mexico	Mexico D.F.	Santa Fe		Office
Mexico	Mexico D.F.	Plaza Carso		Office
Mexico	Mexico D.F.	Tecnoparque		Office
Mexico	Mexico D.F.	Querétaro		Office
Moldova		Chisinau		Office
Morocco		Rabat		Office
Netherlands		Rijen		Office
New Zealand		Auckland		Office
Nigeria		Lagos		Office
Norway		Fornebu		Office
Panama		Panama City		Office
Papua New Guinea		Port Moresby		Office
Paraguay		Asunción		Office
Philippines: Manila		Taguig		Office
Poland		Warsaw		Office
Portugal		Paco de Arcos		Office
Puerto Rico		San Juan		Office
Romania		Bucharest		Office
Russia		Moscow		Office
Senegal		Dakar		Office
Serbia		Belgrade		Office
Singapore		Singapore		Office
Slovakia		Bratislava		Office
Slovenia		Ljubljana		Office
South Africa		Johannesburg		Office
South Korea		Seoul		Office
Spain		Madrid		Office
Sri Lanka		Colombo		Office
Sweden		Stockholm		Headquarters
Sweden		Stockholm		Office
Switzerland		Bern		Office
Taiwan		Taipei		Office
Thailand	Chatuchak	Bangkok		Office
Trinidad and Tobago		St. Clair		Office
Tunisia		Tunis		Office
Turkey		Istanbul		Office
Uganda		Kampala		Office
UK	Surrey	Guildford		Office
UK	Berkshire			Office
UK	West Midlands	Coventry		Office
UK		Manchester		Office
Ukraine		Kiev		Office
USA	Texas	Plano		Office
Uzbekistan		Tashkent		Office
Venezuela		Caracas		Office
VietNam		Hanoi		Office
Zambia		Lusaka		Office
Zimbabwe		Harare		Office

Source: Citi Research

Figure 717. F5 Networks

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia		Brisbane		Office
Australia		Canberra		Office
Australia		Melbourne		Office
Australia		Perth		Office
Australia		Sydney		Office
Belgium				Office
Brazil		Sao Paulo		Office
Canada	Ontario	Toronto		Office
China		Beijing		Office
China		Chengdu		Office
China		Guangzhou		Office
China		Shanghai		Office
China	Hong Kong			Office
Colombia				Office
Denmark				Office
Finland				Office
France				Office
Germany		Munchen		Office
India	Karnataka	Bangalore		Office
India	Maharashtra	Mumbai		Office
India		New Delhi		Office
Indonesia		Jakarta		Office
Israel				Office
Italy	Lombardy	Milan		Office
Japan		Tokyo		Office
Malaysia		Kuala Lumpur		Office
Mexico				Office
Netherlands				Office
New Zealand		Auckland		Office
Norway		Oslo		Office
Philippines		Manila		Office
Russia		Moscow		Office
Russia		Tomsk		Office
Singapore		Singapore		Office
South Africa				Office
South Korea		Seoul		Office
Spain		Barcelona		Office
Spain		Madrid		Office
Sweden		Stockholm		Office
Taiwan		Taipei		Office
Thailand		Bangkok		Office
UK		Chertsey		Office
UK		London		Office
UK		London		International Technology Center
United Arab Emirates		Dubai		Office
USA	Washington	Seattle	300000	Headquarters
USA	Washington	Bellevue		Office
USA	Massachusetts	Boston		Office
USA	Colorado	Boulder		Office
USA	Illinois	Chicago		Office
USA	New York	New York		Office
USA	New York	New York		International Technology Center
USA	California	San Jose		Office
USA	Washington	Spokane		Office
USA	Washington			Office
Vietnam		Hanoi		Office

Source: Citi Research

Figure 718. Fairchild Semiconductors

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Jiangsu	Suzhou		Manufacturing Sites
China		Shanghai		R & D Sites
China		Beijing		R & D Sites
China		Shenzhen		Office Facilities
Finland		Oulu		Design Centers
Germany		Muenchen		Regional Sales and Customer Service Centers
Germany		Muenchen		Design Centers
Hong Kong		Kowloon		Regional Sales and Customer Service Centers
India		Pune		Design Centers
Japan		Tokyo		Regional Sales and Customer Service Centers
Malaysia		Penang		Manufacturing Sites
Philippines		Cebu City		Manufacturing Sites
Singapore				office
South Korea		Seoul		Regional Sales and Customer Service Centers
South Korea Kyonggi		Bucheon		Design Centers
South Korea Kyonggi		Bucheon		Manufacturing Sites
South Korea		Hwasung		Warehouse space
Taiwan		Taipei		Office facilities, warehouse and design center
UK		Wootton Bassett		Office Facilities
USA	California	San Jose		office
USA	Maine	South Portland		office, Design Centers & manufacturing sites
USA	Texas			Regional Sales and Customer Service Centers
USA	California	San Jose		Design Centers
USA	California	Irvine		Office Facilities & Design center
USA	California	Hayward		Office Facilities & Design center
USA	Colorado	Colorado Springs		Design Centers
USA	Pennsylvania	Mountaintop		Manufacturing Sites
USA	Utah	West Jordan		Manufacturing Sites

Source: Citi Research

Figure 719. Finisar Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia		Sydney	51500	Office
China		Wuxi	603000	Office
China		Shanghai	180000	Office
China		Shenzhen	16000	Office
India		Hyderabad	6200	Office
Israel		Tel Aviv	22400	Office
Israel		Ness Ziona	13000	Office
Malaysia		Ipoh	640000	Office
Singapore			13600	Office
South Korea		Gwangju	34500	Office
South Korea		Gwangju	24000	Office
Sweden		Jarfalla	26400	Office
USA	Pennsylvania	Horsham	81000	Office
USA	Texas	Allen	160000	Office
USA	California	Sunnyvale	92000	Office
USA	California	Fremont	56000	Office
USA	Illinois	Champaign	2500	Office

Source: Citi Research

Figure 720. First Solar Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South Wales	Sydney		Office
Belgium		Brussels		Office
Canada	Ontario	Sarnia		Office
Chile		Santiago		Office
China		Beijing		Office
Germany		Mainz		Office
India	Haryana	New Delhi		Office
Malaysia	Kedah	Kulim		Manufacturing
South Africa		Cape Town		Office
United Arab Emirates		Dubai		Office
USA	Washington			Headquarters
USA	California	San Francisco		Office
USA	New Jersey			Office
USA	Ohio	Perrysburg		Manufacturing

Source: Citi Research

Figure 721. Flextronics

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Austria		Althofen	182,986	Design Centers, Manufacturing
Brazil		Sao Paulo		Manufacturing
Brazil		Sorocaba		Manufacturing, Industrial Parks, Service & Software
Brazil		Manaus		Flextronics facilities, Manufacturing
Canada		Toronto		Design Centers, Service & Software
Canada		Ottawa		Flextronics facilities, Design Centers
China		Shenzhen		Manufacturing
China		Beijing		Flextronics facilities, Design Centers
China		Shanghai		Design Centers, Manufacturing
China	Hong Kong			Flextronics facilities, Design Centers
China		Dongguan		Flextronics facilities, Manufacturing
China		Ganzhou		Flextronics facilities, Manufacturing
China	Guangdong	Zuhai		Manufacturing, Industrial Parks
China		Chengdu		Flextronics facilities, Manufacturing
China		Nanjing	196,037	Flextronics facilities, Manufacturing
China		Wuzhong		Manufacturing, Industrial Parks
China		Suzhou		Manufacturing, Industrial Parks
Czech Republic		Brno		Flextronics facilities, Design Centers
Czech Republic		Pardubice		Flextronics facilities, Service & Software
Germany		Frickenhause		Flextronics facilities, Design Centers
Germany		Ostbevern		Flextronics facilities, Design Centers
Germany		Tuebingen		Flextronics facilities, Design Centers
Germany		Boeblingen		Flextronics facilities, Manufacturing
Germany		Paderborn	269,098	Flextronics facilities, Manufacturing
Hungary		Sarvar		Manufacturing, Industrial Parks
Hungary		Tab	172,222	Flextronics facilities, Manufacturing
Hungary		Zalaegerszeg		Manufacturing, Industrial Parks
Hungary		Budapest		Flextronics facilities, Service & Software
Hungary		Pecs		Flextronics facilities, Service & Software
India		Chennai		Manufacturing, Industrial Parks
Indonesia		Batam	258,000	Flextronics facilities, Manufacturing
Ireland		Cork	235,704	Manufacturing, Service & Software
Ireland		Limerick		Flextronics facilities, Service & Software
Israel		Arad		Flextronics facilities, Manufacturing
Israel		Migdal Haem	441.32	Flextronics facilities, Manufacturing
Israel		Ofakim		Flextronics facilities, Manufacturing
Israel		Yavne		Flextronics facilities, Manufacturing
Italy		Milan	240,000	Design Centers, Service & Software
Italy		Treviso		Design Centers, Manufacturing
Italy		Monza		Flextronics facilities, Manufacturing
Japan		Ibaraki		Flextronics facilities, Manufacturing
Malaysia		Penang		Design Centers, Manufacturing, Industrial Parks
Malaysia		Kuala Lumpur		Flextronics facilities, Manufacturing
Malaysia		Johor		Flextronics facilities, Manufacturing

Source: Citi Research

Figure 722. Flextronics (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
				Manufacturing, Design Centers, Industrial Parks, Service & Software
Mexico		Guadalajara		
Mexico		Tijuana		Flextronics facilities, Manufacturing
Mexico		Nogales		Flextronics facilities, Manufacturing
Mexico		Juarez		Manufacturing, Service & Software, Industrial Parks
Mexico	Aguascalientes		516,665	Flextronics facilities, Manufacturing
Mexico	Nuevo Leon	Monterrey		Flextronics facilities, Manufacturing
Mexico		Ramos Arizpe		Flextronics facilities, Manufacturing
Netherlands		Venray		Flextronics facilities, Service & Software
Philippines		Cebu City		Flextronics facilities, Design Centers
Poland		Tczew		Flextronics facilities, Manufacturing, Industrial Parks
Poland		Lodz		Flextronics facilities, Service & Software
Romania		Timisoara	430,000	Flextronics facilities, Manufacturing
Singapore		Singapore		Flextronics facilities, Design Centers
Singapore		Changi		Flextronics facilities, Manufacturing
Singapore		Kallang		Flextronics facilities, Manufacturing
Singapore		Joo Koon	560,000	Flextronics facilities, Manufacturing
Sweden		Ronneby	161,459	Flextronics facilities, Design Centers, Manufacturing
Taiwan		Taipei		Flextronics facilities, Design Centers
Turkey		Istanbul		Flextronics facilities, Service & Software
UK		Manchester		Flextronics facilities, Service & Software
UK		Swindon		Flextronics facilities, Service & Software
Ukraine		Beregov	538,195	Flextronics facilities, Manufacturing
Ukraine		Mukachevo		Flextronics facilities, Manufacturing
United Arab Emirates		Dubai		Flextronics facilities, Service & Software
USA	California	Valencia		Flextronics facilities, Manufacturing, Design Centers
				Manufacturing, Design Centers, Industrial Parks, Service & Software
USA	California	Milpitas		Flextronics facilities, Manufacturing
USA	California	Morgan Hill		Flextronics facilities, Manufacturing
USA	California	San Carlos		Flextronics facilities, Manufacturing
USA	Texas	Austin		Design Centers, Manufacturing, Service & Software
USA	Texas	Plano		Flextronics facilities, Design Centers
USA	Texas	Irving		Flextronics facilities, Design Centers
USA	Michigan	Detroit		Flextronics facilities, Design Centers
USA	Michigan	Rochester Hills		Flextronics facilities, Design Centers
USA	Georgia	Atlanta		Flextronics facilities, Design Centers
USA	Texas	Dallas	320,000	Flextronics facilities, Manufacturing
USA	Texas	Longview		Flextronics facilities, Manufacturing
USA	Texas	Houston	150,000	Flextronics facilities, Manufacturing
USA	Minnesota	Northfield		Flextronics facilities, Manufacturing
USA	Michigan	Coppersville		Flextronics facilities, Manufacturing
USA	North Carolina	Asheville		Flextronics facilities, Manufacturing
USA	North Carolina	Charlotte	455,000	Flextronics facilities, Manufacturing
USA	North Carolina	Creedmoor	290,000	Flextronics facilities, Manufacturing
USA	South Carolina	Columbia	450,000	Flextronics facilities, Manufacturing
USA	Texas	El Paso		Flextronics facilities, Service & Software
USA	Texas	Laredo		Flextronics facilities, Service & Software
USA	Kentucky	Louisville		Flextronics facilities, Service & Software
USA	North Carolina	Raleigh		Flextronics facilities, Service & Software
USA	Tennessee	Memphis		Flextronics facilities, Service & Software

Source: Citi Research

Figure 723. FormFactor Inc

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
				Sales, marketing, finance, manufacturing, product design, service and repair, distribution, research and development
China		SuZhou	9,700	
China		Shanghai	418	Sales office
Germany		Dresden	2,282	Sales office
Japan		Yokohama	8,777	Field service, and repair center
				Sales office, marketing, product design, research and development
Japan		Tokyo	7,816	
Japan		Hiroshima	1,615	Repair center
				Sales, finance, product design, service, field service, supply chain.
Singapore			25,278	
Singapore			1,338	Sales office, field service, and repair center
				Sales office, product design, field service, and repair center
South Korea		Gyeonggi-do	7,979	
South Korea		Gyeonggi-do	1,000	Sales office, field service, and repair center
				Sales office, product design, field service and repair center
Taiwan	Hsinchu	Jubei City	9,309	
Taiwan		Hsinchu	1,267	Sales office, field service, and repair center
				Corporate Headquarters, sales, marketing, finance, product design, manufacturing, service and repair, distribution, research and Storage
USA	California	Livermore	182,167	
				Sales, marketing, finance, product design, manufacturing, service and repair, distribution, research and development
USA	California	San Jose	39,894	
				Sales office, product design, manufacturing, service and repair, distribution for non probe cards
USA	Nevada	Carson	31,100	
				Product design, manufacturing, service and repair, distribution, research and development
USA	California	Carlsbad	25,634	
USA	Texas	Austin	2,025	Service and repair
USA	Southbury	Connecticut	143	Sales office

Source: Citi Research

Figure 724. Flexium Interconnect

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Jiangsu Province	Kunshan City		Kunshan Plant (Manufacturing)
China	Baoan District	Shenzen City		Shenzen Office
China	Xiang-an District	Xiamen City		Xiamen Office
Taiwan	Kaohsiung County	Kaohsiung		HQ
Taiwan	Taoyuan County	Pingzhen City		Taoyuan Office
USA	California	San Jose		America office

Source: Citi Research

Figure 725. Foxconn Technology

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Guangdong	Shenzhen		
China	Jiangsu	Kunshan		
China	Shanxi	Taiyuan		
Taiwan		Tucheng		Headquarter and R&D center

Source: Citi Research

Figure 726. Foxconn International

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil				Mass Production Facilities
				R&D - Mass Production Facilities -
China		Beijing		Client/technology co location facilities
				R&D - Mass Production Facilities -
China	Hebei	Langfang		Client/technology co location facilities
				R&D - Mass Production Facilities -
China		Tianjin		Client/technology co location facilities
				R&D - Mass Production Facilities -
China		Hangzhou		Client/technology co location facilities
				R&D - Mass Production Facilities -
China		Shenzhen		Client/technology co location facilities
Denmark		Copenhagen		R&D
Finland				Client/technology co location facilities
Hungary				R&D - Mass Production Facilities
				R&D - Mass Production Facilities -
				Client/technology co location facilities
India				R&D
Mexico	Chihuahua			R&D
Mexico		Reynosa		R&D
South Korea		Seoul		R&D
Taiwan		Taipei		R&D
USA	Florida			Client/technology co-location facilities

Source: Citi Research

Figure 727. Freescale Semiconductor

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil		Sao Paulo		Office
Canada	Ontario	Ottawa		Design Center & Sales
Canada	Ontario	Toronto		Office
China		Tianjin		Manufacturing Site
China		Tianjin		Office
China		Suzhou		Office
China		Shenzhen		Office
China		Beijing		Office
China		Pudong New		Office
China		Chengdu		Office
Czech Republic				Office
Denmark				Office
France				Office
Germany		Muenchen		Office
Germany		Wiesbaden		Office
India		Noida		Office
India	Karnataka	Bangalore		Office
India		Hyderabad		Office
Israel		Herzliya		Office
Italy	Lombardy	Milan		Office
Japan		Tokyo		Office
Japan	Aichi			Office
Malaysia		Petaling Jaya		Office
Mexico	Jalisco	Tlaquepaque		Office

Source: Citi Research

Figure 728. Freescale Semiconductor (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Romania		Bucharest		Office
Russia		Moscow		Office
Scotland		Glasgow		Office
South Korea		Seoul		Office
Sweden		Kista		Office
Switzerland		Geneva		Office
UK	Buckingham	Aylesbury		Office
USA	Texas	Austin		Headquarters
USA	Arizona	Chandler		Office
USA	Arizona	Tempe		Office
USA	California	Irvine		Office
USA	California	San Jose		Office
USA	Illinois	Hoffman Estate		Office
USA	Massachusetts	Woburn		Office
USA	Michigan	Novi		Office

Source: Citi Research

Figure 729. Funai

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Guangdong	Zhong Shan City		H.F.T. INDUSTRIAL LTD
China	Guangdong	Shenzhen		Funai Electric R&D (Shenzhen) Co., Ltd.
Germany		Hamburg		FUNAI DEUTSCHLAND A DIVISION OF FUNAI ELECTRIC EURO
Hong Kong	N.T.			FUNAI ELECTRIC (H.K.), LTD
India		Mumbai		Funai India Private Limited
Japan	Osaka	Daito city		HEAD OFFICE
Japan	Tokyo	Chiyoda-ku		TOKYO BRANCH OFFICE
Japan	Osaka	Higashi-Osaka		FUNAI SERVICE CO., LTD
Japan	Osaka	Osaka City		FUNAI GENERAL SERVICE CO., LTD
Japan	Hiroshima	Fukuyama City		CHUGOKU FUNAI ELECTRIC CO., LTD
Japan	Ibaraki	Tsukuba City		FUNAI ELECTRIC ADVANCED APPLIED TECHNOLOGY RESEAR
Malaysia		Johor Bahru		Funai Malaysia R and D SDN. BHD
Philippines		Cebu		FUNAI ELECTRIC CEBU, INC.
Poland		Nowa Sol		FUNAI ELECTRIC EUROPE Sp. z o.o.
Poland		Warszawa		FUNAI ELECTRIC EUROPE Sp. z o.o. ODDZIAŁ W WARSZAWIE
Singapore				FUNAI SINGAPORE PTE. LTD

Source: Citi Research

Figure 730. Funai (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Thailand		Nakhon Ratchasima		FUNAI (THAILAND) CO., LTD
USA	New Jersey	Rutherford		FUNAI CORPORATION, INC.
USA	Georgia	Alpharetta		P&F USA, Inc.
USA	Ohio	Groveport		FUNAI SERVICE CORPORATION
USA	Mexico			P&F MEXICANA, S.A. DE C.V

Figure 731. Fujifilm

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South Wales	Brookvale		
Austria		Vienna		
Belgium		Sint-Niklaas		
Belgium		Zwijndrecht		
Belgium		Overpelt		
Brazil		Sao Paulo		
Canada	Ontario	Mississauga		
China		Shanghai		
China		Suzhou		
China	Hong Kong			
Colombia		Bogota		
Denmark		Glostrup		
Finland		Riihimaki		
France		Bois-d'Arcy		
France		Marne La Vallee		
France		Asnieres-sur-Seine		
France		Cedex		
Germany		Dusseldorf		
Germany		Kleve		
Hong Kong		Kwai Fong		
Hong Kong		Tsuen Wan		
Hungary		Budapest		
India	Haryana	Gurgaon		
Indonesia		Jakarta		
Italy		Milan		
Japan		Tokyo		Headquarters
Kenya		Nairobi		
Malaysia	Selangor	Shah Alam		
Morocco		Casablanca		
Myanmar		Yangon		
Netherlands		Rotterdam		
Netherlands		Tilburg		
New Zealand		Auckland		
Pakistan		Karachi		
Philippines		Makati		
Romania		Bucharest		
Russia		Moscow		
Singapore				
South Africa		Johannesburg		
South Korea		Seoul		
South Korea		Chungcheongnam		
Sweden		Stockholm		
Sweden		Kista		
Taiwan	Hsinchu	Zhubei		
Thailand		Bangkok		
Turkey		Istanbul		
UK		Bedford		
UK		Kent		
UK		Manchester		
UK		Billingham		
Ukraine		Kyiv city		
United Arab Emirates		Dubai		
USA	New York	Valhalla		
USA	Massachusetts	Bedford		
USA	Connecticut	Stamford		
USA	Washington	Bothell		
USA	New Jersey	Allendale		
USA	South Carolina	Greenwood		
USA	Rhode Island	North Kingstown		
USA	California	Santa Clara		
USA	Delaware	New Castle		
USA	North Carolina	Morrisville		
Vanuatu				
Vietnam		Ho Chi Minh City		

Source: Citi Research

Source: Citi Research



Figure 732. Fujitsu

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Algeria				Fujitsu Technology Solutions S.a.r.l.
Argentina		Buenos Aires		Fujitsu do Brasil LTDA
Australia	New South	Sydney		Fujitsu Australia Limited
Australia	New South	Frenchs Forest		Fujitsu Australia Software Technology Pty. Ltd
Australia	New South	Eastern Creek		Fujitsu General (Aust.) Pty Limited
Australia	New South	Silverwater		Fujitsu PC Australia
Australia	Victoria	Melbourne		Fujitsu Ten (Australia) Pty. Ltd.
Australia	New South	North Ryde		Office
Austria		Vienna		Fujitsu Technology Solutions GesmbH
Bahamas		Nassau		Branch
Barbados				Branch
Belgium		Brussels		Fujitsu Technology Solutions NV
Brazil		São Paulo		Fujitsu do Brasil Ltda.
Bulgaria		Sofia		Fujitsu Technology Solutions GesmbH
Canada	Ontario	Toronto		Fujitsu Canada, Inc.
Canada	Quebec	Montreal		Fujitsu Conseil (Canada) Inc. / Fujitsu Consulting (Can
Canada	Ontario	Scarborough		Fujitsu Ten Canada Inc.
Chile		Santiago		Fujitsu Chile
China		Beijing		Fujitsu (China) Co., Ltd.
China		Fujian		Fujian Fujitsu Communication Software Co., Ltd.
China		Shanghai		Fujitsu (China) Holdings Co., Ltd
China		Xi'an		Fujitsu (Xi'an) System Engineering Co., Ltd.
China	Jiangsu	Changzhou		Fujitsu Components (Changzhou) Co., Ltd
China	Jiangsu	Wuxi		Fujitsu Electronic Components (Shanghai) Co., Ltd.
China	Jiangsu	Suzhou		Fujitsu Quality Laboratory (Suzhou) Ltd.
China		Chengdu		Fujitsu Semiconductor Design (Chengdu) Co. Ltd.
China		Guangzhou		Fujitsu South China Limited (Guangzhou office)
China		Shenzhen		Fujitsu South China Limited (Shenzhen office)
China		Tianjin		R&D
Colombia		Bogota		FUJITSU LIMITED SUCURSAL DE COLOMBIA
Croatia		Zagreb		Fujitsu Technology Solutions Ges.m.b.H.
Czech Republic				Fujitsu Technology Solutions s.r.o
Denmark		Ballerup		Fujitsu A/S
Egypt		New Cairo		Headquarters
Egypt		Alexandria		Fujitsu Egypt
Egypt		Giza		Service office
Estonia		Tallinn		Fujitsu Services AS
Finland		Helsinki		Fujitsu Finland Oy
France		Paris		Fujitsu Components Europe B.V.
France		Massy		Fujitsu Semiconductor Europe GmbH
France		Asnieres-sur-Seine		Fujitsu Technology Solutions SA
Germany		Dusseldorf		FDK Electronics GMBH
Germany		Munich		Fujitsu Enabling Software Technology GmbH
Germany		Langen		Fujitsu Semiconductor Europe GmbH
Germany		Frankfurt		Fujitsu Services GmbH
Germany		Munich		Fujitsu Technology Solutions GmbH
Greece		Athens		Fujitsu Technology Solutions A.E.
Hong Kong				Fujitsu Components Hong Kong Co., Limited
Hungary		Budapest		Fujitsu Technology Solutions KFT
India	Maharashtra	Pune		Fujitsu Consulting
India	Haryana	Gurgaon		Fujitsu India Pvt. Ltd.
India	Karnataka	Bangalore		Sales Office
Indonesia	Jawa Barat	Bekasi		Office
Indonesia		Jakarta		PT. Fujitsu Indonesia
Ireland		Dublin		Fujitsu (Ireland) Limited
Italy	Lombardy	Milan		Fujitsu Semiconductor Europe GmbH
Jamaica				Headquarters
Japan		Tokyo		Headquarters
Japan		Kawasaki		Research & Manufacturing Facilities
Kazakhstan				Fujitsu Technology Solutions GmbH
Latvia		Riga		Fujitsu Services SIA
Lithuania		Vilnius		Fujitsu Services UAB

Source: Citi Research

Figure 733. Fujitsu (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Luxembourg				Fujitsu Technology Solutions
Malaysia		Penang		FUJITSU SEMICONDUCTOR ASIA
Malaysia	Selangor	Cyberjaya		Fujitsu (Malaysia) Sdn. Bhd.
Malaysia		Kuala Lumpur		Fujitsu (Malaysia) Sdn. Bhd.
Malaysia		Parit Raja		Fujitsu Component (Malaysia) Sdn. Bhd.
Mexico	Baja Californ	Tijuana		Fujitsu Mexico Systems
Mexico	Tamaulipas	Reynosa		Fujitsu Ten de Mexico
Morocco		Casablanca		Fujitsu Technology Solutions S.A
Netherlands		Hoofddorp		Fujitsu Components Europe B.V.
Netherlands		Maarsse		Fujitsu Technology Solutions B.V.
New Zealand		Wellington		Fujitsu New Zealand Limited
Norway		Oslo		Fujitsu Technology Solutions AS
Philippine: Laguna		Binan		Fujitsu Die-Tech Corporation
Philippine: Metro Manila		Makati		Fujitsu Philippines, Inc.
Philippine: Metro Manila		Pasig City		Fujitsu Ten Solutions Philippines, Inc.
Philippine: Laguna		Stanta Rosa		Office
Poland		Warsaw		Fujitsu Technology Solutions Sp. z o.o.
Poland		Krakow		Office
Portugal		Lisbon		Fujitsu Technology Solutions
Portugal		Massama		Fujitsu Telecomunicações Portugal
Romania		Bucharest		Fujitsu Technology Solutions GesmbH Viena
Russia		Moscow		Fujitsu Technology Solutions GmbH
Saudi Arabia		Riyadh		Fujitsu Arabia
Serbia		Belgrade		Office
Serbia		Novi Sad		Fujitsu Technology Solutions
Singapore				Fujitsu Asia
Slovakia		Bratislava		Fujitsu Technology Solutions
Slovenia		Ljubljana		Office
South Africa				Fujitsu Technology Solutions Ltd.
South Korea		Seoul		Fujitsu Semiconductor Korea Limited
South Korea		Suncheon-city		Office
Spain		Madrid		Fujitsu Technology Solutions
Spain		Malaga		Fujitsu Ten Espana
Sri Lanka		Katunayake		Office
Sweden		Kista		Fujitsu Sweden AB
Switzerland		Regensdorf		Fujitsu Technology Solutions
Taiwan		Taipei		Fujitsu Components Asia Pte. Ltd.
Taiwan	Taoyuan			Office
Thailand		Bangkok		Fujitsu Systems Business (Thailand) Ltd.
Thailand	Chonburi			Office
Trinidad and Tobago				Branch
Tunisia		Tunis		Fujitsu Technology Solutions S.a.r.l.
Turkey		Istanbul		Fujitsu Technology Solutions Bilşim Ltd. Şti
UK		London		FUJITSU EMEA PLC
UK	Hertfordshire			Fujitsu General (U.K.) Co., Limited
UK	Berkshire			Fujitsu Technology Solutions Ltd.
UK		Birmingham		Fujitsu Telecommunications Europe Limited
UK				Fujitsu Telecommunications Europe Limited
Ukraine				Office
United Arab Emirates		Dubai		Fujitsu Technology Solutions FZ LLC
United Arab Emirates		Abu Dhabi		Fujitsu Services Limited
USA	California	Sunnyvale		Fujitsu America, Inc.
USA	New Jersey	Fairfield		Fujitsu General America, Inc
USA	Hawaii	Honolulu		Fujitsu Limited Hawaii Representative Office
USA	New York	New York		Office
USA	Washington	Washington		Office
USA	Texas	Richardson		Fujitsu Network Communications Inc.
USA	Arizona	Tempe		Office
USA	Michigan	Plymouth		Office
Uzbekistan		Tashkent		Office
Vietnam	Dong Nai			Fujitsu Computer Products of Vietnam
Vietnam		Hanoi		Fujitsu Vietnam Limited

Source: Citi Research

Figure 734. Garmin Ltd.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Germany		Wurzburg	40,000	office and research and development activities
Romania		Cluj-Napoca	11,355	research and development activities
Taiwan		Taipei	249,326	Facilities - Garmin (Asia) Corporation
Taiwan		Tao-Yang	223,469	
Taiwan		Tao-Yang	580,000	
UK		Southampton	155,000	Facilities - Garmin (Europe) Ltd.
USA	Kansas	Olathe	1,120,000	Facilities, Service Center - Garmin International, Inc.
USA	Illinois	Chicago		Retail Store
USA	Kansas	Gardner	148,320	
USA	Kansas	Gardner	47,254	aircraft hangar, flight test and certification facility
USA	Kansas	Gardner	52,794	aircraft hangar, flight test and certification facility
USA	Oregon	Salem	115,000	office, development and manufacturing use
USA	Oregon	Salem	33,000	aircraft hangar, flight test and certification facility
USA	Oregon	Salem	43,870	office space
USA	Kansas	Olathe	48,625	call center operation
USA	Arizona	Tempe	24,748	office
USA	Arizona	Tucson	33,120	office

Source: Citi Research

Figure 735. Hewlett Packard

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Algeria		Mohammadia		Office
Argentina				Office
Australia		Melbourne		Office
Australia		Sydney		Office
Australia	Australian C.	Turner		Office
Australia	Queensland	Brisbane		Office
Australia		Adelaide		Office
Australia		Darwin		Office
Australia		Alice Springs		Office
Australia		West Perth		Office
Australia		Perth		Office
Austria		Vienna		Headquarters - Austria
Austria	Unterprems	Graz		Office
Austria		Gotzis		Office
Austria		Saint Florian		Location Technology and Innovation Centre
Belarus		Minsk		Office
Belgium		Diegem		Hewlett-Packard Belgium

Source: Citi Research

Figure 736. Hewlett Packard (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Bolivia		Puerto Rico Aguadilla		Product Development and Manufacturing
Brazil		Sao Paulo		Office
Brazil		Rio de Janeiro		Office
Brazil		Rio Grande do Sul		Office
Bulgaria		Sofia		HP Bulgaria - Sales Office
Canada	Ontario	Mississauga		Office
Canada	Alberta	Edmonton		Office
Canada	Alberta	Calgary		Office
Canada	British Colun	Richmond		Office
Canada	Manitoba	Winnipeg		Office
Canada	Nova Scotia			Office
Canada	Ontario	Kanata		Office
Canada	Ontario	Toronto		Office
Canada	Quebec	Quebec		Office
Canada	Quebec	Kirkland		Office
Caribbean	Florida	Miami		Office
Chile				Office
China	Chongqing			Product Development and Manufacturing
China		Beijing		Laboratories
China		Beijing		Office
China		Shanghai		Office
China		Guangzhou		Office
China		Shenyang		Office
China		Nanjing		Office
China		Wuhan		Office
China		Xi'an		Office
China		Chengdu		Office
China		Shenzhen		Office
China	Hong Kong			Office
China		Macau		Office
Colombia				Office
Croatia		Zagreb		Office
Cyprus		Halandri		Headquarters - Hewlett-Packard Hellas Ltd.
Czech Republic		Praha		Headquarters - Hewlett-Packard sro
Czech Republic		Rudna		Rudna Logistics Park
Denmark		Allerod		Headquarters - Hewlett-Packard ApS
Denmark		Aarhus		South Head Office
Ecuador				Office
Estonia		Tallinn		HP office in
Finland		Espoo		Hewlett-Packard Oy
France		Les Ulis		Headquarters - Paris region
France		Boulogne		Office - Paris region
France		Nanterre		Office - Paris region
France		Lille		Office - Northern Region
France		Nantes		Office - Northern Region
France		Strasbourg		Office - Northern Region
France		Grenoble		Office - Southern Region
France		L'Isle d'Abeau		Office - Southern Region
France	Haute-Garor	Toulouse		Office - Southern Region
France		Valbonne		Office - Southern Region

Source: Citi Research

Figure 737. Hewlett Packard (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Germany		Bad Homburg		Office
Germany		Berlin		Office
Germany		Boblingen		Office
Germany		Dortmund		Office
Germany		Dusseldorf		Office
Germany		Hamburg		Office
Germany		Hanover		Office
Germany		Jena		Office
Germany		Krefeld		Office
Germany		Leipzig		Office
Germany		Dornach		Office
Germany		Nuremberg		Office
Germany		Ratingen		Office
Germany		Russelsheim		Office
Germany		Waldorf		Office
Ghana				Office
Greece		Halandri		Office
Hungary		Budapest		Hewlett-Packard Hungary
India	Uttarakhand	Udham Singh Nagar		Product Development and Manufacturing
India		Bangalore		Laboratories
India	Karnataka	Bangalore		Office
India	Gujarat	Ahmedabad		Office
India	Tamil Nadu	Chennai		Office
India		Delhi		Office
India	Andhra	Prad Hyderabad		Office
India	Haryana	Gurgaon		Office
India	Uttarakhand	Rudrapur		Office
India	West Bengal	Kolkata		Office
India	Maharashtra	Mumbai		Office
India	Maharashtra	Pune		Office
Indonesia		Jakarta		Office
Indonesia		Surabaya		Office
Ireland		Leixlip		Product Development and Manufacturing
Ireland		County Kilda	Leixlip	Sales & Services Division, HP Global Service Desk, HP Fin
Ireland		County Galway		HP Galway Limited
Ireland		County Antr	Newtownabbey	HP Belfast
Ireland		Dublin		HP-CDS facility at Swords Business Campus, Swords
Israel		Raanana		Office
Israel		Kiryat Gat		Product Development and Manufacturing
Israel		Ness Ziona		Product Development and Manufacturing
Israel	Haifa	Netanya		Product Development and Manufacturing
Italy		Milan		HP Headquarters - Italy
Italy		Bologna		Commercial office in Bologna
Italy		Naples		Commercial Office in Naples
Italy		Padua		Commercial office of Padua
Italy		Rome		Commercial Office in Rome
Italy		Turin		Commercial office in Turin

Source: Citi Research

Figure 738. Hewlett Packard (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Japan		Tokyo		Office
Japan		Tokyo		Product Development and Manufacturing
Japan		Hachioji		Office
Japan		Central Branch Ushijima		Office
Japan		Osaka		Office
Japan		Sapporo		Office
Japan		Sendai		Office
Japan		Fukuoka		Office
Kazakhstan		Almaty		The main office in Almaty
Kenya		Nairobi		Office
Latvia		Riga		HP Latvian office
Lithuania		Vilnius		HP Office in Lithuania
Luxembourg		Capellen		Hewlett-Packard Luxembourg SCA
Malaysia		Kuala Lumpur		Office
Mexico	Campeche	Colonia Lomas de Santa Fe		Office
Mexico	Campeche	Nuevo León		Office
Mexico	Campeche	Fraccionamiento Loma Bonita		Office
Mexico	Campeche	Guadalajara		Office
Mexico	Campeche	Torreón		Office
Mexico	Campeche	Querétaro		Office
Mexico	Campeche	Chihuahua		Office
Mexico	Campeche	Ciudad Juárez		Office
Morocco		Casablanca		Office
Netherlands		Amstelveen		Head and sales Hewlett-Packard Netherlands BV
New Zealand		Auckland		Office
New Zealand		Wellington		Office
New Zealand		Christchurch		Office
New Zealand		Hamilton		Office
Nigeria		Ikoyi - Lagos		Office
Norway		Oslo		Hewlett-Packard Norway AS
Norway		Stavanger		Hewlett-Packard Norway AS
Norway		Trondheim		Hewlett-Packard Norway AS
Peru	San Isidro			Office
Philippines		Makati		Office
Philippines		Taguig		Office
Poland		Warsaw		Hewlett-Packard Poland Sp. z o.o.
Poland		Wrocław		Global e-Business Operations Sp. Ltd.
Portugal		Oeiras		Headquarters - Portugal
Romania		Bucharest		Hewlett Packard Romania
Romania		Bucharest		HP Global e-Business Center
Romania		Bucharest		HP Global e-Business Center - Union
Romania		Bucharest		HP Solutions Center
Romania		Cluj-Napoca		HP Software BTO - Cluj-Napoca
Romania		Timisoara		HP Romania - Timisoara
Russia	St. Petersburg			Laboratories
Russia		Moscow		The main office
Russia		Moscow		Service center
Saudi Arabia		Riyadh		Office
Serbia		Novi Beograd		Hewlett-Packard Ltd.
Singapore				Office
Singapore				Product Development and Manufacturing
Singapore				Laboratories
Slovakia		Bratislava		Office
Slovenia		Ljubljana		Hewlett-Packard Ltd. Society for technological solutions
South Africa	Sandton	Rivonia		Office
South Africa		Johannesburg		Office
South Africa		Cape Town		Office
South Korea		Seoul		Office
South Korea		Daejeon		Office
South Korea		Gwacheon		Office
South Korea		Daegu		Office
South Korea		Suwon		Office
South Korea		Busan		Office
South Korea		Cheonan		Office
South Korea		Guangzhou		Office

Source: Citi Research

Figure 739. Hewlett Packard (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Spain	Sant Cugat del Valles			Product Development and Manufacturing
Spain		Madrid		Headquarters (Madrid)
Spain		Barcelona		Commercial Office (Barcelona)
Spain		Bilbao		Commercial Office (Bilbao)
Spain		Sevilla		Commercial Office (Sevilla)
Spain		Valencia		Commercial Office (Valencia)
Spain		Zaragoza		Commercial Office (Zaragoza)
Sweden		Solna		Hewlett-Packard Sweden AB
Sweden		Gothenburg		Hewlett-Packard Sweden AB
Sweden		Malmo		Hewlett-Packard Sweden AB
Switzerland		Geneva		Office
Switzerland		Dubendorf		Hewlett-Packard (Switzerland) GmbH
Switzerland		Love Field		Hewlett-Packard (Switzerland) GmbH
Switzerland		Love Field		Hewlett-Packard (Switzerland) GmbH; HP Banking Service
Switzerland		Meyrin		Hewlett-Packard (Suisse) Sarl
Taiwan		Taipei		Office
Taiwan		Taichung		Office
Taiwan		Kaohsiung		Office
Thailand		Bangkok		Office
Tunisia		Ariana		Office
Turkey		Istanbul		HP Turkey Main office
Turkey		Ankara		HP Ankara Office
UK	Erskine			Product Development and Manufacturing
UK	Bristol			Laboratories
UK	Berkshire	Bracknell		Bracknell - HP UK Registered Office
UK		London		Office
UK		Bristol		Office
UK	Cheshire	Warrington		Office
UK		Erskine		HP EMEA Business & Operations Campus
UK	County Antrim	Belfast		Office
Ukraine		Kiev		Company HP
USA	Texas	Houston		Office
USA	California	Palo Alto		Office
USA		Houston		Office
USA	Puerto Rico			Office
USA	Iowa	Des Moines		Product Development and Manufacturing
USA	Oregon	Corvallis		Product Development and Manufacturing
USA	California	Roseville and San Diego		Product Development and Manufacturing
USA	Indiana	Indianapolis		Product Development and Manufacturing
USA	Idaho	Boise		Product Development and Manufacturing
USA	Massachusetts	Andover		Product Development and Manufacturing
USA	Tennessee	La Vergne		Product Development and Manufacturing
USA	Iowa	Des Moines		Product Development and Manufacturing
USA	Colorado	Fort Collins		Product Development and Manufacturing
USA	Virginia	Sandston		Product Development and Manufacturing
USA		Palo Alto		Laboratories
Venezuela		Caracas		Office
Vietnam		Ho Chi Minh City		Office
Vietnam		Hanoi		Office

Source: Citi Research

Figure 740. Hi-P International

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Tianjin		Manufacturing sites
China	Sichuan	Chengdu		Manufacturing sites
China	Jiangsu	Nantong		Manufacturing sites
China		Shanghai		Manufacturing sites
China	Jiangsu	Suzhou		Manufacturing sites
China	Fujian	Xiamen		Manufacturing sites
Poland		Wroclaw		Manufacturing sites
Singapore				Headquarters
Taiwan		Taipei		Marketing & ESI Centers
Thailand		Rayong		Manufacturing sites
USA	Illinois	Chicago		Marketing & ESI Centers

Source: Citi Research

Figure 741. Hirose Electric

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Beijing		Beijing Branch
China		Shanghai		Bo Hirose Electric Trading (Shanghai) Co., Ltd.
China		Shenzhen		Hirose Technology (Shenzhen) Co., Ltd.
China		Dongguan		Domestic Subsidiaries
China		Suzhou		Domestic Subsidiaries
China		Weihai		Domestic Subsidiaries
Finland	Pirkanmaa	Akaa		Finland Branch
Germany		Ostfildern		German Branch
Hong Kong		Kowloon		HIROSE ELECTRIC HONGKONG TRADING CO.,LTD.
India	Karnataka	Bangalore		Bangalore Liaison Office
India	Uttar Pradesh	Noida		Delhi Liaison Office
Indonesia				Domestic Subsidiaries
Japan		Tokyo		Head Office
Japan		Tokyo		Yokohama Center
Japan		Kikuna		Kikuna Center
Japan	Kansai			Kansai Branch
Japan		Chubu		Chubu Sales Office
Japan		Miyako		Domestic Subsidiaries
Japan		Koriyama		Domestic Subsidiaries
Malaysia	Penang	Bayan Baru		Penang Liaison Office
Netherlands		Amsterdam		Hirose Electric Europe B.V.
Singapore				HIROSE ELECTRIC SINGAPORE PTE. LTD
South Korea				Domestic Subsidiaries
Taiwan		Taipei		Taiwan-Electronics Co., Ltd.
UK	Buckingham	Milton Keynes		UK Branch
USA	California	Simi Valley		HIROSE Electric U.S.A., Inc.
USA	California	Santa Clara		San Jose Office
USA	Michigan	Livonia		Automotive Sales Office

Source: Citi Research

Figure 742. Hitachi

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		Hitachi Argentina SA
Australia	New South Wales	North Ryde		Hitachi Australia Pty. Ltd.
Australia	New South Wales	Greystanes		Hitachi Construction Machinery Australia Pty. Ltd.
Australia	New South Wales	Macquarie Park		Hitachi Data Systems Australia Pty. Ltd.
Australia		Blacktown		Hitachi Transport System (Australia) Pty. Ltd.
Austria		Vienna		Hitachi Data Systems GmbH
Austria		Linz		Hitachi Data Systems GmbH
Austria		Wiener Neudorf		Hitachi Medical Systems GesmbH
Belgium		Mechelen		Hitachi Medical Systems N.V./S.A.
Brazil		Sao Paulo		Hitachi Brasil Ltda.
Brazil		Indaiatuba		Hitachi Koki do Brasil Ltda.
Brazil		Santa Rita do Sapucaí		Hitachi Kokusai Linear Equipamentos Eletrônicos
Brazil		Arujá		Hitachi-Mycom Manutenção E Soluções Ltda.
Canada	Saskatchewan	Saskatoon		Headquarters
Canada	Ontario	Mississauga		Nuclear and I&C Affairs
Canada	Ontario	Guelph		Canada Office
Canada		Toronto		Hitachi Data Systems-Toronto
Canada	Ontario	Rexdale		Hitachi High-Technologies Canada, Inc.
Canada	Ontario	Calgary		Hitachi ID Systems, Inc.
Canada	Ontario	Scarborough		Hitachi Kokusai Electric Canada, Ltd.
Canada	Ontario			Hitachi High-Technologies Canada, Inc.
Canada	Ontario			Hitachi Koki (Power Tools) Canada
Chile		Santiago		Hitachi Data Systems (Chile)
China		Beijing		Head Office
China		Shanghai		Hitachi (China) Co., Ltd. Shanghai Branch
China		Guangzhou		Hitachi (China) Co., Ltd. Guangzhou Branch
China		Shenzhen		Hitachi (China) Co., Ltd. Shenzhen Branch
China		Chengdu		Hitachi (China) Co., Ltd. Chengdu Branch
China		Xi'an		Hitachi (China) Co., Ltd. Xi'an Branch
China		Dalian		Hitachi (China) Co., Ltd. Dalian Branch
China		Qingdao		Hitachi (China) Co., Ltd. Qingdao Branch
Czech Republic		Praha		Hitachi Europe Ltd
Egypt		Cairo		Hitachi, Ltd., Egypt Office
Finland		ESPOO		Hitachi Digital Media Group
France		Bron		Hitachi Europe S.A.S. Digital Media Group
France		Velizy-Villacoublay		
Germany		Duisburg		Corporate headquarters - Hitachi Power Europe GmbH
Germany		Berlin		Berlin Office
Germany	Hesse	Dreieich - Buchschlag		Hitachi Data Systems
Germany		Krefeld		Hitachi High-Technologies Europe GmbH
Germany		Erkrath		Hitachi Kokusai Electric Europe GmbH
Germany		Wiesbaden		Hitachi Medical Systems GmbH
Germany		Hilden		Hitachi Tool Engineering Europe GmbH
Germany		Dusseldorf		Hitachi Europe GmbH

Source: Citi Research

Figure 743. Hitachi (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Greece		Athens		Hitachi Digital Media Group
Greece		Chalandri		
Hong Kong				Hitachi (Hong Kong) Limited
Hong Kong				Hitachi Maxell Global Ltd.
Hong Kong		Kowloon		Hitachi Koki Asia Co., Ltd.
Hong Kong	New Territories	Tsuen Wan		Hitachi High-Technologies Hong Kong Ltd.
Hong Kong	New Territories	Sheung Shui		Vantec Hitachi Transport System (Hong Kong) Ltd.
Hong Kong	New Territories	Shatin		Hitachi Data Systems Ltd.
Hong Kong		Causeway Bay		Hitachi India Pvt. Ltd.
India		New Delhi		Bangalore Branch Office
India	Karnataka	Bangalore		Mumbai Branch Office
India	Maharashtra	Mumbai		Chennai Branch Office
India	Tamil Nadu	Chennai		Hitachi Chemical India Private Limited
India	Haryana	Gurgaon		
India	Andhra Pradesh	Hyderabad		Hitachi Consulting Software Services India Private Limited
India	Maharashtra	Pune		Hitachi Consulting India Private Limited
India	Ahmedabad	Gujarat		Hitachi Home and Life Solutions (India) Ltd.
Indonesia		Jakarta		Branches - PT. Hitachi Asia Indonesia
Indonesia		Jakarta		Hitachi, Ltd. Infrastructure Systems Company
Indonesia	West Java	Jakarta		Representative Office of Indonesia
Indonesia		Jakarta		PT. Hitachi Construction Machinery Indonesia
Indonesia		Jakarta		Hitachi Data Systems Pte. Ltd.
Indonesia		Jakarta		PT. Hitachi Modern Sales Indonesia
Indonesia		Jakarta		PT. Hitachi High-Technologies Indonesia (HTI)
Indonesia		Jakarta		PT. Hitachi Plant Technologies Indonesia
Indonesia	West Java	Jakarta		PT. Hitachi Powdered Metals Indonesia
Indonesia		Bekasi		PT. Hitachi Power Systems Indonesia
Italy		Milano		Hitachi Digital Media Group
Japan		Tokyo		Headquarters
Japan		Shinagawa		Headquarters
Japan		Hokkaido		Hokkaido Branch
Japan	Tohoku			Tohoku Branch
Japan	Kanto			Kanto Branch
Japan		Yokohama		Yokohama Branch
Japan	Hokuriku			Hokuriku Branch
Japan	Chubu			Chubu Branch
Japan	Kansai			Kansai Branch
Japan		Hiroshima		China Branch
Japan		Takamatsu		Shikoku Regional Office
Japan		Sawara		Kyushu Branch
Japan		Sapporo		Hitachi Urban support Hokkaido Branch
Japan		Tokyo		Hitachi Transport System

Source: Citi Research

Figure 744. Hitachi (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Malaysia		Kuala Lumpur		Branch - Hitachi Asia (M) Sdn. Bhd.
Malaysia	Selangor			Hitachi Air Conditioning Products (M) Sdn. Bhd.
Malaysia	Johor Bahru			Hitachi Cable (Johor) Sdn. Bhd.
Malaysia	Penang			Hitachi Chemical (M) Sdn. Bhd.
Malaysia				Hitachi Chemical (Selangor) Sdn. Bhd.
Malaysia		Kuala Lumpur		Hitachi Consulting Malaysia Sdn. Bhd.
Malaysia		Kuala Lumpur		Hitachi Data Systems Sdn. Bhd.
Malaysia	Selangor			Hitachi eBworx Sdn. Bhd.
Malaysia		Kuala Lumpur		Hitachi High-Technologies IPC (M) Sdn. Bhd.
Malaysia		Kuala Lumpur		Hitachi International Treasury (M) Sdn. Bhd.
Malaysia	Selangor	Subang Jaya		Hitachi Power Tools (M) Sdn. Bhd.
Netherlands		Amsterdam		Hitachi Construction Machinery (Europe) NV
Netherlands	Gelderland	Waardenburg		Hitachi Transport System(Europe)B.V
Ohio		St. Mary		AAP St. Marys Corp. (A unit of Hitachi Metals America, Ltd.)
Philippines		Makati City		Hitachi Asia Ltd. - Philippine Branch
Philippines		Makati City		Hitachi, Ltd. Infrastructure Systems Company Philippines Branch Office
Philippines		Batangas		Plant
Philippines		Makati City		Hitachi, Ltd., Philippine Branch (HIMAC)
Philippines		Quezon City		Office - Hitachi Air Conditioning Products (Phils.) Inc.
Philippines	Batangas	Lipa City		Hitachi Cable Asia Ltd. - Philippine Branch
Philippines		Makati City		Office - Hitachi Cable Philippines, Inc.
Philippines	Batangas	Lipa City		Plant
Philippines		Quezon City		Hitachi Elevator Philippines Corporation
Philippines	Cavite	Dasmariñas		Hitachi Industrial Machinery Phils. Corp.
Philippines		Makati City		Hitachi Plant Technologies, Ltd. (Philippine Branch Office)
Philippines		Muntinlupa City		Hitachi Via Asia Pte. Ltd. - Philippine Branch
Poland		Warszawa		Hitachi Digital Media Group
Russia		Moscow		Hitachi Home Electronics Russia
Saudi Arabia		Dammam		Hitachi Saihati Engineering Services Co., Ltd.
Singapore				Branch - Hitachi Asia Ltd.
Singapore				Hitachi, Ltd. Infrastructure Systems Company Singapore Branch Office
Singapore				Hitachi Aqua-Tech Engineering Pte. Ltd.
Singapore				Hitachi Automotive Systems Singapore Pte. Ltd.
Singapore				Hitachi Cable Asia Pacific (HCAP) Pte. Ltd.
Singapore		Jurong		Hitachi Cable (S) Pte. Ltd.
Singapore				Hitachi Capital Singapore Pte. Ltd.
Singapore				Hitachi Chemical Asia-Pacific Pte. Ltd.
Singapore				Hitachi Chemical (S) Pte. Ltd.
Singapore				Hitachi Construction Machinery Asia and Pacific Pte. Ltd.
Singapore				Hitachi Consulting Singapore Pte. Ltd.
Singapore				Hitachi Critical Facilities Protection Pte. Ltd.
Singapore				Hitachi Data Systems Pte. Ltd. (S)
Singapore				Hitachi Elevator Asia Pte. Ltd.
Singapore				Hitachi High-Technologies (S) Pte. Ltd.
Singapore				Hitachi Home Electronics Asia (S) Pte. Ltd.
Singapore				Hitachi International Treasury Ltd.
Singapore				Hitachi Koki (S) Pte. Ltd.
Singapore				Hitachi Medical Systems (S) Pte. Ltd.
Singapore				Hitachi Metals Singapore Pte. Ltd.
Singapore				Hitachi Plant Technologies (Asia) Pte. Ltd.
Singapore				Hitachi Powdered Metals (S) Pte. Ltd.
Singapore				Hitachi T&D Systems Asia Pte. Ltd.
Singapore				Hitachi Transport System (Asia) Pte. Ltd.
Singapore				Hitachi Via Asia Pte. Ltd.

Source: Citi Research

Figure 745. Hitachi (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
South Africa		Sandton		Hitachi Europe Ltd. - Johannesburg Representative Office
South Africa		Dunswart		Hitachi Construction Machinery Southern Africa
South Korea		Seoul		Hitachi South Korea Ltd.
South Korea	Geumcheon	Seoul		LG-Hitachi Water Solutions Co
South Korea	Mapo	Seoul		LG Hitachi Ltd.
South Korea	Jongno	Seoul		Hitachi Transport System
South Korea				Hitachi Chemical Electronic Materials (South Korea) Co., Ltd.
Spain		Barcelona		Hitachi Digital Media Group
Sweden		Solna		Hitachi Europe
Taiwan		Taipei		Taiwan Hitachi Asia Pacific Co., Ltd.
Taiwan	Taoyuan			Yungtay-Hitachi Construction Machinery Co., Ltd.
Taiwan		Taipei		Hitachi Metals Admet, Ltd. Taipei Branch
Taiwan		Taipei		Hitachi Asia (Taiwan) Co., Ltd.
Taiwan		Taipei		Hitachi Chemical International Co., (Taiwan) Ltd.
Taiwan		Taipei		Hitachi Cable Asia, Ltd. Taipei Branch
Taiwan		Taipei		Hitachi High-Technologies Taiwan Corporation
Taiwan		Taipei		Hitachi, Ltd. Mechatronics Branch
Taiwan		Taipei		Hitachi Transport System (Taiwan) Ltd.
Thailand		Bangkok		Hitachi Asia (Thailand) Co., Ltd.
Thailand	Chachoengsao			Hitachi Automotive Systems Asia, Ltd.
Thailand	Chonburi			Hitachi Automotive Systems Chonburi Ltd.
Thailand		Korat		Head office - Hitachi Automotive System Korat, Ltd.
Thailand		Bangna		Bangkok Office - Hitachi Automotive System Korat, Ltd.
Thailand		Bangkok		Hitachi Chemical (Thailand) Co., Ltd.
Thailand		Bangkok		Hitachi Capital (Thailand) Co., Ltd.
Thailand		Rayong		Hitachi Chemical Automotive Products (Thailand) Co., Ltd.
Thailand		Ayutthaya		Hitachi Compressor (Thailand), Ltd.
Thailand	Prachinburi			Head Office - Hitachi Consumer Products (Thailand), Ltd
Thailand		Bangkok		Bangkok Office - Hitachi Consumer Products (Thailand), Ltd.
Thailand		Bangkok		Hitachi High-Technologies (Thailand) Ltd.
Thailand	Prachinburi			Hitachi Industrial Technology (Thailand), Ltd.
Thailand		Ayutthaya		Head Office - Hitachi Metals (Thailand) Ltd.
Thailand	Phra Nakhon Si Ayutthaya			Hitachi Metals (Thailand) Ltd.
Thailand	Wattana	Bangkok		Hitachi Plant Technologies (Thailand) Co., Ltd.
Thailand	Chachoengsao			Hitachi Powdered Metals (Thailand) Co., Ltd.
Thailand	Bangkapi	Bangkok		Hitachi Power Tools (Thailand) Co., Ltd.
Thailand	Chachoengsao			Hitachi Storage Battery (Thailand) Co., Ltd.
Thailand		Rayong		Hitachi Tochigi Electronics (Thailand) Co., Ltd.
Thailand	Samut Prakan			Hitachi Transport System (Thailand), Ltd.
Thailand		Bangkok		Hitachi Via Asia (Thailand) Co., Ltd.
Thailand		Bangkok		Head Office - Siam-Hitachi Elevator Co., Ltd.
Thailand	Chonburi			Factory
Thailand	Chachoengsao			Thai Hitachi Enamel Wire Co., Ltd.
UAE		Dubai		Hitachi Ltd. (Gulf Office)
UAE		Riyadh		Hitachi Ltd., Riyadh Branch
UAE		Dubai		
UAE		Abu Dhabi		Hitachi Transport System, Ltd, Middle East Office (Abu Dhab
UAE		Doha		Hitachi Plant Qatar L.L.C

Source: Citi Research

Figure 746. Hitachi (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
UK	Berkshire	Maidenhead		Hitachi Europe Ltd
UK		London		Interactive Media Solutions Division
US	Connecticut	Wallingford		Hitachi Aloka Medical, Ltd.
US	New York	Tarrytown		Hitachi America, Ltd.
US	California	Brisbane		Hitachi America Capital Ltd.
US	Kentucky	Harrodsburg		Hitachi Automotive Systems Americas, Inc.
US	New York	White Plains		Hitachi Cable America, Inc.
US	Connecticut	Norwalk		Hitachi Capital America Corp
US	California	Cupertino		Hitachi Chemical Co. America, Ltd.
US	California	Mountain View		Hitachi Chemical Diagnostics, Inc.
US	California	Irvine		Hitachi Chemical Research Center, Inc.
US	Georgia	Norcross		Hitachi Communication Technologies America, Inc.
US	Oklahoma	Norman		Hitachi Computer Products (America), Inc.
US	North Carolina	Kernersville		Hitachi Construction Machinery Co., Ltd.
US	Texas	Dallas		Texas Dallas - Headquarters
US	California	Santa Clara		Hitachi Data Systems
US	Illinois	Schaumburg		Hitachi High-Technologies America, Inc.
US	Washington			Hitachi, Ltd. (Liaison Office of Hitachi, Ltd.)
US	Georgia	Norcross		Hitachi Koki USA, Ltd. (Hitachi Power Tools)
US	New York	Woodbury		Hitachi Kokusai Electric America, Ltd.
US	Georgia	Kennesaw		Hitachi Maxco, Ltd.
US	Ohio	Twinsburg		Hitachi Medical Systems America, Inc.
US	New York	Purchase		Hitachi Metals America, Ltd.
US	Pennsylvania	Tioga		Hitachi Metals Automotive Components USA, LLC
US	North Carolina	China Grove		Hitachi Metals North Carolina, Ltd.
US	Indiana	Greensburg		Hitachi Powdered Metals (USA), Inc.
US	New Jersey	Basking Ridge		Hitachi Power Systems America, Ltd.
US	California	San Francisco		Hitachi Solutions America, Ltd.
US	California	Torrance		Hitachi Transport System (America), Ltd.
US	Georgia	Suwanee		Hitachi HVB, Inc.
US	Texas	Dallas		Hitachi Consulting
Vietnam		Ho Chi Minh City		Hitachi Asia (Vietnam) Co., Ltd.
Vietnam		Hanoi		Hanoi Office
Vietnam	Tan Binh Dist	Ho Chi Minh		Office
Vietnam	Hai Duong Province			Hitachi Cable Vietnam Co., Ltd.
Vietnam		Hanoi		Hitachi Construction Machinery – Hanoi Representative Offi
Vietnam		Hanoi		Hitachi Data Systems
Vietnam		Hanoi		Hitachi Plant Technologies (Vietnam) Pte. Ltd.
Vietnam		Ho Chi Minh		Hitachi Transport System (Asia) Pte Ltd. – Ho Chi Minh Repr

Source: Citi Research

Figure 747. Hon Hai Precision

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil				Handset assembly, PC component
China	Henan	Zhengzhou		Manufacturing Plant for Apple iPhone
China	Hebei	Langfang		Manufacturing Plant for Handset assembly
China		Beijing		Manufacturing Plant for Handset assembly for Nokia
China		Tianjin		Manufacturing Plant for Handset components for Samsung & Moto
China	Shandong	Yantai		Manufacturing Plant for Game console for Nintendo & Sony; TV assembly
China		Jiangsu		Manufacturing Plant for TV assembly; PC components
China		Shanghai		Networking
China		Hubei		Desktop production
China	Shanxi	Taiyuan		Handset components
China		Shenzhen		Various IT products; Apple products
China		Chongqing		Notebook assembly for HP
China		Chengdu		For Apple iPad
China	Tucheng	New Taipei City		Head Office
China		Hsinchu City		
Czech Republic				PC/PC component
Mexico				LCD TV, Set-top box, and handset assembly
Russia				PC assembly
Slovakia				LCD TV assembly
Taiwan		New Taipei		
USA	California			

Source: Citi Research

Figure 748. Hosiden

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai		Hosiden Electronics (Shanghai)Co.,Ltd. - Sales Division
China		Shenzhen		Hosiden (Shenzhen) Co.,Ltd. - Sales Division
China		Tianjing		Manufacturing Division
China	Shandong	Qingdao		Hosiden Technology (Qingdao) Co., Ltd.
China	Shandong	Qingdao		Qingdao Hosiden Electronics Co., Ltd.
China	Guangdong	Dongguan		China Hosiden Co., Ltd.
China	Guangdong	Dongguan		China Hosiden Co., Ltd.(LCD Factory)
Germany		Dusseldorf		Hosiden Europe GmbH
Hong Kong		Kowloon		Hong Kong Hosiden Ltd.- Sales Division
Japan	Kansai	Osaka		Head Office
Japan		Osaka		Hosiden Seiko Corporation
Japan	Kanagawa	Yokohama		Tokyo Branch
Japan	Chūbu	Nagoya		Nagoya Sales Office
Japan		Isesaki city		Manufacturing Division
Japan	Niigata	Murakami-city		Manufacturing Division
Japan	Wakayama	Aridagawa		Manufacturing Division
Japan		Fukuoka		Manufacturing Division
Japan	Shiga	Echi-gun		Hosiden F.D. Corporation
Japan	Shiga	Echi-gun		Hosiden Plastics Corporation
Malaysia	Selangor			Hosiden Corporation(M)Sdn.Bhd.
Singapore				Hosiden Singapore Pte.Ltd.
South Kor	Gyeonggi-dc	Suwon-si		Suwon Sales Office
South Kor	Gyeongsang	Changwon		Manufacturing Division
Taiwan		Taipei		Taiwan Hosiden Co.,Ltd.
Thailand		Bangkok		Hosiden(Thailand) Co.,Ltd.
UK	East Sussex	Hove		Manufacturing Division
USA	Illinois	Schaumburg		Head Office
USA	California	San Jose		San Jose Sales Office
USA	Michigan	Novi		Detroit Sales Office
Vietnam	Bac Giang	Viet Yen		Manufacturing Division

Source: Citi Research

Figure 749. Hoya Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South W	Sydney		HOYA LENS AUSTRALIA PTY. LTD.
Austria		Brunn am Gebirge		HOYA LENS OSTERREICH
Belgium		Kapellen		HOYA LENS BELGIUM N.V.
BRAZIL		Rio de Janeiro		OPTOTAL HOYA LIMITADA.
Canada	Quebec	Montreal		HOYA LENS CANADA, INC., MONTREAL FACILITY
Canada	Ontario	Toronto		HOYA LENS CANADA, INC., TORONTO FACILITY
Canada	British Colun	Vancouver		HOYA LENS CANADA, INC., VANCOUVER FACILITY
China		Shanghai		HOYA LENS SHANGHAI LTD. SHANGHAI Head Office
China		Shanghai		HOYA LENS SHANGHAI LTD. SHANGHAI Lab
China		Guangzhou		HOYA LENS GUANGZHOU LTD.
China	Hong Kong			HOYA LENS HONG KONG LTD.
China		Shanghai		HOYA HEALTHCARE(SHANGHAI) CO.,LTD.
China		Suzhou		HOYA MICROELECTRONICS (SUZHOU) LTD.
China		Suzhou		HOYA OPTICAL TECHNOLOGY(SUZHOU) LTD.
China		Shandong		HOYA OPTICAL TECHNOLOGY (WEIHAI) CO.,LTD.
China	Hong Kong			HOYA OPTICAL(ASIA) CO., LTD.
China		Shandong		HOYA OPTO-ELECTRONICS QINGDAO LTD.
Czech Republic		Turnov		HOYA LENS CZ a.s
Denmark		Taastrup		HOYA LENS DANMARK A/S
Finland		Helsinki		HOYA LENS FINLAND OY
France		Emerainville		HOYA LENS FRANCE S.A.S.
Germany		Frankfurt		HOYA SURGICAL OPTICS GmbH
Germany		Monchengladbach		HOYA LENS DEUTSCHLAND GmbH
Hungary		Budapest		HOYA LENS HUNGARY Zrt.
Hungary		Mateszalka		HOYA LENS MANUFACTURING HUNGARY PRIVATE CO.
India	Maharashtra	Navi Mumbai		HOYA LENS INDIA PVT.LTD
Indonesia		Jakarta		PT. HOYA LENS INDONESIA
Italy		Milan		HOYA LENS ITALIA S.p.A.
Japan		Tokyo		HOYA Group Corporate Communications
Japan		Tokyo		HOYA SURGICAL OPTICS Japan, Headquarters
Japan		Tokyo		HOYA Medical Research Centre
Japan		Tokyo		International Sales Department
Japan		Tokyo		R & D Department
Japan		Tochigi		Mashiko Factory
Japan		Saitama		HOYA CANDEO OPTRONICS CORPORATION
Malaysia		Kuala Lumpur		MALAYSIAN HOYA LENS SDN. BHD.
Malaysia		Kuala Lumpur		HOYA LENS MANUFACTURING MALAYSIA SDN. BHD.
Malaysia		Kulim		HOYA ELECTRONICS MALAYSIA SDN. BHD
Netherlands		Uithoorn		HOYA HOLDINGS N.V. (NETHERLANDS BRANCH),
Netherlands		Uithoorn		HOYA VISION CARE EUROPE (Europe Regional HQ)
Netherlands		Uithoorn		HOYA LENS NEDERLAND B.V.

Source: Citi Research

Figure 750. Hoya Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Philippines		Makati		HOYA LENS PHILIPPINES, INC.
Philippines	Laguna			HOYA GLASS DISK PHILIPPINES, INC.
Philippines	Batangas			HOYA GLASS DISK PHILIPPINES, INC.
Philippines	Cavite			HOYA GLASS DISK PHILIPPINES, INC.
Poland	Piaseczno			HOYA LENS POLAND SP. Z O.O.
Portugal	Lisbon			HOYA LENS IBERIA S.A.(Portugal)
Romania	Bucharest			HOYA LENS RUMANIA
Singapore				HOYA HOLDINGS ASIA PACIFIC PTE LTD.
Singapore				HOYA SURGICAL OPTICS
Singapore				HOYA MEDICAL SINGAPORE PTE. LTD. Global Headquarters
Singapore				HOYA LENS(S) PTE. LTD.
Singapore				HOYA ELECTRONICS SINGAPORE PTE.LTD.
South Africa	Johannesburg			HOYA HILL OPTICS SOUTH AFRICA (PTY) LTD.
South Korea	Seoul			HOYA LENS KOREA CO., LTD.
South Korea	Gyeonggi			HOYA ELECTRONICS KOREA CO., LTD.
Spain	Madrid			HOYA LENS IBERIA S.A. (Spain) -Iberia Head Office
Sweden	Malmo			HOYA LENS SWEDEN AB
Taiwan	Taipei			HOYA LENS TAIWAN LTD.
Taiwan	Miaoli			HOYA MICROELECTRONICS TAIWAN CO., LTD.
Thailand				HOYA LENS THAILAND LTD.
Thailand	Ayutthaya			HOYA LENS THAILAND LTD., -AYUTTHAYA Plant
Thailand	Bangkok			HOYA LENS THAILAND LTD., -BANGKOK IT Office
Thailand	Bangkok			THAI HOYA LENS LTD.
Thailand	Lamphun			HOYA GLASS DISK (THAILAND) LTD.
Thailand	Lamphun			HOYA OPTICS(THAILAND) LTD.
UK				HOYA LENS U.K. Limited
USA	California	Santa Clara		HOYA CORPORATION USA Optics Division
USA	California	Chino Hills		HOYA SURGICAL OPTICS, INC.
USA	Texas	Lewisville		HOYA VISION CARE
USA	Georgia	Lithia Springs		HOYA VISION CARE, ATLANTA FACILITY
USA	Connecticut	Bethel		HOYA VISION CARE, BETHEL FACILITY
USA	Illinois	Chicago		HOYA VISION CARE, CHICAGO FACILITY
USA	Ohio	Cleveland		HOYA VISION CARE, CLEVELAND FACILITY
USA	Texas	Dallas		HOYA VISION CARE, DALLAS FACILITY
USA	Ohio	Dayton		HOYA VISION CARE, DAYTON FACILITY
USA	Oregon	Eugene		HOYA VISION CARE, EUGENE FACILITY
USA	Connecticut	Hartford		HOYA VISION CARE, HARTFORD FACILITY
USA	Tennessee	Knoxville		HOYA VISION CARE, KNOXVILLE FACILITY
USA	Florida	Largo		HOYA VISION CARE, LARGO FACILITY
USA	Maine	Lewiston		HOYA VISION CARE, LEWISTON FACILITY
USA	California	Los Angeles		HOYA VISION CARE, LOS ANGELES FACILITY
USA	California	Modesto		HOYA VISION CARE, MODESTO FACILITY
USA	Louisiana	New Orleans		HOYA VISION CARE, NEW ORLEANS FACILITY
USA	Oregon	Milwaukee		HOYA VISION CARE, PORTLAND FACILITY
USA	Texas	San Antonio		HOYA VISION CARE, SAN ANTONIO FACILITY
USA	California	San Diego		HOYA VISION CARE, SAN DIEGO FACILITY
USA	Washington	Seattle		HOYA VISION CARE, SEATTLE FACILITY
USA	Illinois	Columbia		HOYA VISION CARE, ST. LOUIS FACILITY
USA	California	Los Angeles		HOYA VISION CARE, LOS ANGELES DISTRIBUTION
Vietnam		Thu Dau Mot		HOYA LENS VIETNAM LTD.
Vietnam		Hanoi		HOYA GLASS DISK VIETNAM LTD.
Vietnam		Hung Yen		HOYA GLASS DISK VIETNAM II LTD.

Source: Citi Research

Figure 751. HTC Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Beijing		Operations Office
China		Shanghai		Operations Office
China	Hong Kong			Operations Office
Taiwan		New Taipei		Operations Office
Taiwan		Taoyuan City		Operations Office
UK		Berks		Operations Office
USA	Washington	Bellevue		Operations Office
USA	Washington	Seattle		Operations Office
USA	North Caroli	Durham		Operations Office

Source: Citi Research

Figure 752. Huawei

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Algeria		Mohammed Algiers		
Angola		Luanda		
Argentina		Buenos Aires		
Australia	Queensland	Brisbane		
Australia	Victoria	Melbourne		
Australia	New South W	Sydney		
Austria		Vienna		
Azerbaijan		Baku		
Bahrain		Seef		
Bahrain		Manama		
Bangladesh		Dhaka		
Belarus		Minsk		
Belgium		Louvain-la-neuve		
Belgium		Leuven		
Belgium		Brussels		
Bosnia and Herzegovin		Sarajevo		Office
Botswana		Gaborone		
Brazil		Rio de Janeiro		
Brazil		Curitiba		
Brazil		Sao Paulo		Latin America Headquarters
Brazil		Brasilia		

Source: Citi Research

Figure 753. Huawei (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Bulgaria		Sofia		
Burundi		Bujumbura		
Cambodia		Phnom Penh		
Cameroon		Yaounde		
Canada		Markham		
Canada	Ontario	Kanata		R&D
Chile		Santiago		
China		shenzhen		
China	Hong Kong	New Territories		
Colombia		Bogota		
Congo		Kinshasa		
Cote d'Ivoire		Abidjan		
Croatia		Zagreb		
Czech Republic		Prague		
Denmark		Copenhagen		
Ecuador		Quito		
Egypt		Cairo		Middle East & North Africa Headquarters
Ethiopia		Addis Ababa		
Finland		Helsinki		
France		Mougins		
France		Boulogne Billancourt		
France		Lannion		

Source: Citi Research



Figure 754. Huawei (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Georgia		Tbilisi		
Germany		Munich		
Germany		Bonn		
Germany		Duesseldorf		
Germany		Frankfurt		
Germany		Nuremberg		
Ghana		Accra		
Greece		Athens		
Hong Kong		Kowloon		
Hungary		Budapest		
Iceland		Reykjavic		
India	West Bengal	Kolkata		
India	Haryana	Gurgaon		Region Headquarter
India	Kerala	Cochin		
India	Maharashtra	Navi Mumbai		Mumbai Representative Office
India	Karnataka	Bangalore		R&D
Indonesia		Jakarta		
Iraq		Sulaimaniyah		
Ireland		Dublin		
Italy		Milan		
Italy		Rome		
Japan		Tokyo		
Jordan		Amman		
Kazakhstan		Almaty		
Kenya		Nairobi		
Kuwait		Shuwaik		
Kyrgyzstan		Bishkek		
Laos		Vientiane		
Latvia		Riga		
Lithuania		Vilnius		
Madagascar		Antananarivo		
Malaysia		Kuala Lumpur		Southern Pacific Headquarters
Malta		Swieqi		
Mauritius		Ebene City		
Mexico		Mexico City		
Mexico	Hidalgo	Mexico City		
Moldova		Chisinau		
Mongolia		Ulan Bator		
Morocco		Rabat		
Mozambique		Maputo		
Nepal		Lalitpur		
Netherlands		Amstelveen		
Netherlands		Amsterdam		
Nigeria		Lagos		
Nigeria		Victoria Island		
Nigeria		Abuja		
Norway		Oslo		
Oman		Muscat		
Pakistan		Islamabad		
Panama				
Peru		Lima		
Philippines		Makati		
Poland		Warsaw		
Portugal		Lisbon		
Romania		Bucharest		
Russia		Moscow		
Rwanda		Kigali		
Saudi Arabia		Riyadh		
Serbia		Belgrade		
Singapore				
Slovakia		Bratislava		

Source: Citi Research

Figure 755. Huawei (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
South Africa		Johannesburg		South Africa Headquarters
South Korea		Seoul		
South Sudan		Juba		
Spain		Madrid		
Sri Lanka		Colombo		S&M Dept, TSD
Sweden		Goteborg		
Sweden		Stockholm		
Sweden		Kista		Rep Office
Sweden		Kista		R&D
Switzerland		Bern		
Switzerland		Zurich		
Switzerland		Münchenstein		
Switzerland		Le Grand-Saconnex		
Switzerland		Visp		
Switzerland		Manno		
Switzerland		Thal		
Switzerland		Bad Ragaz		
Switzerland		Luzern		
Switzerland		Lausanne		
Tajikistan		Dushanbe		
Tanzania		Dar es Salaam		
Thailand		Bangkok		
Tunisia				
Tunisia		Tunis		
Turkey		Istanbul		
Turkmenistan		Ashgabat		
Uganda		Kampala		
UK		London		
UK	Berkshire			
UK	Hampshire	Basingstoke		
UK	Paddington			
UK	Suffolk	Ipswich		
Ukraine		Kyiv		
United Arab Emirates		Dubai		
Uruguay		Montevideo		
USA	Georgia	Atlanta		
USA	Washington			
USA	Virginia	Reston		
USA	Rhode Island	East Greenwich		
USA	Illinois	Chicago		
USA	New Jersey	Bridgewater		
USA	Kentucky	Louisville		
USA	California	Walnut Creek		
USA	California	San Diego		
USA	Washington	Bellevue		
USA	Pennsylvania	Philadelphia		
USA	Oklahoma			
USA	Kansas	Overland Park		
USA	Louisiana	Monroe		
USA	Colorado	Broomfield		
USA	Texas	Plano		North American Headquarters
Uzbekistan		Tashkent		
Venezuela		Caracas		
Vietnam		Hanoi		
Yemen		Sana		
Zambia		Lusaka		
Zimbabwe		Harare		

Source: Citi Research

Figure 756. Ibiiden

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada		Markham		IBIDEN Canada Inc
China		Beijing		IBIDEN Electronics (Beijing) Co., Ltd.
China		Shanghai		IBIDEN Electronics (Shanghai) Co., Ltd
China		Shanghai		IBIDEN Electronics Technology (Shanghai) Co., Ltd.
Finland		Helsinki		Branch: Finnish
France	Courtenay			IBIDEN DPF France S.A.S.
France		Paris		IBIDEN France S.A.S
Germany		Stuttgart		IBIDEN Deutschland GmbH
Hong Kong		Kowloon		IBIDEN HONG KONG Co., Ltd.
Hungary				IBIDEN Hungary Kft
India	Karnataka	Bangalore		Branch: India
Japan	Gifu	Ogaki		Training Center & Head Office
Japan		Tokyo		Tokyo Branch
Japan		Osaka		Osaka Branch
Japan	Gifu	Ogaki		Ogaki Plant
Japan	Gifu	Ogaki		Ogaki Central Plant
Japan	Gifu	Ogaki		Aoyanagi Plant
Japan	Gifu	Ogaki		Gama Plant
Japan	Gifu	Anpachi-gun		Godo Plant
Japan	Gifu	Ibi-gun		Ogaki-Kita Plant
Japan	Aichi	Takahama		Kinuura Plant
Japan	Aichi	Ibi-gun		Higashi-Yokoyama Power Plant
Japan	Aichi	Ibi-gun		Hirose Power Plant
Japan	Aichi	Ibi-gun		Kawakami Power Plant
Japan	Gifu	Ogaki		IBIDEN Electronics Industries Co., Ltd
Japan	Gifu	Ogaki		IBIDEN Greentec Co., Ltd.
Japan	Gifu	Ogaki		IBIDEN Chemicals Co., Ltd
Japan	Gifu	Ogaki		IBIKEN Co., Ltd
Japan	Gifu	Ogaki		IBIDEN Graphite Co., Ltd.
Japan	Gifu	Ogaki		IBIDEN Industries Co., Ltd.
Japan	Gifu	Ikeda-cho		IBIDEN Jushi Co., Ltd
Japan	Gifu	Motosu		IBIDEN Bussan Co., Ltd
Japan	Gifu	Ogaki		IBIDEN Engineering Co., Ltd
Japan	Gifu	Ogaki		IBITECH Co., Ltd
Japan	Gifu	Ogaki		IBIDEN CAREER TECHNO Corp
Japan	Gifu	Ogaki		IBIDEN KENSO Co., Ltd
Malaysia		Penang		IBIDEN (Malaysia) Sdn. Bhd.
Malaysia		Penang		IBIDEN Electronics Malaysia Sdn. Bhd
Netherlands		Hoofddorp		IBIDEN European Holdings B.V
Netherlands		Hoofddorp		IBIDEN Europe B.V
Philippines	Batangas			IBIDEN Philippines, Inc
Singapore				IBIDEN Asia Holdings Pte., Ltd; IBIDEN Singapore Pte
South Korea	Gyeongbuk	Pohang		IBIDEN Graphite Korea Co., Ltd.
South Korea		Seoul		IBIDEN Korea Co., Ltd
Taiwan		Kaohsiung		IBIDEN Taiwan Co., Ltd
UK		London		IBIDEN UK Ltd
USA	California	Santa Clara		IBIDEN U.S.A. Corp. (Head Office)
USA	Massachusetts	Ipswich		Micro Mech, Inc

Source: Citi Research

Figure 757. IBM

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Afghanistan		Karachi		
Algeria		Algiers		IBM Algérie
Andorra		Saint-Jean-de-Braye		IBM France
Angola		Luanda		IBM Africa BV - Sucursal de Angola
Argentina		Buenos Aires		IBM Argentina
Aruba		Ornjestad		IBM World Trade Corporation
Australia	New South Wales			IBM Australia Limited
Austria		Vienna		IBM Österreich Internationale Büromaschinen Gesellschaft m.b.H.
Bahamas		Nassau		IBM Bahamas Ltd
Bangladesh		Dhaka		Bangladesh Head Office
				IBM World Trade Corporation, IBM Business Partners
Barbados		Sain Michael		
Belgium		Brussels		IBM Belgium SA/NV
Brazil		Sao Paulo		IBM Brasil
Bulgaria		Sofia		IBM Bulgaria Ltd
Canada	Ontario	Markham		IBM Canada Ltd.
Chile		Santiago		IBM de Chile SAC
China		Beijing		IBM China Company Limited
China		Hong Kong		IBM China/Hong Kong Limited
China		Macau		IBM World Trade Corporation
Colombia		Bogota		IBM de Colombia
Costa Rica		Heredia		IBM Costa Rica
Cote d'Ivoire		Abidjan		IBM Cote d'Ivoire office
Croatia		Zagreb		IBM Croatia
Curacao		Willemstad		IBM World Trade Corporation
Cyprus		Nicosia		IBM SEMEA S.p.A. Cyprus Branch
Czech Repu	Prague	Chodov		IBM Czech Republic
Denmark		Lyngby		IBM Danmark ApS
Ecuador		Quito		IBM del Ecuador C.A.
Egypt		Giza		IBM World Trade Corporation, Egypt Branch
Estonia		Tallinn		
Finland		Helsinki		Oy International Business Machines Ab
France	Martinique	Fort-de-France		
France		Boigny-sur-Bionne		IBM France
France		Saint Jean de Braye		IBM France
French Guiana		Cayenne		IBM
French Poly	Tahiti	Papeete		L'agence IBM de Tahiti
Ghana		Accra		IBM Ghana Office
Greece		Halandri		IBM Hellas S.A.
Guadeloupe				IBM Guadeloupe
Hungary		Budapest		IBM Hungary Ltd.
Iceland		Reykjavik		Nyherji hf.
India		Bangalore		IBM India Pvt Ltd
Indonesia		Jakarta		IBM Indonesia Head Office
Ireland		Dublin		IBM Ireland Limited
Israel		Petah Tikva		IBM Israel Ltd
Italy		Segrate		IBM Italia
Jamaica		Kingston		IBM World Trade Corporation
Japan		Tokyo		IBM Japan Ltd
Kazakhstan	Panfilov	Almaty		IBM East Europe/Asia Limited
Kenya		Nairobi		IBM Kenya Office
Latvia		Riga		IBM Latvia SIA
Liberia		Lagos		The IBM West Africa Office
Lithuania		Vilnius		IBM Lietuva
Luxembourg		Capellen		IBM Luxembourg
Macedonia		Skopje		
Madagascar		Saint Denis Cedex		
Malawi		Johannesburg		IBM Representative Office - Central
Malaysia	Selangor	Petaling Jaya		Malaysia Head Office IBM Malaysia Sdn Bhd
Maldives				
Malta				
Mauritius		Ebene City		
Mexico		Pena Blanca		IBM de México S.A.
Monaco		Saint-Jean-de-Braye		IBM France
Morocco		Casablanca		IBM Maroc
Namibia		Windhoek		IBM NAMIBIA
Netherlands		Amsterdam		IBM Nederland BV
New Caledonia		Noumea		L'agence IBM de Nouvelle-Calédonie
New Zealand		Wellington		IBM New Zealand Limited
Nigeria		Lagos		The IBM West Africa
Norway		Kolbotn		IBM AS
Pakistan		Karachi		IBM

Source: Citi Research

Figure 758. IBM (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Paraguay				IBM Paraguay
Peru		Lima		IBM de Perú
Philippines		Quezon		IBM Building
Poland		Warsaw		IBM Polska
Portugal		Lisbon		
Qatar		Doha		IBM Qatar SSC
Réunion		Saint Denis Cedex		
Romania		Bucharest		IBM Romania SRL
Russia		Moscow		IBM East Europe/Asia Ltd
Rwanda		Nairobi		IBM Representative Office - IBM Central Africa
Saint Kitts		Basseterre		IBM Business Partners
Saint Lucia		Castries		IBM Business Partners
San Marino		Vimercate		IBM Italia
Saudi Arabia		Dubai		IBM Middle East FZ.LLC
Senegal		Dakar		IBM Senegal Office
Serbia		Belgrade		IBM International Business Machines d.o.o
Sierra Leone		Lagos		The IBM West Africa Office
Singapore		Changi		IBM Singapore Pte. Ltd.
Slovakia		Bratislava		IBM Slovensko, spol. s r.o.
Slovenia		Ljubljana		IBM Slovenija, d.o.o.
South Africa		Sandton		IBM South Africa
South Korea		Seoul		IBM Korea, Inc.
Spain		Madrid		IBM España S. A.
Sri Lanka		Colombo		IBM World Trade Corporation
Suriname		Paramaribo		IBM World Trade Corporation
Sweden		Stockholm		IBM Svenska AB
Switzerland		Zurich		IBM (Switzerland)
Taiwan		Taipei		IBM Taiwan Corporation
Tanzania		Dar es Salaam		IBM Tanzania Office
Thailand		Bangkok		IBM Thailand Co., Ltd.
Trinidad and Tobago		Port of Spain		IBM World Trade Corporation
Tunisia		Tunis		Immeuble IBM
Turkey		Istanbul		IBM Türk Limited Sirketi
Uganda		Nairobi		IBM Representative Office - IBM Central Africa
UK	Tortola	Road Town		IBM Business Partners
UK	Hampshire	Portsmouth		IBM (United Kingdom) Ltd
UK		Hampshire		IBM United Kingdom Limited
UK		Hampshire		IBM (United Kingdom) Ltd
Ukraine		Kyiv		IBM Ukraine
United Arab Emirates		Dubai		IBM Middle East FZ.LLC
Uruguay		Montevideo		
USA	New York	Armonk		Headquarters
Uzbekistan		Tashkent		IBM East Europe/Asia Limited
Venezuela		Caracas		IBM de Venezuela S.A.
Vietnam		Ho Chi Minh City		IBM Vietnam Co., Ltd.
Vietnam		Hanoi		IBM Vietnam Co., Ltd.

Source: Citi Research

Figure 759. Infineon Tech

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Austria		Villach		
China		Beijing		Regional Subsidiaries - Infineon China
China		Shanghai		Regional Subsidiaries - Infineon China
China		Shenzhen		Regional Subsidiaries - Infineon China
China		Wuxi		Regional Subsidiaries - Infineon China
Germany	Bavaria			Headquarter / R&D / Sales Offices
Germany		Regensburg		Manufacturing
Germany		Warstein		Manufacturing
Hungary		Cegléd		Infineon Technologies Austria AG
India		Bangalore		Regional Subsidiaries - Infineon India
Japan		Tokyo		Headquarters - Infineon Technologies Japan K.K.
Japan		Nagoya		Office
Japan		Osaka		Office
Malaysia	Kedah	Kulim		Manufacturing
Malaysia	Melaka	Batu Berendam		Manufacturing
Romania		Bucharest		R&D
Singapore				Office
Singapore				Manufacturing
South Korea		Seoul		Regional Subsidiaries - Infineon Korea
Taiwan		Taipei		Regional Subsidiaries - Infineon Taiwan
USA	California	Milpitas		Infineon Technologies North America Corp

Source: Citi Research

Figure 760. Infinera

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada		Kanata	6000	Office
China	Haidian	Beijing	22000	Office
Hong Kong			3000	Office
India	Karnataka	Bangalore	51000	Office
Japan		Tokyo	2000	Office
Singapore		Singapore		Office
UK		London		Office
USA	California	Sunnyvale	211000	Office
USA	Pennsylvania	Allentown	44000	Office
USA	Maryland	Annapolis	12000	Office

Source: Citi Research

Figure 761. Infoblox

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Belgium		Antwerp		sales support offices
Canada		Burnaby		facilities for development activities
France		Paris		facilities for development activities
Japan		Tokyo		sales support offices
UK		Fleet		sales support offices
USA	California	Santa Clara	127,000	office
USA	Maryland	Annapolis	15,000	development activities

Source: Citi Research

Figure 762. Ingram Micro

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South	Sydney		
Australia	New South	Sydney		
Australia	Victoria	Melbourne		
Australia		Brisbane		
Australia	Perth	Osborne Park		
Canada	Ontario	Mississauga	500000	
Canada	Quebec	Montreal		
Canada	Vancouver	Richmond	125000	
Canada		Ottawa		
Canada	Halifax	Bedford		
Canada	Halifax	Bedford		
China		Shanghai	57049	
China	Haidian	Beijing		
China	Tianhe	Guangzhou		
China	Sichuan	Chengdu		
Hong Kong		Kowloon	17000	
India	Maharashtra	Mumbai		
India		Delhi/NCR		
India	Tamil Nadu	Chennai		
India	Karnataka	Bangalore		
India	West Bengal	Kolkata		
India	Andhra Pradesh	Hyderabad		
India	Gujarat	Ahmedabad		
India	Maharashtra	Pune		
India	Tamil Nadu	Coimbatore		
India	Kerala	Cochin		
India	Uttar Pradesh	Lucknow		
India	Odisha	Bhubaneswar		
India	Punjab	Ludhiana		
India	Rajasthan	Jaipur		
India	Madhya Pradesh	Indore		
India		Pondicherry		
India	Tamil Nadu	Madurai		
India	Andhra Pradesh	Vizag		
India	Karnataka	Hubli		
India	Kerala	Trivandrum		
India	Assam	Guwahati		
India	Punjab	Chandigarh		
India	Uttarakhand	Dehradun		
India	Maharashtra	Goa		

Source: Citi Research

Figure 763. Ingram Micro (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
India	Madhya Pradesh	Bhopal		
India	Gujarat	Baroda		
India	Maharashtra	Nagpur		
India	Gujarat	Surat		
India	Chhattisgarh	Raipur		
India		Jammu		
India	Jharkhand	Ranchi		
India	Bihar	Patna		
India	Jharkhand	Jamshedpur		
Indonesia		Jakarta		Head Office
Indonesia		Jakarta		Warehouse
Malaysia	Selangor			
Malaysia	Penang			
Malaysia	Pahang	Kuantan		
Malaysia	Sabah	Kota Kinabalu		
Malaysia		Johor Bahru		
Malaysia	Sarawak	Kuching		
New Zealand		Auckland		
New Zealand		Wellington		
New Zealand		Christchurch		
New Zealand		Manukau		
Philippines	Manila	Pasig		
Singapore				
Singapore		Kallang		
Singapore	Downtown	Central Business District		
Singapore		Changi		
Thailand	Watthana	Bangkok		
UK	Northampton	Crick		
UK		Berkshire		
USA	California	Santa Ana	400000	Headquarters
USA	New York	Williamsville	374500	Headquarters
USA	Arizona	Scottsdale	144000	DBL Distributing, a Division of Ingram Micro
USA	California	Mira Loma	1150000	ALCs - Warehouse
USA	Texas	Carrollton	235000	ALCs - Logistic Centre
USA	Pennsylvania	Jonestown	850000	ALCs - Warehouse
USA	Illinois	Carol Stream	600000	ALCs - Logistic Centre
USA	California	Elk Grove		ALCs - Logistic Centre
USA	Tennessee	Millington	850000	ALCs - Logistic Centre
Vietnam	Cochinchina	Ho Chi Minh City		
Vietnam		Hanoi		

Source: Citi Research

Figure 764. Innolux

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Guangdong	Shenzhen		Office
China	Jiangsu	Nanjing		Office
China		Shanghai		Office
China	Zhejiang	Ningbo		Office
China	Guangdong	Foshan		Office
Germany	North Rhine-Westphalia			Office
Japan	Kanagawa	Kawasaki		Office
Netherlands		Hoofddorp		Office
Taiwan	Miaoli	Zhunan		Headquarters + Zhunan Operation Center + T3
Taiwan	Taoyuan			Innolux Corporation-Fab Pingjen
Taiwan		Tainan		6 Offices
Taiwan		Kaohsiung		Office
Taiwan		Taipei		2 Offices
USA	California	San Jose		Office

Source: Citi Research

Figure 765. Integrated Device Technology

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Malaysia			145,000	
USA	New Jersey	Basking Ridge		
USA	North Carolina	Cary		
USA	Pennsylvania	Pottstown		
USA	California	San Jose	263,000	
USA	Oregon	Hillsboro	245,000	

Source: Citi Research

Figure 766. Intel

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Cordoba		
Argentina		Buenos Aires		
Australia	New South	Sydney		
Australia	Queensland	Brisbane		
Australia	Victoria	Melbourne		
Austria	Karnten	Villach		
Austria	Oberosterre	Linz		
Bangladesh		Dhaka		
Belgium	Brussels-Cap	Brussels		
Belgium		Antwerp		
Brazil		Sao Paulo		
Canada	British Colur	Vancouver		
Canada	British Colur	Victoria		
Canada	Ontario	Markham		
Canada	Ontario	Waterloo		
Canada	Quebec	Brossard		
Canada	Ontario	Kanata		
Canada	Ontario	Toronto		
Chile		Santiago		
China		Beijing		
China	Liaoning	Dalian		
China	Shaanxi	Xi'an		
China		Shanghai		
China	Sichuan	Chengdu		
China		Chongqing		
China	Fujian	Fuzhou		
China	Guangdong	Guangzhou		
China	Guangdong	Shenzhen		
China	Heilongjiang	Harbin		
China	Henan	Zhengzhou		
China	Hubei	Wuhan		
China	Jiangsu	Nanjing		
China	Liaoning	Shenyang		
China	Shandong	Jinan		
China	Xinjiang	Urumqi		
China	Yunnan	Kunming		
Colombia	Distrito Capi	Bogota		
Costa Rica	Heredia	Heredia		
Czech Repu	Praha, Hlavn	Prague		
Denmark	Nordjylland	Aalborg		
Denmark		Copenhagen		
Ecuador	Pichincha	Quito		
Finland	Southern Fir	Espoo		
Finland		Tampere		
France	Alpes-Mariti	Sophia Antipolis		
France	Haute-Gar	Toulouse		
France	Herault	Montpellier		
France	Loire-Atlanti	Nantes		
France		Meudon		
Germany	Baden-Würt	Karlsruhe		
Germany	Baden-Würt	Ulm		
Germany	Baden-Würt	Ulm		
Germany	Bavaria	Munich		
Germany	Bavaria	Neubiberg		
Germany	Bavaria	Nuremberg		
Germany	Bavaria	Regensburg		
Germany	Bavaria	Unterhaching		
Germany	Niedersachs	Braunschweig		
Germany	Nordrhein-V	Duisburg		
Germany	Sachsen	Dresden		
Greece	Attiki	Athens		
Hong Kong		Hong Kong		
Hungary		Budapest		
India	Andhra Prad	Secunderabad		
India	Karnataka	Bangalore		
India	Uttar Prades	Noida		
India		Chandigarh		
India		New Delhi		
India	Gujarat	Ahmedabad		
India	Kerala	Kochi		
India	Maharashtra	Mumbai		
India	Maharashtra	Pune		
India	Tamil Nadu	Chennai		
India	West Bengal	Kolkata		

Source: Citi Research

Figure 767. Intel (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Indonesia	Jawa Timur	Surabaya		
Indonesia	Yakarta Ray	Jakarta		
Ireland	Clare	Shannon		
Ireland	Kildare	Leixlip		
Israel	HaDarom	Qiryat Gat		
Israel	Haifa	Atlit		
Israel	Haifa	Haifa		
Israel	Hamerkaz	Petah Tikva		
Israel	Hamerkaz	Yakum		
Israel	HaZafon	Yokneam		
Israel		Tel Aviv		
Israel	Yerushalayim	Jerusalem		
Italy		Milan		
Italy		Rome		
Japan	Ibaraki	Tsukuba		
Japan		Tokyo		
Japan	Aichi	Nagoya		
Japan	Nagano	Matsumoto		
Japan		Osaka		
Kazakhstan		Almaty		
Kenya		Nairobi		
Lithuania	Vilniaus Apsl	Vilnius		
Malaysia	Kedah	Kulim		
Malaysia	Pulau Pinang	Penang		
Malaysia		Kuala Lumpur		
Mexico	Jalisco	Guadalajara		
Mexico	Jalisco	Tlaquepaque		
Mexico	Distrito Fede	Lomas de Chapultepec		
Mongolia		Ulaanbaatar		
Netherland	Noord-Brab	Eindhoven		
Nigeria		Lagos		
Pakistan		Islamabad		
Pakistan	Sindh	Karachi		
Peru		Lima		
Philippines	Manila	Taguig		
Poland	Pomorskie	Gdansk		
Poland	Mazowieckie	Warsaw		
Portugal	Lisboa	Paco de Arcos		
Romania	Bucuresti	Bucharest		
Russia	Moskovskaja	Moscow		
Russia	Nizhegorod	Nizhny Novgorod		
Russia	Novosibirsk	Novosibirsk		
Russia	Sankt-Peterb	St. Petersburg		
Serbia	Beograd	Belgrade		
Singapore				
South Africa	Gauteng	Woodmead		
South Korea	Gyeong-sang	Gumi		
South Korea		Seoul		
South Korea		Seoul		
Spain		Barcelona		
Spain		Madrid		
Sri Lanka		Colombo		
Sweden	Skane	Lund		
Sweden		Stockholm		
Sweden		Stockholm		
Switzerland		Zurich		
Taiwan	Hsinchu	Jubei City		
Taiwan		Kaohsiung		
Taiwan		Taipei		
Thailand		Bangkok		
UK	Hertfordshir	Borehamwood		
UK	Lincolnshire	Lincoln		
UK	Westminster	London		
UK		Wokingham		
UK	Wiltshire	Swindon		
Ukraine	Kyivska Obla	Kiev		
USA	Arizona	Chandler		
USA	California	Calabasas		
USA	California	Carlsbad		
USA	California	Folsom		
USA	California	Irvine		
USA	California	Menlo Park		
USA	California	Sacramento		
USA	California	San Diego		

Source: Citi Research

Figure 768. Intel (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
USA	California	San Francisco		
USA	California	Santa Clara		
USA	Colorado	Boulder		
USA	Colorado	Fort Collins		
USA	Colorado	Longmont		
USA	Washington	D.C		
USA	Idaho	Boise		
USA	Illinois	Champaign		
USA	Illinois	Libertyville		
USA	Illinois	Oakbrook Terrace		
USA	Kentucky	Louisville		
USA	Massachusetts	Hudson		
USA	Minnesota	Edina		
USA	New Hampshire	Merrimack		
USA	New Jersey	Parsippany		
USA	New Mexico	Rio Rancho		
USA	Oregon	Aloha		
USA	Oregon	Beaverton		
USA	Oregon	Hillsboro		
USA	Pennsylvania	Allentown		
USA	Pennsylvania	Bala Cynwyd		
USA	Pennsylvania	King of Prussia		
USA	South Carolina	Columbia		
USA	Texas	Austin		
USA	Virginia	Fairfax		
USA	Virginia	Herndon		
USA	Washington	Bellevue		
USA	Washington	DuPont		
USA	Washington	Redmond		
USA	Wisconsin	Eau Claire		
Venezuela		Caracas		
Vietnam	Thanh Pho	Ho Chi Minh City		
Vietnam		Hanoi		

Source: Citi Research

Figure 769. International Rectifier

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Beijing		
China		Shanghai		
China		Shenzhen		
China		Xi'an		
Denmark		Skovlunde		
France		Provence		
Germany		Neu Isenburg		
Hong Kong		Kowloon		
India	Karnataka	Bangalore		
India		New Delhi		
Italy		Milan		
Japan		Osaka		
Japan		Nagoya		
Japan		Tokyo		
Mexico		Tijuana		
Philippines	Manila	Pasig		
Singapore		Serangoon North Avenue		
South Korea		Seoul		
Taiwan		Taipei		
UK		Reigate		
UK		Newport		
USA	California	El Segundo		
USA	California	Temecula		
USA	California	San Jose		
USA	California	Irvine		
USA	Arizona	Chandler		
USA	Arizona	Mesa		
USA	North Carolina	Durham		
USA	Massachusetts	Leominster		
USA	Massachusetts	Tewksbury		
USA	Minnesota	St. Paul		
USA	Rhode Island	Warwick		

Source: Citi Research

Figure 770. Intersil Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shenzhen		Office
China		Shanghai		Office
China	Haidian	Beijing		Sales office
China		Shanghai		Sales office
China		Shenzhen		Sales office
France		Vélizy Villacoublay		Sales office
Germany		Ismaning		Office
Germany		Ismaning		Sales office
India	Karnataka	Bangalore		Sales office
Japan		Tokyo		Office
Japan		Kyoto		Office
Malaysia		Kuala Lumpur		Office
Singapore				Sales office
South Korea	Gyeonggi-dc	Seoul		Sales office
Sweden		Älvsjö		Sales office
Taiwan		Taipei		Sales office
UK				Office
UK		Essex		Sales office & Design Centers
USA	California	Milpitas	166000	Headquarters & Design Centers
USA	Florida	Palm Bay	529000	Office & Design Centers
USA	Massachusetts	Chelmsford		Sales office
USA	Texas	Richardson		Design Centers
USA	North Carolina	Morrisville		Design Centers
USA	New Jersey	Bridgewater		Design Centers
USA	Texas	Austin		Design Centers

Source: Citi Research

Figure 771. Jabil Circuit Inc

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires	4,000	Aftermarket, Support, Storage
Austria		Vienna	88,000	Manufacturing, Design
Belgium		Hasselt	85,000	Prototype Manufacturing, Design
Brazil		Belo Horizonte	155,000	Manufacturing
Brazil		Manaus	170,000	Prototype Manufacturing
Brazil		Sorocaba	39,000	Manufacturing
Brazil		Valinhos	51,000	Aftermarket
Canada		Calgary	11,000	Aftermarket
Canada		Toronto	55,000	Aftermarket
China		Beijing	4,000	Design
China		Huangpu	2,613,000	Manufacturing
China		Huangpu	1,031,000	Manufacturing, Training
China		Nanjing	135,000	Manufacturing
China		Shanghai	494,000	Manufacturing, Design, Aftermarket
China		Shanghai	6,000	Support
China		Shenzhen	795,000	Manufacturing
China		Suzhou	159,000	Manufacturing
China		Suzhou	437,000	Manufacturing, Aftermarket
China		Tianjin	158,000	Manufacturing
China		Tianjin	1,622,000	Manufacturing
China		Wuxi	462,000	Manufacturing, Design, Support, Storage
China		Wuxi	2,188,000	Manufacturing, Design, Support, Storage
China		Yantai	212,000	Manufacturing
France		Brest	463,000	Manufacturing
France		Gallargues	25,000	Manufacturing

Source: Citi Research

Figure 772. Jabil Circuit Inc (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Germany		Boblingen	16,000	Manufacturing, Prototype Manufacturing
Germany		Jena	24,000	Design
Hungary		Pecs	36,000	Aftermarket
Hungary		Szombathely	198,000	Aftermarket
Hungary		Szombathely	68,000	Aftermarket
Hungary		Tiszaújváros	423,000	Manufacturing
Hungary		Tiszaújváros	160,000	Manufacturing
India		Chennai	284,000	
India		Gurgaon	31,000	Aftermarket, Storage, Support
India		Jaipur	6,000	Storage
India		Mumbai	3,000	Support
India		Pune	262,000	Manufacturing
Ireland		Dublin	4,000	Support
Israel		Tel Aviv	3,000	Support
Italy		Cassina de' Pezz	161,000	
Italy		Marcianise	230,000	Manufacturing
Japan		Gotemba	138,000	Manufacturing
Japan		Hachioji	20,000	Manufacturing
Japan		Tokyo	2,000	Support
Malaysia		Penang	969,000	Manufacturing, Aftermarket
Malaysia		Penang	286,000	Manufacturing, Support
Malaysia		Selangor	50,000	Aftermarket, Storage, Support
Mexico		Chihuahua	1,025,000	Manufacturing, Aftermarket, Storage
Mexico		Chihuahua	180,000	Storage
Mexico		Guadalajara	363,000	Manufacturing
Mexico		Guadalajara	703,000	Manufacturing, Support
Mexico		Mexico City	1,000	Support, Storage
Mexico		Nogales	100,000	Aftermarket
Mexico		Reynosa	421,000	Aftermarket
Mexico		Reynosa	285,000	Aftermarket
Netherlands		Amsterdam	79,000	Aftermarket
Netherlands		Eindhoven	124,000	Aftermarket, Storage, Support
Netherlands		Venray	399,000	Manufacturing
Poland		Bydgoszcz	228,000	Aftermarket
Poland		Kwidzyn	563,000	Manufacturing, Storage
Russia		Tver	44,000	Manufacturing
Scotland		Ayr	13,000	Aftermarket
Scotland		Livingston	130,000	Manufacturing
Singapore		Alexandra	13,000	Manufacturing
Singapore		Tampines	8,000	Manufacturing
Singapore		Toa Payoh	88,000	Manufacturing, Design
South Korea		Sungnam-si	1,000	Support
Spain		Madrid	1,000	Support
Taiwan		Hsinchu	21,000	Design
Taiwan		Taichung	419,000	Manufacturing, Design, Support, Storage
Taiwan		Taichung	247,000	Manufacturing, Support, Storage
Taiwan		Taipei	12,000	Design, Support, Storage
Turkey		Ankara	1,000	Aftermarket
UK		Coventry	51,000	Aftermarket
UK		Solihull	22,000	Support, Storage
Ukraine		Uzhgorod	278,000	Manufacturing
United Arab Emirates		Dubai	1,000	Support
USA	Florida	St. Petersburg	297,000	Manufacturing, Aftermarket, Support
USA	Florida	St. Petersburg	150,000	Manufacturing, Aftermarket, Design
USA	Michigan	Auburn Hills	207,000	Manufacturing
USA	Idaho	Boise	3,000	Support
USA	Colorado	Colorado Springs	8,000	Design
USA	Iowa	Council Bluffs	124,000	Aftermarket, Support, Storage
USA	California	Irvine	6,000	Support
USA	Michigan	Lake Orion	45,000	Storage
USA	Kentucky	Louisville	140,000	Aftermarket
USA	Texas	McAllen	71,000	Aftermarket
USA	Tennessee	Memphis	1,201,000	Manufacturing, Aftermarket
USA	Texas	Plano	144,000	Aftermarket, Support, Storage
USA	New York	Poughkeepsie	40,000	Storage
USA	Texas	Round Rock	65,000	
USA	California	San Jose	181,000	Prototype Manufacturing
USA	Florida	Tampa	110,000	Aftermarket, Storage, Support
USA	Florida	Tampa	55,000	Storage
USA	Arizona	Tempe	191,000	Manufacturing, Support, Training, Storage
USA	Arizona	Tempe	27,000	Support, Storage, Training
Vietnam		Ho Chi Minh City	273,000	
Vietnam		Ho Chi Minh City	105,000	Manufacturing

Source: Citi Research

Figure 773. JDSU Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia		Chatswood		Sales Office
Austria				Sales Office
Brazil		Sao Paulo		Office
Brazil		Rio de Janeiro		Office
Canada		Ontario		Office
Canada		Vancouver		Office
China		Beijing		Office
China	Jiangsu	Suzhou City		Office
China		Shenzhen		Office
China		Chengdu		Sales Office
China		Guangzhou		Sales Office
China		Shanghai		Sales Office
Denmark				Sales Office
France				Manufacturing, Research and Development
France				Sales Office
Germany				Sales Office
Germany				Manufacturing, Research and Development
India	Haryana	Gurgaon		Sales Office
India	Maharashtra	Mumbai		Sales Office
India	Maharashtra	Pune		Sales Office
India		Bengaluru		Sales Office
Italy				Sales Office
Japan		Tokyo		Office
Japan		Tokyo		Sales Office
Malaysia		Selangor		Sales Office
Mexico		Mexico City		Office
Russia		Moscow		Sales Office
Scotland		Edinburgh		Research and Development
Singapore				Office
Singapore				Sales Office
South Korea		Seoul		Office
Spain		Madrid		Sales Office
Sweden				Sales Office
Switzerland		Bern		Sales Office
Taiwan		Taipei		Sales Office
Turkey		Istanbul		Sales Office
UK		London		Sales Office
UK		Hampshire		Sales Office
United Arab Emirates		Dubai		Sales Office
USA	California	Milpitas	163000	Headquarters
USA	Connecticut			Office
USA	New Jersey			Office
USA	Florida			Office
USA	Georgia			Office
USA	Indiana			Office
USA	Maryland			Office
USA	North Carolina			Office
USA	Texas			Office
USA	Virginia			Office
USA	Colorado			Office
USA	Georgia			Office
USA	Washington			Office

Source: Citi Research

Figure 774. Ju Teng

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Jiangsu Province	Wu Jiang		Subsidiary (Everyday Computer Components (Suzhou) Co., Ltd.)
China	Jiangsu Province	Wu Jiang		Subsidiary (Suzhou Dazhi Communication Accessory Co., Ltd.)
China		Shanghai		Subsidiary (Ju Teng Electronics (Shanghai) Co., Ltd.)
China	Jiangsu Province	Kunshan City		Subsidiary (Chengyang Precision Mold (Kunshan) Co., Ltd.)
China	Jiangsu Province	Kunshan City		Subsidiary (WIS Precision (Kunshan) Co., Ltd Co., Ltd.)
China	Guangdong	Zhongshan		Subsidiary (Lian-Yi Precision (Zhongshan) Inc.)
China	Jiangsu Province	Jurong City		Subsidiary (Compal Precision Module (Jiangsu) CO.,LTD.)

Source: Citi Research

Figure 775. Ju Teng (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Jiangsu Province	Taizhou		Subsidiary (WIS Precision (Taizhou) Co., Ltd.)
China	Sichuan	Nei Jiang		Subsidiary (JUTENG(NEI JIANG)Communication Accessory Co.,Ltd.)
China	Jiangsu Province	Suzhou city		Subsidiary (WUJIANG DADING PRECISION MOULD CO., LTD. )
Hong Kong				HQ
Macau				Subsidiary (Dynamic Apex Macao Commercial Offshore Limited)
Taiwan	Xinzhuang	New Taipei		Subsidiary (Gi-Li Co., Ltd. )
Taiwan	Tainan			Subsidiary (Hong Ya Technology Inc. )

Source: Citi Research

Figure 776. Juniper Networks Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		
Australia	Queensland	Brisbane		
Australia		Canberra		
Australia	Victoria	Melbourne		
Australia	New South	North Sydney		
Austria		Vienna		
Belgium		Zaventem		
Brazil		Rio de Janeiro		
Brazil		Sao Paulo		
Canada	Ontario	Kanata		
Canada	British Columbia			
Canada	Alberta	Calgary		
Canada	Ontario	Kanata		
Canada	Ontario	Mississauga		
Canada	Quebec	Montreal		
China		Beijing		
China		Guangzhou		
China		Shanghai		
China		Hong kong		
Colombia		Bogota		
Denmark		Copenhagen		
Finland		Espoo		
France		Neuilly sur Seine		
Germany		Frankfurt		
Germany		Munchen		
Greece		Athens		
Hungary		Budapest		
India	Karnataka	Bangalore		
India	Tamil Nadu	Chennai		
India	Maharashtra	Mumbai		
India		New Delhi		
Indonesia		Jakarta		
Ireland		Dublin		
Israel		Herzliya		
Israel		Herzliya		
Italy	Lombardy	Milan		
Italy		Rome		
Japan	Osaka	Chuo-ku		
Japan		Tokyo		
Malaysia		Kuala Lumpur		
Mexico		Mexico City		
Morocco		Casablanca		
Netherlands		Amsterdam		
New Zealand		Auckland		
New Zealand		Wellington		
Norway		Oslo		

Source: Citi Research

Figure 777. Juniper Networks Inc. (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Poland		Warsaw		
Russia		Moscow		
Saudi Arabia		Riyadh		
Singapore		Singapore		
South Africa		Johannesburg		
South Korea		Seoul		
Spain		Madrid		
Sweden		Stockholm		
Switzerland		Zurich		
Taiwan		Taipei		
Thailand		Bangkok		
Turkey		Istanbul		
UK	Surrey	Addlestone		
UK		London		
United Arab Emirates		Dubai		
USA	California	Sunnyvale	1,800,000	Headquarters
USA	Massachusetts	Westford	200,000	
USA	North Carolina	Raleigh		
USA	North Carolina	Durham		
USA	Arizona	Phoenix		
USA	California	Costa Mesa		
USA	California	El Segundo		
USA	California	Sacramento		
USA	Colorado	Denver		
USA	Connecticut	Berlin		
USA	Florida	Ft. Lauderdale		
USA	Georgia	Alpharetta		
USA	Illinois	Chicago		
USA	Kansas	Overland Park		
USA	Maryland	Columbia		
USA	Massachusetts	Westford		
USA	Michigan	Troy		
USA	Minneapolis	Minneapolis		
USA	Missouri	St. Louis		
USA	New Jersey	Bridgewater		
USA	New Jersey	Mt. Laurel		
USA	New York	Albany		
USA	New York	New York		
USA	Ohio	Columbus		
USA	Oklahoma	Tulsa		
USA	Texas	Dallas		
USA	Virginia	Richmond		
USA	Virginia	Herndon		
USA	Washington	Bellevue		
Vietnam		Hanoi		
Vietnam		Ho Chi Minh City		

Source: Citi Research



Figure 778. Kinsus Interconnect Technology

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Suzhou		
Taiwan		Shinwu		
Taiwan		YangMei		
USA	California	Santa Clara		

Source: Citi Research

Figure 779. KLA Tencor Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Belgium	Flemish Brak	Leuven	99,315	Office, plant and warehouse
Belgium	Flemish Brak	Leuven		
China	Guangdong	Shenzhen	33,571	Office and plant
China		Beijing		
China		Shanghai		
China	Hubei	Wuhan		
China		Tianjin		
China	Jiangsu	Wuxi		
China	Shenzhen	Longgang		
France		Meylan		
France		Mennecey		
France	Bouches-du-Rousset			
Germany	Hesse	Weilburg	138,119	Office and plant
Germany	Saxony	Dresden		
Germany	Hesse	Weilburg		
Germany	Thuringia	Jena		
Hong Kong		Kwai Chung		
India	Tamil Nadu	Chennai	33,366	Office
Ireland		Dublin		

Source: Citi Research

Figure 780. KLA Tencor Corp (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Israel		Migdal Haemek	191,982	Office and plant
Israel		Migdal Haemek		
Israel		Kiryat Gat		
Israel		Yokneam		
Italy	Monza Brian	Concorezzo		
Japan		Yokohama	37,418	Office and Warehouse
Japan	Kanagawa	Yokohama		
Japan	Osaka	Osaka		
Japan	Miyagi	Sendai		
Japan	Hiroshima	Higashihiroshima		
Japan	Fukushima	Shirakawa City		
Japan	Oita	Oita		
Japan	Toyama	Toyama		
Japan	Saga	Kiyama		
Japan		Tokyo		
Japan	Kumamoto	Kikuchi-gun		
Japan	Mie	Yokkaichi		
Malaysia	Kedah	Kulim		
Malaysia	Selangor	Suban Jaya		
Netherlands		Oss		
Singapore		Serangoon	188,695	Office and plant
Singapore		Serangoon		
South Korea	Gyeonggi-do	Hwaseong		
South Korea		Icheon		
Taiwan		Hsinchu	73,676	Office
Taiwan		Taoyuan City		
Taiwan		Tainan		
Taiwan		Taichung		
Taiwan		Kaohsiung		
UK	Berkshire	Wokingham		
USA	California	Milpitas	727,302	Office, plant and Warehouse
USA	Massachusetts	Westwood	116,908	Office and plant
USA	Arizona	Chandler		
USA	California	Hayward		
USA	Idaho	Meridian		
USA	Minnesota	Edina		
USA	New Hampshire	Portsmouth		
USA	New Mexico	Albuquerque		
USA	New York	Hopewell Junction		
USA	New York	Malta		
USA	Oregon	Hillsboro		
USA	Texas	Austin		
USA	Texas	Richardson		
USA	Vermont	Colchester		
USA	Virginia	Manassas		

Source: Citi Research

Figure 781. Konica Minolta Holdings

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Austria		Vienna		Head Office
Austria		Linz		Linz Branch
Austria		Salzburg		Salzburg Branch
Austria		Innsbruck		Innsbruck Branch
Austria		Dornbirn		Dornbirn Branch
Austria		Graz		Store Graz
Austria		Klagenfurt		Klagenfurt Branch
Belgium		Zaventem		Konica Minolta Business Solutions (Belgium) N.V./S.A.
Bulgaria		Sofia		Konica Minolta Business Solutions Bulgaria EOOD
Croatia		Zagreb		Konica Minolta Croatia Business Solutions Ltd.
Czech Republic		Brno		Konica Minolta Business Solutions Czech spol. s r.o.
Denmark		Albertslund		Konica Minolta Business Solutions Denmark a/s
Estonia		Tallinn		UAB Konica Minolta branch Estonia
Finland		Espoo		Konica Minolta Business Solutions Finland Oy
France		Carrières-sur-Seine		Konica Minolta Business Solutions France S.A.S.
Germany		Langenhagen		Konica Minolta Business Solutions Europe GmbH
Greece		Metamorfoosi		Konica Minolta Business Solutions Greece SA
Hungary		Budapest		Konica Minolta Hungary Business Solutions Ltd.
Italy	Lombardy	Milan		Konica Minolta Business Solutions Italia S.p.A.
Japan		Tokyo		Head Office
Japan		Tokyo		Marunouchi Trust Tower
Japan		Tokyo		Shinjuku Nomura Building
Japan		Hino		Tokyo Hino site
Japan		Hachioji		Tokyo Hachioji site
Japan	Kanagawa			Atsugi site
Japan	Yamanashi			Kofu
Japan		Toyokawa		Toyokawa site
Japan	Aichi			Mizuho site
Japan	Aichi			Mikawa site
Japan		Kansai		Kansai Branch
Japan	Hyogo	Itami		Itami site
Japan		Osaka		Takatsuki site
Japan		Osaka		Sakai site
Japan		Sayama		Osaka Sayama site
Japan	Hyogo	Kobe		Kobe site
Japan	Hyogo	Kobe		Kobe second site
Japan	Hyogo	Kobe		Seishin site
Japan		Tokyo		Development, manufacture and sale
Japan		Tokyo		Printing, binding, and processing
Japan		Tokyo		Medical imaging equipment / medical equipment
Japan		Hokkaido		Hokkaido Branch
Japan		Tomakomai		Tomakomai office
Japan		Hakodate		Hakodate office
Japan		Kushiro		Kushiro office
Japan		Asahikawa		Asahikawa office
Japan		Kitami		Kitami office
Japan	Miyagi			Praça Office
Japan		Aomori		Aomori office
Japan		Morioka		Morioka office
Japan		Akita		Akita office
Japan		Yamagata		Yamagata office
Japan		Koriyama		Koriyama office
Japan		Tokyo		Kanto Branch
Japan	Chiba			Chiba office
Japan		Matsudo		Matsudo office
Japan		Funabashi		Funabashi office
Japan	Kanagawa			Kanagawa office
Japan		Atsugi		Atsugi office
Japan		Saitama		Saitama office
Japan	Niigata			Niigata office
Japan		Nagaoka		Nagaoka office
Japan		Utsunomiya		Utsunomiya office
Japan		Maebashi		Maebashi office
Japan		Mito		Mito office
Japan		Chubu Branch		Chubu Branch
Japan		Gifu		Gifu office
Japan		Hamamatsu		Hamamatsu sales office
Japan	Shizuoka			Shizuoka office
Japan		Kanazawa		Kanazawa office
Japan	Toyama			Toyama office
Japan		Nagano		Nagano office
Japan		Tsu		Triple sales office
Japan	Aichi			Aichi north office
Japan		Kariya		Kariya office
Japan		Toyohashi		Toyohashi office

Source: Citi Research

Figure 782. Konica Minolta Holdings (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Japan		Kansai		Kansai Branch
Japan		Osaka		Minami Osaka sales office
Japan		Itami		Hanshin office
Japan		Himeji		Himeji Office
Japan		Hyogo		Hyogo Office
Japan		Kyoto		Kyoto Office
Japan		Wakayama		Wakayama office
Japan		Takamatsu		Takamatsu office
Japan		Matsuyama		Matsuyama office
Japan		Fukuyama		Fukuyama office
Japan		Kure		Wu office
Japan		Okayama		Okayama office
Japan	Yamaguchi			Yamaguchi office
Japan		Tottori		Tottori Office
Japan		Matsue		Matsue office
Japan		Fukuoka		Kyushu Branch
Japan		Kitakyushu		Kitakyushu Branch
Japan		Kurume		Kurume office
Japan	Oita			Oita office
Japan		Nagasaki		Nagasaki office
Japan		Kumamoto		Kumamoto office
Japan		Miyazaki		Miyazaki office
Japan		Kagoshima		Kagoshima office
Japan		Okinawa		Okinawa office
Latvia		Riga		UAB Konica Minolta branch Latvia
Lithuania		Vilnius		Konica Minolta Baltia UAB
Malta		Birkirkara		Konica Minolta Business Solutions GmbH
Netherlands		Amsterdam		Konica Minolta Business Solutions Nederland bv
Norway		Oslo		Konica Minolta Business Solutions Norway AS
Poland		Warsaw		Konica Minolta Business Solutions SP. Z.O.O.
Portugal		Lisbon		Konica Minolta Business Solutions Portugal
Romania		Bucharest		Konica Minolta Business Solutions Romania S.R.L.
Russia		Moscow		Konica Minolta Business Solutions Russia
Scotland		Livingston		Livingston Office
Serbia		Novi Beograd		Konica Minolta Poslovna Rešenja SE d.o.o.
Slovakia		Bratislava		Konica Minolta Slovakia spol. s.r.o.
Slovenia		Ljubljana		Konica Minolta Business Solutions, Poslovne
Spain		Madrid		Konica Minolta Business Solutions Spain S.A.
Sweden		Solna		Konica Minolta Business Solutions Sweden AB
Turkey		Istanbul		Konica Minolta Turkey İş Teknolojileri A.Ş.
UK	Essex			Konica Minolta Business Solutions (UK) Ltd.
UK		Sunderland		Sunderland Office
UK		Warrington		Warrington Office
UK		Norwich		Norwich Office
UK		Nottingham		Nottingham Office
UK	Sheffield			Sheffield Office
UK	Essex			Basildon Head Office
UK		London		Konica Minolta
UK		Milton Keynes		Milton Keynes Office
UK	West Midlands			Birmingham Office
UK	Reading			Reading Office
UK		Aberystwyth		Aberystwyth Office
UK		Bristol		Bristol Office
UK		Swansea		Swansea Office
UK	Denbighshire	St Asaph		St Asaph Office
Ukraine		Kiev		Konica Minolta Business Solutions Ukraine
USA	New Jersey	Ramsey		

Source: Citi Research

Figure 783. Kyocera

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South Wales	North Ryde		Solar Business - Head Office - KYOCERA Solar
Australia	Queensland	Cannon Hill		Solar Business - Kyocera Solar Pty Ltd.
Australia	Perth	Osborne Park		Solar Business - Kyocera Solar Pty Ltd.
Australia	New South Wales	North Ryde		KYOCERA Solar PTY Ltd
Austria		Vienna		KYOCERA Document Solutions Austria GmbH
Belgium		Zaventem		KYOCERA Document Solutions Belgium N.V.
Brazil		Barueri		Information Equipment
Brazil				Solar Business - KYOCERA Solar do Brasil Ltda.
Canada	Ontario	Mississauga		Information Equipment
Canada		Richmond		Information Equipment
Canada		Dorval		Information Equipment
China	Guangdong	Zhuhai		Kyocera Taikang alloy tool (Zhuhai) Co., Ltd
China				Components Business
China		Shanghai		KYOCERA (China) Sales & Trading Corporation
China		Shanghai		Shanghai KYOCERA Electronics Co., Ltd.
China		Tianjin		KYOCERA (Tianjin) Solar Energy Co., Ltd.
China		Shanghai		KYOCERA Document Solutions (China) Corporation
China	Guangdong	Dongguan		Dongguan Shilong KYOCERA Co., Ltd.
China		Shanghai		KYOCERA Management Consulting Service
China		Shanghai		Shanghai KYOCERA Sales & Trading Corporation
China	Guangdong	Dongguan		KYOCERA Document Technology (Dongguan) Co., Ltd.
China		Beijing		Tianjin AVX/KYOCERA International Trading Co., Ltd.
China		Shanghai		AVX/KYOCERA (Shanghai) International Trading Co. Ltd.
China		Pudong		KYOCERA Communication Systems (Shanghai) Co., Ltd.
China		Kowloon		KYOCERA Connector Products Hong Kong Ltd.
China	Jiangsu			KYOCERA Chemical (Wuxi) Co., Ltd.
China		Kowloon		KYOCERA Chemical (Hong Kong) Ltd.
China	Guangdong	Dongguan		KYOCERA OPTEC (Dongguan) Co., Ltd.
Czech Republic		Kadan		KYOCERA Solar Europe s.r.o.
Denmark		Glostrup		KYOCERA Document Solutions Denmark A/S
Denmark				KYOCERA UNIMERCO A/S
Finland		Helsinki		KYOCERA Document Solutions Finland Oy
France		Gif-sur-Yvette		KYOCERA Document Solutions France S.A.S.
Germany		Esslingen		KYOCERA Fincceramics GmbH
Germany		Meerbusch		KYOCERA Document Solutions Deutschland GmbH
Germany		Dietzenbach		KYOCERA Display Europe GmbH
Hong Kong		Wang Wo Tsai		Components Business
Hong Kong		Kowloon		KYOCERA (Hong Kong) Sales & Trading Limited
Hong Kong		Tsuen Wan		KYOCERA Document Solutions Asia Limited
Hong Kong		Tsuen Wan		KYOCERA Tycom (H.K.) Limited
India	Haryana	Gurgaon		KYOCERA Asia Pacific (India) Pvt. Ltd.
India	Haryana	Gurgaon		KYOCERA Document Solutions India Private Limited
Italy	Lombardy	Milan		KYOCERA Document Solutions Italia S.p.A.
Japan		Tokyo		Tokyo Office
Japan		Osaka		KYOCERA Document Solutions Inc.
Japan	Mie			Tamaki Plant
Japan		Osaka		Hirakata Plant
Japan		Kyoto		KYOCERA Communication Systems Co., Ltd.
Japan	Shiga			KYOCERA Display Corporation
Japan		Kyoto		KYOCERA Solar Corporation
Japan	Yamagata	Higashine-shi		KYOCERA Crystal Device Corporation
Japan	Shiga			KYOCERA SLC Technologies Corporation
Japan		Tokyo		KYOCERA Circuit Solutions, Inc.
Japan	Yokohama	Midori		KYOCERA Connector Products Corporation
Japan	Saitama			KYOCERA Chemical Corporation
Japan		Tokyo		KYOCERA Realty Development Co., Ltd.
Japan		Tokyo		KYOCERA Optec Co., Ltd.
Japan		Osaka		KYOCERA Medical Corporation
Japan		Tokyo		KYOCERA Document Solutions Japan Inc.
Japan		Tokyo		KYOCERA MARUZEN Systems Integration Co., Ltd.
Japan		Kagoshima		International Golf Resort KYOCERA Co., Ltd.
Japan		Kagoshima		Hotel KYOCERA

Source: Citi Research

Figure 784. Kyocera (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Malaysia	Johor			KYOCERA Telecom Equipment (Malaysia) Sdn. Bhd.
Mexico		Mexico City		Information Equipment
Mexico				Components Business - KYOCERA Mexicana S.A. de C.V.
Netherlands		Hoofddorp		KYOCERA Document Solutions Europe B.V.
Netherlands				KYOCERA Document Solutions Nederland B.V.
New Zealand		Auckland		KYOCERA Document Solutions New Zealand Ltd.
Norway		Oslo		KYOCERA Document Solutions Norge Nuf
Philippines		Cebu City		KYOCERA Document Solutions Philippines, Inc.
Philippines	Laguna	Calamba		KYOCERA Circuit Solutions Philippines, Inc.
Philippines		Quezon		KYOCERA Circuit Design Philippines, Inc.
Portugal		Lisbon		KYOCERA Document Solutions Portugal Lda.
Russia		Moscow		KYOCERA Document Solutions Russia LLC
Singapore				KYOCERA Communication Systems Singapore Pte. Ltd.
Singapore				KYOCERA Document Solutions Singapore Pte. Ltd.
Singapore				KYOCERA Connector Products Singapore Pte. Ltd.
Singapore				KYOCERA Chemical Singapore Pte. Ltd.
South Africa		Midrand		KYOCERA Document Solutions South Africa (Pty) Ltd.
South Korea		Seoul		KYOCERA Korea Co., Ltd.
South Korea		Incheon		KYOCERA Precision Tools Korea Co., Ltd.
South Korea		Seoul		KYOCERA Document Solutions Korea Co., Ltd.
South Korea		Seoul		AVX/KYOCERA Yuhan Hoesa
Spain		Madrid		KYOCERA Document Solutions Espana S.A.
Sweden		Kista		KYOCERA Document Solutions Nordic AB
Switzerland		Zurich		KYOCERA Document Solutions Europe Zurich Branch
Taiwan		Taipei		KYOCERA Document Solutions Taiwan Corporation
Thailand		Bangkok		KYOCERA Asia Pacific (Thailand) Co., Ltd.
Thailand		Bangkok		KYOCERA Document Solutions (Thailand) Corp., Ltd.
Thailand	Lamphun			KYOCERA Display (Thailand) Co., Ltd.
UK	Surrey	Frimley		KYOCERA Fineceramics Limited
UK	Berkshire			KYOCERA Document Solutions (U.K.) Limited
United Arab Emirates		Dubai		KYOCERA Document Solutions Middle East
USA	California	San Diego		Headquarters
USA	California	San Diego		Telecommunications Equipment
USA	New Jersey	Fairfield		Information Equipment
USA	California	Concord		Information Equipment
USA	Arizona	Scottsdale		Solar Business - KYOCERA Solar, Inc.
USA	California	San Diego		Components Business - KYOCERA America, Inc.
USA	North Caroli	Hendersonville		Components Business - KYOCERA Industrial Ceramics
USA	California	Costa Mesa		Components Business - KYOCERA TYCOM Corporation
USA	California	San Jose		Northern California Office
USA	Minnesota	Brooklyn Park		Minnesota Office
USA	New York	Owego		NY Office
USA	Oregon			Oregon Office
Vietnam		Haiphong		KYOCERA Document Technology Vietnam Co., Ltd.

Source: Citi Research

Figure 785. Lam Research Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Austria				Office
China	Pudong	Shanghai		Office
China		Beijing		Office
China	Jiangsu Province			Office
China		Hubei		Office
China	Liaoning			Office
China		Xi'an		Office
France		Meylan		Office
France		Corbeil Essonnes Cedex		Office
France		Rousset Cedex		Office
Germany		Dresden		Office
Germany		Ismaning		Office
Germany		Rendsburg		Office
India	Karnataka	Bangalore		Office
Ireland		Dublin		Office
Israel		Ramat-Gan		Office
Israel		Qiryat Gat		Office
Italy				Office
Japan		Kanagawa		Office
Japan	Mie	Yokkaichi		Office
Japan		Oita		Office
Japan	Toyama	Toyama		Office
Japan		Hiroshima		Office
Japan		Kumamoto		Office
Malaysia	Kedah	Kulim		Office
Netherlands				Office
Singapore				Office
South Korea:Gyeonggi-dc		Seongnam		Office
South Korea:Gyeonggi-dc		Hwaseong		Office
South Korea:Chungcheon		Cheonan		Office
South Korea:Gyeonggi-dc		Icheon		Office
Switzerland				Office
Taiwan		Hsinchu		Office
Taiwan		Taoyuan City		Office
Taiwan		Taichung		Office
Taiwan		Tainan		Office
USA	California	Fremont		Headquarters
USA	California	Livermore		Manufacturing
USA	Oregon	Tualatin		Manufacturing & Office
USA	Arizona	Chandler		Office
USA	California	San Jose		Office
USA	Idaho	Boise		Office
USA	New York	Albany		Office
USA	New York	Clifton Park		Office
USA	New York	Fishkill		Office
USA	Ohio	Eaton		Office
USA	Oregon	Hillsboro		Office
USA	Texas	Austin		Office
USA	Washington	Vancouver		Office

Source: Citi Research

Figure 786. Largan Precision

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Guangdong	Dongguan		Larga Precision Co.,Ltd
China	Jiangsu	Wujiang		Suzhou Largan Co.,Ltd
Taiwan		Taichung		Larga Precision Co.,Ltd

Source: Citi Research

Figure 787. Lenovo

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		
Australia	New South v	Chatswood		Australia Head office
Austria		Vienna		Lenovo Technology B.V.
Belgium	Flemish Brat	Diegem		Lenovo Belgium bvba
Brazil		Sao Paulo		
Bulgaria		Sofia		
Canada	Ontario	North York		Lenovo (Canada) Inc.
Chile		Santiago		
China		Beijing		Principal Operations, Lenovo BU R&D Centre, Sales
China		Beijing		Headquarters and Manufacturing Centers
China	Guangdong	Shenzhen		Lenovo Corporate R&D Centre
China		Shanghai		Development Lab
China	Fujian	Xiamen		Notebook/Mobile Phone Development Centre
China	Sichuan	Chengdu		Mobile Phone R&D Centre
China	Guangdong	Huiyang		Branch of Lenovo Corporate Research
				Manufacturing Centers

Source: Citi Research

Figure 788. Lenovo (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Colombia		Bogota		
Croatia		Zagreb		
Czech Republic		Prague		Lenovo Technology B.V.
Egypt		Cairo		Egypt Office: Lenovo Egypt
Finland	Uusimaa	Espoo		
France	Ile-de-France	Courbevoie		Sales Headquarters
Germany	Baden-Württemberg	Stuttgart		Lenovo (Deutschland) GmbH
Greece	Attica	Athens		Lenovo Technology B.V.- Greece Branch
Hungary		Budapest		Lenovo Magyarország
India	Pondicherry			Manufacturing Centers
India	Karnataka	Bangalore		Lenovo (India) Private Limited (Registered Office)
India	Haryana	Gurgaon		Lenovo India Pvt.Ltd
India	West Bengal	Kolkata		Lenovo India Pvt.Ltd
India	Maharashtra	Mumbai		
India	Tamil Nadu	Chennai		Lenovo India Pvt.Ltd
Indonesia		Jakarta		Lenovo (Indonesia) Pte Ltd. – Kantor Perwakilan
Ireland	Leinster	Dublin		
Israel		Petah Tikva		Lenovo (Israel) Ltd
Italy		Milan		LENOVO (Italy) S.r.l
Japan	Kanagawa	Yamato		Switchboard
Latvia		Riga		Lenovo Technology B.V.
Lithuania		Vilnius		
Malaysia	Selangor	Petaling Jaya		Lenovo Technology Sdn Bhd
Mexico	Nuevo Leon	Monterrey		Manufacturing Centers
Mexico	Federal District			
Mexico	Jalisco	Guadalajara		
Morocco	Chichaoua	Casablanca		Morocco Office: Lenovo Morocco
Netherlands	North Holland	Amsterdam		Lenovo (International) BV
Peru		Lima		
Philippines		Makati		Lenovo (Singapore) Pte Ltd. – Philippines
Poland		Warsaw		Lenovo Technology B.V. Sp. z o.o.
Romania		Bucharest		Lenovo Romania
Russia		Krasnogorsk		
Saudi Arabia		Riyadh		Saudi Arabia Office: Lenovo Saudi Arabia Ltd.
Scotland		Renfrew		
Serbia		Belgrade		Lenovo Technology B.V.
Singapore		Serangoon		Principal Operations and Sales Headquarters
Slovakia		Bratislava		Lenovo (Slovakia) s.r.o.
South Africa	Gauteng	Johannesburg		Lenovo South Africa
Spain		Madrid		Lenovo (Spain) S.L.
Switzerland		Zurich		Lenovo (Schweiz) GmbH
Switzerland	Geneva	Petit-Lancy		Lenovo (Suisse) S.à.r.l
Thailand		Bangkok		Lenovo (Thailand) Limited
Turkey		Istanbul		
UK		Hook		
Ukraine				
United Arab Emirates		Dubai		MEA Head Office: Lenovo Middle East & Africa Principal Operations, Research Centers and Sales Headquarters
USA	North Carolina	Morrisville		Manufacturing Centers
USA	North Carolina	Greensboro		Manufacturing Centers
USA	North Carolina	Raleigh		Corporativo Internacional Raleigh, USA
Venezuela		El Hatillo		
Vietnam		Hanoi		
Vietnam		Ho Chi Minh City		

Source: Citi Research

Figure 789. Lexmark

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		Lexmark International Inc.
				Lexmark International (Australia) Pty Limited & NSW
				Sales Branch
Australia	New South Wales	North Ryde		Melbourne Offices (Sales Only)
Australia	Victoria	Melbourne		Brisbane Office
Australia	Queensland	Brisbane		Canberra Office
Australia		Canberra		Perth Office
Australia	Western Australia	Perth		Lexmark Handelsgesellschaft m.b.H
Austria		Vienna		Lexmark International nv/sa
Belgium		Diegem		Lexmark International Bulgaria Ltd
Bulgaria		Sofia		Lexmark sales offices
Canada	Alberta	Calgary		Lexmark sales offices
Canada	Alberta	Edmonton		Lexmark sales offices
Canada	British Columbia	Burnaby		Lexmark sales offices & Headquarters
Canada	Ontario	Richmond Hill		Lexmark sales offices
Canada	Ontario	Ottawa		Lexmark sales offices
Canada	Quebec	Brossard		Lexmark sales offices
Canada	Quebec	Sainte-Foy		Lexmark sales offices
China		Beijing		Lexmark China Office
China		Shanghai		Lexmark China Office
China		Guangzhou		Lexmark China Office
China		Chengdu		Lexmark China Office
China	Hong Kong			Lexmark International (China) Co., Ltd.
Colombia		Bogota		Lexmark International
Croatia		Zagreb		Lexmark International CRT
Denmark		Birkerød		Lexmark Denmark
Finland		Espoo		Lexmark Finland
France				Lexmark International SASU
Germany	Hesse	Dietzenbach		Lexmark Deutschland GmbH
Greece		Athens		Infoclix S.A.
Hungary		Budapest		Lexmark Magyarország Kft.
India		Bangalore		Lexmark Bangalore Office
Indonesia		Jakarta		Lexmark International (S) Pte Ltd
Israel		Petah Tikva		Getter Tech Head Office
Italy		Milan		Lexmark International Srl
Malaysia	Selangor			Lexmark International (Malaysia) Sdn Bhd
Mexico	Alvaro Obregón	Santa Fe		Lexmark International de Mexico, S. de RL de CV
MOROCCO		Casablanca		Lexmark International Africa
Netherlands	Gooi	Naarden		Lexmark International B.V.
New Zealand				
Norway		Oslo		Lexmark Norge
Philippines		Cebu City		Lexmark Cebu
Poland		Warsaw		Lexmark International Polska Sp. z o.o.
Portugal		Bogsborg		Escritórios da Lexmark em Portugal
Romania		Bucharest		Lexmark Romania Headquarters
Serbia		Beograd		Lexmark International RS
				Lexmark International (Singapore) Pte Ltd - Main Office
Singapore				Lexmark International Slovakia sro
Slovakia		Bratislava		NA
Slovenia		Ljubljana		Contact Lexmark
South Africa				South Africa
South Korea		Seoul		Lexmark
Spain		Madrid		LEXMARK SPAIN L.L.C. & CIA
Sweden		Kista		LexmarkSweden
Switzerland		Thalwil		Lexmark Schweiz AG
Taiwan		Taipei		American Lexmark International, Inc. Taiwan Branch
				Lexmark International (Singapore) Pte Ltd, Bangkok Office
Thailand		Bangkok		Lexmark Office
Turkey		Istanbul		Lexmark Izmir Branch
Turkey		Izmir		Lexmark Ankara Branch
Turkey		Ankara		Lexmark International Ltd
UK	Berkshire	Maidenhead		Lexmark International Middle East FZ LLC
United Arab Emirates		Dubai		R&D Headquarters
USA	Kentucky	Lexington		Lexmark office
USA	Colorado	Boulder		
USA	Kansas	Shawnee		Perspective Software from Lexmark (Headquarters)
USA	Florida	Coral Gables		Lexmark International Inc.

Source: Citi Research

Figure 790. LG Display

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada	Ontario	Mississauga		Sales
China		Yantai		Production
China		Nanjing		Production
China	Guangdong	Guangzhou		Production
China		Shanghai		Sales
China	Henan	XinXiang		Sales
China	Guangdong	Shenzhen		Sales
Finland		Helsinki		Sales
Germany	North Rhine-Westphalia			Sales
Japan		Tokyo		Sales
Malaysia	Penang	George Town		Sales
Poland		Wroclaw		Production
Singapore		Singapore		Sales
South Korea		Seoul		Headquarters, Sales & Financial Administration
South Korea		Seoul	48400000	Paju Plant, Production
South Korea		Seoul		Gumi Plant, Production
Taiwan		Taipei		Sales
Turkey		Istanbul/Maslak		Sales
USA	California	San Jose		Sales
USA	Texas	Austin		Sales
USA	Texas	Houston		Sales
USA	California	Cerritos		Sales
USA	California	Carlsbad		Sales

Figure 791. LG Electronics

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Algeria				LG Electronics Algeria SARL
Angola				LG Electronics Angola Limitada (Limited)
Argentina		Buenos Aires		LG Electronics Argentina S.A., Marketing
Australia	New South Wales			LG Electronics Australia Pty Ltd, Marketing
Austria		Vienna		LG Electronics Austria GmbH, Marketing
Brazil				LG Electronics do Brasil, Marketing & Production
Canada	Ontario			LG Electronics Canada, Inc.
Chile		Santiago		LG Electronics Inc. Chile Ltda
China		Beijing		China Holdings Company - Holdings
China		Hangzhou		LG Electronics (Hangzhou) Co., Ltd, Production
China	Jiangsu	Kunshan		LG Electronics (Kunshan) Co., Ltd, Production
China		Tianjin		LG Electronics (Kunshan) Co., Ltd, Production
China	Shandong	Qingdao		Air-Conditioning, Production
China	Hong Kong			LG Electronics HK Ltd., Marketing
China		Huizhou		LG Electronics Huizhou Ltd., Production
China		Nanjing		LG Electronics Nanjing Display Co., Ltd, Production
China	Shenyang Province			LG Electronics(Shenyang)Inc., Production
China	Shandong	Yantai		MOBILE COMMUNICATIONSProduction
China		Nanjing		Nanjing LG-Panda Appliances Co., Ltd., Production
China	Shandong	Qingdao		Digital Communication, Production
China	Hebei	Qinhuangdao		Digital Communication, Production
China		Shanghai		Shanghai LG ElectronicsCo. Ltd., Production
China	Jiangsu	Taizhou		REFRIGERATION, Production
China		Tianjin		Tianjin Lijie Cartridge Heater Co., Ltd, Production
Colombia				LG Electronics Colombia Ltda, Marketing
Czech Republic		Praha		LG ELECTRONICS CZ, s.r.o., Marketing
Egypt				LG Electronics Egypt S.A.E.
France	Ile-de-France	Paris		LG Electronics France S.A.S, Marketing
Germany	North Rhine	Ratingen		LG Electronics Deutschland GmbH, Marketing
Greece		Athens		LG Electronics SA, Marketing
Hungary				LG electronics Magyar KFT, Marketing
India	Uttar Pradesh	NOIDA		Marketing & Production
Indonesia	West Java	Bekasi		Marketing & Production
Italy		Milan		LG Electronics Italia Spa, Marketing
Japan		Tokyo		LG Electronics Japan co., LTD, Marketing
Jordan		Amman		LG Electronics (Levant) Jordan
Kazakhstan		Almaty		Marketing & Production
Kenya		Nairobi		LG Electronics Service Kenya Limited, Inc.
Latvia		Riga		LG Electronics Latvia, LLC, Marketing
Malaysia	Selangor	Petaling Jaya		LG Electronics (M) Sdn. Bhd, Marketing
Mexico		Mexicali		LG Electronics Mexicali S.A.DE C.V.
Mexico				LG Electronics Mexico S.A.DE C.V.
Mexico				LG Electronics Monterrey Mexico S.A. de C.V
Mexico				LG Electronics Reynosa S.A.DE C.V.
Morocco				LG Electronics Morocco S.A.R.L.
Netherlands				Shared Service Center
Netherlands				LG Electronics European Holdings BV - Holdings
Nigeria		Lagos		LG Electronics Nigeria Limited
Norway		Oslo		LG Electronics Norway AS, Marketing
Panama		Panama City		LG Electronics Panama SA, Marketing
Peru		Lima		LG Electronics Peru S.A., Marketing
Philippines		Pasig City		LG Electronics Philippines Inc., Marketing
Poland		Mława		LG Electronics Mława Sp.z o.o., Production
Poland		Warsaw		LG Electronics Polska Spzoo, Marketing
Poland		Kobierzyce		LG Electronics Wrocław Spzoo, Production
Portugal		Oeiras		LG Electronics Portugal SA, Marketing
Romania		Bucharest		LG Electronics Romania S.R.L., Marketing
Russia		Moscow		Service, Marketing & Production
Saudi Arabia		Jeddah		LG Electronics Saudi Arabia Limited
Saudi Arabia		Riyadh		LG-Shaker Company Ltd
Singapore				LG Electronics Singapore PTE LTD, Marketing
South Africa		Johannesburg		LG Electronics S.A. (Pty) Ltd
South Korea		Seoul		Headquarters + 7 Offices
South Korea	Gyeonggi-do			LG Electronics Anyang Institute, Digital Park
South Korea	Gyeongsangnam-do			LG Electronics Changwon Plant
South Korea	Chungcheong Cheongju			LG Electronics Cheongju Plant
South Korea	Gyeongsang Gumi			LG Electronics Gumi Plant
South Korea	Incheon			LG Electronics Incheon Campus
Spain		Madrid		LG Electronics Espana SA, Marketing
Sweden		Stockholm		LG Electronics Nordic AB, Marketing
Taiwan		Taipei		LG Electronics Taiwan Taipei Co.,Ltd., Marketing
Thailand		Bangkok		Marketing & Production
Turkey	Kocaeli	Gebze		Arcelik-LG Klima Sanayi ve Ticaret A.S., Production
Turkey		Istanbul		LG Electronics Ticaret A.S.
UK		Berkshire		LG Electronics United Kingdom Ltd., Marketing
Ukraine		Kiev		LG Electronics Ukraine Inc. - Service
United Arab Emirates		Dubai		LG Electronics Dubai FZE
United Arab Emirates		Dubai		LG Electronics Gulf FZE
United Arab Emirates		Dubai		LG Electronics Middle East Co., Ltd.
United Arab Emirates		Dubai		LG Electronics Africa Logistic FZE
United Arab Emirates		Dubai		LG Electronics Russia and Ukraine
USA	California	San Diego		LG Electronics Mobile Research. U.S.A., L.L.C
USA				Zenith Electronics Corporation of Pennsylvania
USA	Illinois	Lincolnshire		Zenith Electronics LLC
USA	Huntsville	Alabama		LG Electronics Alabama Inc.
USA	New Jersey			LG Electronics Mobilecomm U.S.A.,Inc.
USA	New Jersey			LG Electronics U.S.A., Inc.
Venezuela		Caracas		LG Electronics Venezuela S.A, Marketing
Vietnam	Hung Yen			Marketing & Production

Source: Citi Research

Source: Citi Research

Figure 792. LG Innotek

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Shandong			LG Innotek Yantai Co., Ltd. (LGITYT)
China	Guangdong			LG Innotek Huizhou Co.,Ltd. (LGITHZ)
China	Fuzhou			LG Innotek Fuzhou Co.,Ltd. (LGITFZ)
China				LG Innotek Guangzhou Co., Ltd. (LGITGZ)
China		Shanghai		LG Innotek Trading (Shanghai) Co., LTD (LGITSH)
China		Shenzhen		LG Innotek Trading (Shanghai) Co., LTD. Shenzhen
China		Beijing		LG Innotek Trading (Shanghai) Co., LTD. Beijing
Germany	Hesse	Frankfurt		LG Innotek Co.,Ltd. Frankfurt office (LGITEU)
Indonesia				LG Innotek Indonesia PT. (LGITIN)
Japan		Tokyo		LG Innotek Co.,Ltd. Japan (LGITJP)
Japan		Tokyo		LG Innotek Co.,Ltd. Japan R&D Center
Poland				LG Innotek Poland Sp. z o.o. (LGITPO)
South Korea		Seoul		Overseas Marketing
South Korea: Gyeonggi-dc		Ansan		Field of Research performed at Patterning
South Korea: Gyeongsang		Gumi		
South Korea: Gyeongsang		Gumi		Touch Window, Electronic Material, Lead Frame
South Korea: Gyeongsang		Gumi		Photo Mask, Tape Substrate
South Korea		Gwangju		
South Korea: Gyeonggi-dc		Paju		
South Korea: Kyenggi-do		Osan-si		
South Korea: Chungcheon		Cheongju		
Taiwan		Taipei		LG Innotek Taiwan Co., Ltd (LGITTW)
USA	California	San Jose		LG Innotek USA Inc. (LGITUS)
USA	Illinois	Lincolnshire		LG Innotek USA Inc. Chicago Office (LGITUS)
USA	California	San Diego		LG Innotek USA Inc. San Diego office (LGITUS)
USA	Michigan	Troy		LG Innotek USA Inc. Detroit Office (LGITUS)

Figure 793. Linear Technology

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	Victoria	Kew Vic		Office
Australia	New South	Crows Nest		Office
Brazil		São Paulo		Office
China		Beijing		Office
China	Sichuan	Chengdu		Office
China		Shanghai		Office
China		Shenzhen		Office
China		Wuhan		Office
China	Shaanxi	Xi'an		Office
Finland		Vantaa		Office
France		Rungis		Office
Germany		Ismaning		Office
Germany		Ascheberg		Office
Germany	Baden-Würt	Kirchheim unter Teck		Office
Hong Kong		Kwai Fong		Office
India	Karnataka	Bangalore		Office
Italy		Vimercate		Office
Japan		Nagoya		Office
Japan		Osaka		Office
Japan		Tokyo		Office
Malaysia			338,000	Assembly operations, research and development
				Test and packaging operations, warehousing and
				distribution, research and development, and sales and
				administration
Singapore			260,000	
South Korea		Seoul		Office
Sweden		Kista		Office
UK		Buckinghamshire		Office
				Executive and administrative offices, wafer
				fabrication, test and assembly operations, research
				and development, sales and marketing, and
USA	California	Milpitas	430,000	warehousing and distribution
USA	Washington	Camas	105,000	Wafer fabrication
USA	Massachuse	Chelmsford	30,000	Research and development; sales and administration
USA	Colorado	Colorado Spring	20,000	Research and development
USA	New Hampsi	Auburn	20,000	Research and development
USA	North Caroli	Raleigh	20,000	Research and development
USA	Alabama	Huntsville		Office
USA	Arizona	Tempe		Office
USA	Texas	Plano		Office
USA	California	Irvine		Office
USA	California	San Diego		Office
USA	California	Los Angeles		Office
USA	Colorado	Boulder		Office
USA	Massachuse	North Chelmsford		Office
USA	Pennsylvania	Bensalem		Office
USA	Florida	Lake Mary		Office
USA	Florida	Wimauma		Office
USA	Georgia	Cumming		Office
USA	Utah	West Haven		Office
USA	Illinois	Schaumburg		Office
USA	Indiana	Carmel		Office
USA	Ohio	Columbus		Office
USA	Michigan	Livonia		Office
USA	Minnesota	Bloomington		Office
USA	Washington	Bellevue		Office
USA	North Caroli	Cary		Office
USA	Ohio	Middleburg Heights		Office
USA	Oregon	Lake Oswego		Office
USA	Wisconsin			Office
USA	Texas	Houston		Office

Source: Citi Research

Source: Citi Research

Figure 794. Logitech International

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Suzhou	627900	High-volume manufacturing
China		Suzhou	245200	High-volume manufacturing
China		Shanghai	22200	Sales and marketing
China		Shenzhen	11700	Sales and marketing
China	Hong Kong		67300	Distribution center
China		Shenzhen	32000	Distribution center
Germany		Munich	17800	LifeSize operating segment
India		Bangalore	22400	R&D
India		Chennai	10100	Digital Home Group engineering and quality assurance
Ireland		Cork	18900	Finance, administration, R&D
				Sales, logistics, finance, administration and human resources
Japan		Tokyo	10100	
Japan		Tokyo	33000	Distribution center
Mexico		Mexico City	20000	Distribution center
Netherlands		Nijmegen	14700	Finance, administration and distribution center
Netherlands		Oostrum	155600	Distribution center
Netherlands		Waalwijk	26000	Distribution center
Singapore			60000	Distribution center
Switzerland		Morges	62300	EMEA headquarters
Switzerland		Lausanne	46700	R&D, product marketing and technical support
Taiwan		Hsinchu	116500	Asia Pacific headquarters
Taiwan		Dayuan Townst	18100	Distribution center
United Arab Emirates		Dubai	54000	Distribution center
Uruguay		Montevideo	12500	Distribution center
USA	California	Newark	264000	Silicon valley campus
USA	Texas	Austin	99000	LifeSize operating segment
USA	California	Fremont	46300	Former silicon valley campus
USA	Washington	Camas	44700	Ultimate Ears Group
USA	California	Irvine	13500	Ultimate Ears Group
USA	Mississippi	Olive Branch	397000	Distribution center

Source: Citi Research

Figure 795. Mabuchi Motor

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Jiangsu		147000	Sales Office & Factory for Motors
China		Shanghai		Sales Office
China		Chongqing		Sales Office - CHONGQING BRANCH
China	Guangdong	Shenzhen		Sales Office
China	Hong Kong			Factories for Motors and Parts
China		Dalian	213000	Factory for Motors and parts
				Design and Development/Factory for Motors, Parts, and Production Equipment
China	Guangdong	Dongguan	80000	
China	Liaoning	Wafangdian	59000	Factory for Motors
China	Jiangxi	Yingtian	74000	Factory for Parts
China	Guangdong	Dongguan	22000	Factory for Parts
China	Guangdong	Dongguan	118000	Factory for Motors
China	Jiangxi	Ganzhou	129000	Factory for Motors
Germany		Frankfurt		Sales Office
Japan	Chiba	Matsudo City		Sales Office - Headquarters
Singapore		Singapore		Sales Office
South Korea		Seoul		Sales Office
				Sales Office & Factory for Motors and Production
Taiwan		Hsinchu	41000	Equipment
Taiwan		Kaohsiung	31000	Factory for Parts and Production Equipment
USA	Michigan	Troy		Sales Office
Vietnam	Dong Nai	Bien Hoa	130000	Factory for Motors
Vietnam		Da Nang City	164000	Factory for Motors

Source: Citi Research

Figure 796. MagnaChip Semiconductor

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai		Sales Office
China		Shenzhen		Sales Office
Germany		Garching		Sales Office
Hong Kong		Kowloon		Sales Office
Japan		Osaka		Sales Office
South Korea		Cheongju		Manufacturing
South Korea		Gumi		Manufacturing
South Korea		Seoul		Sales Office
Taiwan		Taipei		Sales Office
USA	California	Cupertino		Sales Office

Source: Citi Research

Figure 797. Manz AG

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Jiangsu	Suzhou	7,17,586.85	Production, Sales & Service
China	Jiangsu	Wuxi		Service
China	Jiangsu	Huaian		Service
China	Jiangsu	Jiangyin		Service
China	Zhejiang	Ningbo		Service
China	Liaoning	Yinkou		Service
China	Fujian	Xiamen		Service
China	Guangdong	Shenzhen		Service
Germany	Baden-Würt	Reutlingen	3,44,445.13	Headquarters, Worldwide Production, Sales & Service
Germany		Stuttgart	48,438	Production, Sales & Service
Germany	Bavaria	Karlstein	20451.43	Production
Germany	Baden-Würt	Schwäbisch Hal	1,39,930.84	Production
Germany	Saxony	Leipzig		Service
Hungary		Debrecen	53,820	Production
India		New Delhi		Sales & Service
Slovakia	Trenčín Regi	Nove Mesto na	1,72,222.57	Production, Sales & Service
South Korea		Daegu		Sales & Service
Taiwan	Taoyuan	Chung li	3,55,209.04	Production, Sales & Service
Taiwan		Taichung		service
Taiwan		Tainan		Service
USA	Rhode Island			Sales & Service

Source: Citi Research



Figure 798. Marvell

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Bermuda		Hamilton		
Canada				
China			115,000	
Denmark				
Germany				
Hong Kong				
India				
Israel		Yokneam	361,000	
Italy				
Japan		Tokyo		
Malaysia				
Netherlands				
Singapore			340,000	
South Korea				
Spain				
Sweden				
Switzerland			26,000	
Taiwan				
UK				
USA	California	Santa Clara	993,000	

Figure 799. Maxim Integrated

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Austria		Graz		Office
China		Beijing		Office
China		Shanghai		Office
China	Guangdong	Shenzhen		Office
France		Grenoble		Office
France		La Ciotat		Office
France		Paris		Office
France				Office
Germany		Munich		Office
Germany		Itzehoe		Office
Hong Kong		Kowloon		Office
India	Karnataka	Bangalore		Office
India	Gujarat	Gandhinagar		Office
Ireland		Dublin		Office
Italy		Catania		Office
Italy		Milan		Office
Italy		Milan		Office
Italy		Pavia		Office
Italy		Pisa		Office
Italy		Ragusa		Office
Japan		Tokyo		Office
Japan		Osaka		Office
				Manufacturing, engineering, administration, office space, customer service,
Philippines	Cavite		479000	shipping, and other
Philippines	Batangas		78000	Manufacturing, engineering, office space
Philippines	Cavite			Office
Philippines	Batangas	Tanauan City		Office
Philippines		Manila		Office
Singapore				Office
South Korea		Gyeongsangbuk-do		Office
South Korea		Seoul		Design Center
South Korea		Seoul		Sales office
Sweden		Kista		Office
Taiwan		Taipei		Design Center
Taiwan		Taipei		Sales office
				Manufacturing, engineering, administration, office space, customer service,
Thailand			144000	shipping, and other
Thailand		Chonburi		Office
Turkey		Istanbul		Office
UK		Berkshire		Office
UK		Bristol		Office
UK		Edinburgh		Office
USA	California	San Jose	435000	Corporate Headquarters
USA	California	San Jose	80000	Wafer fabrication, office space and admin.
USA	Massachuse	N. Chelmsford	30000	Engineering, office space and administration
USA	Oregon	Beaverton	226000	Wafer fabrication, engineering, and admin.
USA	Oregon	Hillsboro	325000	Engineering, manufacturing, admin.
				Office space, engineering, manufacturing, administration, bump facility,
USA	Texas	Farmers Branch	581000	customer service, warehousing, shipping, and other
USA	Texas	San Antonio	381000	Wafer fabrication, office space and administration
USA	Arizona	Chandler	65000	Office space, engineering, and test
USA	Illinois	Champaign		Office
USA	Indiana	Westfield		Office
USA	Michigan	Brighton		Office
USA	Florida	Melbourne		Office
USA	Georgia	Norcross		Office
USA	Texas	Austin		Design Center
USA	Texas	Austin		Sales office
USA	Texas	Dallas		Office
USA	Texas	San Antonio		Office
USA	Arizona	Tucson		Office
USA	California	Irvine		Office
USA	California	San Diego		Office
USA	Colorado	Colorado Springs		Office
USA	Colorado	Fort Collins		Office
USA	Oregon	Beaverton		Office
USA	Oregon	Hillsboro		Office

Source: Citi Research

Source: Citi Research

Figure 800. MediaTek

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai		MediaTek (Shanghai) Inc.
China		Shenzhen		MediaTek (Shenzhen) Inc.
China		Wuhan		MediaTek (Wuhan) Inc.
China	Jiangsu	Nanjing		MediaTek (Nanjing) Inc.
China		Beijing		MediaTek (Beijing) Inc.
China		Hefei		MediaTek (Hefei) Inc.
China		Chengdu		MediaTek (Chengdu) Inc.
China	Jiangsu			MediaTek (Suzhou) Inc.
Denmark		Aalborg		MediaTek Denmark ApS (Denmark)
India	Uttar Pradesh	Noida		MediaTek India Technology Pvt. Ltd (India)
Japan	Kanagawa	Yokohama		MediaTek Japan Inc. (Shin-Yokohama)
Singapore				MediaTek Singapore Pte. Ltd.
South Korea		Seoul		MediaTek Korea Inc.(Seoul)
South Korea	Gyeonggi-do	Bundang-gu		MediaTek Korea Inc. (Seongnam)
Sweden		Linköping		MediaTek Sweden AB (Sweden)
Taiwan		Hsinchu		Headquarters
Taiwan		Jhubei City		Ralink Technology Corporation (Jhubei)
Taiwan		Taipei		MediaTek Inc. (Taipei office)
UK		Cambridge		MTK Wireless Limited (Cambourne)
UK	Kent	West Malling		MTK Wireless Limited (Kent)
United Arab Emirates		Dubai		MediaTek Wireless LLC (Dubai)
USA	California	San Jose		MediaTek USA Inc. (San Jose)
USA	California	Irvine		MediaTek USA Inc.(Irvine)
USA	Texas	Austin		MediaTek USA Inc. (Austin)
USA	Massachusetts	Woburn		MediaTek USA Inc.(Woburn)

Source: Citi Research

Figure 801. Meyer Burger Tech

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai		Meyer Burger Machinery Co. Ltd
China		Shanghai		Meyer Burger Trading Shanghai Co. Ltd
Germany	North Rhine	Zulrich		Hennecke - Metrology Systems, Service Contacts
Germany	Baden-Würt	Umrkirch		Somont GmbH, Service Contacts
Germany	Hesse	Reichelsheim		MUEGGE GMBH, Service Contacts
India	Maharashtra	Pune		Meyer Burger India Private Ltd, Service Contacts
India	Maharashtra	Mumbai		Neotronics International
Japan		Tokyo		Correns Corporation
Philippines		Muntinlupa		Aurotech Corporation
Russia		Moscow		High Tech Solution GmbH
Switzerland	Bern	Thun		Headquarters

Source: Citi Research

Figure 802. Microchip Technology

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia		Sydney		
Austria		Wels		
Belgium		Buggenhout		
Canada	Ontario	Mississauga		
China		Shenzhen		
China		Nanjing		
China		Guangzhou		
China		Shandong		
China	Liaoning			
China		Sichuan		
China		Wuhan		
China		Xiamen		
China		Xi'an		
China	Guangdong	Zhuhai		
China		Beijing		
China	Hong Kong			
China		Shanghai		
Czech Republic		Brno		
Denmark		Ballerup		
France		Courtaboeuf Cedex		
Germany		Pforzheim		
Germany		Ismaning		
Germany		Haan		
Hong Kong		Kowloon		
India	Karnataka	Bangalore	67174	
India		New Delhi		
India	Maharashtra	Pune		
Indonesia		Jakarta		
Italy		Milan		
Italy		Padova		
Japan		Tokyo		
Japan	Osaka	odogawa-ku		
Malaysia		Penang		

Source: Citi Research

Figure 803. Microchip Technology (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Netherlands		Drunen		
Philippines		Metro Manila		
Philippines		Pasig City		
Singapore				
South Korea		Seoul		
Spain		Madrid		
Spain		Solna		
Taiwan		Taipei		
Taiwan		SBIP Hsinchu		
Taiwan		Kaohsiung		
				Test and Assembly; Wafer Probe; Sample Center;
Thailand	Chachoengsao		489000	Warehousing; and Administrative
Thailand	Chachoengsao		215000	Assembly and Test
Thailand		Bangkok		
UK	Berkshire	Wokingham		
UK		Norwich		
USA	Arizona	Chandler	415000	Headquarters
				Wafer Fabrication (Fab 2); R&D Center; Administrative
USA	Arizona	Tempe	379000	Offices; and Warehousing
				Wafer Fabrication (Fab 4); R&D Center; Administrative
USA	Oregon	Gresham	826500	Offices; and Warehousing
USA	Georgia	Duluth		
USA	California	San Jose		
USA	California	Mission Viejo		
USA	Texas	Addison		
USA	Massachusetts	Westborough		
USA	Georgia	Duluth		
USA	Illinois	Itasca		
USA	Indiana	Noblesville		
USA	Michigan	Novi		
USA	New York	Hauppauge		
USA	Ohio	Independence		
Vietnam		Ho Chi Minh City		
Vietnam	Binh Thanh	1 HCM City		

Source: Citi Research

Figure 804. Micron

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Xi'an		Module assembly and test
China		Shanghai		Design
China		Xiamen		Design
China		Xi'an		Manufacturing
China		Beijing		Sales
China		Shanghai		Sales
China		Shenzhen		Sales
Finland		Lohja		Sales
France		Les Ulis		Sales
Germany		Ismaning		Sales
India		Ulsoor		Sales
Israel		Kiryat Gat		Wafer fabrication
Italy	Agrate Brianza			Design & Manufacturing
Italy		Arzano Napoli		Design
Italy		Avezzano		Design & Sales
Italy		Catania		Design
Italy		Padova		Design
Italy		Vimercate		Design & Sales
Japan		Hiroshima		Wafer fabrication
Japan		Akita		Module assembly and test
Japan		Tokyo		Design
Japan		Tsukuba		Design
Japan		Osaka		Sales
Japan		Tokyo		Sales
Malaysia		Muar		Assembly and test
Singapore				Three wafer fabrication facilities and a test, assembly
South Korea		Seoul		Design & Sales
Taiwan		Taichung		Wafer fabrication
Taiwan		Taipei		Sales
UK		Cheadle Manchester		Design
UK		East Kilbride		Manufacturing
UK		Bracknell		Sales
UK		East Kilbride		Sales
UK		Wootton Bassett		Sales
USA	Idaho	Boise		R&D, including wafer fabrication; reticle manufacturin
USA	Utah	Lehi		Wafer fabrication
USA	Virginia	Manassas		Wafer fabrication
USA	Puerto Rico	Aguadilla		Module assembly and test
USA		Allen		Design
USA		Folsom		Design
USA		Kirkland		Design
USA		Longmont		Design
USA		Minneapolis		Design
USA		San Diego		Design
USA		San Jose		Design
USA		Fremont		Headquarters
USA		Nampa		Manufacturing
USA		Houston		Sales
USA		Meridian		Sales
USA		Round Rock		Sales

Source: Citi Research

Figure 805. Mitsubishi Electric

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South Wales	Rydalmere		Mitsubishi Electric Australia Pty. Ltd.
Belgium		Bruges		Mitsubishi Electric Europe B.V.
				Mitsubishi Electric do Brasil Comércio e Serviços Ltda. - Head Office
Brazil		Sao Paulo		Barueri Office
Brazil		Barueri		Mitsubishi Electric Sales Canada Inc.
Canada	Ontario	Markham		Mitsubishi Electric (China) Co., Ltd.
China		Beijing		
				Shanghai Branch, Mitsubishi Electric (China) Co., Ltd.
China		Shanghai		
				Mitsubishi Electric & Electronics (Shanghai) Co., Ltd.
China		Beijing		Beijing Branch, Mitsubishi Electric & Electronics (Shanghai) Co., Ltd.
				Guangzhou Office, Mitsubishi Electric & Electronics (Shanghai) Co., Ltd.
China		Guangzhou		XD-Mitsubishi Electric Switchgear Co., Ltd.
China		Shaanxi		
				Mitsubishi Electric Shanghai Electric Elevator Co., Ltd
				Mitsubishi Electric Air-Conditioning & Visual Information Systems (Shanghai) Ltd.
China		Shanghai		
China	Guangdong	Guangzhou		Mitsubishi Electric (Guangzhou) Compressor Co., Ltd.
				Shanghai Mitsubishi Electric & Shangling Air-Conditioner and Electric Appliance Co., Ltd.
China		Shanghai		Mitsubishi Electric Automation (China) Ltd.
China		Shanghai		
China	Liaoning			Mitsubishi Electric Dalian Industrial Products Co., Ltd.
				Mitsubishi Electric Shihlin Automotive ChangZhou Co., Ltd.
China	Jiangsu			Mitsubishi Electric Hong Kong Group Ltd.
China	Hong Kong			Mitsubishi Electric (H.K.) Ltd.
China	Hong Kong			Mitsubishi Elevator Hong Kong Co., Ltd.
China	Hong Kong			Mitsubishi Electric Ryoden Air-Conditioning & Visual Information Systems (Hong Kong) Ltd.
China	Hong Kong			
China	Hong Kong			Mitsubishi Electric Automation (Hong Kong) Ltd.
Czech Republic		Slany		Mitsubishi Electric Automotive Czech s.r.o.
France		Cedex		Mitsubishi Electric Europe B.V. - French Branch
				Mitsubishi Electric Automotive Europe B.V. - technical Center
				Mitsubishi Electric R&D Centre Europe B.V. (MERCER) - French Branch
France		Rennes		Ascenseurs Mitsubishi France S.A.S
France		Nanterre		Mitsubishi Electric Europe B.V.
Germany		Ratingen		Mitsubishi Electric Automotive Europe B.V. - Technical Center
Germany		Sindelfingen		Vincotech GmbH
Germany		Unterhaching		Mitsubishi Electric India Pvt. Ltd., Gurgaon Head Office
India	Haryana	Gurgaon		Delhi Registered Office
India		New Delhi		Bangalore Sales Office
India	Karnataka	Bangalore		Pune FAID Head Office
India	Maharashtra	Pune		Pune Sales Office
India	Maharashtra	Mumbai		Mumbai Sales Office
India	Tamil Nadu	Chennai		Chennai Sales Office
India	Andhra Pradesh	Secunderabad		Hyderabad Sales Office
India	Punjab	Chandigarh		Chandigarh Sales Office
India	Rajasthan	Jaipur		Jaipur Sales Office
India	Gujarat	Ahmedabad		Ahmedabad Sales Office
India	Tamil Nadu	Coimbatore		Coimbatore Sales Office
India	Gujarat	Vadodara		Vadodara Sales Office
India	Kerala	Kochi		Kochi Sales Office
India	Tamil Nadu	Chennai		Mitsubishi Elevator ETA India Pvt. Ltd.
India	Haryana	Gurgaon		Mitsubishi Electric Automotive India Pvt. Ltd.
Indonesia		Jakarta		P.T. Mitsubishi Electric Indonesia
Indonesia		Jakarta		P.T. Mitsubishi Jaya Elevator and Escalator
Indonesia		Bekasi		P.T. Mitsubishi Electric Automotive Indonesia
Ireland		Dublin		Mitsubishi Electric Europe B.V. - Irish Branch
Italy	Agrate Brianza			Mitsubishi Electric Europe B.V. - Italian Branch
Japan		Tokyo		Mitsubishi Electric Corporation (Head Office)
Kuwait		Kuwait City		Mitsubishi Electric Corporation - Kuwait office
Lebanon		Metn		Mitsubishi and Equipment S.A.L.
Malaysia	Selangor	Petaling Jaya		Mitsubishi Electric Sales Malaysia Sdn Bhd
Malaysia	Selangor	Petaling Jaya		Mitsubishi Elevator Malaysia Sdn. Bhd.
Malaysia	Selangor			Mitsubishi Electric (Malaysia) Sdn. Bhd.
Mexico		Tlalneapantla		Mitsubishi Electric de Mexico, S.A. de C.V
Mexico	Querétaro			San Juan Del Rio Factory
Mexico	Baja California			PIMS S.A. de C.V.

Source: Citi Research

Figure 806. Mitsubishi Electric (Continued)

Mi	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Netherlands				Mitsubishi Electric Europe B.V. - Automotive Equipment Group
Netherlands	Mijdrecht			Mitsubishi Electric Europe B.V. - Benelux Branch
Netherlands	Veenendaal			Mitsubishi Elevator Europe B.V.
				Mitsubishi Electric Automotive Europe B.V. - Head Office
Netherlands				Re-Manufacturing / Technical Center
Poland				Mitsubishi Electric Europe B.V. - Polish Branch
Portugal	Lisbon			Mitsubishi Electric Europe B.V. - Portuguese Branch
Russia	Moscow			Mitsubishi Electric Europe B.V. - Russian Branch
Saudi Arabia	Riyadh			Mitsubishi Electric Saudi Ltd.
Singapore				Mitsubishi Electric Asia Pte Ltd
Singapore				Mitsubishi Elevator (Singapore) Pte Ltd
South Korea	Seoul			Mitsubishi Electric Korea Co., Ltd.
South Korea	Seoul			Mitsubishi Elevator Korea Co., Ltd.
South Korea	Seoul			Mitsubishi Electric Automation Korea Co., Ltd.
Spain	Barcelona			Mitsubishi Electric Europe B.V. - Spanish Branch
Sweden				Mitsubishi Electric Europe B.V. - Scandinavian Branch
				Mitsubishi Electric Automotive Europe B.V. - Tehnical Center
Sweden	Gothenburg			
Taiwan	Taipei			Mitsubishi Electric Taiwan Co., Ltd.
Thailand	Bangkok			Mitsubishi Electric Asia (Thailand) Co., Ltd.
Thailand	Chonburi			Mitsubishi Elevator Asia Co., Ltd.
Thailand	Samutprakarn			Mitsubishi Elevator (Thailand) Co., Ltd.
				Mitsubishi Electric Consumer Products (Thailand) Co., Ltd.
Thailand	Chonburi			
Thailand	Bangkok			Mitsubishi Electric Kang Yong Watana Co., Ltd.
Thailand	Bangkok			Mitsubishi Electric Automation (Thailand) Co., Ltd.
Thailand	Rayong			Mitsubishi Electric Factory Automation (Thailand) Co., Ltd
Thailand	Rayong			Mitsubishi Electric Thai Auto-Parts Co., Ltd.
Thailand	Bangkok			Mitsubishi Electric Thai Foundation
Turkey	Istanbul			Mitsubishi Electric Turkey A.Ş. - Head Office
Turkey	Istanbul			Umraniye Office (Factory Automation)
UK	Middlesex	Uxbridge		Mitsubishi Electric Europe B.V.
UK	England			UK Branch
UK		Livingston		Mitsubishi Electric R&D Centre Europe B.V. (MERCE) - UK Branch
UK	Middlesex	Uxbridge		Mitsubishi Electric Finance Europe PLC
				Mitsubishi Electric Air Conditioning Systems Europe Ltd.
UK				
United Arab Emirates	Dubai			Mitsubishi Electric Corporation - Dubai Branch
				Mitsubishi Electric US, Inc. (Corporate HQ, Elevators & Escalators, Photovoltaics)
USA	California	Cypress		
USA	Georgia	Suwanee		Atlanta-area Office (Cooling & Heating)
USA	New York	New York		New York Office (International Purchasing)
USA	California	Santa Clara		Santa Clara Office (Semiconductors)
USA	Virginia	Arlington		Washington, D.C. Office (Public Affairs)
USA	Massachuse	Cambridge		Mitsubishi Electric Research Laboratories, Inc.
USA	Pennsylvania	Warrendale		Mitsubishi Electric Power Products Inc.
USA	California	Irvine		Mitsubishi Electric Visual Solutions America, Inc.
USA	Illinois	Vernon Hills		Mitsubishi Electric Automation, Inc.
USA	Ohio	Cincinnati		Cincinnati, Ohio Office
USA	Ohio	Sidney		Sidney, Ohio Office
USA	Georgia	Duluth		Duluth, Georgia Office
USA	Texas	Grapevine		Grapevine (Dallas), Texas Office
USA	California	La Mirada		La Mirada, California Office
USA	Michigan	Northville		Michigan Office
USA	Ohio	Mason		Mitsubishi Electric Automotive America, Inc.
USA	Michigan	Detroit		Detroit Office
USA	Kentucky	Maysville		Maysville Plant
USA	California	Garden Grove		Orange County Office
USA	Virginia	Arlington		Mitsubishi Electric America Foundation
Vietnam		Ho Chi Minh City		Mitsubishi Electric Vietnam Company Limited

Source: Citi Research

Figure 807. Mitsumi Electric

Mi	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Hong Kong			Sales Office
China		Shanghai		Sales Office
China		Beijing		Sales Office
China	Guangdong	Shenzhen		Sales Office
China	Guangdong	Zhuhai		ZHUHAI MITSUMI ELECTRIC CO., LTD.
China	Shandong	Qingdao		QINGDAO MITSUMI ELECTRONICS CO., LTD.
China		Tianjin		TIANJIN MITSUMI ELECTRIC CO., LTD.
China	Jiangsu	Wujiang		WUJIANG MITSUMI ELECTRONICS CO., LTD.
Finland		Helsinki		Sales Office
France		Cergy-Pontoise		Sales Office
Germany		Eschborn		Sales Office & Head Office of Europe
Germany		Pleidelshheim		Sales Office
Japan		Tokyo		Head Office - SALES
Japan	Kansai			Sales Office
Japan		Kariya		Sales Office
Japan		Kyoto		Sales Office
Japan		Sumoto		Sales Office
Japan		Hiroshima		Sales Office
Japan	Kyushu			Sales Office & Business Division
Japan	Kanagawa			Operation Base
Japan	Yamagata			Yamagata Business Division
Japan	Akita			Akita Business Division
Japan		Chitose		Chitose Business Division
Japan	Ibaraki			Interface Equipment Business Division
Malaysia	Penang			Sales Office
Malaysia		Kuala Lumpur		Sales Office
Malaysia	Johor	Batu Pahat		SALES OFFICE
Philippines		Bataan		SALES OFFICE
Philippines		Danao		SALES OFFICE
Singapore		Singapore		Sales Office
South Korea		Seoul		Sales Office
Taiwan		Keelung		TAIPEI MITSUMI CO., LTD.
Taiwan		Taipei		Sales Office
Taiwan		Kaohsiung		TAIWAN MITSUMI CO., LTD.
Thailand		Bangkok		Sales Office
Thailand	Chonburi	Amphoe Ban Bung		SALES OFFICE
USA	Michigan	Detroit		Sales Office & Head Office of US
USA	California	Cupertino		Sales Office

Source: Citi Research

Figure 808. Molex

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Argentina		Buenos Aires			
Australia		Melton		Australia Sales	
Austria		Wien		German Sales Branch	
Austria		Sittendorf		German Sales Branch	
Brazil		Sao Paulo			
Canada	Ontario	Markham			
China		Beijing		Beijing Sales Office	
China	Sichuan	Chengdu		Chengdu Plant	
China	Guangdong	Dongguan		Dongguan Plant 1,2	
China	Hong Kong	New Territories		Hong Kong Sales Office	
China		Shanghai		Shanghai Plant & Sales Office	
China		Shenzhen		Shenzhen Sales Office	
China	Jiangsu	Suzhou		Suzhou Sales Office	
China		Tianjin		Tianjin Sales Office	
Czech Republic		Brno		Molex Czech and Slovakia	
Denmark		Glostrup		Molex Knutsen Denmark AS	
France		Bievres		France Sales Branch	
Germany		Walldorf		German Sales Branch	
Germany		Ettlingen		Design Center and European Logistic Center	
Germany		Bretten		Design Center	
Hungary		Budapest		Molex Deutschland GmbH	
India	Gujarat	Ahmedabad		Molex (India) Pvt. Ltd.	
India	Karnataka	Bangalore		Bangalore Sales Office	
India		New Delhi		New Delhi Sales Office	
India	Gujarat	Gandhinagar		Gandhinagar Plant	
India	Maharashtra	Pune		Pune Plant - Factory	
India	Uttar Pradesh	Noida		Noida Plant	
India	Maharashtra	Pune		Pune Sales Office	
India	Maharashtra	Mumbai		Mumbai Sales Office	
India	Andhra Pradesh	Hyderabad		Hyderabad Sales Office	
India	Tamil Nadu	Chennai		Chennai Sales Office	
India	West Bengal	Kolkata		Kolkata Sales Office	
Indonesia		Jakarta		Indonesia Sales Office	
Ireland		Shannon		Molex Sales (Ireland)	
Ireland		Shannon		Molex Ireland Ltd. (Factory)	
Israel		Ramat Gan		Molex B.V. Israel	
Italy	Lombardy	Milan		Italian Sales Branch	
Italy		Padova		Zetronic SPA (Factory)	
Japan	Kanagawa	Yamato		Molex Japan Co., Ltd.	
Malaysia		Penang		Penang Plant & Sales Office	
Malaysia	Selangor			Kuala Lumpur Sales Office	
Malaysia		Johor		Johore Bahru Sales Office	
Mexico	Jalisco	Guadalajara			
Netherlands		Eindhoven		Molex B.V. - Benelux Sales Branch	
Norway		Oslo		Molex Knutsen Norge AS	
Philippines	Manila	Taguig		Philippines Sales Office	
Poland		Warsaw		MOLEX POLSKA Sp. z o.o.	
Poland	Lubuszewo			Manufacturing & Customer Services	
Russia		Moscow		Molex Russia	
Singapore				Singapore Plant & Sales Office	
South Africa		Fourways			
South Korea	Gyeonggi-Do	Ansan		Molex Korea Co., Ltd.	
Spain		Barcelona		Molex BV España	
Sweden		Stockholm		Molex Sweden	
Taiwan		Taipei Hsein		Taiwan Plant & Sales Office	
Thailand	Chachoengs	Bangpakong		Thailand Plant & Sales Office	
Turkey		Istanbul		Molex Turkey	
UK	Surrey	Farnham		Molex UK	
United Arab Emirates		Dubai		Molex Premise Networks	
USA	Illinois	Lisle			
USA	Illinois	Grove			
USA	Illinois	Lincolnshire			
Vietnam		Ho Chi Minh City		Molex Sales Office	

Source: Citi Research

Figure 809. Motorola Solutions

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Australia	Victoria			Corporate & Regional Office	
Australia		Sydney		Sales Office	
Austria		Vienna		Sales Office	
Belarus				Sales Office	
Belgium				Sales Office	
Brazil		Barueri		Corporate & Regional Office	
Brazil				Sales Office	
Canada	Ontario			Sales Office	
Canada	Quebec			Sales Office	
China		Beijing		Sales Office	
China		Shanghai		Sales Office	
China		Shenzhen		Sales Office	
Colombia		Bogotá		Corporate & Regional Office	
Czech Republic				Corporate & Regional Office	
Denmark		Glostrup		Corporate & Regional Office	
Denmark				Sales Office	
Finland				Sales Office	
France				Sales Office	
Germany		Berlin		Corporate & Regional Office	
Germany		Taunusstein		Sales Office	
Germany		Duesseldorf		Sales Office	
Greece		Athens		Sales Office	
Hong Kong		Kowloon		Corporate & Regional Office	
India	Haryana	Gurgaon		Corporate & Regional Office	
India	Karnataka	Bangalore		Sales Office	
Indonesia		Jakarta		Corporate & Regional Office	
Israel				Corporate & Regional Office	
Italy	Lombardy	Milan		Sales Office	
Japan		Minato		Corporate & Regional Office	
Japan		Tokyo		Sales Office	
Japan		Osaka		Sales Office	
Kazakhstan				Sales Office	
Luxembourg		Bruxelles		Sales Office	
Malaysia		Selangor		Sales Office	
Mexico				Corporate & Regional Office	
Mexico				Sales Office	
Netherlands				Sales Office	
Norway		Oslo		Sales Office	
Philippines		Taguig		Corporate & Regional Office	
Philippines				Sales Office	
Poland		Krakow		Corporate & Regional Office	
Poland		Warsaw		Sales Office	
Portugal				Sales Office	
Russia		Moscow		Corporate & Regional Office	
Singapore				Corporate & Regional Office	
South Africa		Johannesburg		Corporate & Regional Office	
South Africa		Cape Town		Sales Office	
South Africa		Gauteng		Sales Office	
South Korea		Seoul		Sales Office	
Spain		Madrid		Sales Office	
Sweden		Kista		Sales Office	
Switzerland				Sales Office	
Taiwan		Taipei		Sales Office	
Thailand		Bangkok		Sales Office	
Turkey		Istanbul		Sales Office	
UK	Hampshire			Corporate & Regional Office	
Ukraine				Sales Office	
United Arab Emirates		Dubai		Corporate & Regional Office	
USA	Illinois	Schaumburg		Corporate & Regional Office	
USA	Texas			Corporate & Regional Office	
USA	California			Sales Office & Technology Center	
USA	Florida			Corporate & Regional Office	
USA				Corporate & Regional Office, Sales Office & Technology Center	
USA	New York			Sales Office	
USA	Colorado			Sales Office	
USA	Georgia			Sales Office	
USA	Virginia			Sales Office	
USA	Massachusetts			Sales Office	
USA	Michigan			Sales Office	
USA	Minnesota			Sales Office	
USA	Missouri			Sales Office	
USA	New Jersey			Sales Office	
USA	North Carolina			Sales Office	
USA	Ohio			Sales Office	
USA	Pennsylvania			Sales Office	
USA	Tennessee			Sales Office	
USA	Texas			Sales Office	
USA	Washington			Sales Office	
USA	Maryland			Sales Office & Technology Center	
Vietnam				Corporate & Regional Office	

Source: Citi Research

Figure 810. Murata

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil		Sao Paulo		Sao Pulo Office
Canada	Ontario			Development
China		Shanghai		Regional Headquarters
China	Jiangsu	Wuxi		Production and Sales
China	Guangdong	Shenzhen		Production
China		Tianjin		Sales Office
China		Beijing		Sales Office
China		Shanghai		Sales Office
China		Shenzhen		Sales Office
China		Shanghai		Development
China	Guangdong	Guangzhou		Development & Sales
Finland		Vantaa		Development & Productions
France		Le Plessis - Robinson		Sales Office
Germany		Nuremberg		Sales Office
Hong Kong		Kowloon		Sales Office
Hungary		Budapest		Sales Office
India	Tamil Nadu	Chennai		Sales Office
Italy		Monza Brian Caponago		Sales Office
Malaysia	Perak	Batu Gajah		Production and Sales
Malaysia		Kuala Lumpur		Sales Office
Malaysia		Penang		Sales Office
Mexico		Jalisco		Sales Office
Netherlands		Hoofddorp		Regional Headquarters - Murata Electronics Europe B.V.
Netherlands		Hoofddorp		Sales Office - Murata Electronics (Netherlands) B.V.
Philippines	Laguna	Santa Rosa		Sales Office
Philippines	Batangas	Tanauan City		Productions
Singapore				Regional Headquarters, Production and Sales
South Korea		Seoul		Sales Office
Spain		Barcelona		Sales Office
Switzerland	Baden	Mägenwil		Sales Office
Taiwan		Taichung		Production and Sales
Thailand	Lamphun			Production and Sales
Thailand		Bangkok		Sales Office
UK	Hampshire			Sales Office
UK		Milton Keynes		Development
UK	Hampshire			Development, Productions & Sales
USA	Georgia	Smyrna		Regional Headquarters
USA	Texas	Plano		Development & Sales
USA	Massachuse	Mansfield		Development
USA	Colorado	Broomfield		Development
Vietnam		Hanoi		Sales Office

Source: Citi Research

Figure 811. Nan Ya PCB

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Kunshan		Office
Taiwan	Taoyuan	Luchu Hsiang		Office
Taiwan		Taipei		Office

Source: Citi Research

Figure 812. NEC

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Algeria				NEC Telecommunications & Information Technologies
Argentina		Buenos Aires		NEC Argentina S.A.
Australia	Victoria			NEC Australia Pty. Ltd.
Bangladesh		Dhaka		
Belarus				NEC Neva Communications Systems
Brazil		Sao Paulo		NEC Latin America S.A.
Canada	Ontario	Mississauga		NEC Canada, Inc.
Chile		Santiago		NEC Chile S.A.
China		Beijing		NEC (China) Co., Ltd.
China		Guilin		NEC Telecommunications Co., Ltd.
China	Jiangsu			NEC AccessTechnica (Suzhou) Co., Ltd.
China		Beijing		NEC Advanced Software Technology (Beijing) Co., Ltd.
China				NEC Energy Devices (Wujiang) Co., Ltd.
China				NEC Fielding Information Technology Service (Beijing)
China				NEC Information Systems (Shanghai), Ltd.
China				NEC Laboratories China
China		Shanghai		NEC Lighting (Shanghai) Co., Ltd.
China	Liaoning			NEC Neusoft Information Technologies Co., Ltd.
China		Beijing		NEC Solutions (China) Co., Ltd.
China	Hangzhou			NEC System Technologies (Hangzhou), Ltd.
China	Fujian			NEC TOKIN Electronics (Xiamen) Corporation
China		Shanghai		NEC Unified Solutions (Shanghai) Co., Ltd.
China		Shenzhen		NEC Viewtechnology Trading (Shenzhen), Ltd.
China	Hubei	Wuhan		Wuhan FiberHome Mobile Communication Inc.
China	Hubei	Wuhan		Wuhan NEC Fiber Optic Communications Industry Co.,
China	Hong Kong			NEC Hong Kong Limited
China	Hong Kong			NEC Logistics Hong Kong Limited
China	Hong Kong			NEC Platform Technologies Hong Kong Limited

Source: Citi Research

Figure 813. NEC (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Colombia		Bogota		NEC de Colombia S.A.
Egypt		Cairo		NEC Telecommunications & Information Technologies
Finland		Espoo		
France	Nanterre			NEC France S.A.S.
Germany	North Rhine	Dusseldorf		NEC Deutschland
Germany	Bavaria	Munich		NEC Display Solutions Europe
Germany	Baden-Würt	Heidelberg		NEC Laboratories Europe
Germany	North Rhine	Neuss		NEC Tokin Europe
Greece		Athens		NEC Unified Solutions Hellas S.A.
India	Uttar Pradesh	Noida		NEC Technologies India Limited
India		New Delhi		NEC India Private Limited
Indonesia		Jakarta		P.T. NEC Indonesia
Italy		Milan		NEC Italia s.p.a.
Kazakhstan				
Kenya				NEC Nairobi
Libya		Tripoli		
Malaysia		Kuala Lumpur		NEC Corporation of Malaysia Sdn. Bhd.
Malaysia		Kuala Lumpur		PERNEC Corporation Berhad
Mexico				NEC de Mexico S.A. de C.V.
Netherlands	North Holland	Hoofddorp		NEC Logistics Europe
Netherlands		Hilversum		NEC Nederland B.V.
New Zealand		Wellington		NEC New Zealand Limited
Nigeria		Lagos		NEC West Africa Limited
Norway		Oslo		
Pakistan		Islamabad		
Philippines		Manila		NEC Philippines, Inc.
Philippines	Cebu			
Philippines	Laguna			

Source: Citi Research

Figure 814. NEC (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Poland				NEC Display Solutions Poland
Portugal				NEC Portugal Telecomunicacoes e Sistemas
Russia				
Saudi Arabia				NEC Saudi Arabia
Singapore				NEC Asia Pacific Pte. Ltd.
Singapore				Decillion Solutions Pte. Ltd.
Singapore				NEC Logistics Singapore Pte. Ltd.
Singapore				NEC STEE Cloud Services Pte. Ltd.
Singapore				NEC TOKIN Singapore Pte. Ltd.
South Africa				NEC Africa (Pty) Ltd.
South Africa	Johannesburg			NEC Display Solutions South Africa
South Korea	Seoul			NEC Corporation of Korea
South Korea	Seoul			NEC TOKIN Korea, Co., Ltd.
Spain	Madrid			NEC Iberica
Sweden				NEC Scandinavia AB
Switzerland				
Switzerland	Zurich			NEC Switzerland AG
Taiwan	Taipei			NEC Logistics Taiwan Ltd.
Taiwan	Taipei			NEC Taiwan Ltd.
Taiwan	Taipei			NEC TOKIN Taiwan Co., Ltd.
Thailand	Bangkok			NEC Corporation (Thailand) Ltd.
Thailand	Bangkok			NEC Logistics(Thailand) Co., Ltd.
Thailand	Pathumthani			NEC TOKIN Electronics (Thailand) Co., Ltd.
Turkey	Istanbul			NEC Telecommunications and Information Technology
UK	London			NEC Europe
UK				NEC Capital (UK)
UK				NEC Technologies (UK)
UK				NEC Telecom MODUS Limited
UK				NEC (UK)
Ukraine				NEC Ukraine
USA	Texas	Irving		NEC Corporation of America
USA	Massachuse	Waltham		NetCracker Technology Corporation
USA	Illinois	Itasca		NEC Display Solutions of America
USA	New Jersey	Saddle Brook		NEC Financial Services, LLC.
USA	New Jersey	Princeton		NEC Laboratories America, Inc.
USA	California	Rancho Dominguez		NEC Logistics America, Inc
USA	Illinois	Lincolnshire		NEC Enterprise Communication Technologies, Inc.
USA	California	San Jose		NEC Tokin America, Inc.
Uzbekistan		Tashkent		
Venezuela				NEC de Venezuela, C.A.
Vietnam	Hanoi			NEC Vietnam Co., Ltd.
Vietnam	Hanoi			VNPT-NEC Telecommunication Systems Company Limi

Source: Citi Research

Figure 815. NetApp Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Algeria		Algiers		Aacom Algeria, Advanced Computer Engineering
Argentina		Buenos Aires		
Australia		Adelaide		
Australia		Brisbane		
Australia		Canberra		
Australia		Melbourne		
Australia		Perth		
Australia		Sydney		
Austria		Vienna		
Belgium	Machelen	Diegem		
Brazil		Rio de Janeiro		
Brazil		Sao Paulo		
Brazil		Brasilia		
Brazil		Mexico City		
Canada		Vancouver		
Canada	Ontario	Mississauga		
Chile		Santiago		
China		Beijing		
China	Sichuan	Chengdu		
China	Guangdong	Guangzhou		
China	Liaoning	Dalian		
China		Shanghai		
China	Guangdong	Guangzhou		
China	Futian	Shenzhen		
China	Hong Kong			
China	Guangdong	Shenzhen		
Colombia		Bogota		
Congo		Brazzaville		Burotop Iris SPRL
Congo	Brazzaville	Pointe Noire		CIS Congo
Czech Republic		Prague		
Denmark		Kokkedal		Comm2IG
Denmark		Ballerup		Dustin
Denmark		Brøndby		MicroData Aps
Denmark		Copenhagen		Netdesign
Finland		Espoo		
France		Paris		
Germany		Berlin		
Germany	North Rhine	Düsseldorf		
Germany	Hesse	Frankfurt		
Germany		Hamburg		
Germany		Kirchheim unter Teck		
Germany	Bavaria	Nuremberg		
Germany	Baden-Würt	Stuttgart		
Germany	Rhein-Neckar	Waldorf		
Greece		Marousi		
Hungary		Budapest		
Iceland		Reykjavik		Sensa ehf
India	Karnataka	Bangalore	1,053,400	
India		New Delhi		
India	Tamil Nadu	Chennai		
India	Andhra Prad	Hyderabad		
India	West Bengal	Kolkata		
India	Maharashtra	Mumbai		
India	Haryana	Gurgaon		
India	Maharashtra	Pune		
Indonesia		Jakarta Pusat		
Indonesia		Jakarta		
Israel		Ramallah		Integrated Solutions
Israel		Petah Tikva		
Italy		Milan		
Italy		Rome		
Italy	Lombardy	Milan		
Japan		Tokyo		
Japan	Chūbu	Nagoya		
Japan	Kansai	Osaka		
Japan	Kyushu	Fukuoka		
Japan		Toyota		
Kazakhstan		Almaty		
Luxembourg				
Malaysia		Penang		
Malaysia		Kuala Lumpur		

Source: Citi Research

Figure 816. NetApp Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Mexico		Ciudad Juárez		
Mexico	Nuevo Leon	Monterrey		
Morocco		Casablanca		Bull Maroc, Compagnie Bureautique Informatique, Ne
Morocco		Temara		Intelcom
Mozambique		Maputo		Satec Mocambique
Namibia		Windhoek		Business Connexion Namibia, Green Enterprise Soluti
Netherlands	North Holland	Schiphol-Rijk		
New Zealand		Wellington		
New Zealand		Auckland		
Nigeria		Lagos		
Norway		Oslo		
Norway		Stavanger		
Pakistan				
Philippines				
Poland		Warsaw		
Portugal		Lisbon		
Russia		Moscow		
Rwanda		Kigali		MATRIX Business Solutions
Saudi Arabia				
Scotland		Edinburgh		
Senegal		Dakar		ABM Technologies SENEGAL, ATM Afrique
Singapore		Millenia Tower		
South Africa: Gauteng		Midrand		Blue Turtle, Bytes Systems Integration, Datacentrix
South Africa: Gauteng		Bedfordview		EOH
South Africa		Johannesburg		
South Africa		Johannesburg		
South Korea		Seoul		
Spain		Barcelona		
Spain		Madrid		
Sri Lanka				
Sweden		Stockholm		
Sweden		Västra Frölunda		
Switzerland Büla		Wallisellen		
Switzerland		Bern		
Switzerland Romandy		Lausanne		
Taiwan		Taipei		
Tanzania		Dar es Salaam		Double Click Consulting Ltd, Sihebs Technologies Ltd.
Thailand		Bangkok		
Tunisia		Tunis		One TECH Business Solutions
Tunisia				Antinea Consulting, Athena Sualr
Turkey		Ankara		
Turkey		Istanbul		
Uganda	Buganda	Kampala		
UK		Uxbridge		Waterview House
UK		London		
UK		Manchester		
UK	Middlesex	Uxbridge		
UK		Midlands		
United Arab Emirates		Dubai		
USA	California	Sunnyvale	1,700,000	Headquarters
USA	North Carolina	Research Triangle Park	600,000	
USA	Kansas	Wichita	300,000	
USA	Virginia	Vienna		
USA	Kansas	Wichita		
USA	Massachusetts	Waltham		
USA	Colorado	Boulder		
USA	Pennsylvania	Cranberry Township		
USA	Oregon	Hillsboro		
USA	Florida	Aventura		
Venezuela				
Vietnam		Ho Chi Minh City		
Vietnam		Hanoi		Uncategorized
Zambia		Lusaka		Netone Information Technology
Zimbabwe		Harare		Axis Solutions, Realtime

Source: Citi Research

Figure 817. Nidec

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada		Quezon		R&D
Canada		Vancouver		Sales
China	Guangdong	Zhuhai		Sales
China	Hong Kong			Sales
China	Hong Kong			Sales
China	Hong Kong			Sales
China	Hong Kong			Sales
China		Shenzhen		Sales
China		Shenzhen		Sales
China		Shenzhen		Sales
China		Shenzhen		Sales
China		Shanghai		Sales
China		Chongqing		Sales
China		Dailan		Manufacturing
China		Dailan		Sales
China		Quindao		Sales
China		Wuhan		Sales
China		Dongguan		R&D
China	Zhejiang	Pinghu		Manufacturing
China		Free Zone		Manufacturing
China	Liaoninh	Dailan		Manufacturing
Colombia		Cisneros		Sales
France		CRÉTEIL Cedex		R&D, Manufacturing and Sales of Automotive Motors
France		Roche-La-moliere		Sales & Factory
Germany		Duesseldorf		Sales
Germany				Sales & Factory
Germany		Eschborn		Sales
Germany		Bietigheim-Bissingen		Sales
Germany		Bietigheim-Bissingen		Sales Office. Factory and R&D
Germany		Halblech		Sales
Hungary		Bercel		Manufacturing of Motors for Home Appliances
India	Haryana	Gurgaon		Sales
India	Karnataka	Bangalore		Sales
Indonesia		Bekasi		Manufacturing
Indonesia		Batam		Manufacturing
Indonesia		Batam		Manufacturing
Indonesia		Batam		Manufacturing
Italy		Milan		Sales, Factory and R&D
Italy		Milan		Headquarters
Italy		Genova		Sales Office. Factory and R&D
Italy		Casalmaggiore		Sales Office & Factory
Italy		Montebello Vicentino		Sales Office. Factory and R&D
Italy		Pordenone		Factory, R&D and Techno Motor Division
Italy		Monfalcone		Sales Office. Factory and R&D
Japan		Tottori		Head Office
Japan		Kyoto		Head Office
Japan		Kyoto		Head Office
Japan		Kyoto		Multifunctional Bases
Japan		Kyoto		Head Office
Japan	Fukui	Obama		Head Office
Japan	Nagano	Suwa-gun		Multifunctional Bases
Japan	Nagano	Ueda City		Head Office
Japan	Gunma	Kiryu-shi		Multifunctional Bases
Japan	Kanagawa	Zama City		Multifunctional Bases
Japan		Tokyo		Multifunctional Bases
Japan		Tokyo		Multifunctional Bases
Japan		Tokyo		Head Office
Japan	Fukuoka	Iizuka		R&D
Japan		Kyoto		Multifunctional Bases
Japan		Kyoto		R&D
Japan		Kyoto		R&D
Japan		Kyoto		R&D
Japan	Shiga	Echi-gun		Multifunctional Bases
Japan	Fukui	Obama		R&D
Japan	Fukui	Obama		R&D
Japan	Nagano	Komagane-city		Multifunctional Bases
Japan	Nagano	Ina-shi		Multifunctional Bases
Japan	Nagano	Chino-shi		R&D
Japan	Nagano	Suwa-gun		R&D
Japan	Kanagawa	Zama City		R&D
Japan	Saitama	Iruma city		R&D
Japan		Tokyo		R&D
Japan	Tochigi	Sano-city		R&D
Japan	Gunma	Kiryu-shi		R&D
Japan		Tokyo		Multifunctional Bases
Japan	Fukushima	Koriyama		Multifunctional Bases
Japan	Miyagi	Osaki		R&D
Japan	Fukuoka	Chikugo-city		Manufacturing
Japan	Fukuoka	Iizuka		Manufacturing
Japan	Kanagawa	Ayase-shi		Manufacturing
Japan	Yamanashi	Sudama		Manufacturing

Source: Citi Research



Figure 818. Nidec (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Japan	Nagano	Suwa-gun		Manufacturing
Japan	Nagano	Azumino		Manufacturing
Japan	Nagano	Chikuma		Manufacturing
Japan	Nagano	Shiojiri		Multifunctional Bases
Japan	Niigata	Minami-Uonuma		Multifunctional Bases
Japan	Iwate	Ichinoseki		Manufacturing
Japan	Akita	Yurihonjo-shi		Manufacturing
Japan	Osaka	Osaka		Sales Offices
Japan	Osaka	Nishi-ku		Sales Offices
Japan	Osaka	Chuo-ku		Sales Offices
Japan	Osaka	Kita-ku		Sales Offices
Japan	Osaka	Kyoto		Sales Offices
Japan	Osaka	Kyoto		Sales Offices
Japan	Osaka	Kyoto		Sales Offices
Japan	Osaka	Kyoto		Sales Offices
Japan	Osaka	Kyoto		Sales Offices
Japan	Osaka	Kyoto		Sales Offices
Japan	Shiga	Echi-gun		Sales Offices
Japan	Fukui	Obama		Sales Offices
Japan	Gifu	Ogaki		Sales Offices
Japan	Aichi	Nagoya		Sales Offices
Japan		Nagoya		Sales Offices
Japan		Nagoya		Sales Offices
Japan		Nagoya		Sales Offices
Japan	Nagano	Komagane		Sales Offices
Japan	Nagano	Ina-shi		Sales Offices
Japan	Nagano	Kamiina-gun		Sales Offices
Japan	Nagano	Suwa-gun		Sales Offices
Japan	Nagano	Suwa-shi		Sales Offices
Japan	Nagano	Siojiri		Sales Offices
Japan	Kanagawa	Zama City		Sales Offices
Japan	Kanagawa	Zama City		Sales Offices
Japan	Kanagawa	Zama City		Sales Offices
Japan	Kanagawa	Kawasaki		Sales Offices
Japan		Tokyo		Sales Offices
Japan		Tokyo		Sales Offices
Japan		Tokyo		Sales Offices
Japan	Saitama	Kawaguchi		Sales Offices
Japan	Niigata	Minami-Uonuma		Sales Offices
Japan	Gunma	Kiryu-shi		Sales Offices
Japan	Gunma	Kiryu-shi		Sales Offices
Japan	Fukushima	Koriyama		Sales Offices
Japan	Fukushima	Nihonmatsu		Sales Offices
Japan	Akita	Yurihonjo-shi		Sales Offices
Japan		Tokyo		Multifunctional Bases
Japan		Tokyo		Multifunctional Bases
Japan		Tokyo		Multifunctional Bases
Japan		Tokyo		Multifunctional Bases
Japan	Nagano	Suwa-gun		Multifunctional Bases
Japan	Nagano	Suwa-gun		Multifunctional Bases
Malaysia	Selangor	Petaling Jaya		Sales
Malaysia	Selangor	Kajang		Manufacturing
Malaysia	Negeri Semb Nilai			Manufacturing
Mexico		Juarez		Manufacturing
Mexico	San Luis Potosí			Manufacturing
Mexico		Apodaca		Manufacturing
Mexico	Tamaulipas	Reynosa		Manufacturing
Netherlands				Sales
Philippines		Subic Bay Freeport Zone		Manufacturing
Philippines	Laguna	Binan		Manufacturing
Poland		Niepolomice		Manufacturing of Automotive Motors
Romania	Dambovit			Sales & Factory
Singapore		Singapore		Manufacturing
Singapore		Singapore		Sales
Singapore		Singapore		R&D
Singapore		Singapore		Sales
Singapore		Singapore		Sales
Singapore		Singapore		Sales

Source: Citi Research

Figure 819. Nidec (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Singapore		Singapore		Sales
South Korea	Chungbuk	Cheongju		Development, Manufacturing, Sales and Maintenance
South Korea	Gyeonggi			R&D, manufacturing and Sales
South Korea	Seoul			Manufacturing
Spain				Sales Office. Factory and R&D
Taiwan		Tainan		R&D
Taiwan		Kaohsiung		Manufacturing
Taiwan		Taichung		Manufacturing
Thailand		Chonburi		Manufacturing
Thailand		Chonburi		Manufacturing
Thailand	Chachoengsao			Sales
Thailand		Bangkok		Sales
Thailand		Patumthani		Manufacturing
Thailand		Patumthani		Manufacturing
Thailand		Patumthani		Sales
Thailand		Patumthani		Manufacturing
Thailand		Ayutthaya		Manufacturing
Thailand		Ayutthaya		Manufacturing
Thailand		Ayutthaya		Manufacturing
Thailand		Ayutthaya		Manufacturing
Thailand	Saraburi			Manufacturing
UK	North Yorks	Harrogate		Technology Center (R&D and Factory)
UK		London		IR Activity office in European Region
United Arab Emirates		Abu Dhabi		Sales
USA	Washington	Battle Ground		Sales
USA	California	Rancho Cordova		Factory and R&D
USA	California	Livermore		Sales & Factory
USA	California	Santa Clara		Sales
USA	California	Santa Clara		Sales Support
USA	California	Torrance		Sales
USA	California			Manufacturing
USA	Texas	Houston		Sales
USA	Texas	Dallas		Sales
USA	Texas	Austin		Sales
USA	Colorado	Longmont		Sales
USA	Arkansas	Mena		Manufacturing
USA	Arkansas	Paragould		Manufacturing
USA	Missouri	St. Louis		Sales & Techno Motor Division
USA	Missouri	St. Louis		R&D
USA	Indiana	Princeton		R&D
USA	Minnesota	Minneapolis		Sales
USA	Wisconsin	Darlington		Manufacturing
USA	Illinois	Chicago		R&D
USA	Illinois	Itasca		Sales
USA	Illinois	Itasca		Sales
USA	Indiana	Indianapolis		R&D
USA	Indianapolis	Shelbyville		Sales
USA	Ohio	Minster		Sales, Manufacturing, R&D and Factory
USA	Ohio	Minster		Holding Company
USA	Indiana	Fort Wayne		Sales
USA	Michigan	Auburn Hills		Sales
USA	Michigan	Auburn Hills		Sales
USA	Ohio	Akron		Sales & Factory
USA	Ohio	Independence		Factory and R&D
USA	Ohio	Solon		Production
USA	Ohio	Perry		R&D
USA	New York	Syracuse		Manufacturing
USA	New York			Headquarters, IR Activity in America and an European
USA	New York	Glendale		Factory
USA	Connecticut	Cheshire		Sales
USA	Connecticut	Granby		Sale
USA	New Mexico	Alamogordo		Manufacturing
Venezuela		Edf		Sales
Vietnam		Ben Tre Province		Manufacturing
Vietnam		Ho Chi Minh City		Manufacturing
Vietnam		Ho Chi Minh City		Global Transportation
Vietnam		Ho Chi Minh City		Manufacturing
Vietnam		Hanoi		Manufacturing

Source: Citi Research

Figure 820. Nikon

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia				Imaging Products, Sport Optics
Australia				Instruments Products
Austria				Imaging Products, Sport Optics
Belarus				Imaging Products, Sport Optics
Belgium				Imaging Products, Sport Optics
Brazil				Imaging Products
Brazil				Instruments Products
Canada				Imaging Products, Sport Optics
Canada				Ophthalmic Lenses
Canada				Precision Equipment
China				Imaging Products, Sport Optics
China	Hong Kong			Imaging Products, Sport Optics
China				Ophthalmic Lenses
China				Precision Equipment
China				Instruments Products
China	Hong Kong			Instruments Products
Czech Republic				Imaging Products, Sport Optics, Instruments Products
Denmark				Imaging Products, Sport Optics
Estonia				Imaging Products, Sport Optics
Finland				Imaging Products, Sport Optics
France				Imaging Products, Sport Optics, Instruments Products
France				Precision Equipment
Germany				Imaging Products, Sport Optics, Instruments Products
Germany				Precision Equipment
Hungary				Imaging Products, Sport Optics
Iceland				Imaging Products, Sport Optics
India	Haryana	Gurgaon		Imaging Products, Sport Optics - Corporate Office
India		New Delhi		Imaging Products - Branch Office
India	Karnataka	Bangalore		Imaging Products - Branch Office
India	West Bengal	Kolkata		Imaging Products - Branch Office
India	Maharashtra	Mumbai		Imaging Products - Branch Office
India				Precision Equipment
India				Instruments Products
Indonesia		Jakarta		Imaging Products
Indonesia				Instruments Products
Ireland				Imaging Products, Sport Optics
Ireland				Precision Equipment
Israel				Precision Equipment
Israel				Instruments Products
Italy				Precision Equipment
Italy				Instruments Products
Japan				Imaging Products
Japan				Sport Optics
Japan				Ophthalmic Lenses
Japan				Precision Equipment
Japan				Instruments Products
Latvia				Imaging Products, Sport Optics
Lithuania				Imaging Products, Sport Optics
Luxembourg				Imaging Products, Sport Optics
Malaysia				Imaging Products, Sport Optics
Malaysia				Precision Equipment
Malaysia				Instruments Products
Mexico				Imaging Products
Moldova				Imaging Products, Sport Optics
Netherlands				Imaging Products, Sport Optics
New Zealand				Instruments Products
Norway				Imaging Products, Sport Optics
Pakistan				Instruments Products
Philippines				Instruments Products
Poland				Imaging Products, Sport Optics
Russia				Imaging Products, Sport Optics
Russia				Instruments Products
Saudi Arabia				Instruments Products
Singapore				Imaging Products, Sport Optics
Singapore				Precision Equipment
Singapore				Instruments Products
Slovakia				Imaging Products, Sport Optics
Slovenia				Imaging Products, Sport Optics
South Africa				Instruments Products
South Korea				Imaging Products, Sport Optics
South Korea				Precision Equipment
South Korea				Instruments Products
Sweden				Imaging Products, Sport Optics
Switzerland				Imaging Products, Sport Optics, Instruments Products
Taiwan				Precision Equipment
Taiwan				Instruments Products
Thailand				Imaging Products, Sport Optics
Thailand				Instruments Products
Turkey				Instruments Products
UK				Imaging Products, Sport Optics, Instruments Products
UK				Ophthalmic Lenses
UK				Precision Equipment
Ukraine				Imaging Products, Sport Optics
United Arab Emirates				Instruments Products
USA	New York	Melville		Imaging Products, Sport Optics
USA				Ophthalmic Lenses
USA				Precision Equipment
USA				Instruments Products
USA				Instruments Products
Vietnam				Instruments Products

Source: Citi Research

Figure 821. Nippon Electric Glass

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Minhang	Shanghai		Manufacturing Plant : Glass for LCD substrates
China	Guangdong	Guangzhou		Manufacturing Plant
Germany		Dusseldorf		Manufacturing Plant : Glass fiber
				Manufacturing Plant : Glass for CCFL, Glass for electronic devices, Heat-resistant glass, Glass for lighting applications, Glass for thermos bottles, Glass for radiation shielding
Japan	Shiga	Otsu		Manufacturing Plant : Glass for medical and laboratory use, Glass for LCDs
Japan	Kanagawa	Fujisawa		Manufacturing Plant : Glass for LCDs, Glass for PDPs, Glass for building materials
Japan	Shiga	Nagahama		Manufacturing Plant : Glass fibers, Glass for LCDs, Glass for electronic devices
Japan	Shiga	Notogawa		Manufacturing Plant : Glass for display devices (thin film processing)
Japan	Fukui			Manufacturing Plant :
Japan	Shiga	Kusatsu		Sales Headquarters
Japan	Yodogawa	Osaka		Sales Headquarters
Japan		Tokyo		Manufacturing Plant : Glass fiber, Glass for CRTs, Glass for lighting applications, Heat-resistant glass
Malaysia	Selangor	Shah Alam		Manufacturing Plant : Substrate glass for LCDs
South Korea	Gyeonggi-do	Gumi		Manufacturing Plant : Glass for LCD substrates
South Korea	Gyeonggi-do	Paju		Manufacturing Plant : Glass for LCD substrates
Taiwan	Wuchih	Taichung		Manufacturing Plant : Glass for LCD substrates
				Manufacturing Plant : Glass fiber, Heat-resistant glass, Super heat-resistant glass-ceramics, Glass for electronic devices
USA	Illinois			

Source: Citi Research

Figure 822. Nokia

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South W	Sydney		Regional Office
Bangladesh		Dhaka		Regional Office
Belgium	Diegem			Regional Office
China		Beijing		Regional Office
China	Anhui	Fuyang		Regional Office
China	Gansu	Lanzhou		Regional Office
China	Guangdong	Dongguan		Regional Office
China	Guangdong	Foshan		Regional Office
China	Guangdong	Tianhe		Regional Office
China	Guangdong	Shantou		Regional Office
China	Guangdong	Shenzhen		Regional Office
China	Guangxi	Nanning		Regional Office
China	Guizhou	Guiyang		Regional Office
China	Guizhou	Zunyi		Regional Office
China	Hainan	Haikou		Regional Office
China	Anhui			Regional Office
China	Hebei	Baoding		Regional Office
China	Hebei	Cangzhou		Regional Office
China	Hebei	Shijiazhuang		Regional Office
China	Tangshan			Regional Office
China	Heilongjiang	Daqing		Regional Office
China	Heilongjiang	Harbin		Regional Office
China	Heilongjiang	Qiqihar		Regional Office
China	Henan			Regional Office
China	Henan	Luoyang		Regional Office
China	Henan	Zhengzhou		Regional Office
China	Hubei	Wuhan		Regional Office
China	Hunan			Regional Office
China	Inner Mongol	Hohhot		Regional Office
China	Jiangsu	Nanjing		Regional Office
China	Jiangsu	Nantong		Regional Office
China	Jiangsu			Regional Office
China	Jiangsu	Wuxi		Regional Office
China	Jiangsu	Xuzhou		Regional Office
China	Jiangsu	Yancheng		Regional Office
China	Nanchang			Regional Office
China	Jilin	Changchun		Regional Office
China	Liaoning			Regional Office
China	Liaoning	Nanjing		Regional Office
China	Inner Mongol	Baotou		Regional Office
China	Inner Mongol	Chifeng		Regional Office
China	Ningxia			Regional Office
China	Xining	Qinghai		Regional Office
China	Shandong	Jinan		Regional Office
China	Shandong	Linyi		Regional Office
China	Shandong	Qingdao		Regional Office
China	Shandong	Weifang		Regional Office
China	Shandong			Regional Office
China		Shanghai		Regional Office
China	Shaanxi	Xi'an		Regional Office
China	Shaanxi	Xi'an		Regional Office
China		Chengdu		Regional Office
China	Nanchang			Regional Office
China	Sichuan			Regional Office
China	Sichuan	Yibin		Regional Office
China	Chongqing			Regional Office
China		Tianjin		Regional Office
China	Xinjiang	Korla		Regional Office
China	Xinjiang			Regional Office
China	Yunnan	Dali		Regional Office
China	Kunming			Regional Office

Source: Citi Research

Figure 823. Nokia (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Zhejiang	Hangzhou		Regional Office
China	Zhejiang	Taizhou		Regional Office
China	Zhejiang	Wenzhou		Regional Office
China	Fuzhou			Regional Office
China	Fujian	Quanzhou		Regional Office
China	Fujian	Xiamen		Regional Office
Czech Republic				Regional Office
Egypt		Cairo		Regional Office
Estonia		Tallinn		Regional Office
Finland				Regional Office
France		Paris		Regional Office
Greece		Athens		Regional Office
Hungary				Regional Office
India	Haryana	Gurgaon		Regional Office
Indonesia		Balikpapan		Regional Office
Indonesia		Bandung		Regional Office
Indonesia		Jakarta		Regional Office
Indonesia		Makassar		Regional Office
Indonesia		Medan		Regional Office
Indonesia		Palembang		Regional Office
Indonesia		Sanur		Regional Office
Indonesia		Semarang		Regional Office
Indonesia		Surabaya		Regional Office
Ireland		Dublin		Regional Office
Italy		Milan		Regional Office
Kazakhstan				Regional Office
Lithuania		Vilnius		Regional Office
Malaysia		Kuala Lumpur		Regional Office
Netherlands		Rijswijk		Regional Office
New Zealand		Auckland		Regional Office
Pakistan		Karachi		Regional Office
Philippines		Makati		Regional Office
Poland		Warsaw		Regional Office
Romania		Bucharest		Regional Office
Russia		Moscow		Regional Office
Saudi Arabia		Jeddah		Regional Office
Slovakia		Bratislava		Regional Office
Spain		Madrid		Regional Office
Taiwan		Taipei		Regional Office
UK		London		Regional Office
UK		Cambridge		Regional Office
UK		Bristol		Regional Office
Ukraine		Kyiv		Regional Office
United Arab Emirates		Dubai		Regional Office
USA	California	Sunnyvale		Regional Office
Venezuela		Caracas		Regional Office

Source: Citi Research

Figure 824. Novatek

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Xiamen		Office
China		Suzhou		Sales and Marketing
China		Xi'an		Design, Testing and Consulting
China		Shanghai		Testing and Consulting
China		Shenzhen		Office
China		Chengdu		Office
Hong Kong		Kowloon		Manufacturing and Marketing
Japan		Tokyo		Office
Japan		Tokyo		Manufacturing and Marketing
Samoa				
Samoa				
Taiwan		Hsinchu		Headquarters
Taiwan		Taipei		Sales Office
Taiwan		Hsinchu		
UK	British Virgin Islands			

Source: Citi Research

Figure 825. NVIDIA

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil		Sao Paulo		Office
China		Beijing		Office
China		Shanghai		Office
China		Shenzhen		Office
China	Shanxi			Office
China		Tianjian		Office
Finland		Helsinki		Office
France				Office
Germany		Berlin		Office
Germany		Munich		Office
Germany		Wurselen		Office
Hong Kong				Office
India	Karnataka	Bangalore		Office
India	Andhra Pradesh	Hyderabad		Office
India	Maharashtra	Mumbai		Office
India	Maharashtra	Pune		Office
Italy	Lombardy	Milan		Office
Japan		Tokyo		Office
Netherlands				Office
Russia		Moscow		Office
South Korea		Seoul		Office
Sweden				Office
Switzerland		Zurich		Office
Taiwan		Taipei		Office
Taiwan		Hsinchu		Office
UK		Bristol		Office
UK		Cambridge		Office
UK		Reading		Office
UK		London		Office
United Arab Emirates		Dubai		Office
USA	California	Santa Clara		Headquarters
USA	Alabama	Madison		Office
USA	Colorado	Boulder		Office
USA	Florida	Orlando		Office
USA	Massachusetts	Westford		Office
USA	Michigan	Ann Arbor		Office
USA	Missouri	St. Louis		Office
USA	North Carolina	Durham		Office
USA	Oregon	Beaverton		Office
USA	Oregon	Lake Oswego		Office
USA	South Carolina	Greenville		Office
USA	Texas	Austin		Office
USA	Texas	Richardson		Office
USA	Utah	Salt Lake City		Office
USA	Virginia	Charlottesville		Office
USA	Washington	Redmond		Office

Source: Citi Research

Figure 826. Oclaro Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada		Ottawa	4000	Administrative, manufacturing and R&D facilities
China		Shenzhen	247000	Office space, manufacturing, R&D
China		Shanghai	24000	Administrative, manufacturing and R&D facilities
Germany		Munich	3000	Administrative, manufacturing and R&D facilities
Israel		Jerusalem	5000	Administrative, manufacturing and R&D facilities
Italy		San Dona	66000	Office space, manufacturing, R&D
Japan		Sagamihara	342000	Office space, manufacturing, R&D
Japan		Komoro	35000	Office space, manufacturing, R&D
Japan		Kanazawa	3000	Administrative, manufacturing and R&D facilities
Japan		Tokyo	1000	Administrative, manufacturing and R&D facilities
South Korea		Daejeon	7000	Administrative, manufacturing and R&D facilities
Switzerland		Zurich	124000	Office space, manufacturing, R&D
UK		Caswell	183000	Office space, manufacturing, R&D
UK		Paignton	18000	Administrative, manufacturing and R&D facilities
USA	California	San Jose	52000	Corporate headquarters, office space, manufacturing, R&D
USA	Massachusetts	Acton	31000	Office space, manufacturing, R&D
USA	California	San Jose	25000	Administrative, manufacturing and R&D facilities
USA	Arizona	Tucson	15000	Administrative, manufacturing and R&D facilities
USA	New York	Horsehead	15000	Administrative, manufacturing and R&D facilities
USA	California	Santa Clara	10000	Administrative, manufacturing and R&D facilities

Source: Citi Research

Figure 827. Olympus

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
				Sale and service of medical and industrial endoscopes, microscopes, and UT and ECT instruments in Australia, New Zealand, Papua New Guinea, Tahiti, and the South Pacific region
Australia	Victoria			
Australia	New South Wales			Sale and service of imaging products in Australia, New Zealand, Papua New Guinea, Tahiti, and the South Pacific region
Australia	Victoria	Notting Hill		Olympus Australia Pty Ltd
Australia	New South Wales	Macquarie Park		Olympus Imaging Australia Pty Ltd
Austria		Vienna		Olympus Austria Ges.m.b.H.
Belgium		Aartselaar		Olympus Belgium N.V.
Brazil		Sao Paulo		Olympus Optical do Brasil, Ltda
				Sales of product lines except imaging products and UT and ECT instruments
Canada	Ontario	Richmond Hill		Manufacture and service of advanced UT and ECT instruments and systems
Canada	Quebec			
China		Shenzhen		Manufacture of imaging products
China		Beijing		Head office operations in China, Micro-Imaging System Division, Industrial Endoscope Dept.
China		Shanghai		Sale of imaging products in China
China		Guangzhou		Manufacture of imaging products

Source: Citi Research

Figure 828. Olympus (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Costa Rica		San José		Service Center
Croatia		Zagreb		Olympus d.o.o. za trgovinu
Czech Republic		Vokovice		Olympus Czech Group
Denmark		Ballerup		Olympus Danmark A/S
Estonia		Tallinn		Olympus Estonia OÜ
Finland	ESPOO	Vantaa		Olympus Finland Oy
France		Rungis		Sales of all product lines and service of digital cameras and medical endoscopes in Russia and CIS
Germany		Hamburg		Principal Business Bases
Germany		Munster		Development, manufacture, and sale of complete microscope system solutions
Hong Kong		Kowloon		Principal Business Bases
Hungary		Budapest		Olympus Hungary Kft.
India	Haryana	New Delhi		Marketing, sale, and service of medical equipment in India
India		Mumbai		Marketing and service of digital cameras and digital voice recorders in India
Ireland		Dublin		Olympus Ireland
Ireland		Limerick		Olympus Biotech International Ltd.
Italy		Milan		Olympus Italia S.r.l.
Japan		Tokyo		Principal Business Bases
Japan		Tokyo		Manufacture and sale of medical equipment and other medical devices
Japan		Nagano		Development, manufacture, and repair of products related to industrial videoscopes
Japan		Fukushima		Manufacture of medical and industrial endoscopes
Japan	Aomori			Manufacture of medical endoscope related products
Japan	Kanagawa			Distribution center
Japan		Tokyo		Sasazuka Facility
Japan		Tokyo		Ishikawa & Utsugi Facility
Japan		Sapporo		Sapporo Branch
Japan	Miyagi	Sendai		Sendai Sales Office
Japan	Niigata			Niigata Sales Office
Japan		Yokohama		Yokohama Sales Office
Japan		Matsumoto		Matsumoto Sales Office
Japan		Shizuoka		Shizuoka Sales Office
Japan		Nagoya		Nagoya Branch
Japan		Kanazawa		Kanazawa Sales Office
Japan		Osaka		Osaka Branch
Japan		Hiroshima		Hiroshima Sales Office
Japan		Matsuyama		Matsuyama Sales Office
Japan		Fukuoka		Fukuoka Branch
Japan		Tokyo		Hinode Plant
Japan		Fukushima		Shirakawa Facility
Japan		Kyoto		Kyoto Sales Office
Japan		Okayama		Okayama Sales Office
Japan		Kagoshima		Kagoshima Sales Office
Kazakhstan		Almaty		Olympus Moscow Limited Liability Company
Latvia		Riga		Olympus Latvia SIA
Lithuania		Vilnius		Olympus Lithuania UAB
Malaysia		Kuala Lumpur		Sale of imaging products in Malaysia
Mexico		Naples		Service Center
Mexico		Mexico City		Olympus Imaging de Mexico, S.A. de C.V.
New Zealand		Auckland		Sale and service of endoscopes and microscopes in New Zealand
Norway		Oslo		Olympus Norge A/S
Portugal		Lisbon		Olympus Iberia, S.A.U.
Russia		Moscow		Olympus Moscow LLC
Serbia		Belgrade		Olympus d.o.o.
Singapore				Sales of all product lines in ASEAN, India, and Pakistan
Slovakia		Bratislava		Olympus SK, s r.o.
Slovenia		Ljubljana		Olympus Slovenija d.o.o.
South Korea		Seoul		Sale of imaging products and medical endoscopes in Korea
South Korea	Gyeonggi-do	Yongin		Olympus Korea Service Co., Ltd.
Spain		L'Hospitalet de Llobre		Olympus Iberia, S.A.U.
Sweden		Stockholm		Olympus Sverige AB
Switzerland	Uster	Volketswil		Olympus Schweiz AG
Taiwan		Taichung		Olympus Taiwan Co., Ltd
Thailand		Bangkok		Import, sale, and service of endoscopes in Thailand
Turkey		Istanbul		Olympus Istanbul Optik Ürünler
UK	Essex			Sales of all product lines, and development and manufacture of endoscopes and related equipment
UK		Southend-on-Sea		Olympus KeyMed
Ukraine		Kiev		Olympus Europa Holding GmbH
USA	Pennsylvania	Center Valley		Principal Business Bases
USA	Pennsylvania			Business Center
USA	Florida	Miami		Sale and service of medical endoscopes and microscopes in Latin America
USA	Massachusetts			Development, manufacture, and sale of medical devices
USA	Massachusetts	Waltham		Olympus NDT Inc
USA	California	San Diego		Olympus Communication Technology of America, Inc.
USA	Massachusetts	Hopkinton		Olympus Biotech Corporation
Vietnam		Hanoi		Service of medical endoscope related products in Vietnam
Vietnam	Dong Nai			Olympus Vietnam Co.,Ltd.

Source: Citi Research

Figure 829. OmniVision

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Pudong	Shanghai		
China		Shanghai		
China		Beijing		
China		Shenzhen		
Germany		Munich		
India		Bangalore		
India		New Delhi		
Japan		Yokohama		
Japan		Osaka		
Norway		Oslo		
Singapore				
South Korea		Seoul		
Taiwan		Taipei		
Taiwan		Hsinchu		
UK		London		
USA	California	Santa Cla	207000	Corporate Headquarters
USA	Illinois	Chicago		
USA	Colorado	Louisville		
USA	Michigan	Detroit		

Source: Citi Research

Figure 830. On Semiconductor

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia		Melbourne		Sales Office
Belgium	Flemish Brabant	Oudenaarde	167,900	Front end Facilities
Belgium		Oudenaarde		Sales Office
Brazil		Sao Paulo		Sales Office
Canada		Burlington	95,400	Front End/ Back end Facilities
Canada	Ontario	Oakville		Sales Office
Canada	Ontario	Waterloo		Sales Office
Canada	Quebec	Point Claire		Sales Office
China		Leshan	363,000	Back end Facilities
China		Shenzhen	208,000	Back end Facilities
China		Beijing		Sales Office
China		Shanghai		Sales Office
China		Shenzhen		Sales Office
Czech Republ Zlin Region		Roznov	237,000	Front end Facilities
Czech Republic		Roznov	405,300	Other Facilities
France		Velizy-Villacoublay		Sales Office
Germany		Munich		Sales Office
Hong Kong		Shatin		Sales Office
Israel		Tel Aviv		Sales Office
Israel		Raanana		Sales Office
Israel		Rosh HaAyn		Sales Office
Italy		Milan		Sales Office
Japan	Maebashi	Gunma	59,043	Front end Facilities
Japan	Niigata		1,724,600	Front end Facilities
Japan		Saitama	377,000	Back end Facilities
Japan		Tokyo		Sales Office
Malaysia	Negeri Sembilan	Seremban	404,700	Front end/Back End Facilities
Malaysia		Penang		Sales Office
Mexico	Jalisco	Guadalajara		Sales Office
Philippines		Carmona	222,500	Back end Facilities
Philippines		Tarlac City	861,100	Back end Facilities
Philippines		Manila		Sales Office
Singapore				Sales Office
Slovakia		Vrbovska Cesta		Sales Office
South Korea		Gyeonggi-do		Sales Office
Switzerland		Marin-Epagnier		Sales Office
Taiwan		Taipei		Sales Office
Thailand		Bang Pa In	9,000	Back end Facilities
Thailand		Bangkok		Sales Office
UK		Berkshire		Sales Office
USA	Arizona	Phoenix	1,400,000	Headquarters
USA	Oregon	Gresham	518,000	Front end Facilities
USA	Idaho	Pocatello	443,000	Front end Facilities
USA	California	Santa Clara	42,000	
USA	Alberta	Pacific Northwest		Sales Office
USA	Massachusetts	Boxborough		Sales Office
USA	Alabama	Huntsville		Sales Office
USA	North Carolina	Raleigh		Sales Office
USA	Colorado	Longmont		Sales Office
USA	Texas	Plano		Sales Office
USA	Massachusetts	Boxborough		Sales Office
USA	California	Laguna Hills		Sales Office
USA	California	San Jose		Sales Office
USA	New Jersey	Mount Laurel		Sales Office
USA	Florida	Orlando		Sales Office
USA	Georgia	Duluth		Sales Office
USA	Minnesota	Edina		Sales Office
USA	Illinois	Hoffman Estates		Sales Office
USA	Indiana	Fishers		Sales Office
USA	Indiana	Michigan		Sales Office
USA	Indiana	Kokomo		Sales Office
USA	Minnesota	Edina		Sales Office
USA	Kansas	Overland Park		Sales Office
USA	Columbia	Maryland		Sales Office
USA	Missouri	Saint Charles		Sales Office
USA	New York	Jericho		Sales Office
USA	New York	Rochester		Sales Office
USA	Ohio	Brecksville		Sales Office
USA	Texas	Austin		Sales Office
USA	Virginia	Newport News		Sales Office
USA	Wisconsin	Evansville		Sales Office
Vietnam		Ho Chi Minh	59,200	Back end Facilities
Vietnam		Bien Hoa	247,572	Back end Facilities

Source: Citi Research

Figure 831. Panasonic

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Austria		Biedermannsdorf		Panasonic Electric Works Austria GmbH
Austria		Enns		Sale / Marketing, Production
Brazil		Sao Paulo		Semiconductor Sales office
Brazil		Sao Paulo		Brazil Representative Office
Canada	Ontario	Mississauga		Semiconductor Sales office
Canada	Ontario	Mississauga		Canada Branch Office
China		Tianjin		Panasonic Industrial Devices (Tianjin) Co., Ltd.
China		Qingdao		Panasonic Industrial Devices (Qingdao) Co., Ltd.
China	Guangdong	Jianmen		Panasonic Electronic Devices (Jiangmen) Co., Ltd.
China	Hong Kong			
China	Fujian	Xiamen		
China		New Taipei		Technology Domain Business
China		Beijing		Semiconductor Sales office
China		Tianjin		Semiconductor Sales office
China		Dalian		Semiconductor Sales office
China		Shanghai		Semiconductor Sales office
China		Shenzhen		Semiconductor Sales office
China	Hong Kong			Semiconductor Sales office
China		Suzhou		Semiconductor Production Plants
China		Shanghai		Semiconductor Production Plants
China		Beijing		Manufacturing locations
China	Jiangsu	Suzhou		Manufacturing locations
China		Shenzhen		Manufacturing locations
China		Beijing		Sales Office
China		Shanghai		Sales Office
China		Tianjin		Sales Office
China		Guangzhou		Sales Office
China		Shenzhen		Sales Office
China		Shenyang		Sales Office
China	Shandong	Qingdao		Sales Office
China		Dalian		Sales Office
China		Zhengzhou		Sales Office
China		Xi'an		Sales Office
China		Chengdu		Sales Office
China		Wuhan		Sales Office
China		Chongqing		Sales Office
China	Jiangsu	Nanjing		Sales Office
China		Hangzhou		Sales Office
China		Xiamen		Sales Office
China	Hong Kong			Sales Office
China		Guangzhou		Sale / Marketing, Production
China		Suzhou		Sale / Marketing, Production
China		Shanghai		Sale / Marketing, Production
China	Hong Kong			Sale / Marketing
Czech Republic				Manufacturing locations
Czech Republic		Brno		Panasonic Electric Works Czech s.r.o.
France		Windows-le-Buisson		French Branch Office
Germany	Bavaria	Holzkirchen		European Headquarters
Germany		Haar		Semiconductor Sales office
Germany		Pfaffenhofen		Manufacturing locations
Hungary		Budapest		Hungarian Representative Office
India	Karnataka	Bangalore		Semiconductor Sales office
India	Haryana	Gurgaon		Gurgaon Head Office
India	Maharashtra	Pune		Pune Office
India	Tamil Nadu	Chennai		Chennai Office
India	Karnataka	Bangalore		Bangalore Office
India	Maharashtra	Mumbai		Mumbai Office
Indonesia		Batam		
Indonesia				Components Division Capacitor Unit
Indonesia		Jakarta		Semiconductor Production Plants
Indonesia		Jakarta		Sales Office
Ireland		Dublin		Irish Branch Office
Italy		Bussolengo		Panasonic Electric Works Italia s.r.l.
				Capacitor Business Division; Conductive Polymer
				Capacitor Division; Aluminum Capacitor Division Uji
				Capacitor Business Division Aluminum Capacitor
				Division Yamaguchi
				Capacitor Business Division Film Capacitor Division
				Printed Circuit Board Business Division
				Circuit Components Business Division Morita
				Circuit Components Business Division Tajima
				Circuit Components Business Division Kanazu

Source: Citi Research

Figure 832. Panasonic (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Japan	Mie	Tamaki		Circuit Components Business Division Built-in Sensor
Japan		Osaka		Circuit Components Business Division
Japan	Kyoto	Kyōtanabe		Panasonic Industrial Devices Nitto Co., Ltd.
Japan	Fukui	Tsuruga		Electromechanical Components Business Division
Japan	Okayama	Tsuyama		Electromechanical Components Business Division; Input
Japan	Mie	Matsusaka		Devices Division
Japan	Toyama	Tonami		Electromechanical Components Business Division; Power
Japan	Yamanashi	Minami-Alps		Module Division; Speaker Division
Japan	Hokkaido	Chitose		Capacitor Business Division Film Capacitor Division
Japan	Fukushima	Motomiya		Panasonic Industrial Devices Yamanashi Co., Ltd.
Japan		Okayama		Circuit Components Business Division
Japan		Kyoto		Electromechanical Components Business Division
Japan		Kagoshima		Semiconductor Production Plants
Japan	Kyoto	Kameoka		Semiconductor Production Plants
Japan	Kyoto	Nagaokakyo		Semiconductor Production Plants
Japan	Aichi	Kasugai		Semiconductor Production Plants
Japan	Tochigi	Otawara		Manufacturing and sales companies
Japan	Mie	Watarai		Manufacturing and sales companies
Japan	Hokkaido	Obihiro		Manufacturing locations
Japan	Hyogo	Tatsuno		Manufacturing locations
Japan	Kagoshima	Minamisatsuma		Manufacturing locations
Japan	Mie	Yokkaichi		Sale / Marketing
Japan	Mie	Yokkaichi		Sale / Marketing
Japan	Fukushima	Koriyama		Production
Japan		Moriguchi Region		Head Office
Japan		Osaka		Suminoe Plant
Japan	Wakayama			Wakayama Plant
Japan		Kasai		Kasai Plant
Japan		Sumoto		Sumoto Plant
Japan		Tokushima		Tokushima Plant
Japan		Osaka		Daito Region
Japan		Seishin		Seishin Region
Japan		Tokyo		Tokyo Region
Japan	Shiga	Kusatsu		
Korea		Seoul		Semiconductor Sales office
Korea		Seoul		Sale / Marketing
Korea		Seoul		Sales Office
Malaysia	Selangor			
Malaysia		Kuala Lumpur		Semiconductor Sales office
Malaysia		Penang		Semiconductor Sales office
Malaysia		Johor		Semiconductor Sales office
Malaysia				Semiconductor Production Plants
Malaysia		Melaka		Semiconductor Production Plants
Malaysia		Kuala Lumpur		Panasonic Industrial Devices Sales (M) Sdn. Bhd.
Mexico	Tamaulipas			
Mexico		Guadalajara		Semiconductor Sales office
Mexico		Mexicali		Semiconductor Sales office
Mexico				Manufacturing locations
Netherlands		Best		Head Office
Philippines		Makati		Sales Office
Poland		Warsaw		Panasonic Electric Works Polska sp. z o.o.
Portugal		Cascais		Portuguese Branch Office
Singapore				
Singapore				Semiconductor Production Plants
Singapore				Sales Office
Singapore				Sale / Marketing, Production
Singapore				Semiconductor Sales office
Slovakia		Trstena		
Spain		Madrid		Head Office
Sweden		Kista		Panasonic Electric Works Europe AG Filial Nordic
Switzerland		Risch-Rotkreuz		Panasonic Electric Works Schweiz AG
Taiwan	Taoyuan			Technology Domain Business
Taiwan		Taipei		Sales Office
Taiwan		Hsinchu		Sale / Marketing, Production
Taiwan		Taipei		Semiconductor Sales office
Thailand	Samutprakarn			
Thailand		Bangkok		Semiconductor Sales office
Thailand		Khon Kaen		Manufacturing locations
Thailand		Bangkok		Panasonic Eco Solutions Sales (Thailand) Co., Ltd.
Thailand	Ayuthaya	Uthai		Sale / Marketing, Production
Turkey		Istanbul		Sales Office
UK	Milton Keynes			Head Office
USA	California	San Diego		Semiconductor Sales office
USA	California	Cupertino		Semiconductor Sales office
USA	New Jersey	Newark		Semiconductor Sales office
USA	Illinois	Chicago		Semiconductor Sales office
USA	Michigan	Detroit		Semiconductor Sales office
USA	New Jersey	Newark		Head Office/New Jersey Sales Office
USA	California	Cupertino		Cupertino Sales Office
USA	Michigan	Farmington Hills		Automotive Sales Office
USA	Kentucky	Hebron		Kentucky Sales Office
USA	California	Cupertino		Sale / Marketing
Vietnam		Ho Chi Minh City		Sales Office
Vietnam		Hanoi		

Source: Citi Research

Figure 833. Pegatron

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil		Sao Paulo		Operation Sites
China	Jiangsu	Suzhou		Operation Sites
China		Chongqing		Operation Sites
China		Shanghai		Operation Sites
Czech Republic		Ostrava		Operation Sites
Japan		Tokyo		Operation Sites
Mexico		Juarez		Operation Sites
Taiwan		Taipei		Operation Sites
Taiwan		Taoyuan City		Operation Sites
USA	Indiana			Operation Sites

Source: Citi Research

Figure 834. Pioneer

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	Victoria	Heatherton		Pioneer Electronics Australia
Belgium		Beveren		Pioneer Belgium, Division of Pioneer Europe N.V.
Belgium		Beveren		Pioneer Europe NV, European headquarters
Brazil				Pioneer do Brasil Ltda.
Brazil				Pioneer Yorkey do Brasil Ltda.
Canada	Ontario	Markham		Pioneer Electronics of Canada, Inc.
China		Beijing		Pioneer China Holding Co., Ltd.
China				Pioneer Technology (Dongguan) Co., Ltd.
China				Pioneer Technology (Shanghai) Co., Ltd.
China				Pioneer Electronics (Shanghai Export Zone) Co. Ltd.
China				Pioneer (HK) Ltd.
China				Pioneer Industrial Components (Hong Kong) Co., Ltd.
China				Dongguan Monotech Electronic Co., Ltd.
China				Dongguan Monotech Pai Yue Electronic Co., Ltd.
China				Shanghai Pioneer Speakers Co., Ltd.
China				Mogami Hong Kong Co., Ltd.
China				Mogami Dongguan Electronics Co., Ltd.
China				Pioneer Suntec (Shanghai) Electronic Technology Co., Ltd.
China				INCREMENT P Shanghai Co., Ltd.
China				Pioneer Digital Design And Manufacturing (Hong Kong) Ltd.
China				Mogami Hong Kong Co. Ltd.
China				Pioneer Trading (Shenzhen) Co., Ltd.
Denmark		Herlev		Pioneer Europe N.V. Representative Office
Finland		Espoo		Pioneer Europe N.V. Representative Office
France		Argenteuil		Pioneer France S.A.S
Germany		Willlich		Pioneer Electronics Deutschland GmbH
India	Haryana	Gurgaon		Pioneer India Electronics Pvt. Ltd
Italy		Milan		Pioneer Italia S.P.A.
Japan	Kanagawa	Kawasaki-shi		PIONEER CORPORATION - WORLD HEADQUARTERS
Japan		Yamagata		Tohoku Pioneer Corporation
Japan				Mogami Denki Corporation
Japan				Tohoku Pioneer EG Corporation
Japan		Yamanashi		Pioneer Micro Technology Corporation
Japan		Aomori		Towada Pioneer Corporation
Japan		Saitama		Pioneer FA Corporation
Japan				Pioneer Investment Corporation

Source: Citi Research

Figure 835. Pioneer (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Japan		Kawasaki		Increment P Corporation
Japan		Kawasaki		Pioneer Service Network Corporation
Japan				Pio Tec, Inc.
Japan				Pioneer Digital Design And Manufacturing Corporation
Japan				Pioneer OLED Lighting Devices Corporation
Japan				Pioneer Sales and Marketing Corporation
Japan				Pioneer Home Electronics Corporation
Japan				Pioneer Solutions Corporation
Japan				Pioneer Tokyo Service, Inc.
Japan				TPS Corporation
Japan				Pioneer System Technologies Corporation
Japan				Pioneer Welfare Services Co., Ltd.
Japan				Pioneer Technology (Malaysia) Sdn. Bhd.
Japan				Pioneer Holding BV
Malaysia		Kuala Lumpur		Pioneer Benelux, branch office of Pioneer Europe NV
NETHERLANDS				Pioneer Europe N.V.
Netherlands		Almere		Pioneer International Latin America S.A.
Norway		Oslo		Pioneer Europe NV
Panama				Pioneer International Latin America S.A.
Portugal		Alcochete		Pioneer Europe NV
Russia		Moscow		PIONEER RUS LLC
Singapore				Pioneer Electronics AsiaCentre Pte Ltd
SOUTH KOREA				Pioneer Korea Corporation
Spain				Pioneer Electronics Iberica S.A.
Sweden		Sant Cugat del Vallès		Pioneer Nordic
Taiwan		Farsta		Pioneer High Fidelity Taiwan Co., Ltd.
Thailand		Taipei		Pioneer Electronics (Thailand) Co., Ltd.
Thailand		Bangkok		Pioneer Manufacturing (Thailand) Co., Ltd.
Thailand				Tohoku Pioneer (Thailand) Co., Ltd.
UAE		Ayutthaya		Pioneer Gulf Free Zone
UAE		Dubai		Pioneer Digital Design Centre Ltd
UK				Pioneer GB LTD
United Kingdom		Middlesex HA4		Pioneer Finetech Corporation
USA				Pioneer North America, Inc.
USA				Pioneer Electronics (USA) Inc.
USA				Pioneer Automotive Technologies, Inc.
USA				Discovision Associates
USA				Pioneer Speakers, Inc.
USA				Pioneer International (Miami) Inc.
USA				Pioneer Advanced Solutions, Inc.

Source: Citi Research



Figure 836. Plexus

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Xiamen		124,000	Manufacturing Solutions
China	Hangzhou		106,000	Manufacturing Solutions
Germany	Darmstadt		16,000	Engineering Solutions
Malaysia	Penang		1,048,000	Penang Design Center
Mexico	Juarez		210,000	Manufacturing Solutions
Romania	Oradea		66,000	Engineering & Manufacturing Solutions
Scotland	Kelso		57,000	Manufacturing Solutions
Scotland	Galashiels		43,000	
Scotland	Livingston		4,000	
USA	Wisconsin	Neeah	277,000	Engineering & Manufacturing Solutions
USA	Wisconsin	Appleton	272,000	Engineering & Manufacturing Solutions
USA	Idaho	Nampa	216,000	Engineering & Manufacturing Solutions
USA	Illinois	Buffalo G	189,000	Engineering & Manufacturing Solutions
USA	Wisconsin	Neeah	105,000	Engineering & Manufacturing Solutions
USA	Wisconsin	Neeah	104,000	Engineering & Manufacturing Solutions
USA	California	Fremont	46,000	Engineering & Manufacturing Solutions
USA	Wisconsin	Neeah	39,000	Engineering & Manufacturing Solutions
USA	Colorado	Louisville	27,000	Engineering & Manufacturing Solutions
USA	North Carolina	Raleigh	25,000	Engineering & Manufacturing Solutions
USA	California	San Diego	198,000	Engineering & Manufacturing Solutions

Source: Citi Research

Figure 837. Polycom Inc

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina				Office
Australia		Sydney		Office
Australia		Brisbane		Office
Australia		Canberra		Office
Australia		Melbourne		Office
Australia		Perth		Office
Belgium				Office
Brazil		Sao Paulo		Office
Canada		San Jose		Office
Canada		Toronto		Office
China		Beijing		Office
China		Chengdu		Office
China		Guangzhou		Office
China		Jinan		Office
China		Shanghai		Office
China		Shenyang		Office
China		Xi'an		Office
Denmark				Office
Finland				Office
France				Office
Germany		Hallbergmoos		Office
India	Haryana	Gurgaon		Sales and Marketing Office
India	Karnataka	Bangalore		Office
India		Hyderabad		Office
India	West Bengal	Kolkata		Office
India	Maharashtra	Mumbai		Office
Indonesia		Jakarta		Office
Israel				Office
Italy	Lombardy	Milan		Office
Japan		Tokyo		Office
Malaysia		Kuala Lumpur		Office
Mexico				Office
Netherlands		Amsterdam		Office
New Zealand		Auckland		Office
Norway				Office
Philippines				Office
Poland		Warsaw		Office
Russia		Moscow		Office
Singapore				Office
South Korea		Seoul		Office
Spain		Madrid		Office
Sweden		Stockholm		Office
Switzerland		Zurich		Office
Taiwan		Taipei		Office
Thailand		Bangkok		Office
Turkey		Istanbul		Office
UK	Berkshire			Office
United Arab Emirates		Dubai		Office
USA	California	San Jose		Headquarter
USA	Massachusetts	Andover		Office
USA	Georgia	Atlanta		Office
USA	Texas	Austin		Office
USA	Massachusetts	Burlington		Office
USA	Oregon	Corvallis		Office
USA	Rhode Island	East Providence		Office
USA	California	El Segundo		Office
USA	Ohio	Englewood		Office
USA	Virginia	Herndon		Office
USA	Massachusetts	Marlborough		Office
USA	Massachusetts	Newton		Office
USA	New York	New York		Office
USA	Illinois	Rosemont		Office
USA	California	Tracy		Office
USA	Massachusetts	Westborough		Office
USA	Colorado	Westminster		Office
USA	British Columbia	Burnaby		Office
Vietnam		Hanoi		Office

Source: Citi Research

Figure 838. Powertech Technology

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Suzhou		Plant
China		Suzhou		Semiconductor Testing Design
Singapore				Investment Business
Taiwan		Hsinchu		Headquarters
Taiwan	Miaoli			Semiconductor Assembly and testing
UK	British Virgin Islands			
USA				Sales and marketing

Source: Citi Research

Figure 839. Qlogic Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Hong Kong			
China		Beijing		
France				
Germany		Munich		
India	Maharashtra	Pune		
India		Bangalore		
Ireland				
Japan		Tokyo		
Singapore				
Taiwan		Taoyuan City		
UK		Camberley		
USA	California	Aliso Viejo	195000	Headquarters
USA	California	Roseville		
USA	California	Mountain View		
USA	Minnesota	Shakopee	100000	

Source: Citi Research

Figure 840. Qualcomm Incorporated

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		
Australia	New South W	Sydney		
Austria		Vienna		
Belgium		Brussels		
Brazil		Sao Paulo		
Brazil		Brasilia		
Canada	Ontario	Kanata		
Canada	Ontario	Markham		
Canada	Ontario	Toronto		
Canada	Ontario	Windsor		
Canada	Quebec	Montreal		
China		Beijing		
China		Shanghai		
China		Shenzhen		
China		Xi'an		
China	Hong Kong			
China		Macau		
Egypt		Cairo		
Finland		Espoo		
Finland		Tampere		
France		Issy les Moulineaux		
France		Paris		
Germany	Bavaria	Munich		
Germany	Bavaria	Nuremberg		
Germany	Hesse	Sulzbach		
Germany	North Rhine-W	Munster		
Greece		Athens		
India	Andhra Pradesh	Hyderabad		
India		Delhi		
India	Karnataka	Bangalore		
India	Maharashtra	Mumbai		
India	Tamil Nadu	Chennai		
Indonesia	Java	Jakarta		
Ireland		Dublin		
Israel		Haifa		
Israel		Beit Shemesh		
Israel		Hod Hasharon		
Israel		Tel Aviv		
Italy	Lazio	Rome		
Japan		Osaka		
Japan		Tokyo		
Kenya		Nairobi		
Mexico		Mexico City		
Mexico		Tijuana		
Netherlands	Utrecht	Breukelen		
Netherlands		Waalre		
New Zealand		Auckland		
Nigeria		Lagos		
Philippines		Manila		
Poland		Warsaw		
Russia		Moscow		
Saudi Arabia		Riyadh		

Source: Citi Research

Figure 841. Qualcomm Incorporated (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Singapore		Singapore		
South Africa	Gauteng	Johannesburg		
South Korea		Seoul		
South Korea	Gyeonggi-do	Suwon		
Spain		Madrid		
Sweden	Scania	Lund		
Sweden		Stockholm		
Switzerland	Baden	Mägenwil		
Taiwan		Hsinchu		
Taiwan		Longtan		
Taiwan		New Taipei		
Taiwan		Taipei		
Turkey		Istanbul		
UK		Cambridge		
UK		Farnborough		
UK		London		
UK		Poole		
United Arab Emirates		Dubai		
USA	California	San Diego		
USA	California	Berkeley		
USA	California	Carlsbad		
USA	California	Irvine		
USA	California	San Francisco		
USA	California	San Jose		
USA	California	Santa Clara		
USA	Arizona	Chandler		
USA	Colorado	Boulder		
USA	Columbia	Washington		
USA	Florida	Ocala		
USA	Florida	Orlando		
USA	Georgia	Atlanta		
USA	Massachusetts	Andover		
USA	Massachusetts	Boxborough		
USA	Massachusetts	Marblehead		
USA	Michigan	Woodhaven		
USA	Nevada	Las Vegas		
USA	New Hampshire	Portsmouth		
USA	New Jersey	Bridgewater		
USA	New York	Amherst		
USA	North Carolina	Clemmons		
USA	North Carolina	Raleigh		
USA	Texas	Austin		
USA	Utah	South Jordan		
USA	Washington	Bellevue		
USA	Washington	Seattle		
Vietnam		Hanoi		
Vietnam		Ho Chi Minh City		

Source: Citi Research

Figure 842. Quanta Computer

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai		Quanta Shanghai Manufacture City
China	Jiangsu			Tech-Full (Changshu) Computer Co., Ltd
China		Chongqing		Tech-Front (Chongqing) Computer Co., Ltd.
Germany	North Rhine-Westphalia	Aachen		QCG Computer GmbH
Taiwan				Quanta Computer Inc
USA	California	Fremont		Quanta Computer USA Inc.
USA	Tennessee	La Vergne		Quanta Computer Nashville, LLC.

Source: Citi Research

Figure 843. Radian Opto-Electronics

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Jiangsu	Wujiang		3 offices + 3 factories
China	Jiangsu	Nanjing		1 office + 1 Factory
China		Guangzhou		1 office + 1 Factory
Taiwan		Kaohsiung		Headquarters + 6 factories

Source: Citi Research

Figure 844. Rambus

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
France		Paris		Regional Office
				Administrative offices, research and development and service functions
India	Karnataka	Bangalore		Research and development
Italy	Monza and Brianza	Burago di Molgora		Business development
Japan		Tokyo		Business development
South Korea		Seoul		Business development
Taiwan		Taipei		Business development
United States	California	Sunnyvale		Corporate Headquarters
United States	Ohio	Brecksville		Research and development and prototyping facility
United States	North Carolina	Chapel Hill		Research and development
United States	California	San Francisco		Research and development

Source: Citi Research

Figure 845. REC Solar

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai		Solar sourcing
Germany		Munich		Solar Sales Office
Germany		Munich		Systems and Solutions Offices
India		New Delhi		Solar Sales Office
Japan		Tokyo		Solar Sales Office
Norway		OSLO		Group Headquarters
Singapore				Operating Headquarters/production plant
Singapore				Systems and Solutions Offices
				Solar Sales Office - APAC Regional Office - REC Solar Pte. Ltd.
Singapore				
Thailand		Bangkok		Systems and Solutions Offices
UAE		Dubai		Solar Sales Office/Systems and Solutions Offices
USA	California	San Luis Obispo		Solar Sales Office - North America Regional Office

Source: Citi Research

Figure 846. RF Microdevices

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shenzhen		Sales & Customer Support Center
China		Shanghai		Sales & Customer Support Center; Design Center
China		Beijing		Sales & Customer Support Center
Denmark		Aalborg		Design Center
Finland		Oulu		Sales & Customer Support Center
France		Paris		Design Center
Germany		Nuremberg		Manufacturing Unit
Germany		Munich		Sales & Customer Support Center
India		Bangalore		Sales & Customer Support Center
Japan		Tokyo		Sales & Customer Support Center
South Korea		Seoul		Sales & Customer Support Center
Sweden		Stockholm		Sales & Customer Support Center
Taiwan		Taipei		Sales & Customer Support Center
UK		Reading		Sales & Customer Support Center
UK		Newton Aycliffe		Manufacturing Unit
USA	California	San Jose		Design Center
USA	California	Scotts Valley		Design Center
USA	California	Torrance		Design Center
USA	California	Carlsbad		Design Center
USA	California	Irvine		Design Center
USA	California	San Diego		Sales & Customer Support Center
USA	Arizona	Tempe		Design Center
USA	Arizona	Chandler		Design Center
USA	Colorado	Boulder		Design Center
USA	Colorado	Broomfield		Design Center
USA	Texas	Richardson		Design Center
USA	Iowa	Cedar Rapids		Design Center
USA	Illinois	Chicago		Sales & Customer Support Center
USA	Florida	Brooksville		MCM Manufacturing & Test
USA	North Carolina	Charlotte		Design Center
USA	North Carolina	Greensboro		Headquarters & Manufacturing Unit
USA	Massachusetts	Boston		Design Center

Source: Citi Research

Figure 847. Richtek

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shenzhen		Shenzhen Office
China		Shanghai		Shanghai Office
China		Beijing		Beijing Office
Japan		Tokyo		Japan Office
Netherlands		Eindhoven		Europe Office
South Korea	Gyeonggi-do	Seongnam		Korea Office
Taiwan		Chupai		Headquarters
Taiwan		Taipei		Taipei Office
USA	California	Campbell		US Office

Source: Citi Research

Figure 848. Ricoh Co.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		Sales & Services - Ricoh Argentina, S.A.
Australia	New South Wales			Sales & Services - Ricoh Australia Pty, Ltd.
Austria		Vienna		Sales & Services - Ricoh Austria GmbH
Belgium		Vilvoorde		Sales & Services - Ricoh Belgium N.V.
Brazil		Rio de Janeiro		Sales & Services - Ricoh Brasil, S.A.
Canada	Ontario	Mississauga		Sales & Services - Ricoh Canada, Inc.
Canada	Ontario	Mississauga		Sales & Services - RICOH IMAGING CANADA INC.
Chile		Santiago		Sales & Services - Ricoh Chile, S.A.
China	Hong Kong			Sales & Services - Ricoh Hong Kong Ltd.
China		Shanghai		Sales & Services - Ricoh China Co., Ltd.
				Sales & Services - Ricoh Electronic Technology Co., Ltd.
China		Shanghai		(China)
China		Shanghai		Sales & Services - Ricoh International (Shanghai) Co., Ltd.
China		Shanghai		Sales & Services - RICOH IMAGING CHINA CO.,LTD.
China		Beijing		R&D - Ricoh Software Research Center (Beijing) Co., Ltd.
China		Shanghai		R&D - Ricoh Imaging Technology (Shanghai) Co., Ltd.
China		Shanghai		R&D - Ricoh Electronic Devices Shanghai Co., Ltd.
China		Shenzhen		Manufacturing - Ricoh Asia Industry (Shenzhen) Ltd.
China		Shanghai		Manufacturing - Shanghai Ricoh Digital Equipment Co., Ltd.
China		Shanghai		Manufacturing - Shanghai Ricoh Office Equipment Co., Ltd.
China		Shanghai		Manufacturing - Ricoh Components & Products (Shenzhen) Ltd.
China	Guangdong			Manufacturing - Ricoh Thermal Media (Beijing) Co., Ltd.
China		Beijing		Ltd.
China		Wuxi		Manufacturing - Ricoh Thermal Media (Wuxi) Co., Ltd.
Colombia		Bogota		Sales & Services - Ricoh Colombia, S.A.
Costa Rica		San Jose		Sales & Services - Ricoh Costa Rica, S.A.
Denmark		Vallensbæk		Sales & Services - Ricoh Denmark A/S
El Salvador		San Salvador		Sales & Services - Ricoh El Salvador, S.A. de C.V.
Finland		Espoo		Sales & Services - Ricoh Finland Oy
France		Cedex		Sales & Services - Ricoh France S.A.S.
France		Wettolsheim		Manufacturing - Ricoh Industrie France S.A.S.
				Sales & Services - RICOH IMAGING DEUTSCHLAND
Germany		Hamburg		GmbH
				Sales & Services - European Technology Centre, Ricoh
Germany		Dusseldorf		Europe PLC
Germany		Hannover		Sales & Services - Ricoh Deutschland GmbH
Guatemala		Guatemala City		Sales & Services - Ricoh Guatemala, S.A.
Hungary		Budaors		Sales & Services - Ricoh Hungary Kft.
India	Karnataka	Bangalore		R&D - Ricoh Innovations Private Limited
				Manufacturing - Ricoh Thermal Media Asia Pacific Private Limited
India	Maharashtra	Mumbai		Sales & Services - Ricoh India Limited
India		New Delhi		Sales & Services - Ricoh India Ltd.
Ireland		Dublin		Sales & Services - Ricoh Ireland Ltd.
Italy		Vimodrone, Milan		Sales & Services - Ricoh Italia Srl
Japan		Tokyo		Operations - Ohmori Office
Japan		Tokyo		Operations - Ricoh System Center
Japan		Kanagawa		Operations - Shin-Yokohama Office
Japan		Tokyo		Sales & Services - Ricoh Japan Corporation
Japan		Tokyo		Sales & Services - Ricoh Imaging Company, Ltd.
Japan		Kanagawa		R&D - Ricoh Technology Center
Japan		Osaka		R&D - Ikeda Office
Japan		Miyagi		R&D - General Electronics R&D Center
Japan		Yokohama		R&D - Research and Development Center
Japan		Tokyo		R&D - Ricoh Institute of Sustainability and Business
Japan		Kanagawa		R&D - Ricoh Technologies Co., Ltd.
Japan		Kanagawa		Manufacturing - Atsugi Plant

Source: Citi Research

Figure 849. Ricoh Co. (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Japan		Numazu		Manufacturing - Numazu Plant
Japan		Fukui		Manufacturing - Fukui Plant
Japan		Hyogo		Manufacturing - Yashiro Plant
Japan		Kanagawa		Manufacturing - Service Parts Center
Japan		Hanamaki		Manufacturing - Ricoh Optical Industries Co., Ltd.
Japan		Miyagi		Manufacturing - Hasama Ricoh, Inc.
Japan		Kanagawa		Manufacturing - Ricoh Industry Co., Ltd.
Japan		Nagoya		Manufacturing - Ricoh Elemex Corporation
Japan		Tottori		Manufacturing - Ricoh Microelectronics Co., Ltd.
Japan		Tokyo		Operations - Ricoh Company, Ltd.
Luxembourg		Bertrange		Sales & Services - Ricoh Luxembourg PSF Sàrl
Malaysia		Shah Alam		Sales & Services - Ricoh (Malaysia) Sdn.Bhd.
Mexico				Sales & Services - Ricoh Mexicana, S.A. de C.V.
Netherlands		Amstelveen		Sales & Services - Ricoh Europe (Netherlands) B.V.
Netherlands				Sales & Services - Ricoh Europe SCM B.V.
Netherlands				Sales & Services - Ricoh Nederland B.V.
New Zealand		Auckland		Sales & Services - Ricoh New Zealand Ltd.
Norway		Oslo		Sales & Services - Ricoh Norge A.S.
Panama		Curundu		Sales & Services - Ricoh Panama, S.A.
Peru		Lima		Sales & Services - Ricoh Del Peru S.A.C.
Philippines		Makati		Sales & Services - Ricoh (Philippines), Inc.
Poland		Warsaw		Sales & Services - Ricoh Polska Sp.zo.o.
Portugal		Vila Nova de Gaia		Sales & Services - Ricoh Portugal, Unipessoal, Lda
Puerto Rico		San Juan		Sales & Services - Ricoh Puerto Rico, Inc.
Republica Dominicana		Santo Domingo		Sales & Services - Ricoh Dominicana, S.A.
Russia		Moscow		Sales & Services - Ricoh Rus, Ltd.
				Sales & Services - Ricoh Asia Pacific Pte Ltd. - Regional HQ
Singapore				Sales & Services - Ricoh (Singapore) Pte Ltd.
Singapore				Sales & Services - Ricoh South Africa (Pty) Ltd.
South Africa		Gauteng		Sales & Services - Ricoh Korea Co., Ltd.
South Korea		Seoul		Sales & Services - Ricoh Korea Co., Ltd.
Spain		Barcelona		Sales & Services - Ricoh España S.L.U.
Sweden		Solna		Sales & Services - Ricoh Sverige AB.
Switzerland		Wallisellen		Sales & Services - Ricoh Schweiz AG
Taiwan		Taipei		Sales & Services - Ricoh Taiwan Co., Ltd.
Thailand		Rayong		Manufacturing - Ricoh Manufacturing (Thailand) Ltd.
UK		London		Sales & Services - Ricoh Europe PLC -Regional HQ
UK		Northampton		Sales & Services - Ricoh UK Ltd.
UK		Berks		Sales & Services - RICOH IMAGING UK LTD.
				Sales & Services - European Technology Centre, Ricoh
UK	Middlesex	Feltham		Europe PLC
UK				Manufacturing - Ricoh UK Products Ltd.
USA	Pennsylvania	Malvern		Regional HQ - Ricoh Americas Corporation - Sales & Services
USA	Florida	Weston		Sales & Services - Ricoh Latin America, Inc.
USA	Colorado	Boulder		Sales & Services - Ricoh Production Print Solutions LLC
USA				Sales & Services - RICOH IMAGING AMERICAS CORPORATION
USA	Colorado	Denver		R&D - Ricoh Innovations Corporation
USA	California	Menlo Park		R&D - Ricoh Americas Corporation Advanced
USA	California	Cupertino		Customer Technologies
USA	California	Tustin		Manufacturing - Ricoh Electronics, Inc.
USA	Georgia	Lawrenceville		Manufacturing - Ricoh Electronics, Inc. Georgia Plant
USA	California	Tustin		Manufacturing - Ricoh Development Of California, Inc.
Vietnam		Ho Chi Minh City		Sales & Services - Ricoh Vietnam Company Limited

Source: Citi Research

Figure 850. Riverbed Technology

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		
Australia	New South W	North Sydney		
Australia	Queensland	Brisbane		
Austria		Vienna		
Belgium				
Belgium		Diegem		
Brazil		Sao Paulo		
Canada	Quebec	Montreal		
Canada	Ontario	Mississauga		
China		Shanghai		
China		Beijing		
Colombia		Bogota		
Denmark	Hovedstaden	Ballerup		
Finland		Espoo		
France		Paris		
France		Paris		
Germany		Aschheim		
Germany		Regensburg		
Germany		Stuttgart		
Germany		Ratingen		
Germany		Hamburg		
Germany		Frankfurt		
Hong Kong				
India	Karnataka	Bangalore		
India		New Delhi		
India	Maharashtra	Mumbai		
Indonesia		Jakarta		
Israel		Herzliya		
Italy	Lombardy	Milan		
Japan		Tokyo		
Malaysia	Selangor	Kuala Lumpur		
Mexico				
New Zealand		Auckland		
Philippines		Makati		
Poland		Warsaw		
Russia		Moscow		
Singapore				
South Africa		Pretoria		
South Korea		Seoul		
Spain		Madrid		
Sweden		Stockholm		
Switzerland		Zurich		
Taiwan		Taipei		
USA	California	San Franc	204,716	Headquarters
USA	Maryland	Bethesda	82,000	
USA	California	Sunnyval	67,000	
USA	Texas	Austin		
USA	North Carolin	Cary		
USA	Texas	Dallas		
USA	Pennsylvania	Malvern		
USA	California	Margarita		
USA	Illinois	Champaign		
USA	California	Davis		
USA	New Hampsh	Nashua		
USA	Virginia	Reston		
USA	Texas	The Woodlands		
USA	Massachusetts	Cambridge		
USA	Colorado	Colorado Springs		
USA	California	El Segundo		
USA	New York	El Segundo		
USA	California	Santa Clara		

Source: Citi Research

Figure 851. Rohm

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Dalian		Sales Office
China	Jilin	Changchun		Sales Office
China		Shanghai		Sales, QA & R&D Office
China		Beijing		Sales & R&D Office
China		Ningbo		Sales Office
China		Qingdao		Sales Office
China		Nanjing		Sales Office
China		Suzhou		Sales Office
China		Hangzhou		Sales Office
China		Tianjin		Sales Office
China		Wuhan		Sales Office
China		Wuxi		Sales Office
China		Xi'an		Sales Office
China		Shenzhen		Sales & R&D Office
China		Chengdu		Sales Office
China		Chongqing		Sales Office
China		Dongguan		Sales Office
China		Guangzhou		Sales Office
China		Huizhou		Sales Office
China		Xiamen		Sales Office
China	Guangdong	Zhuhai		Sales Office
China		Tianjin		Overseas Manufacturing Centers
China		Dalian		Overseas Manufacturing Centers
China		Tianjin		Overseas Manufacturing Centers
Finland		Oulu		Sales Office - ROHM Semiconductor GmbH
France		Paris		Sales Office - ROHM Semiconductor GmbH
Germany		Dusseldorf		Sales & QA Office - ROHM Semiconductor GmbH
Germany		Stuttgart		Sales Office - ROHM Semiconductor GmbH
Hong Kong		Kowloon		Sales Office - ROHM Semiconductor Hong Kong
Hungary		Budapest		Sales Office - ROHM Semiconductor India Pvt Ltd.
India	Tamil Nadu	Chennai		Sales Office - ROHM Semiconductor India Pvt Ltd.
India	Karnataka	Bangalore		Sales Office - ROHM Semiconductor India Pvt Ltd.
India		New Delhi		Sales Office - ROHM Semiconductor India Pvt Ltd.
India	Maharashtra	Pune		Sales Office - ROHM Semiconductor India Pvt Ltd.
Italy		Besana Brianza		Sales Office - ROHM Semiconductor GmbH
Japan		Kyoto		Sales Headquarters
Japan		Tokyo		Sales Office
Japan		Yokohama		Sales & R&D Office
Japan		Nagoya		Sales & R&D Office
Japan		Fukuoka		Sales Office
Japan		Hiroshima		Sales Office
Japan		Nagano		Sales Office
Japan	Ibaraki	Mito		Sales Office
Japan		Hachioji		Sales Office
Japan		Sendai		Sales Office
Japan	Gunma	Takasaki		Sales Office
Japan		Hamamatsu		Manufacturing Centers
Japan		Okayama		Manufacturing & Distribution Centers
Japan		Fukuoka		Manufacturing Centers
Japan		Kyoto		Manufacturing Centers
Malaysia		Petaling Jaya		Sales Office
Malaysia		Penang		Sales Office
Malaysia	Kelantan	Kota Bharu		Overseas Manufacturing Centers
Philippines		Muntinlupa		Sales Office
Philippines	Cavite			Overseas Manufacturing Centers
Russia		Moscow		Sales Office
Singapore				Sales Office
South Korea		Seoul		Sales & QA Office
South Korea		Cheonan		Sales Office
South Korea		Gumi		Sales Office
South Korea		Changwon		Sales Office
South Korea		Suwon		Sales Office
South Korea		Seoul		Overseas Manufacturing Centers
Spain		Barcelona		Sales Office
Taiwan		Taipei		Sales Office
Taiwan		Kaohsiung		Sales Office
Thailand		Bangkok		Sales Office
Thailand	Pathumthani			Overseas Manufacturing Centers
Thailand	Saraburi			Overseas Manufacturing Centers
UK		Milton Keynes		Sales Office - ROHM Semiconductor GmbH
USA	California	San Diego		Sales & R&D Office
USA	California	Santa Clara		Sales & R&D Office
USA	Georgia	Atlanta		Sales Office - ROHM Semiconductor U.S.A.,LLC
USA	Massachusetts	Boston		Sales Office - ROHM Semiconductor U.S.A.,LLC
USA	Illinois	Chicago		Sales Office - ROHM Semiconductor U.S.A.,LLC
USA	Texas	Dallas		Sales Office - ROHM Semiconductor U.S.A.,LLC
USA	Colorado	Denver		Sales Office - ROHM Semiconductor U.S.A.,LLC
USA	Michigan	Detroit		Sales Office - ROHM Semiconductor U.S.A.,LLC

Source: Citi Research

Figure 852. Samsung Electro-Mechanics

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil		Sao Paulo		Overseas Sales Offices
Canada		Toronto		Overseas Sales Offices
China	Guangdong	Dongguan		Overseas Production Subsidiaries
China		Tianjin		Overseas Production Subsidiaries
China	Jiangsu			Overseas Production Subsidiaries
China	TEDA West District			Overseas Branch Production Plants
China		Suzhou		Overseas Branch Production Plants
China	Hong Kong			Overseas Sales Offices
China	Futian	Shenzhen		Overseas Sales Offices
China		Shanghai		Overseas Sales Offices
China		Beijing		Overseas Sales Offices
Finland		Espoo		Overseas Sales Offices
Germany	Hesse	Schwalbach am Taunus		Overseas Sales Offices
Hungary		Szigetszentmiklós		Overseas Branch Production Plants
India		New Delhi		Overseas Sales Offices
India	Karnataka	Bangalore		Overseas Sales Offices
Japan		Tokyo		Overseas Sales Offices
Japan		Shizuoka		Overseas Sales Offices
Japan		Osaka		Overseas Sales Offices
Malaysia	Penang	Gelugor		Overseas Sales Offices
Philippines		Calamba		Overseas Production Subsidiaries
Philippines		Manila		Overseas Sales Offices
Singapore				Overseas Sales Offices
South Korea	Gyeonggi-do	Suwon		Headquarters - Suwon Plant
South Korea		Sejong		Sejong Plant
South Korea	Gangseo	Busan		Bussan Plant
South Korea	Seocho Distric	Seoul		Seoul Office
Taiwan		Taipei		Overseas Sales Offices
Thailand	Chachoengsao			Overseas Production Subsidiaries
Thailand	Ratchasima	Khon		Overseas Production Subsidiaries
Thailand		Bangkok		Overseas Sales Offices
Turkey		Istanbul		Overseas Sales Offices
UK	Surrey			Overseas Sales Offices
USA	California	Irvine		Overseas Sales Offices
USA	California	San Jose		Overseas Sales Offices
USA	Illinois	Chicago		Overseas Sales Offices
USA	Arizona	Phoenix		Overseas Sales Offices
Vietnam		Hanoi		Overseas Sales Offices

Source: Citi Research

Figure 853. Samsung Electronics

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil		Sao Paulo		Brazil - Samsung Medison Do Brasil Ltda.
Canada	Ontario	Mississauga		SAMSUNG Electronics Canada, Inc.
China		Beijing		Samsung (CHINA) Investment Electronics Co.,Ltd.
France		Paris		France - Samsung Electronics France
Germany		Schwalbach am Taunus		Germany - Samsung Electronics GmbH
India	Haryana	Gurgaon		India - Samsung India Electronics Private Limited
Italy	Lombardy	Milan		Italy - Samsung Electronics Italia SPA
Japan		Tokyo		Japan - Samsung Electronics Japan Co.,Ltd.
South Korea		Seoul		HQ - Samsung Electronics
USA	New Jersey	Ridgefield Park		USA - Samsung Electronics America, Inc.
USA	Texas	Richardson		SAMSUNG Telecommunications America, LLC

Source: Citi Research

Figure 854. Samsung SDI

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shenzhen		Shenzhen Subsidiary ( SSDI )
China		Shanghai		Shanghai Subsidiary ( SSED )
China	Hong Kong			Hong Kong Subsidiary ( SDIH )
China		Tianjin		Tianjin Subsidiary ( TSDI )
China		Beijing		Beijing Office
Germany		Ismaning		Germany/Europe Subsidiary
Hungary		Ipartelp		Hungarian Plant ( SDIHU )
India		New Delhi		India Office
Japan		Tokyo		Tokyo Subsidiary
Malaysia	Negeri Semb	Sungai Gadut		Malaysian Plant ( SDI(M) )
Mexico		Tijuana		Mexican Plant ( SDIM )
South Korea	Gyeonggi-do	Yongin		Samsung SDI Headquarters
South Korea	Chungcheong	Cheonan		Samsung SDI Cheonan
South Korea		Ulsan		Samsung SDI Ulsan
Taiwan		Taipei		Taiwan Branch
USA	California	San Jose		Americas Subsidiary ( SDIA )
VietNam		Yentrung		VietNam Plant

Source: Citi Research

Figure 855. Samsung Techwin

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai		Shanghai Office
China		Tianjin		Tianjin Office
Italy		Milan		Milan Office
Russia		Moscow		Moscow Office
South Korea	Gyeonggi-do	Seongnam-si		Headquarters, R&D Center
United Arab Emirates		Dubai		Dubai Office
USA	Texas	Houston		Houston Design & Development Center, USA

Source: Citi Research

Figure 856. Sanmina

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires	1,335	Logistics/Post-Manufacturing Repair/Warranty
Australia			7,105	Logistics/Post-Manufacturing Repair/Warranty & PCBA
Brazil		Multiple	265,933	& System Assembly
				Design & JDM, New Product Introduction, Optical
Canada		Ottawa	183,698	Solutions & PCBA & System Assembly
				Backplanes, Cables, Enclosures, Logistics/Post-
				Manufacturing Repair/Warranty, New Product
				Introduction, Optical Solutions, PCB Fabrication,
China		Multiple	2,813,996	Precision Machining & PCBA & System Assembly
Colombia		Bogota	1,390	Logistics/Post-Manufacturing Repair/Warranty
Czech Republic		Brno	70,870	Logistics/Post-Manufacturing Repair/Warranty
				Enclosures, Logistics/Post-Manufacturing
				Repair/Warranty, New Product Introduction & PCBA &
Finland		Multiple	223,060	System Assembly
				New Product Introduction, PCBA & System Assembly &
Germany		Multiple	363,778	Logistics/Post-Manufacturing Repair/Warranty
Hong Kong			31,457	Enclosures, Logistics/Post-Manufacturing
				Repair/Warranty, New Product Introduction & PCBA &
Hungary		Multiple	592,388	System Assembly
				Design & JDM, Logistics/Post-Manufacturing
				Repair/Warranty, New Product Introduction & PCBA &
India		Chennai	240,700	System Assembly
Indonesia		Batam	99,210	New Product Introduction & PCBA & System Assembly
Ireland		Fermoy	110,000	New Product Introduction & PCBA & System Assembly
				Design & JDM, Logistics/Post-Manufacturing
				Repair/Warranty, New Product Introduction & PCBA &
Israel		Multiple	295,893	System Assembly
				Logistics/Post-Manufacturing Repair/Warranty & PCBA
Malaysia		Penang	516,556	& System Assembly
				Backplanes, Cables, Enclosures, Logistics/Post-
				Manufacturing Repair/Warranty, New Product
				Introduction, Optical Solutions & PCBA & System
Mexico		Multiple	2,021,984	Assembly
				Design & JDM, Logistics/Post-Manufacturing
				Repair/Warranty, New Product Introduction, PCB
Singapore		Multiple	463,019	Fabrication & PCBA & System Assembly
South Africa		Johannes	3,670	Logistics/Post-Manufacturing Repair/Warranty
Sweden		Ornskold	77,425	PCBA & System Assembly
				Logistics/Post-Manufacturing Repair/Warranty & PCBA
Thailand		Phatum T	326,293	& System Assembly
				Logistics/Post-Manufacturing Repair/Warranty &
UK		Multiple	38,203	Cables
				Backplanes, Cables, Enclosures, Logistics/Post-
				Manufacturing Repair/Warranty, Design & JDM,
				Modular Solutions, New Product Introduction, Optical
				Solutions, PCB Fabrication, PCBA & System Assembly &
USA		Multiple	2,918,982	Precision Machining

Source: Citi Research

Figure 857. Seagate Technology

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Suzhou	1,103,000	Manufacture of drives
China		Wuxi	716,000	Manufacture of drives and drive subassemblies
Ireland		Springtown		Manufacture of recording heads
Malaysia		Johor	631,000	Manufacture of substrates
Malaysia		Penang	390,000	Manufacture of drive subassemblies
Singapore		Woodlands	1,404,000	Manufacture of media
Singapore		Ang Mo Kio	258,000	Manufacturing support, product development and
				administrative
			110,000	Product development
Singapore			220,000	Product development
South Korea		Suwon		Product development
Thailand		Korat	1,716,000	Manufacture of drives and drive subassemblies
Thailand		Teparuk	362,000	Manufacture of drive subassemblies
				Product development and marketing and
USA		California	895,000	administrative
USA		Colorado	528,000	Product development
				Manufacture of recording heads and product
USA		Minnesota	1,085,000	development
USA		Oklahoma	150,000	Administrative

Source: Citi Research

Figure 858. Seiko Epson

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		Epson Argentina, SRL
Australia	New South W	Sydney		Epson Australia Pty. Ltd.
Austria				Epson Deutschland GmbH
Belgium				Epson Europe B.V.
Brazil		Sao Paulo		Epson do Brasil Industria e Comercio Ltda.
Brazil		Rio De Janeiro		Epson Rio De Janeiro Importadora e Exportadora Ltda
Brazil		Sao Paulo		Manufacturing Subsidiaries and Affiliates - Epson Paulista Ltda.
Canada	Ontario			Epson Canada, Ltd.
Canada	British Colum	Vancouver		R&D Subsidiaries and Affiliates - Epson Research and Development, Inc., Vancouver Design Center
Canada				R&D Subsidiaries and Affiliates - Epson Canada Ltd.(Development Center)
Chile		Santiago		Epson Chile S.A.
China		Beijing		Regional Headquarters - Epson (China) Co., Ltd.
China	Hong Kong			Epson Hong Kong Ltd.
China	Hong Kong			Representative Offices/Branches - Seiko Epson Corporation
China		Tianjin		Manufacturing Subsidiaries and Affiliates - Tianjin Epson Co., Ltd.
China		Zhenjiang		Manufacturing Subsidiaries and Affiliates - Epson Surface Engineering (Zhenjiang) Co. Ltd.
China		Suzhou		Manufacturing Subsidiaries and Affiliates - Epson Precision Suzhou Co., Ltd
China		Shanghai		Manufacturing Subsidiaries and Affiliates - Shanghai Epson Magnetics Co., Ltd.
China		Fujian		Manufacturing Subsidiaries and Affiliates - Fujian Epson Co., Ltd.
China		Shenzhen		Manufacturing Subsidiaries and Affiliates - Epson Engineering (Shenzhen) Ltd.
China		Shenzhen		Manufacturing Subsidiaries and Affiliates - E&G Electronic (Shenzhen) Ltd.
China		Shenzhen		Manufacturing Subsidiaries and Affiliates - Epson Precision (Hong Kong) Ltd.
China	Hong Kong			Manufacturing Subsidiaries and Affiliates - Epson Wuxi Co., Ltd.
China		Wuxi		Manufacturing Subsidiaries and Affiliates - Epson Precision (Shenzhen) Ltd.
China	Shenzhen			Epson Colombia Ltda.
Colombia		Bogota		Epson Costa Rica, S.A.
Costa Rica		San Jose		Epson Europe B.V.
Czech Republic				Epson (U.K.) Ltd., Denmark Office
Denmark				Epson Europe Electronics GmbH
Finland				Epson (U.K.) Ltd., Finland Office
France		Paris		Epson France S.A.
Germany		Meerbusch		Epson Deutschland GmbH
Germany		Munich		Epson Europe Electronics GmbH
Greece				Epson Italia S.p.A.
Guatemala				Epson Guatemala, S.A.
Hungary				Epson Europe B.V.
India	Karnataka	Bangalore		Epson India Pvt. Ltd.
Indonesia		Jakarta		P.T. Epson Indonesia
Indonesia				Manufacturing Subsidiaries and Affiliates - P.T.Epson Batam
Indonesia				Manufacturing Subsidiaries and Affiliates - P.T.Indonesia Epson Industry
Ireland				Epson (U.K.) Ltd., Ireland Office
Israel				Epson Europe B.V. Israel Office
Italy		Milan		Epson Italia S.p.A.
Kazakhstan				Epson Europe B.V. Kazakhstan Office
Latvia				Epson Europe B.V. Baltic Office (Latvia)
Malaysia		Subang Jaya		Epson Malaysia Sdn. Bhd.

Source: Citi Research

Figure 859. Seiko Epson (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Malaysia				Manufacturing Subsidiaries and Affiliates - Epson Precision (Johor) Sdn. Bhd.
Malaysia				Manufacturing Subsidiaries and Affiliates - Epson Precision Malaysia Sdn. Bhd.
Mexico		Mexico City		Epson Mexico, S.A. de C.V.
Netherlands		Amsterdam		Regional Headquarters - Epson Europe B.V.
Norway				Epson (U.K.) Ltd., Norway Office
Norway				R&D Subsidiaries and Affiliates - Epson Norway
Norway				Research And Development AS
Peru		Lima		Epson Peru, S.A.
Philippines		Manila		Epson Philippines Corporation
Philippines		Cabuyao		Manufacturing Subsidiaries and Affiliates - Epson Precision (Philippines) Inc.
Poland				Epson Europe B.V.
Portugal		Lisbon		Epson Iberica S.A. Sucursal em Portugal
Romania				Epson Europe B.V.
Russia				Epson Europe B.V.
Russia		Moscow		Epson CIS Ltd.
Saudi Arabia				Epson Europe B.V. Saudi Arabia Office
Singapore				Regional Headquarters - Epson Singapore Pte. Ltd.
Singapore				Manufacturing Subsidiaries and Affiliates - Singapore Epson Industrial Pte. Ltd.
South Africa				Epson Europe B.V. South Africa Office
South Korea		Seoul		Epson Korea Co., Ltd.
South Korea		Seoul		Representative Offices/Branches - Seiko Epson Corporation
Spain				Epson Iberica, S.A.
Sweden				Epson (U.K.) Ltd., Sweden Office
Switzerland				Epson Deutschland GmbH
Taiwan		Taipei		Epson Taiwan Technology & Trading Ltd.
Thailand		Bangkok		Epson (Thailand) Co., Ltd.
Thailand				Manufacturing Subsidiaries and Affiliates - Epson Precision (Thailand) Ltd.
Turkey				Epson Italia S.p.A.
UK		Hemel Hempstead		Epson (U.K.) Ltd.
UK		Telford		Manufacturing Subsidiaries and Affiliates - Epson Telford Ltd.
Ukraine				Epson Europe B.V. Kiev Office
United Arab Emirates		Dubai		Epson Europe B.V. Middle East Office
USA	California	Long Beach		Epson America, Inc.
USA	California	Long Beach		Epson Accessories, Inc.
USA	California	San Jose		Epson Electronics America, Inc.
USA	Florida	Miami		Epson Latin America, L.L.C.
USA	Oregon	Portland		Manufacturing Subsidiaries and Affiliates - Epson Portland Inc.
USA				Manufacturing Subsidiaries and Affiliates - Epson El Paso, Inc.
USA	Texas	El Paso		Manufacturing Subsidiaries and Affiliates - Epson Seattle, Inc.
USA				R&D Subsidiaries and Affiliates - Epson Research and Development, Inc.
USA	California	San Jose		R&D Subsidiaries and Affiliates - Epson Electronics America, Inc., San Jose ASIC Design Center
Venezuela		Caracas		Epson Venezuela, SAL

Source: Citi Research



Figure 860. Semtech

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada	Ontario	Burlington		
Canada	Calgary			
Canada	Ontario	Kanata		
Canada	Ontario	Toronto		
China	Pudong	Shanghai		
China	Guangdong	Shenzhen		
France	Courtaboeuf			
Germany	Hallbergmoos			
India	Odisha	Bhubaneswar		
Japan		Tokyo		
Japan		Osaka		
Japan		Beijing		
Malaysia	Perak	Ipoh		
Malaysia	Penang			
Mexico	Tamaulipas			Semtech Corpus Christi SA de CV
Mexico	Aguascalientes			
Mexico	Reynosa		30000	
Philippines		Manila		
South Korea		Seoul		
Switzerland		Neuchâtel		
Switzerland		Wil		
Taiwan		Taipei		
UK				
UK	Southampton			
UK	Bristol			
UK	Hertfordshire			
USA	California	Camarillo	87600	
USA	California	San Jose		
USA	California	San Diego	10,000	
USA	California	Irvine	35,000	
USA	California	Redondo	26,300	
USA	North Carolina	Raleigh		

Source: Citi Research

Figure 861. Sensata

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Belgium		Olen		Business Centre
Brazil		Campinas		Business Centre
Bulgaria		Botevgrad		Manufacturing
China		Baoying	440000	Manufacturing
China		Changzhi	252000	Manufacturing
China		Shanghai		Manufacturing
Dominican Republic		Haina	62000	Manufacturing
Japan		Oyama	74000	Manufacturing
Japan		Saitama-Ken		Business Centre
Japan		Shizuoka-ken		Business Centre
Malaysia		Subang Ja	108000	Manufacturing
Mexico	Aguascalientes		444000	Manufacturing
Netherlands		Almelo	188000	Manufacturing
South Korea		Jincheon	133000	Manufacturing
South Korea		Chongcheongnam-do		Business Centre
USA	Massachusetts	Attleboro	433000	Manufacturing
USA	Maryland	Cambridge	157000	Manufacturing
USA	Arizona			Business Centre
USA		Minnesota		Business Centre

Source: Citi Research

Figure 862. Sharp Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South W	Huntingwood		SHARP CORPORATION OF AUSTRALIA PTY. LTD. [Australia]
Austria		Vienna		HEADQUARTERS SHARP ELECTRONICS (EUROPE) GMBH
Belgium		Bijgaarden		SHARP ELECTRONICS BENELUX B.V. BELGIUM BRANCH [Belgium]
Brazil		Sao Paulo		SHARP BRAZIL COMÉRCIO E DISTRIBUIÇÃO DE ARTIGOS ELETRÔNICOS LTDA [Brazil]
Canada	Ontario	Mississauga		SHARP ELECTRONICS OF CANADA LTD. [Canada]
China	Hong Kong			SHARP-ROXY (HONG KONG) LTD. [Hong Kong]
China		Macau		SHARP-ROXY (HONG KONG) LTD. MACAU AUTHORIZED SERVICE STATION [Macau]
China		Shanghai		SHARP ELECTRONICS SALES (CHINA) CO., LTD. [China]
France		Cedex		SHARP ELECTRONICS FRANCE S.A. [France]
Germany		Hamburg		SHARP ELECTRONICS GMBH [Germany/Austria]
India	Maharashtra	Pune		SHARP INDIA LIMITED [India]
India		New Delhi		SHARP BUSINESS SYSTEMS (INDIA) LIMITED [India]
Indonesia		Jakarta		P.T. SHARP ELECTRONICS INDONESIA [Indonesia]
Italy		Milan		SHARP ELECTRONICS (ITALIA) S.P.A. [Italy]
				SHARP CORPORATION, Customer Assistance Center [Japan]
Japan				SHARP-ROXY SALES & SERVICE COMPANY (M) SDN. BHD. [Malaysia]
Malaysia	Selangor	Shah Alam		
Mexico		Mexico City		SHARP CORPORATION MEXICO S.A DE C.V. [Mexico]
Netherlands		Houten		SHARP ELECTRONICS BENELUX B.V. [Netherlands]
New Zealand		Auckland		SHARP CORPORATION OF NEW ZEALAND LTD. [New Zealand]
Philippines		Muntinlupa		SHARP (PHILS.) CORPORATION [Philippines]
Poland		Warsaw		Sharp Electronics (EUROPE) GMBH Spółka z o. o., Oddział w Polsce [Poland]

Source: Citi Research

Figure 863. Sharp Corp (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Russia		Moscow		SHARP ELECTRONICS RUSSIA LLC. [Russian Federation]
				SHARP-ROXY SALES (SINGAPORE) PTE. LTD. [Singapore]
Singapore				
Spain		Barcelona		SHARP ELECTRONICA ESPAÑA, S.A. [Spain]
Sweden		Bromma		SHARP ELECTRONICS (NORDIC) AB [Sweden]
Switzerland		Ruschlikon		SHARP ELECTRONICS (SCHWEIZ) AG [Switzerland]
Taiwan		Taipei		SHARP CORPORATION (TAIWAN) [Taiwan]
Thailand		Bangkok		SHARP THAI CO., LTD. [Thailand]
UK	Middlesex	Uxbridge		SHARP ELECTRONICS (U.K.) LTD. [United Kingdom]
United Arab Emirates		Dubai		SHARP MIDDLE EAST FREE ZONE ESTABLISHMENT [U.A.E.]
USA	Tennessee	Memphis		SHARP ELECTRONICS CORPORATION [U.S.A.]
Vietnam		Ho Chi Minh City		SHARP ELECTRONICS (VIETNAM) CO. LTD. [Vietnam]

Source: Citi Research

Figure 864. Shinko Electric

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada	Ontario	Toronto		Sales Office - SHINKO ELECTRIC AMERICA, INC.
China		Shanghai		Head Office - SHANGHAI SHINKO TRADING LTD.
China		Chengdu		Sales Office - SHANGHAI SHINKO TRADING LTD.
				Plants & Facilities - SHINKO ELECTRIC INDUSTRIES
China	Jiangsu	Wuxi		(WUXI) CO., LTD
Japan		Nagano		Head Office
Japan		Nagano		Wakaho Plant
Japan		Nagano		Takaoka Plant
Japan	Niigata	Myoko		Arai Plant
Japan	Niigata	Agano		Kyogase Plant
Japan		Nagano		SHINKO R&D Center
Japan		Nagano		Kurita Sogo Center
Japan		Fukushima		Aizu Branch
Japan		Tokyo		Sales Office
Japan		Osaka		Sales Office
Japan		Sendai		Sales Office
Japan		Nagano		Sales Office
Japan		Nagoya		Sales Office
Japan	Oita			Sales Office
Japan		Fukuoka		Sales Office
				Plant & Facilities & Sales Office - SHINKO ELECTRONICS
Malaysia		Kuala Lumpur		(MALAYSIA) SDN. BHD.
				Sales Office - SHINKO ELECTRONICS (MALAYSIA) SDN.
Malaysia		Penang		BHD.
				Sales Office - SHINKO ELECTRONICS (MALAYSIA) SDN.
Malaysia		Melaka		BHD.
				Sales Office - SHINKO ELECTRONICS (SINGAPORE) PTE.
Singapore				LTD.
South Korea		Seoul		Sales Office - KOREA SHINKO TRADING CO., LTD.
				Plants & Facilities - KOREA SHINKO
South Korea	Jeollanamdo	Suncheon		MICROELECTRONICS CO., LTD.
Taiwan		Taipei		Head Office - TAIWAN SHINKO ELECTRONICS CO., LTD.
Taiwan		Kaohsiung		Sales Office - TAIWAN SHINKO ELECTRONICS CO., LTD.
				Sales Office - SHINKO MICROELECTRONICS (THAILAND)
Thailand		Bangkok		CO., LTD.
USA	California	San Jose		Head Office - SHINKO ELECTRIC AMERICA, INC.
USA	Texas	Dallas		Sales Office - SHINKO ELECTRIC AMERICA, INC.
USA	Arizona	Phoenix		Sales Office - SHINKO ELECTRIC AMERICA, INC.
USA	Vermont	Burlington		Sales Office - SHINKO ELECTRIC AMERICA, INC.
USA	Texas	Austin		Sales Office - SHINKO ELECTRIC AMERICA, INC.
USA	California	San Diego		Sales Office - SHINKO ELECTRIC AMERICA, INC.
USA	Washington	Bellevue		Sales Office - SHINKO ELECTRIC AMERICA, INC.

Source: Citi Research

Figure 865. Silicon Laboratories Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil		São Paulo		
China		Shenzhen		
France	Essonne	Les Ulis		
Germany	Bavaria	Hallbergmoos		
Hong Kong		Tsim Sha Tsui		
Italy		Gallarate		
Japan		Tokyo		
Singapore		Serangoon North Avenue		
Singapore				
South Korea		Seoul		
Taiwan		Taipei		
UK	Camberley	Surrey		
USA	Texas	Austin	441,000	
USA	California	Sunnyvale		
USA	Indiana	Carmel		
USA	New Jersey	Shrewsbury		

Source: Citi Research

Figure 866. Silitech

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Guangdong	Shenzhen		
China	Jiangsu	Changshu		
China	WuZhong	Suzhou		
China	Hong Kong			
Malaysia		Penang		
Taiwan		Taipei		
UK		Oxfordshire		

Source: Citi Research

Figure 867. Simplo

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Taiwan		Hsinchu		

Source: Citi Research

Figure 868. SK Hynix

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Jiangsu	Wuxi		Headquarters, SK hynix Semiconductor (China) Ltd.
China	Hong Kong			Headquarters, SK hynix Semiconductor Hong Kong Ltd.
China		Shanghai		Headquarters, SK hynix Semiconductor (Shanghai) Co. Ltd.
China		Beijing		Beijing Office
China		Shenzhen		Shen Zhen Office
China		Chongqing		Chongqing Office
China	Jiangsu	Wuxi		Headquarters, SK hynix Semiconductor Sales Ltd.
Finland		Espoo		Helsinki Office
France	Cedex	Paris		Paris Office
Germany		Raunheim		Headquarters, SK hynix Deutschland GmbH
India	Karnataka	Bangalore		Headquarters, SK hynix Semiconductor India Pvt. Ltd.
Ireland		Dublin		Dublin Office
Italy	Agrate Brianza			Headquarters, SK hynix Italy S.r.l.
Japan		Tokyo		Headquarters, SK hynix Japan Inc.
Japan		Osaka		Osaka Office
Malaysia	Penang	Bayan Lepas		Penang Office
Russia		Moscow		Moscow Office
Singapore				Headquarters, SK hynix Asia Pte. Ltd.
South Korea	Gyeonggi-do	Icheon		Headquarters
South Korea		Seoul		Marketing & Sales Division
South Korea	Chungcheong	Cheongju		
South Korea	Gyeonggi-do	Seongnam-si		Flash Solution Design Center
Sweden		Stockholm		Stockholm Office
Taiwan		Taipei		Headquarters, SK hynix Semiconductor Taiwan Inc.
Taiwan		Zhubei		Headquarters, SK hynix flash solutions Taiwan Ltd.
UK		Surrey		Headquarters, SK hynix UK Limited
USA	California	San Jose		Headquarters, SK hynix America Inc. Pin - 3101
				Headquarters, SK hynix memory solutions Inc. Pin - 3103
USA	California	San Jose		
USA	Texas	Austin		Austin Office
USA	Texas	Houston		Houston Office
USA	North Carolina	Raleigh		Raleigh office

Source: Citi Research

Figure 869. Skyworks

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Beijing		
China		Shanghai		
China		Shenzhen		
Finland		Espoo		
France		Paris		
Japan		Tokyo		
Mexico		Mexicali	380000	Manufacturing and office space
Singapore				
South Korea		Seoul	22900	Design Center
Taiwan		Taipei		
UK	Hertfordshire			
USA	Massachusetts	Woburn	158000	Corporate headquarters and manufacturing
USA	California	Santa Clara	42200	Design Center
USA	California	Irvine	63400	Design Center
USA	Maryland	Adamstown	121200	Manufacturing and office space
USA	California	Newbury	111600	Manufacturing and office space
USA	California	Newbury	108400	Design Center
USA	Iowa	Cedar Rapids	42900	Design Center

Source: Citi Research

Figure 870. SMA Solar Tech

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South Wales	North Ryde		SMA Australia Pty Ltd
Belgium		Mechelen		SMA Benelux bvba / sprl
Canada	Ontario	Mississauga		SMA Canada, Inc
Chile		Santiago		SMA South America SpA
China	Haidian	Beijing		SMA Beijing Commercial Company Ltd.
Czech Republic		Praha		SMA Central & Eastern Europe s.r.o
France		Saint Priest		SMA France S.A.S
Germany	Hesse	Niestetal		
Germany		Kassel		SMA Solar Technology GmbH
Germany		Niestetal		SMA Railway Technology GmbH
Greece		Athens		SMA Hellas AE
India	Maharashtra	Mumbai		SMA Solar India Pvt. Ltd
Italy	Lombardy	Milan		SMA Italia S.r.l.
Japan		Tokyo		SMA Japan K.K.
Poland		Zabierzów		dtw sp.z. o.o
Portugal		Pinhal Novo		SMA Solar Technology Portugal, Unipessoal LDA
South Africa	Gauteng	Pretoria		SMA Solar Technology South Africa Pty Limited
South Korea		Seoul		SMA Technology Korea Co., Ltd.
Spain		Barcelona		SMA Iberica Tecnologia Solar, S.L.
Thailand		Bangkok		SMA Solar (Thailand) Co., Ltd.
UK	Buckinghamshire	Milton Keynes		SMA Solar UK Ltd.
United Arab Emirates		Abu Dhabi		SMA Middle East Limited
USA	California	Rocklin		SMA America, LLC
USA	Colorado	Denver		SMA America Production

Source: Citi Research

Figure 871. SolarWorld AG

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
France		Grenoble		SOLARWORLD FRANCE
Germany		Bonn		Sales center
Germany		Rheinfelden		
Germany		Freiberg		
Singapore				SolarWorld Asia Pacific Pte Ltd.
South Africa		Cape Town		SOLARWORLD AFRICA PTY. LTD.
Spain		Madrid		SolarWorld Ibérica
UK		Salisbury		
United Arab Emirates		Qatar		
USA	California	Camarillo		Sales, Service & Technical Support
USA	Oregon	Hillsboro		Manufacturing

Source: Citi Research

Figure 872. Sony

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia				Sony Australia Ltd.
Brazil				Sony Brasil Ltda.
Canada				Sony of Canada Ltd.
China	Hong Kong			Sony Corporation of Hong Kong Ltd.
China				Sony (China) Limited
Germany				Sony Deutschland G.m.b.H.
India				Sony India Pvt. Ltd.
Japan		Shinagawa		Gotenyama Technology Center
Japan		Koto		Ariake Business Center
Japan		Kanagawa		Atsugi Technology Center
Japan		Kanagawa		Atsugi Technology Center No.2
Japan		Fujisawa		Shonan Technology Center
Japan		Tagajo		Sendai Technology Center
Japan		Azumino		Nagano Business Center
Japan		Minato		Sony Corporation
Japan		Shinagawa		Sony City Osaka
Mexico				Sony de Mexico S.A. de C.V.
Singapore				Sony Electronics (Singapore) Pte. Ltd.
South Korea				Sony Korea Corporation
Taiwan				Sony Taiwan Limited.
Thailand				Sony Thai Co., Ltd.
USA				Sony Corp. of America

Source: Citi Research

Figure 873. Spansion

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Beijing		Spansion Beijing office
				Spansion Semiconductor (China) Ltd. (Shanghai Branch), Design Centers and Specialized Centers of Excellence
China		Shanghai		
China		Shanghai		Spansion Semiconductor Trading (Shanghai) Co., LTD, Design Centers and Specialized Centers of Excellence
China		Shenzhen		Spansion Semiconductor Trading (Shanghai) Co., LTD Shenzhen Branch
France		Paris		Spansion EMEA, Design Centers and Specialized Centers of Excellence
Germany		Munich		Spansion International Inc., Design Centers and Specialized Centers of Excellence
Israel		Netanya		Design Centers and Specialized Centers of Excellence
Japan	Kanagawa	Kawasaki		Headquarters, Design Centers and Specialized Centers of Excellence
Japan	Kanagawa	Yokohama		Spansion Microcontroller & Analog Business Group
Malaysia	Penang	Bayan Lepas		Manufacturing Facilities, Design Centers and Specialized Centers of Excellence
Singapore				Spansion Asia Holdings (Singapore) PTE. LTD
South Korea	Gyeonggi-do	Seongnam		Spansion International, Inc. - Korea Branch
				Spansion International, Inc. (Sweden Branch/Stockholm)
Sweden		Stockholm		
Taiwan		Taipei		Spansion International, Inc. - Taiwan Branch
Thailand		Nonthaburi		Manufacturing Facilities
UK	Hampshire	Farnborough		Spansion International Inc
				Headquarters, Design Centers and Specialized Centers of Excellence
USA	California	Sunnyvale		
USA	Texas	Austin		Manufacturing Facilities

Source: Citi Research

Figure 874. SPIL

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Suzhou		Manufacturing
Singapore				Design, manufacturing
Taiwan		Taichung		Headquarters & Da Fong Facility
Taiwan		Hsinchu		Branch Company
Taiwan		Changhua		Changhua Facility
Taiwan	Taoyuan			R & D
UK	British Virgin Islands			
UK	Cayman Islands			
USA	California			Assembly Service Providing
USA	California	San Jose		Communications and Relationship Maintenance

Source: Citi Research

Figure 875. Spirent Communications

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
UK		Crawley		Corporate Head Office
USA	California	Sunnyvale		Operational Head Office

Source: Citi Research

Figure 876. STMicroelectronics

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia		Sydney		Sales Office & Representative
Australia		Melbourne		Sales Office & Representative
Belgium		Zaventem		Manufacturing & Design Center, Sales Office
Brazil		Joinville		Sales Office & Representative
Brazil		Sao Paulo		Sales Office & Representative
Brazil		Manaus		Sales Office & Representative
Canada	Ontario	Thornhill		Manufacturing & Design Center, Sales Office
Canada	Ontario	Nepean		Sales Office & Representative
Canada	Ontario	Mississauga		Sales Office & Representative
China		Shenzhen		Manufacturing & Design Center
China		Shanghai		Manufacturing & Design Center
China	Hong Kong			Manufacturing & Design Center
China		Beijing		Sales Office & Representative
China		Suzhou		Sales Office & Representative
China		Shenzhen		Sales Office & Representative
China		Shanghai		Sales Office & Representative
China	Hong Kong			Sales Office & Representative
Czech Republic		Prague 8		Manufacturing & Design Center
Finland		Nummela		Sales Office & Representative
France		Sofia Antipolis		Manufacturing & Design Center
France		Rennes		Manufacturing & Design Center
France		Grenoble		Manufacturing & Design Center
France		Rousset		Manufacturing & Design Center
France		Paris		Manufacturing & Design Center
France		Crolles		Manufacturing & Design Center
France		Le Mans		Manufacturing & Design Center
France				Manufacturing & Design Center
France		Saint-Genis-Pouilly		Warehouses
Germany		Stuttgart		Sales Office & Representative
Germany		Aschheim		Sales Office & Representative
India	Uttar Pradesh	Greater Noida		Manufacturing & Design Center, Sales Office
India	Karnataka	Bangalore		Sales Office & Representative
India	Maharashtra	Pune		Sales Office & Representative
India	Maharashtra	Mumbai		Sales Office & Representative
Israel		Tel Aviv		Manufacturing & Design Center
Israel		South Netanya		Sales Office & Representative
Italy		Aosta		Manufacturing & Design Center
Italy		Arzano Napoli		Manufacturing & Design Center
Italy		Palermo		Manufacturing & Design Center
Italy		Cornaredo (MI)		Manufacturing & Design Center
Italy	Agrate Brianza			Manufacturing & Design Center
Italy		Catania		Manufacturing & Design Center
Italy		Rome		Sales Office & Representative
Italy		Cornaredo		Sales Office & Representative
Japan		Tokyo		Sales Office & Representative
Japan		Nagoya		Sales Office & Representative
Japan		Osaka		Sales Office & Representative
Japan	Chiba			Warehouses
Malaysia		Muar		Manufacturing & Design Center
Malaysia		Jakarta		Sales Office & Representative
Malaysia		Kuala Lumpur		Sales Office & Representative
Malaysia		Penang		Sales Office & Representative
Malta		Kirkop		Manufacturing & Design Center
Mexico		Mexico City		Sales Office & Representative
Mexico	Nuevo Leon	Monterrey		Sales Office & Representative
Mexico		Guadalajara		Sales Office & Representative
Morocco		Rabat		Manufacturing & Design Center
Morocco		Casablanca		Manufacturing & Design Center
Netherlands		Eindhoven		Sales Office & Representative
Pakistan	Punjab	Lahore		Sales Office & Representative
Philippines		Calamba		Manufacturing & Design Center
Philippines		Pasig City		Sales Office & Representative
Poland		Warsaw		Sales Office & Representative
Russia		Moscow		Sales Office & Representative
Singapore		Singapore		Manufacturing & Design Center
Singapore		Ang Mo Kio		Manufacturing & Design Center

Source: Citi Research

Figure 877. STMicroelectronics (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Singapore		Toa Payoh		Manufacturing & Design Center
Singapore		Singapore		Sales Office & Representative
Singapore		Singapore		Warehouses
South Africa		Johannesburg		Sales Office & Representative
South Korea		Seoul		Manufacturing & Design Center, Sales Office
Spain		Madrid		Manufacturing & Design Center
Spain		Barcelona		Sales Office & Representative
Sweden		Kista		Sales Office & Representative
Switzerland		Geneva		Headquarters, Manufacturing & Design Center
Taiwan		Taipei		Sales Office & Representative
Thailand		Bangkok		Sales Office & Representative
Turkey		Istanbul		Manufacturing & Design Center
Turkey		Pasaport-Konak Izmir		Sales Office & Representative
Turkey		Yesilkoy Istanbul		Sales Office & Representative
UK		Edinburgh		Manufacturing & Design Center
UK		Bristol		Manufacturing & Design Center
UK		Marlow		Manufacturing & Design Center
UK		Marlow Bucks		Sales Office & Representative
USA	Arizona	Scottsdale		Manufacturing & Design Center, Sales Office
USA	California	La Jolla		Manufacturing & Design Center, Sales Office
USA	California	Santa Clara		Manufacturing & Design Center, Sales Office
USA	Illinois	Schaumburg		Manufacturing & Design Center, Sales Office
USA	Michigan	Livonia		Manufacturing & Design Center, Sales Office
USA	Alabama	Huntsville		Sales Office & Representative
USA	New York	Kings Park		Sales Office & Representative
USA	California	Aliso Viejo		Sales Office & Representative
USA	Colorado	Longmont		Sales Office & Representative
USA	Indiana	Kokomo		Sales Office & Representative
USA	Kansas	Schamburg		Sales Office & Representative
USA	Texas	Houston		Sales Office & Representative
USA	Massachusetts	Burlington		Sales Office & Representative
USA	Michigan	Livonia		Sales Office & Representative
USA	Minnesota	Edina		Sales Office & Representative
USA	Missouri	Kansas City		Sales Office & Representative
USA	North Carolina	Cary		Sales Office & Representative
USA	New Jersey	Newark		Sales Office & Representative
USA	Texas	Coppell		Sales Office & Representative
USA	Oregon	Portland		Sales Office & Representative
USA	Pennsylvania	Quakertown		Sales Office & Representative
USA	Pennsylvania	Lancaster		Sales Office & Representative
USA	Pennsylvania	Pittsburgh		Sales Office & Representative
USA	Texas	Austin		Sales Office & Representative
USA	Washington	Redmond		Sales Office & Representative
Vietnam		Hanoi		Sales Office & Representative

Source: Citi Research

Figure 878. Stratasy Ltd

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil		São Paulo		
China	Hong Kong		5165	Objet AP Limited office space
China	Hong Kong		30	Stratasy, Inc. Chinese sales office
China		Shanghai	3227	Objet Shanghai Ltd. office space
Germany		Rheinmu	8571	Objet GMBH office space
Germany		Frankfurt	16081	Stratasy GMBH sales and service office
India		Bangalore	1800	Stratasy, Inc. sales office
Israel		Rehovot	91025	Israeli headquarters
Israel		Kiryat Gat	72118	Resin factory and laboratories
Italy		Genoa	6857	Technimold, S.R.L. sales and service office
Japan		Tokyo	862	Objet Japan Co., Ltd. office space
Japan		Osaka		
South Korea		Seoul		
USA	Minnesota	Eden Prairie	288312	U.S. headquarters and manufacturing facility
USA	Minnesota	Minneapolis	8475	research and development
USA	Massachusetts	Billerica	15000	office space
USA	California	Rancho C	7583	North American sales office
USA	New Hampshire	Merrimack	28590	Solidscape facilities, including manufacturing

Source: Citi Research

Figure 879. SunEdison

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil		São Paulo		
Canada	Ontario	Toronto		
Chile		Santiago		
Greece		Athens		
India	Tamil Nadu	Chennai		
ITALY		Lecce		
Japan		Tokyo		
Mexico				
South Korea		Seoul		
Spain		Madrid		Headquarters
Thailand		Bangkok		
Turkey		Istanbul		
UK		London		
United Arab Emirates		Dubai		
USA	Missouri	O'Fallon		Headquarters
USA	California	Belmont		Headquarters
USA	Arizona	Prescott		
USA	California	McClellan		
USA	California	San Clemente		
USA	California	San Francisco		
USA	California	Belmont		
USA	Colorado	Denver		
USA	Maryland	Beltsville		
USA	New Jersey	Pennsauken		
USA		New York		

Source: Citi Research

Figure 880. SunPower Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia		Victoria		Office
France				Office
Germany		Frankfurt		Office
Greece				Office
India		New Delhi		Office
Israel				Office
Italy				Office
Japan		Tokyo		Office
South Africa		Cape Town		Office
South Korea		Seoul		Office
Spain		Madrid		Office
Switzerland		Geneva	4000	Office
UK		Solihull		Office
USA	California	San Jose	129000	Headquarters
USA	California	Richmond	186000	Office
USA	Texas	Austin		Office
USA	Hawaii	Kailua Kona		Office
USA	California	Roseville		Office
USA	New Jersey	Hamilton		Office
USA	California	Anaheim		Office
USA	Oregon	Portland		Office

Source: Citi Research

Figure 881. Suntech Power Holding

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South Wales	Sydney		
China		Wuxi		
Germany		Frankfurt		
Greece		Athens		
Italy	Agrate Brianza			
Japan		Tokyo		
Netherlands		Meijel		
South Korea		Seoul		
Switzerland		Schaffhausen		
United Arab Emirates		Dubai		
USA	California	San Francisco		

Source: Citi Research

Figure 882. Synnex

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada	Ontario	Toronto		Sales
Canada	Ontario	Markham		
Canada	Quebec	Montreal		Sales
Canada	Ontario	Guelph		SYNNEX Canada
Canada	Alberta	Calgary		Warehouse
Canada	British Columbia	Richmond		
Canada	Nova Scotia	Halifax		Warehouse
USA	California	Fremont		Warehouse, Sales
USA	California	Ontario		Warehouse
USA	California	Carson		Sales
USA	Oregon	Beaverton		Warehouse, Sales
USA	Texas	Dallas		Warehouse, Sales
USA	Mississippi			Warehouse
USA	Florida	Miami		Warehouse, Sales
USA	Georgia	Atlanta		Warehouse, Sales
USA	South Carolina	Greenville		Sales, Headquarters
USA	Illinois	Romeville		Warehouse
USA	Ohio	Grove City		Warehouse
USA	Chantilly	Virginia		Warehouse
USA	New Jersey	Monroe		Warehouse, Sales

Source: Citi Research

Figure 883. Taiyo Yuden

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada	Ontario	Kitchener		Canada Office
China	Jiangsu	Suzhou		Sales Headquarters/Manufacturing
China		Shanghai		Sales Office
China		Beijing		Beijing Office
China		Tianjin		Tianjin Office/Manufacturing
China	Guangdong	Shenzhen		Sales Office
China	Shaanxi	Xi'an		Xi'an Office
China	Sichuan	Chengdu		Chengdu Office
China	Fujian	Xiamen		Xiamen Office
China	Guangdong	Dongguan		Manufacturing Base
Finland		Salo		Finland Office
France	La Chapelle-Saint-Mesmin			France Office
Germany		Fürth		Sales Headquarters
Hong Kong		Kowloon		Sales Office/Manufacturing
Japan		Tokyo		Head Office
Japan	Gunma	Takasaki		Global Center/Sales Offices/R&D
Japan	Miyagi	Sendai		Sales Offices
Japan		Nagoya		Sales Offices
Japan		Osaka		Sales Offices
Japan		Fukuoka		Sales Offices
Japan	Gunma	Takasaki		Haruna Plant
Japan	Gunma	Agatsuma		Nakanajo Plant
Japan	Gunma	Sawa		Tamamura Plant
Japan	Gunma	Takasaki		Yawatabara Plant/Development
Japan	Hyogo	Akashi		Akashi Device R&D Center
Japan	Kanagawa	Yokohama		Development Base
Japan	Saitama	Iruma		Development Base
Malaysia	Selangor			Kuala Lumpur Office/Manufacturing
Malaysia		Penang		Penang Office/Manufacturing
Malaysia	Sarawak	Kuching		Manufacturing Base
Philippines		Cebu City		Manufacturing Base
Singapore				Sales Office/Manufacturing
South Korea	Gyeongsangnam-do	Changwon		Sales Office/Manufacturing /Development
South Korea	Geumcheon-gu			Seoul Office
South Korea	Gyeongsangnam-do	Tongyeong		Manufacturing Base
South Korea	Gyeongsangnam-do	Sachon		Manufacturing Base
Sweden		Skänninge		Scandinavia Office
Taiwan		Taipei		Sales Office/Manufacturing/Development
Thailand		Bangkok		Sales Office/Manufacturing
UK		Oxfordshire		UK Office
USA	Illinois	Schaumburg		Sales Headquarters
USA	California	Solana Beach		San Diego Office
USA	California	San Jose		San Jose Office
USA	Texas	Irving		Dallas Office
USA	Colorado	Fort Collins		Denver Office
USA	New Hampshire	Manchester		Boston Office

Source: Citi Research

Figure 884. Tamron

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Guangdong		TAMRON OPTICAL (FOSHAN) CO., LTD.
China	Hong Kong			TAMRON INDUSTRIES (HONG KONG) LIMITED
China		Shanghai		TAMRON OPTICAL (SHANGHAI) CO., LTD.
France				TAMRON France EURL
Germany				TAMRON Europe GmbH
India	Haryana	Gurgaon		TAMRON INDIA PRIVATE LIMITED
Japan	Saitama			Head Office, Domestic Sales Office
Japan		Osaka		Domestic Sales Office
Japan		Hirosaki		Production Facilities
Japan		Aomori		Production Facilities
Russia		Moscow		TAMRON (Russia) LLC.
USA	New York	Commack		TAMRON USA, INC.
Vietnam		Hanoi		TAMRON OPTICAL (VIETNAM) CO., LTD.

Source: Citi Research

Figure 885. TDK Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil		Sao Paulo		TDK DO BRASIL IND. E COM. LTDA.
Brazil				TDK DA AMAZONIA IMP. E COM. LTDA.
Canada	Ontario			TDK-EPC Corporation of Canada
China		Beijing		TDK CHINA CO., LTD.
China		Shenzhen		
China		Guangzhou		
China		Shanghai		TDK(SHANGHAI) INTERNATIONAL TRADING CO., LTD., SHANGHAI Sales Office
China		Suzhou		SUZHOU Sales Office
China		Tianjin		TIANJIN Sales Office
China		Qingdao		QINGDAO Sales Office
China	Hong Kong			TDK HONGKONG CO., LTD.
Finland		Turku		FINLAND Branch Office
France		Pantin		PARIS Branch Office

Source: Citi Research

Figure 886. TDK Corp (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Germany	North Rhine-Westphalia	Dusseldorf		TDK ELECTRONICS EUROPE GmbH - Headquarters
Germany	Baden-Württemberg	Leonberg		STUTTGART Regional Office
Hungary		Budapest		HUNGARY Sales Office
Italy		Milan		MILAN Branch Office
Japan		Tokyo		Headquarters
Malaysia				TDK (MALAYSIA) SDN. BHD.
Malaysia	Penang			PENANG Sales Office
Philippines	Laguna			TDK ELECTRONICS PHILIPPINES CORPORATION
Singapore				TDK SINGAPORE (PTE) LTD.
South Korea				TDK Korea Corporation
Sweden				STOCKHOLM Branch Office
Taiwan				TDK TAIWAN CORPORATION
Thailand				TDK (THAILAND) CO., LTD.
UK				UK Branch Office
USA	Illinois	Lincolnshire		TDK CORPORATION OF AMERICA
USA	New Jersey	Iselin		NEW JERSEY Office
USA	New Hampshire	Bedford		NEW ENGLAND District Office
USA	North Carolina	Greensboro		GREENSBORO District Office
USA	Michigan	Livonia		DETROIT District Office
USA	Texas	Richardson		DALLAS District Office
USA	California	San Jose		SAN JOSE District Office
USA	California	San Diego		SAN DIEGO District Office
USA	Colorado	Louisville		DENVER Sales Office

Source: Citi Research

Figure 887. TE Connectivity

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia				1 Manufacturing Plant
Austria				1 Manufacturing Plant
Belgium				2 Manufacturing Plants
Brazil				1 Manufacturing Plant
China				16 Manufacturing Plants
Czech Republic				3 Manufacturing Plants
France				4 Manufacturing Plants
Germany				6 Manufacturing Plants
Hungary				1 Manufacturing Plant
India				7 Manufacturing Plants
Italy				2 Manufacturing Plants
Japan				2 Manufacturing Plants
Mexico				10 Manufacturing Plants
New Zealand				1 Manufacturing Plant
Poland				1 Manufacturing Plant
South Korea				1 Manufacturing Plant
Spain				1 Manufacturing Plant
Switzerland		Schaffhausen		3 Manufacturing Plants
UK				7 Manufacturing Plants
Ukraine				1 Manufacturing Plant
USA	Pennsylvania	Berwyn		Headquarters & 27 manufacturing plants

Source: Citi Research

Figure 888. Tech Data

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Austria		Vienna		
Belgium		Aalst	209358	
Brazil		Sao Paulo	61350	
Canada	Ontario	Mississauga	257683	
Canada	British Columbia	Vancouver	77772	
Canada		Toronto		
Canada		Ottawa		
Chile		Santiago	25830	
Costa Rica		San Jose		
Czech Republic		Prague		
Czech Republic		Bor		
Czech Republic		Ostrava		
Denmark		Copenhagen		
Finland		Helsinki		
France		Bussy St.	430556	
Germany	North Rhine-Westphalia	Duisburg		
Germany	Bavaria	Munich		
Italy		Milan	121632	
Mexico		Naucaalpa	25830	Warehouse
Netherlands		Utrecht		
Norway		Oslo		
Peru		Lima	41622	
Poland		Warsaw	125292	
Poland		Krakow		
Slovakia		Bratislava		
Spain		Barcelona		
Spain		Bilbao		
Spain		Alcobendas		
Spain		Alovera	215278	Warehouse
Spain		Porto		
Spain		Alfragide		
Sweden		Stockholm	252952	
Switzerland		Altshofen		Warehouse
Switzerland	Zug	Risch-Rotkreuz		
Switzerland	Vaud	Gland		
UK	Leicestershire	Lutterworth	386424	
UK	North Yorkshire	York		
UK	Hampshire	Basingstoke		
Uruguay		Montevideo	31900	
USA	Florida	Miami	273045	
USA	Georgia	Swansea	208000	
USA	California	Fontana	436000	
USA	Indiana	South Ber	336000	
USA	New Jersey	Swedesboro	436000	
USA	Texas	Fort Worth	527000	

Source: Citi Research

Figure 889. Tellabs Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Argentina		Buenos Aires		Sales Office
Australia		Melbourne		Sales Office
Austria		Vienna		Sales Office
Brazil		Sao Paulo		Sales Office
China		Beijing		Sales Office
China		Shanghai		Business Units
Denmark		Herlev		Business Units
Finland		Espoo		Business Units
France		Boulogne Billancourt		Sales Office
Germany		Munich		Sales Office
Hungary		Budapest		Sales Office
India		Bengaluru		Sales Office
India	Haryana	Gurgaon		Business Units
Italy		Rome		Sales Office
Japan		Tokyo		Sales Office
Malaysia		Kuala Lumpur		Sales Office
Mexico		Mexico City		Sales Office
Philippines		Pasig City		Sales Office
Poland		Warsaw		Sales Office
Russia		Moscow		Sales Office
Singapore				Sales Office
South Africa		Zwartkops		Sales Office
South Korea		Seoul		Sales Office
Spain		Madrid		Sales Office
Sweden		Danderyd		Sales Office
Thailand		Bangkok		Sales Office
UK				Sales Office
Ukraine		Kiev		Sales Office
United Arab Emirates		Dubai		Sales Office
USA	Illinois	Naperville		Headquarters
USA	Virginia	Vienna		Sales Office
USA	Colorado	Littleton		Sales Office
USA	California	Santa Clara		Business Units
USA	Texas	Dallas		Business Units
USA	Florida	Sunrise		Sales Office

Source: Citi Research



Figure 890. Teradyne

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada	Quebec	Montreal		Semiconductor Test Technology Centers
Canada		Ottawa		Semiconductor Test Technology Centers
China	Pudong	Shanghai	44,000	Semiconductor Test & Systems Test Group
China	Guangdong	Shenzhen		Local Sales and Support Office
Costa Rica		Heredia	42,000	Semiconductor Test
France	Cedex			Local Sales and Support Office
Germany		Munich		Local Sales and Support Office
India	Tamil Nadu	Chennai		Semiconductor Test Technology Centers
Japan		Kumamoto	79,000	Semiconductor Test
Philippines	Cebu		135,000	Semiconductor Test & Corporate
Singapore				Local Sales and Support Office
South Korea		Seoul		Local Sales and Support Office
Taiwan		Hsinchu	43,000	Semiconductor Test & Systems Test Group
Taiwan		Taoyuan City		Local Sales and Support Office
UK	Berkshire			Local Sales and Support Office
USA	Massachusetts	North Re	413,000	Semiconductor Test, Systems Test Group
USA	California	Agoura H	120,000	Semiconductor Test
USA	California	San Jose	128,000	Semiconductor Test
USA	Illinois	Buffalo G	95,000	Semiconductor Test
USA	California	Sunnyvale	75,000	Wireless Test
USA	Massachusetts	North Re	60,000	Corporate
USA	Oregon	Tualatin		Semiconductor Test Technology Centers
USA	Minnesota	Fridley		Semiconductor Test Technology Centers

Source: Citi Research

Figure 891. Texas Instruments

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Chengdu		
China		Shanghai		
France		Nice		
Germany		Freising		
India	Karnataka	Bangalore		
Japan		Aizu		
Japan		Miho		
Japan		Hiji		
Japan		Tokyo		
Malaysia		Kuala Lumpur		
Malaysia		Melaka		
Mexico	Aguascalientes			
Philippines		Baguio		
Philippines		Pampanga (Clark)		
Scotland		Greenock		
Taiwan		Taipei		
USA	Texas	Dallas		
USA	Texas	Sherman		
USA	Texas	Houston		
USA	Arizona	Tucson		
USA	California	Santa Clara		
USA	Maine	South Portland		

Source: Citi Research

Figure 892. Tokyo Electron

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai		Service and sales
China	Jiangsu			Manufacturing and parts repair
France	Meylan	Grenoble		French Branch
Germany		Dresden		German Branch
Ireland		Dublin		Irish Branch
Israel		Kiryat Gat		Service and sales support in Israel
Italy		Milan		Italian Branch
Japan		Tokyo		World Headquarters, sales, marketing and R&D
Japan		Fuchu City		Branch Office, Sales Office
Japan	Yamanashi	Nirasaki		Head Office - Yamanashi Plant
Japan	Yamanashi	Nirasaki		Yamanashi Plant (Hosaka)
				Head Office - Development and manufacturing of thermal processing systems
Japan	Iwate	Oshu		Head Office - Koshi Plant
Japan		Kumamoto		Head Office - Development and manufacturing of plasma etch systems
Japan	Miyagi	Kurokawa		Branch Office - Matsushima Plant
Japan	Miyagi	Matsushima		Branch Office - Matsushima Plant
Japan		Kanagawa		Sales Office
Japan	Ibaraki	Tsukuba		Regional Office
Japan	Miyagi	Sendai		Regional Office
Japan		Osaka		Osaka Branch Office
Japan		Sapporo		Regional Office
Mexico		Albuquerque		Albuquerque Office
Netherlands		Nijmegen		Netherlands Branch
Singapore				Sales and services support
South Korea	Gyeonggi-do	Seongnam		Bundang Office
South Korea	Gyeonggi-do	Hwaseong		Balan Factory
South Korea	Chungcheongnam-d	Cheonan		Cheonan Office
South Korea	Chungcheongbuk-d	Cheongju		Cheongju Office
South Korea	Gyeongsangbuk-do	Gumi		Gumi Office
South Korea	Gyeonggi-do	Hwaseong		Hwaseong Office
South Korea	Kyonggi	Icheon		Icheon Office
South Korea	Geumchon	Paju		Paju Office
Switzerland		Trubbach		Development, manufacturing and sales
Taiwan		Hsinchu		Service, sales & R&D
UK	West Sussex	Crawley		European sales and service Headquarters
USA	Texas	Austin		Headquarters
USA	Virginia	Manassas		Manassas Office
USA	Idaho	Boise		Boise Office
USA	Arizona	Chandler		Phoenix Office
USA	New York	Hopewell Junction		Fishkill Office
USA	Oregon	Beaverton		Portland Office
USA	California	Fremont		Fremont Office
USA	Utah	Lehi		Lehi Office
USA	New York	Malta		Malta Office
USA	New York	Albany		R&D for semiconductor production equipment
USA	Massachusetts	BillERICA		Development and manufacturing of gas cluster
USA	Minnesota	Chaska		Development, manufacturing and sales

Source: Citi Research

Figure 893. Toshiba

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	New South Wales	Parramatta		Toshiba International Corporation Pty., Ltd.
Australia	New South Wales	North Ryde		Toshiba (Australia) Pty., Ltd.
Australia	New South Wales	Rydalmere		Toshiba TEC Australia Pty., Ltd.
Austria		Vienna		Toshiba Europe GmbH
Belgium		Brussels		Toshiba TEC Europe Retail Information Systems
Belgium		Winegem		Toshiba Medical Systems NV / SA
Belgium		Brussels		Toshiba TEC Europe Retail Information Systems NV / SA
Belgium		Sint-Stevens-Woluwe		Toshiba Medical Systems NV / SA BELGIUM
Brazil		Curitiba		Factory
Brazil		Sao Paulo		Sao Paulo Office
Brazil		Santo Amaro		Semp Toshiba
Brazil		Salvador		Semp Toshiba Sa Bahia
Brazil		Manaus		Semp Toshiba Amazonas Sa
Brazil		Barueri		Toshiba Medical do Brasil Ltda.
Canada		Markham		Corporate Headquarters
Colombia				
Egypt		Cairo		Toshiba El Araby Visual & Appliances Marketing Company
Germany		Neuss		Toshiba Europe GmbH (no Service-/Reparaturannahme)
Germany		Dusseldorf		Toshiba Electronics Europe GmbH, Storage Products Division
Germany		Regensburg		Toshiba Europe GmbH - Technology and Service Center
Germany		Krefeld		Toshiba TEC Europe Retail Information Systems, SA (subsidiary Germany)
Germany		Ismaning		Toshiba Machine (Europe) GmbH
India	Haryana	Gurgaon		Toshiba India Private Ltd.
India	Andhra Pradesh	Hyderabad		TPSC (India) Pte., Ltd.
India	Karnataka	Bangalore		Toshiba Software (India) Pvt. Ltd.
India	Maharashtra	Mumbai		Toshiba Johnson Elevators (India) Pte., Ltd.
India	Tamil Nadu	Chennai		Toshiba JSW Turbine & Generator Pvt., Ltd.
Indonesia		Jakarta		Jakarta Representative Office
Indonesia	West Jawa	Bekasi		P.T. Toshiba Consumer Products Indonesia
Indonesia		Jakarta		P.T. Toshiba Visual Media Network Indonesia, P.T. Toshiba Indonesia
Italy	Monza Brianza	Tokyo		Toshiba Europe GmbH (Branch Office in Italy)
Japan				Hamamatsucho
Japan	Kanagawa	Kawasaki		Kawasaki Office, Microelectronics Center, Semiconductor System Engineering Center, Hamakawasaki Operations, Ukishima Works, Komukai Complex
Japan	Kanagawa	Yokohama		Yokohama Complex, Ofuna Office, Keihin Product Operations, West Turbine Works
Japan	Hyogo	Himeji		Himeji Operations
Japan	Saitama	Fukaya		Fukaya Complex
Japan		Ome		Ome Complex
Japan	Hyogo	Taishi		Himeji Operations - Semiconductor
Japan	Oita			Oita Operations
Japan		Yokkaichi		Yokkaichi Operations
Japan		Fuchu		Fuchu Complex
Japan		Kashiwazaki		Kashiwazaki Operations
Japan	Mie			Mie Operations
Malaysia		Kuala Lumpur		Kuala Lumpur Representative Office
Malaysia		Shah Alam		Toshiba Sales & Services Sdn. Bhd.
Malaysia		Selangor		Toshiba Transmission & Distribution Sys Asia Sdn. Bhd.
Malaysia		Petaling Jaya		Toshiba Electronics Trading (Malaysia) Sdn. Bhd.

Source: Citi Research

Figure 894. Toshiba (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Mexico		Lomas de Chapultepec		Toshiba de Mexico, S.A. de C.V.
Mexico	Nuevo León	Cienega de Flores		GE Toshiba Turbine Components de Mexico S.R.L. de C.V.
Myanmar		Yangon		Toshiba Asia Pacific Pte, Ltd (Yangon Branch Office)
Netherlands		Breda		Toshiba Europe GmbH
Netherlands		Breda		Toshiba Europe GmbH
New York		New York		Toshiba Nuclear Energy Holdings (US), Inc.
Philippines		Makati City		Toshiba (Philippines), Inc.
Philippines		Biliran City		Toshiba Information Equipment (Philippines), Inc., v
Poland		Warsaw		Toshiba Europe GmbH Distributor Sales, Central & Eastern
Poland		Kobierzyce		Europe, Computers Systems, EMEA Sales
Poland		Warsaw		Toshiba Television Central Europe Sp. Ltd.
Portugal		Porto Salvo		Toshiba TEC Poland SA
Portugal		Linda-a-Velha		Toshiba Portugal
Singapore				Toshiba Medical Systems SA
Singapore				Headoffice - Toshiba Asia Pacific Pte Ltd
Singapore				Toshiba Medical Systems Asia Pte., Ltd.
Singapore				Toshiba TEC Singapore Pte., Ltd.
Singapore				Toshiba Logistics (Singapore) Pte., Ltd
Singapore				Toshiba Global Commerce Solutions (Singapore), Pte. Ltd.
Singapore				Toshiba Data Dynamics Pte., Ltd.
South Korea		Seoul		Toshiba Elevator South Korea Inc.
South Korea		Seoul		Toshiba Electronics South Korea Corporation
South Korea		Seoul		Toshiba TEC South Korea Co., Ltd.
South Korea		Seoul		Toshiba Digital Media Network South Korea Corporation
Spain		Madrid		Toshiba Europe GmbH Branch in Spain
Spain		Alcobendas		Toshiba Medical Systems SA
Spain		Madrid		Toshiba TEC Europe Retail Information Systems SA
Switzerland		Uster		Toshiba Europe GmbH, Zweigniederlassung Volketswil
Switzerland		Zürich		Toshiba TEC Switzerland AG
Switzerland		Meilen		Toshiba Medical Systems AG
Taiwan		Taipei		Taiwan Toshiba International Procurement Corporation
Taiwan		Taipei		Toshiba Digital Media Network Taiwan Corporation
Taiwan		Taipei		Toshiba Memory Semiconductor Taiwan Corporation
Taiwan		Taipei		Toshiba Electronics Taiwan Corporation
Taiwan		Taipei		Harrison Toshiba Lighting Taiwan Co., Ltd.
Thailand		Bangkok		Toshiba Asia Pacific (Thailand) Co., Ltd.
Thailand	Pathum Thani			Toshiba Semiconductor (Thailand) Co., Ltd.
Thailand		Bangkok		Toshiba Asia Pacific (Thailand) Co., Ltd.
Thailand	Nonthaburi			Thai Toshiba Electric Industries Co., Ltd.
Thailand		Bangkok		Toshiba Thailand Co., Ltd.
UAE		Dubai		Office
USA	California	Irvine		Toshiba America Business Solutions
USA	Washington			Toshiba America Research, Inc.
USA				Toshiba America Nuclear Energy Corporation
USA				(Headquarters)
USA	North Carolina	Charlotte		Headquarters - Toshiba Global Commerce Solutions
USA	North Carolina	Research Triangle		
USA	Michigan	Farmington Hills		Harrison Toshiba Lighting
USA	Texas	Houston		Toshiba International Corporation
USA	California	Irvine		Toshiba America Electronic Components, Inc.
USA	California	Tustin		Toshiba America Medical Systems, Inc.
USA	Washington			
USA	California	Fresno		
USA	California	Hayward		
USA	California	Inland Empire		
USA	California	Los Angeles		
USA	California	Orange County		
USA	California	Petaluma		
USA	California	Sacramento		
USA	California	San Diego		
USA	California	San Francisco		
USA	California	San Jose		
USA	California	San Ramon		
USA	California	Oxnard		
USA	Nevada	Las Vegas		
USA	Nevada	Reno		
USA	Arizona	Phoenix		
USA	Arizona	Tucson		
USA	Idaho			
USA	Montana	Helena		
USA	Montana	Missoula		
USA	Colorado	Colorado Springs		
USA	Colorado	Denver		
USA	New Mexico	Hobbs		
USA	North Dakota	Fargo		
USA	North Dakota	Grand Forks		

Source: Citi Research

Figure 895. Toshiba (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
USA	Nebraska	Omaha		
USA	Kansas	Lawrence		
USA	Texas	Abilene		
USA	Texas	Austin		
USA	Texas	Corpus Christi		
USA	Texas	Dallas		
USA	Texas	El Paso		
USA	Texas	Fort Worth		
USA	Texas	Laredo		
USA	Texas	San Antonio		
USA	Texas	Victoria		
USA	Texas	Weslaco		
USA	Minnesota	Duluth		
USA	Minnesota	Eagan		
USA	Minnesota	Rochester		
USA	Iowa			
USA	Missouri	Lee's Summit		
USA	Wisconsin			
USA	Illinois			
USA	Kentucky	Bowling Green		
USA	Kentucky	Lexington		
USA	Kentucky	Louisville		
USA	Kentucky	Somersett		
USA	Mississippi	Columbus		
USA	Mississippi	Greenville		
USA	Mississippi	Greenwood		
USA	Mississippi	Jackson		
USA	Mississippi	Laurel		
USA	Mississippi	Meridian		
USA	Mississippi	Tupelo		
USA	Michigan	Grand Blanc		
USA	Michigan	Lansing		
USA	Michigan	Farmington Hills		
USA	Ohio	Akron		
USA	Ohio	Cleveland		
USA	Georgia	Norcross		
USA	Florida	Miami Lakes		
USA	Florida	Orlando		
USA	Florida	Palm Beach		
USA	Florida	Tamarac		
USA	Florida	Tampa		
USA	Florida	Treasure Coast		
USA	South Carolina	Greenville		
USA	New Hampshire	Bedford		
USA	Massachusetts	Boston		
USA	Massachusetts	Westborough		
USA	Massachusetts	Wilmington		
USA	New York	Albany		
USA	New York	Binghamton		
USA	New York	Buffalo		
USA	New York	Long Island		
USA	New York	Newburgh		
USA	New York	New York		
USA	New York	Rochester		
USA	New York	Syracuse		
USA	Pennsylvania	Allentown		
USA	Pennsylvania	Kingston		
USA	Pennsylvania	Wyomissing		
USA	Pennsylvania	Philadelphia		
USA	Pennsylvania	Elizabethtown		
USA	Pennsylvania	Hanover		
USA	Pennsylvania	Pittsburg		

Source: Citi Research

Figure 896. Toshiba (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
USA	North Carolina	Asheville		
USA	North Carolina	Charlotte		
USA	North Carolina	Fayetteville		
USA	North Carolina	Greensboro		
USA	North Carolina	Hickory		
USA	North Carolina	Mt. Gilead		
USA	North Carolina	Raleigh		
USA	North Carolina	Wilmington		
USA	Hawaii	Big Island		
USA	Hawaii	Maui		
USA	Hawaii	Oahu		
Venezuela		Caracas		Toshiba de Venezuela C.A.
Vietnam		Hanoi		Hanoi Representative Office
Vietnam		Ho Chi Minh City		Ho Chi Minh City Representative Office
Vietnam	Dong Nai	Bien Hoa		Toshiba Industrial Products Asia Co., Ltd.
Vietnam	Tay Ninh			Toshiba Clean Development Service (Vietnam) Co., Ltd.

Source: Citi Research

Figure 897. TPK

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
				TPK Touch Solutions (Xiamen) Inc., Optera Technology (Xiamen) Co., Ltd, Ray-Star Technology (Xiamen) Inc., Ray-Star System Solutions (Xiamen) Inc., TPK Touch Systems (Xiamen) Inc., TPK Lens Solutions Inc., Ray-Star Optical (Xiamen) Inc., PK Glass Solutions
China	Fujian	Xiamen		
Japan		Tokyo		TPK Japan Office
South Korea		Seoul		TPK Korea Office
Taiwan		Taipei		Headquarters
Taiwan		New Taipei		Xinzhuang Office
Taiwan		New Taipei		Wugu Office
Taiwan		New Taipei		Banqiao Office
				Zhongli Ding'an Rd Office, Zhongli Zhongbei Rd Office
Taiwan	Taoyuan	Zhongli City		
USA	California	San Mateo		TPK US Office

Source: Citi Research

Figure 898. TPV Technology

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Bermuda		Hamilton		Registered Office
China	Hong Kong			Headquarters

Source: Citi Research

Figure 899. Trina Solar Ltd

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia		Sydney		Trina Solar (Australia) Pty Ltd
Canada	Ontario	Toronto		Trina Solar (Canada) Inc
Chile		Santiago		Trina Solar (Chile) SpA
China		Changzhou		Corporate Headquarters
China		Shanghai		
France		Lyon		Trina Solar (France) SAS
Germany		Munich		Trina Solar (Germany) GmbH
Italy		Milan		Trina Solar (Italy) S.r.l.
Japan	Minato			Trina Solar (Japan) Limited
Luxembourg				Trina Solar (Luxembourg) S.à.r.l.
Singapore				Regional Headquarters - Trina Solar (Singapore) Pte L
South Korea		Seoul		Trina Solar (Korea) Ltd
Spain		Madrid		Trina Solar (Spain) S.L.U.
Switzerland				Trina Solar (Schweiz) AG
UK		Derby		Trina Solar (UK) Ltd
United Arab Emirates		Abu Dhabi		Trina Solar Middle East Ltd
USA	California	San Jose		Regional Headquarters

Source: Citi Research

Figure 900. Tripod Technology

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Wuxi		Plant
Taiwan	Taoyuan	Ping-jen		Plant

Source: Citi Research

Figure 901. TriQuint

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai	5850	Engineering and marketing
Costa Rica		San Jose	62700	Test, assembly and administration
Germany		Munich	21050	Engineering and marketing
Japan		Tokyo	2000	Engineering and marketing
Philippines	Laguna		9000	Administration, test and assembly
Singapore			4400	Engineering, administration and marketing
South Korea		Seoul	6700	Engineering and marketing
Taiwan		Taipei	2600	Engineering and marketing
				Headquarters, administration, test, technical, wafer
USA	Oregon	Hillsboro	260000	fabrication and engineering
				Wafer fabrication, engineering, administration,
USA	Texas	Richardson	540000	test and technical
				Wafer fabrication, engineering, administration,
USA	Florida	Apopka	119000	test and technical
				Engineering, test and
USA	California	San Jose	51500	technical
				Wafer fabrication, engineering, administration,
USA	Oregon	Bend	14100	test and technical
				Engineering, administration
USA	California	Santa Rosa	14050	and test
USA	Massachusetts	Chelmsford	14100	Engineering
USA	North Carolina	High Point	7250	Engineering
USA	California	Los Gatos	4100	Engineering and marketing

Source: Citi Research

Figure 902. TSMC

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Canada	Kanata	Kanata		Offices
China		Shanghai		Offices
India	Karnataka	Bangalore		Offices
Japan		Kanagawa		Offices
Netherlands		Amsterdam		Offices
South Korea		Seoul		Offices
Taiwan		Hsinchu		Headquarters (1HQ)(3 Bldg) (3 Facilities)
Taiwan		Tainan		Offices (2 Bldg) (2 Facilities)
Taiwan		Taichung		Offices(1 Bldg) (1 Facilities)
USA	California			Offices

Source: Citi Research

Figure 903. UMC

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Japan		Chiba City		Wafer production
Netherlands		Amsterdam		Subsidiary
Singapore				
South Korea		Seoul		Subsidiary
Taiwan		Hsinchu		Wafer production
Taiwan		Hsinchu		Wafer production
Taiwan		Taoyuan City		Cell production
Taiwan		Taichung		
Taiwan		Tainan,		R&D
Taiwan		Hsinchu		
Taiwan		Taipei		Office
Taiwan		Tainan		
Taiwan		Hsinchu		Wafer production
USA	California			Subsidiary

Source: Citi Research

Figure 904. Unimicron

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	JiangSu			Plant
China		Shenzhen		Plant
China		Kun Shan		Plant
Taiwan	Taoyuan			Plant
Taiwan	Hsinchu			Plant

Source: Citi Research

Figure 905. Vanguard International Semiconductor

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
British Virgin Islands				IC Business Investment
Taiwan	Hsinchu			Office
UK	British Virgin Islands			IC Business Investment
USA	California	Santa Clara		Office
USA	Delaware			IC Business Investment
USA	California	Santa Clara		Service and marketing Activity

Source: Citi Research

Figure 906. Veeco Instruments Inc.

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai	18700	Customer Training Center
China		Shanghai		
Germany		Mannheim		
Japan		Tokyo		
Malaysia		Penang		
Philippines		Binan		
Singapore				
				Sales Office, Customer Training Center & R&D
South Korea		Yongin	56000	Center
South Korea	Gyeonggi-do	Pyeongtaek-si		
				Sales Office, Process Development, & Customer
Taiwan		Hsinchu	13500	Training Center
Thailand		Bangkok		
UK		Cambridge		
USA	New York	Plainview	80000	Data Storage and Corporate Headquarters
USA	Somerset	New Jersi	80000	LED & Solar
USA	Somerset	New Jersi	38000	LED & Solar
USA	Minnesota	St. Paul	111000	LED & Solar
USA	California	Camarillo	23000	Data Storage
USA	Colorado	Fort Collie	26000	Data Storage
USA	Massachusetts	Peabody	30000	Held for Sublease
USA	Somerset	New Jersi	14000	LED & Solar
USA	New York	Poughke	9000	LED & Solar
USA	New York	Kingston	44000	LED & Solar
USA	Minnesota	Edina		Support Center
USA	California	Santa Clara		Support Center

Source: Citi Research

Figure 907. Venture Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai	216959	Residential, Office & Industrial Usage
China		Shenzhen		
Hungary				
Malaysia		Penang	425415	Industrial Usage
Malaysia		Johor	1649077	Industrial Usage
Netherlands				
Singapore			113560	Office & Industrial Usage
Spain		Barcelona		
USA	California	Newark		
USA	California	Anaheim		

Source: Citi Research

Figure 908. Vishay

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Austria		Vocklabr	153000	Diodes	
Austria		Klagenfur	130000	Capacitors	
China		Tianjin	374000	Diodes	
China		Shanghai	195000	Optoelectronic Components	
China		Xi'an	121000	MOSFETS and Diodes	
China		Danshui	446000	Capacitors	
China		Shanghai	217000	MOSFETS	
China	Guangdong	Zhuhai	129000	Resistors & Inductors	
Czech Republic		Blatna	191000	Capacitors	
Czech Republic		Dolni Ryc	182000	Resistors & Inductors and Capacitors	
Czech Republic		Prachatic	91000	Resistors & Inductors	
Czech Republic		Volary	35000	Resistors & Inductors	
Czech Republic		Prestice	13000	Resistors & Inductors	
Dominican Republic		Santo Doi	16000	Resistors & Inductors	
France		Nice	215000	Resistors & Inductors	
France		Heyres	65000	Resistors & Inductors	
Germany				Vishay Electronic GmbH	
Germany	Bavaria	Selb	306000	Resistors & Inductors and Capacitors	
Germany		Heide	161000	Resistors & Inductors	
Germany		Landshtut	72000	Capacitors	
Germany		Fichtelbei	24000	Resistors & Inductors	
Germany		Itzehoe	207000	MOSFETS	
Germany		Heilbronn	48000	Diodes and Optoelectronic Components	
Hungary		Budapest	116000	Diodes	
India	Uttar Pradesh	Loni	350000	Resistors & Inductors and Capacitors	
India	Maharashtra	Mumbai	34000	Diodes	
Israel		Dimona	404000	Resistors & Inductors and Capacitors	
Israel		Migdal H	288000	Resistors & Inductors and Capacitors	
Israel		BeerShev	276000	Resistors & Inductors and Capacitors	
Italy		Turin	127000	Diodes	
Malaysia	Melaka		480000	Optoelectronic Components	
Mexico		Juarez	57000	Resistors & Inductors	
Mexico		Juarez	128000	Resistors & Inductors	
Netherlands		Zwolle	283000	Capacitors	
Philippines		Manila	144000	Diodes and Optoelectronic Components	
Portugal		Famalicao	167000	Capacitors	
Singapore				Vishay Intertechnology Asia Pte. Ltd	
Taiwan		Taipei	366000	Diodes	
Taiwan		Kaohsiung	52000	MOSFETS	
USA	Pennsylvania	Malvern		Vishay Intertechnology, Inc	
USA	Connecticut	Shelton		Vishay Americas	
USA	California	Santa Cla	227000	MOSFETS	
USA	Nebraska	Columbu	158000	Resistors & Inductors	
USA	South Dakota	Yankton	58000	Resistors & Inductors	
USA	Rhode Island	Warwick	55000	Resistors & Inductors	
USA	Vermont	Benningt	54000	Capacitors	
USA	New York	Niagara F	38000	Resistors & Inductors	
USA	Minnesota	Marshall	22000	Resistors & Inductors	
USA	California	Ontario	46000	Resistors & Inductors	
USA	Wisconsin	Milwauke	42000	Resistors & Inductors	
USA	New Hampshire	Dover	35000	Resistors & Inductors	
USA	Indiana	Huntingt	16000	Resistors & Inductors	
USA	Minnesota	Duluth	10000	Resistors & Inductors	

Source: Citi Research

Figure 909. Vtech Holdings

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Australia		Victoria		Regional Office - Telecommunication Products	
Canada		Richmond		Regional Office - Telecommunication Products	
China	Hong Kong			Head Office - Telecommunication Products & Sales	
China	Nanshan			Office - Electronic Learning Products	
China	Guangdong	Dongguan			
China	Guangdong	Qingyuan		Manufacturing Facilities - Telecommunication Products	
China	Hong Kong			Customer Service Centre - Telecommunication Products	
China	Hong Kong			Customer Service Centre - Electronic Learning Products	
France				Regional Office - Electronic Learning Products	
Germany		Filderstadt		Regional Office - Electronic Learning Products	
Japan		Osaka		Regional Office - Electronic Learning Products	
Japan		Tokyo		Liaison Office - Contract Manufacturing Services	
Netherlands				Regional Office - Electronic Learning Products	
Spain		Madrid		Regional Office - Electronic Learning Products	
UK		Buckinghamshire		Regional Office - Telecommunication Products	
UK		Oxfordshire		Regional Office - Electronic Learning Products	
USA	Oregon	Beaverton		Regional Office - Telecommunication Products	
USA	Illinois	Arlington		Regional Office - Electronic Learning Products	
USA	Massachusetts	Cambridge		Liaison Office - Contract Manufacturing Services	

Source: Citi Research

Figure 910. Western Digital Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Haidian	Beijing		
China		Shanghai	273900	Manufacturing of media
China	Futian	Shenzhen		
China	Hong Kong			
China		Shenzhen	248000	Administrative
China		Shenzhen	641000	Manufacturing of hard drives
China		Shenzhen	263000	Manufacturing of HGAs
Czech Republic				
France				
Germany				
Japan		Tokyo		
				Manufacturing of head wafers and head
Japan		Odawara	578000	development
Japan		Fujisawa	661000	Product development
Malaysia				
				Manufacturing of hard drives and printed circuit
Malaysia		Kuala Lun	1072700	boards and research and development
Malaysia		Kuching	271300	Manufacturing and development of substrates
				Manufacturing of media, research and development
Malaysia		Penang	891100	and slider fabrication
Netherlands				
				Administrative and manufacturing of hard drives;
				Manufacturing of media and research and
Russia		Moscow	837100	development
Singapore				
South Korea		Johor	270600	Manufacturing of substrates
				Slider fabrication, manufacturing of hard drives and
Taiwan		Bang Pa li	1665200	HGAs, and research and development
Thailand				
Thailand		Navanak	290200	Manufacturing of HGAs
Thailand		Prachinb	729000	Manufacturing of hard drives
				Corporate Headquarters, Research and
UK		Edinburg	467100	development, administrative, marketing and sales
United Arab Emirates		Dubai		
USA	California	Irvine		Corporate Headquarters
				Manufacturing of head wafers and research and
USA	Florida	Belleair	391800	development
USA	California	Fremont		
USA	Florida	Boca Raton		
USA	Maryland	Pasadena		
USA	Massachusetts	Reading		
USA	Ohio	Cleveland		
USA	South Dakota	North Sioux City		
USA	Texas	Austin		
USA	Texas	Houston		
USA	Washington	Bellevue		
				Manufacturing of head wafers and head, media and
USA	California	San Jose	2487000	product development
				Research and development, administrative,
USA	California	San Jose	648000	marketing and sales
USA	Colorado	Longmon	43000	Research and development
USA	Minnesota	Rocheste	91800	Product development

Source: Citi Research

Figure 911. Wintek

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Jiangsu	Suzhou		Production
China	Guangdong	Dongguan		Production, RD Center,
Germany	Bavaria	Munich		Wintek Central Europe GmbH
Taiwan		Taichung		Headquarters - Marketing, Production, RD Center
Taiwan		Youth		Production
USA	Michigan	Ann Arbor		Wintek Electro-Optics Corporation - Marketing, RD C
USA	California	San Jose		Marketing
Vietnam		Hanoi		Production

Source: Citi Research

Figure 912. Winstron Corp

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil		Sao Paulo		Service center
China		Zhongshan		Manufacturing center, Technology campus, R&D
				Manufacturing center, Technology campus, R&D
China		Kunshan		center, service center
China		Shanghai		R&D center
China		Taizhou		Manufacturing center
China		Wuhan		R&D center
China		Beijing		Customer sales support, R&D center
China		Chengdu		Manufacturing center
China		Chongqing		Manufacturing center
China	Hong Kong			Service center
Colombia		Bogota		Service center
Czech Republic		Brno		Manufacturing center, Service center
India	Karnataka	Bangalore		Service center
Japan	Chiba			Service center
Malaysia		Port Klang		Manufacturing center
Mexico		Juarez		Manufacturing center
Mexico		Mexico City		Service center
Netherlands		Veldhoven		Service center
Netherlands		Eindhoven		R&D center
Philippines				Technology support center, service center
Singapore				Service center
Taiwan		Taipei		Global R&D center
Taiwan		Hsinchu		Global Manufacturing center, Global service center
Turkey		Istanbul		Service center
USA	Texas	Round Rock		Customer sales support
USA	Texas	Dallas		Service center

Source: Citi Research

Figure 913. Wolfson

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Australia	Victoria	Richmond		
China		Shanghai		
China		Shenzhen		
Japan		Yokohama		
Japan		Osaka		
South Korea	Gyunggi-do	Sungnam-si		
Taiwan		Taipei		
UK		Edinburgh		
UK		Newbury		
USA	California	Cupertino		

Source: Citi Research

Figure 914. WPG Holding

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Brazil		Sao Paulo		
Canada				
China		Qingdao		
China		Wuhan		
China		Fuzhou		
China		Chuhai		
China		Shenzhen		
China		Xi'an		
China		Hangzhou		
China		Xiamen		
China		Shanghai		
China		Nanjing		
China		Chongqing		
China		Guangzhou		
China		Beijing		
China		Suzhou		
China		Chang Sha		
China		Dongguan		
China		Shenyang		
China		Chengdu		
China		Ningbo		
Hong Kong	Tsuen Wan			
Hong Kong	Tuen Mun			
India	Karnataka	Bangalore		
India	Haryana	New Delhi		
Japan		Tokyo		
Japan		Yokohama		
Japan		Osaka		
Malaysia		Penang		
Malaysia		Kuala Lumpur		
Mexico				
Philippines		Manila		
Singapore				
South Korea	Gyeonggi-do			
South Korea		Seoul		
Taiwan		Taipei		Headquarters
Thailand		Bangkok		
USA	Florida	Tampa		
USA	California	Laguna Hills		
USA	California	San Jose		Headquarters
USA	Illinois	Elgin		
USA	New York	Ronkonkoma		
USA	Texas	Allen		
USA	Utah	Salt Lake City		
USA	Wisconsin			

Source: Citi Research

Figure 915. WPG Holding (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
USA	Vermont			
USA		New York		
USA	Pennsylvania			
USA	Kentucky			
USA	Oklahoma			
USA	Alabama			
USA	Texas			
USA	North Dakota			
USA	Michigan			
USA	New Hampshire			
USA	Illinois			
USA	Virginia			
USA	New Mexico			
USA	Georgia			
USA	Montana			
USA	Idaho			
USA	Wyoming			
USA	Iowa			
USA	Ohio			
USA	Colorado			
USA	Kansas			
USA	California	San Diego		
USA	California	Los Angeles		
USA	Arizona			
USA	Louisiana			
USA	Minnesota			
USA	South Dakota			
USA	Massachusetts			
USA	Connecticut			
USA	Indiana			
USA	Nevada			
USA	Tennessee			
USA	Carolinas			
USA	Maine			
USA	Oregon			
USA	Washington			
USA	Nebraska			
USA	New Jersey			
USA	Maryland			
USA	Missouri			
USA	Arkansas			
USA	Mississippi			
Vietnam		Hanoi		
Vietnam		Ho Chi Minh City		

Source: Citi Research

Figure 916. Xerox

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Afghanistan				Office	
Algeria	Mohammedia	Algiers		Office	
Angola		Luanda		Office	
Antigua	St. Johns			Office	
Antigua		St. Johns		Office	
Argentina		Buenos Aires		Office	
Aruba				Office	
Australia	New South Wales	North Ryde		Office	
Australia	New South Wales	Frenchs Forest		Office	
Australia		Sydney		Manufacturing plant	
Austria		Vienna		Office	
Bahamas		Freeport		Office	
Bahamas		Nassau		Office	
Bahrain		Manama		Office	
Bangladesh		Dhaka		Office	
Barbados		St. Michael		Office	
Belarus		Minsk		Office	
Belgium				Office	
Belize		Belize City		Office	
Benin		Cotonou		Office	
Bhutan		Thimphu		Office	
Bolivia		Santa Cruz		Office	
Bolivia		La Paz		Office	
Botswana		Gaborone		Office	
Brazil		Rio de Janeiro		Office	
Brazil		Resende		Manufacturing plant	
Bulgaria		Sofia		Office	
Burkina Faso				Office	
Burundi		Bujumbura		Office	
Cameroon		Douala		Office	
Canada	Ontario	Toronto		Office	
Canada	Ontario	Mississauga		Manufacturing plant	
Canada	Ontario	Oakville		Manufacturing plant	
Canada	Ontario	Toronto		Manufacturing plant	
Central African Republic		Bangui		Office	
Chad		N'Djamena		Office	
Chile		Santiago		Office	
China		Shanghai		Office	
China	Guangdong			Manufacturing plant	
China	Shenzhen			Manufacturing plant	
Colombia		Bogota		Office	
Congo		Kinshasa		Office	
Costa Rica		San Jose		Office	
Cote d'Ivoire		Abidjan		Office	
Croatia		Zagreb		Office	
Cyprus		Nicosia		Office	
Czech Republic		Prague		Office	
Denmark		Ballerup		Office	
Dominica				Office	
Dominican Republic		Santo Domingo		Office	
Ecuador		Quito		Office	
Ecuador		Guayaquil		Office	
Egypt		Cairo		Office	
El Salvador		Antiguo Cuscatlan		Office	
Ethiopia		Addis Ababa		Office	
Finland		ESPOO		Office	
France	Saint Martin	Phillipsburg		Office	
France		Saint-Denis		Office	
France		Bobigny		Office	
France	Haute-Garonne	Toulouse		Office	
France		Guilherand-Granges		Office	
France		Asnieres-sur-Seine		Office	
France		Neuville-en-Ferrain		Manufacturing plant	
France		Lille		Manufacturing plant	
Gabon		Libreville		Office	
Gambia		Banjul		Office	
Germany		Mülheim		Office	
Ghana		Accra		Office	
Greece		Athens		Office	
Greenland		Nuuk		Office	
Grenada		St George		Office	
Guatemala				Office	
Guyana		Georgetown		Office	
Haiti		Port au Prince		Office	
Honduras		Tegucigalpa		Office	
Honduras		San Pedro Sula		Office	
Hong Kong				Office	

Source: Citi Research

Figure 917. Xerox (Continued)

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Hungary		Budapest		Office	
Iceland		Reykjavik		Office	
India	Haryana	Gurgaon		Office	
India	Gujarat	Ahmedabad		Office	
India	Karnataka	Bangalore		Office	
India		Chandigarh		Office	
India	Tamil Nadu	Chennai		Office	
India	Kerala	Cochin		Office	
India	Andhra Pradesh	Hyderabad		Office	
India	West Bengal	Kolkata		Office	
India	Uttar Pradesh	Lucknow		Office	
India	Maharashtra	Mumbai		Office	
India	Maharashtra	Pune		Office	
India	Uttar Pradesh	Rampur		Office	
Indonesia		Jakarta		Office	
Iraq		Kurdistan		Office	
Iraq		Basra		Office	
Iraq		Baghdad		Office	
Ireland		Dublin		Office	
Ireland		Dundalk		Manufacturing plant	
Israel		Petah Tikva		Office	
Italy		Milan		Office	
Jamaica		Kingston		Office	
Japan		Tokyo		Office	
Japan		Kashiwazakishi		Manufacturing plant	
Japan		Suzuka		Manufacturing plant	
Jordan		Amman		Office	
Kazakhstan		Almaty		Office	
Kenya		Mombassa		Office	
Kuwait		Safat		Office	
Latvia		Riga		Office	
Lebanon		Beirut		Office	
Lesotho		Maseru		Office	
Libya		Tripoli		Office	
Luxembourg				Office	
Madagascar		Isando		Office	
Malawi		Lilongwe		Office	
Malaysia		Petaling Jaya		Office	
Malaysia		Penang		Manufacturing plant	
Maldives		Male		Office	
Mali		Bamako		Office	
Malta		Valetta		Office	
Mauritius		Port Louis		Office	
Mayotte		Mamoudzou		Office	
Mexico		Col. Bosques de las		Office	
Mexico	Aguascalientes			Manufacturing plant	
Morocco		Casablanca		Office	
Mozambique		Maputo		Office	
Namibia		Windhoek		Office	
Nepal		Kathmandu		Office	
Netherlands		Phillipsburg		Office	
Netherlands		Oranjestad		Office	
Netherlands		Bonaire		Office	
Netherlands		Amsterdam		Office	
Netherlands		Venray		Manufacturing plant	
New Zealand		Auckland		Office	
Nicaragua		Managua		Office	
Niger		Niamey		Office	
Nigeria		Lagos		Office	
Norway		Lysaker		Office	
Oman		Muscat		Office	
Pakistan		Lahore		Office	
Panama		Panama City		Office	
Paraguay		Codigó		Office	
Peru		Lima		Office	
Philippines		Makati		Office	
Poland		Krakow		Office	
Poland		Warsaw		Office	
Portugal		Lisbon		Office	
Qatar		Doha		Office	
Romania		Bucharest		Office	
Russia		Moscow		Office	
Rwanda		Kigali		Office	
Saint Kitts		Basseterre		Office	
Saint Lucia				Office	

Source: Citi Research



Figure 918. Xerox (Continued)

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Saint Vincent and the Grenadines		Kingstown		Office	
Saudi Arabia		Riyadh		Office	
Saudi Arabia		Jeddah		Office	
Saudi Arabia		Khobar		Office	
Senegal		Dakar		Office	
Seychelles		Mahe		Office	
Sierra Leone		Freetown		Office	
Singapore				Office	
Slovakia		Bratislava		Office	
Slovenia		Ljubljana		Office	
South Africa		Johannesburg		Office	
South Korea		Seoul		Office	
Spain		Madrid		Office	
Spain		Santa Maria de Barb		Office	
Sri Lanka		Galle		Office	
Sri Lanka		Colombo		Office	
Suriname		Paramaribo		Office	
Swaziland		Mbabane		Office	
Sweden		Upplands Vasby		Office	
Switzerland		Kloten		Office	
Switzerland		Bümplizstrasse		Office	
Taiwan		Taipei		Office	
Tanzania		Dar es Salaam		Office	
Thailand		Bangkok		Office	
Togo		Lome		Office	
Trinidad and Tobago		Port of Spain		Office	
Trinidad and Tobago		Port of Spain		Office	
Tunisia		Tunis		Office	
Turkey		Istanbul		Office	
Turkey		Ankara		Office	
Uganda		Kampala		Office	
UK	Anguilla			Office	
UK	Bermuda	Hamilton		Office	
UK	Cayman Islands			Office	
UK	Falkland Islands			Office	
UK	Montserrat	St. Johns		Office	
UK	Turks and Caicos	Providenciales		Office	
UK		London		Office	
UK	Shropshire	Telford		Office	
UK	Gibraltar			Office	
UK		Uxbridge		Office	
UK		Mitcheldean		Manufacturing plant	
Ukraine		Kiev		Office	
United Arab Emirates		Dubai		Office	
United Arab Emirates		Abu Dhabi		Office	
Uruguay		Montevideo		Office	
USA	Connecticut	Norwalk		Office	
USA	Middlesex			Office	
USA	California	Santa Ana		Manufacturing plant	
USA	California	El Segundo		Manufacturing plant	
USA	California	Fremont		Manufacturing plant	
USA	California	Irvine		Manufacturing plant	
USA	California	Manhattan Beach		Manufacturing plant	
USA	California	Monrovia		Manufacturing plant	
USA	California	Newark		Manufacturing plant	
USA	California	Palo Alto		Manufacturing plant	
USA	California	Panorama City		Manufacturing plant	
USA	Georgia	Atlanta		Manufacturing plant	
USA	Hawaii	Honolulu		Manufacturing plant	
USA	Illinois	Elk Grove		Manufacturing plant	
USA	Illinois	Oak Brook		Manufacturing plant	
USA	New Jersey	Blauvelt		Manufacturing plant	
USA	New Jersey	Rockleigh		Manufacturing plant	
USA	New York	Canandaigua		Manufacturing plant	
USA	New York	Farmington		Manufacturing plant	
USA	New York	Henrietta		Manufacturing plant	
USA	New York	Utica		Manufacturing plant	
USA	New York	Webster		Manufacturing plant	
USA	Oklahoma	Oklahoma		Manufacturing plant	
USA	Oklahoma	Yukon		Manufacturing plant	
USA	Oregon	Wilsonville		Manufacturing plant	
USA	Texas	Carrollton		Manufacturing plant	
Venezuela				Office	
Vietnam		Ho Chi Minh City		Office	
Yemen		Sana'a		Office	
Zambia		Lusaka		Office	
Zimbabwe		Harare		Office	

Source: Citi Research

Figure 919. Xilinx

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Australia		Tallinn			
Australia		Brisbane			
Belgium		Brussels			
Belgium		Benelux			
Canada	Quebec	Montreal			
Canada	Ontario	Toronto			
Canada	Ontario	Ottawa			
China	Hong Kong				
China		Xi'an			
China		Beijing			
China		Chengdu			
China	Hong Kong				
China		Nanjing			
China		Beijing			
China		Shanghai			
China		Shenzhen			
Estonia					
Finland		Helsinki			
Finland		Espoo			
France		Paris			
France	Ile-de-France	VOISINS LE BRETONNEUX			
Germany		Munich			
India		Bangalore			
India	Andhra Pradesh	Hyderabad			
Indonesia		Manila			
Ireland		Dublin	228,000		
Israel		Tel Aviv			
Italy		Milan			
Japan		Tokyo			
Japan		Tokyo			
Japan		Osaka			
Scotland		Edinburgh			
Singapore		Singapore	222,000		
South Korea		Seoul			
South Korea		Yoido-dong			
Sweden		Gothenburg			
Sweden		Kista			
Taiwan		Taichung			
Taiwan		Taipei			
UK		London			
UK	Northern Ireland	Belfast			
UK		Chertsey			
USA	Colorado	Longmon	130,000		
USA	California	San Jose	588,000		
USA	New Mexico	Albuquerque			
USA	Oregon	Portland			
USA	Texas	Austin			
USA	Illinois	Chicago			
USA	Texas	Dallas			
USA	Michigan	Detroit			
USA	California	Los Angeles			
USA	New Hampshire	Nashua			
USA	Arizona	Phoenix			
USA	North Carolina	Raleigh			
USA	Washington	Seattle			
USA	Oregon	Portland			
USA	New Jersey	Hazlet			
USA	California	Irvine			
USA	California	San Diego			
USA	Florida	Oviedo			
USA	Illinois	Schaumburg			
USA	Minnesota	Plymouth			
USA	New Hampshire	Nashua			
USA	North Carolina	Raleigh			
USA	Ohio	Brecksville			
USA	Oregon	Beaverton			
USA	Texas	Plano			
USA	Washington	Bothell			

Source: Citi Research

Figure 920. Xyratex

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Canada	Ontario	Kitchener		Office	
China	Jiangsu	Suzhou		Office	
Japan		Tokyo		Office	
Japan	Jiangsu	Wuxi		Office	
Malaysia		Seremban	246,900	Production and R&D	
Malaysia		Penang		Office	
Mexico		Guadalajara	59,300	R&D	
Mexico	Jalisco	Tlaquepaque		Office	
Philippines	Laguna	Calamba		Office	
Singapore			18,300	Office	
Thailand	Pathumthani	Klongluang		Office	
UK		Havant	125,000	Headquarters	
UK	Hampshire	Havant		Office	
USA	California	Sacramento	170,400	R&D	
USA	California	Fremont	85,700	R&D	
USA	Florida	Heathrow	21,000	R&D	
USA	California	Valencia	14,300	R&D	
USA	California	San Francisco		Office	

Source: Citi Research

Figure 921. Yingli Green Energy

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Australia	New South Wales	Pyrmont		Office	
China				Headquarters	
France		Lyon		Yingli Green Energy France S.A.S.	
Germany		Dusseldorf		Yingli Green Energy Europe GmbH	
Germany		Munich		Munich Office	
Greece		Athens		Athens Office	
Italy		Rome		Yingli Green Energy Italia S.r.l. s.u.	
Japan		Tokyo		Yingli Green Energy Japan Corporation, Ltd.	
Singapore				Yingli Green Energy Company Singapore Pte. Limited	
South Africa				Office	
Spain		Madrid		Yingli Green Energy Spain, S.L.U	
Turkey		Atasehir		Office	
USA	California	San Francisco		Office	
USA		New York		Office	

Source: Citi Research

Figure 922. Young Fast

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Taiwan	Taoyuan			Headquarters	
Taiwan		Taipei		Headquarters	

Source: Citi Research

Figure 923. ZTE

Country	State	City	Size (sq ft)	Description	Comments (manufacturing, office)
Australia	Victoria	Melbourne		Sales Office	
Armenia		Yerevan		Sales Office	
Austria		Vienna		Sales Office	
Azerbaijan		Baku		Sales Office	
Argentina		Buenos Aires		Sales Office	
Algeria	Mohammedia	Algiers		Sales Office	
Bangladesh		Dhaka		Sales Office	
Bulgaria		Sofia		Sales Office	
Belarus		Minsk		Sales Office	
Bolivia		La Paz		Sales Office	
Brazil		Brasilia		Sales Office	
Brazil		Sao Paulo		Sales Office	
Brazil		Brooklyn Novo		Sales Office	
Benin		Cotonou		Sales Office	
Burkina Faso		Ouagadougou		Sales Office	
Cambodia		Phnom Penh		Sales Office	
Czech Republic		Prague		Sales Office	
Serbia		New Belgrade		Sales Office	
Canada	Ontario	Toronto		Sales Office	
Costa Rica		San Jose		Sales Office	
Chile		Santiago		Sales Office	
Colombia		Bogota		Sales Office	
Cameroon		Yaounde		Sales Office	
Chad		N'Djamena		Sales Office	
Congo		Batetela Kinshasa		Sales Office	
Cote d'Ivoire		Abidjan		Sales Office	
Dominican Republic		Santo Domingo		Sales Office	
Ecuador		Quito		Sales Office	
Egypt		Cairo		Sales Office	
Equatorial Guinea		Malabo		Sales Office	
Eritrea		Asmara		Sales Office	
Ethiopia		Addis Ababa		Sales Office	
Finland		Espoo		Sales Office	
France		Paris		Sales Office	
Germany		Bonn		Sales Office	
Germany		Darmstadt		Sales Office	
Germany		Dusseldorf		Sales Office	
Greece		Athens		Sales Office	
Georgia		Tbilisi		Sales Office	
Guatemala				Sales Office	
Gabon		Libreville		Sales Office	
Ghana		Accra		Sales Office	
Hong Kong		Kowloon		Sales Office	
Hungary		Budapest		Sales Office	

Source: Citi Research

Figure 924. ZTE (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Haiti		Pétionville		Sales Office
India	Haryana	Gurgaon		Sales Office
India	Maharashtra	Navi Mumbai		Sales Office
Indonesia		Jakarta		Sales Office
Ireland		Dublin		Sales Office
Italy		Rome		Sales Office
Iraq		Baghdad		Sales Office
Japan		Tokyo		Sales Office
Jamaica		Kingston		Sales Office
Jordan		Amman		Sales Office
Kyrgyzstan		Bishkek		Sales Office
Kazakhstan		Almaty		Sales Office
Kenya		Nairobi		Sales Office
Kuwait		Kaifan		Sales Office
Laos		Vientiane		Sales Office
Lithuania		Vilnius		Sales Office
Luxembourg				Sales Office
Latvia		Riga		Sales Office
Libya		Tripoli		Sales Office
Liberia		Monrovia		Sales Office
Malaysia		Kuala Lumpur		Sales Office
Mongolia		Ulaanbaatar		Sales Office
Mexico		Miguel Hidalgo		Sales Office
Morocco		Rabat		Sales Office
Madagascar		Antananarivo		Sales Office
Malawi		Limbe		Sales Office
Mali		Bamako		Sales Office
Mauritius		Port Louis		Sales Office
Mozambique		Maputo		Sales Office
Nepal		Kathmandu		Sales Office
Netherlands		The Hague		Sales Office
Norway				Sales Office
Nicaragua		Managua		Sales Office
Nigeria		Abuja		Sales Office
Nigeria		Lagos		Sales Office
Pakistan		Islamabad		Sales Office
Philippines		Makati		Sales Office
Poland		Warsaw		Sales Office
Portugal		Lisbon		Sales Office
Paraguay		Asunción		Sales Office
Panama		Panama City		Sales Office

Source: Citi Research

Figure 925. ZTE (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Peru		Lima		Sales Office
Qatar		Doha		Sales Office
Romania		Bucharest		Sales Office
Russia		Moscow		Sales Office
Singapore				Sales Office
South Korea		Seoul		Sales Office
Sri Lanka		Colombo		Sales Office
Serbia		New Belgrade		Sales Office
Spain		Madrid		Sales Office
Sweden		Stockholm		Sales Office
El Salvador		San Salvador		Sales Office
Sierra Leone		Freetown		Sales Office
Saudi Arabia		Riyadh		Sales Office
South Africa		Johannesburg		Sales Office
Taiwan		Taipei		Sales Office
Thailand		Bangkok		Sales Office
Turkey		Istanbul		Sales Office
Turkey		Ankara		Sales Office
Tajikistan				Sales Office
Togo		Lome		Sales Office
Tanzania		Dar es Salaam		Sales Office
UK	Middlesex	Brentford		Sales Office
Ukraine		Kiev		Sales Office
Uzbekistan		Tashkent		Sales Office
USA	Virginia	Herndon		Sales Office
USA	California	San Diego		Sales Office
USA	Georgia	Atlanta		Sales Office
USA	Texas	Richardson		Sales Office
USA	Illinois	Chicago		Sales Office
USA	Kansas	Leawood		Sales Office
USA	New Jersey	Morristown		Sales Office
USA	North Carolina	Morrisville		Sales Office
USA	Washington	Bellevue		Sales Office
Uruguay		Montevideo		Sales Office
Uganda		Kampala		Sales Office
United Arab Emirates		Abu Dhabi		Sales Office
Vietnam		Hanoi		Sales Office
Venezuela		Caracas		Sales Office
Zimbabwe		Harare		Sales Office
Zambia		Lusaka		Sales Office

Source: Citi Research

Figure 926. Zhen Ding

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
China	Guangdong	Shenzhen		HQ/Manufacturing Plant
China	Jiangsu	Hualian		Manufacturing Plant
China	Hebei	Qinhuangdao		Manufacturing Plant
China	Liaoning	Yingkou		Manufacturing Plant
China		Beijing		Service center
China		Shanghai		Service center
China	Guangdong Provin	Shenzhen		Service center

Source: Citi Research

Figure 927. Zhen Ding (Continued)

Country	State	City	Size (sq ft)	Description Comments (manufacturing, office)
Finland		Espoo		Service center
India	Tamilnadu	Chennai		Service center
Japan	Kanagawa	Yokohama		Service center
Singapore				Service center
South Korea	Kyungkido	Suwon City		Service center
Taiwan		Taoyuan		R&D Center
USA	California	Santa Clara		Service center

Source: Citi Research

## Appendix2: Facility Locations By Countries/Continents

Figure 928. USA

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Alabama	Huntsville	Adtran		
USA	Alabama	Birmingham	Apple Inc		Retail Store
USA	Alabama	Huntsville	Apple Inc		Retail Store
USA	Alabama	Huntsville	Arrow Electronics		Office
					Providing EMS services to commercial, aerospace, defense, networking, industrial, test, instrumentation, and computer OEMs.
USA	Alabama	Huntsville	Benchmark Electronics	276,000	
USA	Alabama	Birmingham	Brocade Communications		
USA	Alabama	Birmingham	Cisco Systems Inc		
USA	Alabama	Montgomery	Cisco Systems Inc		
USA	Alabama	Hoover	EMC Corp		
USA	Alabama	Huntsville	Linear Technology		Office
USA	Alabama	Madison	NVIDIA		Office
USA	Alabama	Huntsville	On Semiconductor		Sales Office
USA	Alabama	Huntsville	STMicroelectronics		Sales Office & Representative
USA	Alabama		WPG Holding		
USA	Alaska	Anchorage	Apple Inc		Retail Store
USA	Alaska	Anchorage	Cisco Systems Inc		
USA	Alberta	Pacific Northwest	On Semiconductor		Sales Office
USA	Arizona	Chandler	Amkor Technology Inc	6,000	Package and process development
USA	Arizona	Cottonwood	Amphenol		Amphenol Griffith Enterprises
USA	Arizona	Nogales	Amphenol		Amphenol Optimize Mfg Company
USA	Arizona	Nogales	Amphenol		TFC Broadband Solutions Division
USA	Arizona	Chandler	Apple Inc		Retail Store
USA	Arizona	Gilbert	Apple Inc		Retail Store
USA	Arizona	Glendale	Apple Inc		Retail Store
USA	Arizona	Phoenix	Apple Inc		Retail Store
USA	Arizona	Scottsdale	Apple Inc		Retail Store
USA	Arizona	Tucson	Apple Inc		Retail Store
USA	Arizona	Phoenix	Arrow Electronics	60000	Office
USA	Arizona	Tempe	ASE		
USA	Arizona	Chandler	ASML Holding NV	96875	
USA	Arizona	Tempe	ATMI Inc		Sales & Marketing
USA	Arizona	Chandler	Avnet	399,000	EM warehousing and value-added operations
USA	Arizona	Chandler	Avnet		EM warehousing, integration and value-added
USA	Arizona	Phoenix	Avnet	231,000	operations
USA	Arizona	Tempe	Avnet	176,000	Corporate and EM Headquarters
USA	Arizona	Tempe	Avnet	132,000	TS Headquarters
USA	Arizona	Tempe	Benchmark Electronics	48,000	Benchmark Precision Technologies
					The Benchmark Phoenix facility has its roots and process heritage grounded in the Aerospace and Defense industry since the facility first opened in
USA	Arizona	Phoenix	Benchmark Electronics	100,000	1999
USA	Arizona	Chandler	Brocade		Office
USA	Arizona	Phoenix	Brocade Communications		
USA	Arizona	Scottsdale	Electronics For Imaging, Inc	29	office
USA	Arizona	Chandler	Freescale Semiconductor Ltd.		Office
USA	Arizona	Tempe	Fujitsu		Office
USA	Arizona	Tempe	Garmin Ltd.	24,748	office
USA	Arizona	Tucson	Garmin Ltd.	33,120	office
USA	Arizona	Scottsdale	Ingram Micro	144,000	DBL Distributing, a Division of Ingram Micro
USA	Arizona	Chandler	Intel		
USA	Arizona	Tempe	Jabil	191,000	Manufacturing, Support, Training, Storage
USA	Arizona	Tempe	Jabil	27,000	Support, Storage, Training
USA	Arizona	Chandler	International Rectifier Corp		
USA	Arizona	Mesa	International Rectifier Corp		
USA	Arizona	Phoenix	Juniper Networks Inc		
USA	Arizona	Chandler	KLA Tencor Corp		
USA	Arizona	Scottsdale	Kyocera		Solar Business - KYOCERA Solar, Inc.
USA	Arizona	Chandler	Lam Research Corp		Office
USA	Arizona	Tempe	Linear Technology		Office
USA	Arizona	Chandler	Maxim Integrated	65000	Office space, engineering, and test
USA	Arizona	Tucson	Maxim Integrated		Office
USA	Arizona	Chandler	Microchip Technology	415000	Headquarters
					Wafer Fabrication (Fab 2); R&D Center;
USA	Arizona	Tempe	Microchip Technology	379000	Administrative Offices; and Warehousing
USA	Arizona	Phoenix	On Semiconductor	1,400,000	Headquarters
USA	Arizona	Chandler	QUALCOMM Incorporated		
USA	Arizona	Tempe	RF Microdevices		Design Center
USA	Arizona	Chandler	RF Microdevices		Design Center
USA	Arizona	Phoenix	Samsung Electro-Mechanics		Overseas Sales Offices
USA	Arizona		Sensata		Business Centre
USA	Arizona	Phoenix	Shinko Electric Industries		Sales Office - SHINKO ELECTRIC AMERICA, INC.
					Manufacturing & Design Center, Sales Office & Representative
USA	Arizona	Scottsdale	STMicroelectronics		
USA	Arizona	Tucson	Texas Instruments		
USA	Arizona	Chandler	Tokyo Electron		Phoenix Office
USA	Arizona	Phoenix	Toshiba		
USA	Arizona	Tucson	Toshiba		
USA	Arizona	Phoenix	WPG Holding		
USA	Arizona	Phoenix	Xilinx Inc		
USA	Arizona	Tucson	Cisco Systems Inc		
USA	Arizona	Phoenix	Cisco Systems Inc		
USA	Arizona		Corning		Office
USA	Arizona	Tempe	CSR Plc		
USA	Arizona	Phoenix	CSR Plc	52573	R&D
USA	Arizona		Cypress Semiconductor Corp		
USA	Arizona	Tempe	Freescale Semiconductor Ltd.		Office
					Administrative, manufacturing and research and development facilities
USA	Arizona	Tucson	Oclaro Inc.	15000	development facilities
USA	Arizona	Prescott	Sun Edison		

Source: Citi Research

Figure 929. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Arkansas	Little Rock	Apple Inc		Retail Store
USA	Arkansas	Bentonville	EMC Corp		
USA	Arkansas	Conway	EMC Corp		
USA	Arkansas	Little Rock	EMC Corp		
USA	Arkansas	Mena	Nidec		Manufacturing
USA	Arkansas	Paragould	Nidec		Manufacturing
USA	Arkansas		WPG Holding		
USA	Arkansas	Little Rock	Cisco Systems Inc		
USA	Arkansas	Bentonville	Cisco Systems Inc		
USA	British Colum	Richmond	Broadcom		Office
USA	British Colum	Burnaby	Polycorn Inc.		Office
					advanced research and development facility
USA	California	Valencia	3D Systems Corp	11000	personalized medical devices development and
					Cubify development
USA	California	San Francisco	3D Systems Corp	8000	Office
USA	California	Walnut	AAC Technologies Holdings		Office
USA	California	San Jose	AAC Technologies Holdings		Office
USA	California	San Jose	Acer Inc		Acer America Corp. (Regional Headquarters)
USA	California	San Jose	Acer Inc		Tech Support
USA	California	San Jose	Advanced Energy Industries, Inc		Advanced Solar Energy - Headquarters
USA	California	Sunnyvale	Aixtron	100,513	Manufacturing, Sales, Services, Engineering, & R&D
USA	California	Calabasas	Alcatel Lucent SA		
USA	California	Daly City	Alcatel Lucent SA		
USA	California	Mountain View	Alcatel Lucent SA		
USA	California	Petaluma	Alcatel Lucent SA		
USA	California	San Diego	Alcatel Lucent SA		
USA	California	San Jose	Altera Corp	505,000	Headquarters
USA	California	Santa Clara	Amkor Technology Inc		Sales Office
USA	California	Irvine	Amkor Technology Inc		Sales Office
USA	California	San Diego	Amkor Technology Inc		Sales Office
USA	California	Moorpark	Amphenol		Amphenol Connex Corporation
USA	California	Cerritos	Amphenol		Amphenol Nelson Dunn Technologies
USA	California	Milpitas	Amphenol		Amphenol TCS Integrated Systems
USA	California	Ventura	Amphenol		Holland Electronics
USA	California	San Jose	Analog Devices, Inc	76700	Engineering, administrative offices
USA	California	Cupertino	Apple Inc	2.6 million	Office
USA	California	Bakersfield	Apple Inc		Retail Store
USA	California	Berkeley	Apple Inc		Retail Store
USA	California	Brea	Apple Inc		Retail Store
USA	California	Burlingame	Apple Inc		Retail Store
USA	California	Canoga Park	Apple Inc		Retail Store
USA	California	Carlsbad	Apple Inc		Retail Store
USA	California	Cerritos	Apple Inc		Retail Store
USA	California	Chula Vista	Apple Inc		Retail Store
USA	California	Corte Madera	Apple Inc		Retail Store
USA	California	Costa Mesa	Apple Inc		Retail Store
USA	California	Emeryville	Apple Inc		Retail Store
USA	California	Escondido	Apple Inc		Retail Store
USA	California	Fresno	Apple Inc		Retail Store
USA	California	Glendale	Apple Inc		Retail Store
USA	California	Glendale	Apple Inc		Retail Store
USA	California	Irvine	Apple Inc		Retail Store
USA	California	Los Angeles	Apple Inc		Retail Store
USA	California	Los Angeles	Apple Inc		Retail Store
USA	California	Los Angeles	Apple Inc		Retail Store
USA	California	Los Gatos	Apple Inc		Retail Store
USA	California	Manhattan Beach	Apple Inc		Retail Store
USA	California	Mission Viejo	Apple Inc		Retail Store
USA	California	Modesto	Apple Inc		Retail Store
USA	California	Monterey	Apple Inc		Retail Store
USA	California	Newport Beach	Apple Inc		Retail Store
USA	California	Northridge	Apple Inc		Retail Store
USA	California	Palm Desert	Apple Inc		Retail Store
USA	California	Palo Alto	Apple Inc		Retail Store
USA	California	Palo Alto	Apple Inc		Retail Store
USA	California	Pasadena	Apple Inc		Retail Store
USA	California	Pleasanton	Apple Inc		Retail Store
USA	California	Rancho Cucamonga	Apple Inc		Retail Store
USA	California	Roseville	Apple Inc		Retail Store
USA	California	Sacramento	Apple Inc		Retail Store
USA	California	San Diego	Apple Inc		Retail Store
USA	California	San Diego	Apple Inc		Retail Store
USA	California	San Francisco	Apple Inc		Retail Store
USA	California	San Francisco	Apple Inc		Retail Store
USA	California	San Francisco	Apple Inc		Retail Store
USA	California	San Jose	Apple Inc		Retail Store
USA	California	San Luis Obispo	Apple Inc		Retail Store
USA	California	San Mateo	Apple Inc		Retail Store
USA	California	Santa Barbara	Apple Inc		Retail Store
USA	California	Santa Clara	Apple Inc		Retail Store
USA	California	Santa Monica	Apple Inc		Retail Store
USA	California	Santa Rosa	Apple Inc		Retail Store
USA	California	Los Angeles	Apple Inc		Retail Store
USA	California	Simi Valley	Apple Inc		Retail Store
USA	California	Temecula	Apple Inc		Retail Store
USA	California	Thousand Oaks	Apple Inc		Retail Store
USA	California	Valencia	Apple Inc		Retail Store
USA	California	Walnut Creek	Apple Inc		Retail Store
					Headquarters; Marketing; Manufacturing; Distribution; Research, Development, Engineering;
USA	California	Santa Clara	Applied Materials Inc	1,626,000	Customer Support

Source: Citi Research

Figure 930. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	California	Sunnyvale	Applied Materials Inc		Maydan Technology Center
USA	California	San Jose	ARM Holdings PLC		Main Regional Office
USA	California	Irvine	ARM Holdings PLC		
USA	California	San Diego	ARM Holdings PLC		
USA	California	Ontario	Arris Enterprises, Inc.	59,269	Warehouse
USA	California	Ontario	Arris Enterprises, Inc.	17,400	Warehouse
USA	California	Redwood City	Arris Enterprises, Inc.	15,736	Office
USA	California	Foot Hill Ranch	Arrow Electronics		Office
USA	California	Roseville	Arrow Electronics		Office
USA	California	San Diego	Arrow Electronics		Office
USA	California	Santa Clara	Arrow Electronics		Office
USA	California	Woodland Hills	Arrow Electronics		Office
USA	California		ASE	96000	Engineering and Final testing
USA	California	Sunnyvale	ASE		
USA	California	Irvine	ASE		
USA	California	San Diego	ASE		
USA	California	San Jose	ASML Holding NV		
USA	California	Santa Clara	ASML Holding NV	53820	
USA	California	Irvine	ASML Holding NV		
USA	California	Fremont	ASUSTek COMPUTER INC		US Headquarters
USA	California	Milpitas	AU Optronics		Office
					Administration, Research and Development and
					Center
USA	California	Sun Valley	AVX Corporation	25,000	Manufacturing — PC
USA	California	Fremont	Belden		
USA	California	Concord	Benchmark Electronics		
USA	California	Fremont	Benchmark Electronics	52,000	Benchmark Precision Technologies
USA	California	Campbell	Blackberry		
USA	California	Redwood City	Blackberry		
USA	California	San Diego	Blackberry		
USA	California	Mountain View	Blackberry		
USA	California	Irvine	Broadcom		Headquarters
USA	California	San Diego	Broadcom		Office
USA	California	San Jose	Broadcom		Office
USA	California	Santa Clara	Broadcom		Office
USA	California	Santa Clara	Broadcom		Office
USA	California	Sunnyvale	Broadcom		Office
USA	California	Irvine	Brocade Communications		
USA	California	San Bruno	Brocade Communications		
USA	California	San Jose	Brocade Communications		
USA	California	Fremont	Brooks Automation Inc		Office
USA	California	Poway	Brooks Automation Inc	67600	Manufacturing and R&D
USA	California	Petaluma	Brooks Automation Inc	72300	Manufacturing and R&D
USA	California		Celestica	428,000	
USA	California	La Mirada	Cheil Industries		Chemicals/Electronic Materials Division
USA	California	San Diego	Cheil Industries		Chemicals/Electronic Materials Division
USA	California	San Jose	Cheil Industries		Chemicals/Electronic Materials Division
USA	California	Irvine	Chicony Electronics		Chicony America Inc.
USA	California	San Jose	Ciena Corp		
USA	California	San Jose	Cisco Systems Inc		Headquarters
USA	California	Gold River	Cisco Systems Inc		
USA	California	Pleasanton	Cisco Systems Inc		
USA	California	Los Angeles	Cisco Systems Inc		
USA	California	Irvine	Cisco Systems Inc		
USA	California	Clovis	Cisco Systems Inc		
USA	California	San Diego	Cisco Systems Inc		
USA	California		Compal Electronics		Bizcom Electronics, Inc.
USA	California		Corning		Office
USA	California	Palo Alto	Corning		Office
USA	California	Santa Ana	CSR Plc	12643	
USA	California	San Jose	CSR Plc		
USA	California	Sunnyvale	CSR Plc	88924	R&D, Sales and Administration
USA	California	San Jose	Cypress Semiconductor Corp	171,000	Administrative offices, research and development
USA	California	Fremont	Delta Electronics		Fremont Office
USA	California	Los Angeles	Delta Electronics		Los Angeles Office
USA	California	Fremont	E Ink Holdings		E Ink Fremont Site
USA	California	Foster City	Electronics For Imaging, Inc	294	Office
USA	California	Palo Alto	EMC Corp	1,642,000	Office
USA	California	Burbank	EMC Corp		
USA	California	Campbell	EMC Corp		
USA	California	Carlsbad	EMC Corp		
USA	California	El Segundo	EMC Corp		
USA	California	Irvine	EMC Corp		
USA	California	Long Beach	EMC Corp		
USA	California	Menlo Park	EMC Corp		
USA	California	Pleasanton	EMC Corp		
USA	California	Roseville	EMC Corp		
USA	California	San Diego	EMC Corp		
USA	California	San Francisco	EMC Corp		
USA	California	San Jose	EMC Corp		
USA	California	San Mateo	EMC Corp		
USA	California	Santa Clara	EMC Corp		
USA	California	Santa Monica	EMC Corp		
USA	California	Costa Mesa	Emulex Corp	180,000	Headquarters
USA	California	Roseville	Emulex Corp		Office
USA	California	San Jose	Emulex Corp		Office
USA	California	Sunnyvale	Emulex Corp		Office
USA	California	San Diego	Entegris Inc	13,000	Research & Manufacturing
USA	California	Pleasant Hill	Entegris Inc		
USA	California	San Jose	Fairchild Semiconductor International		office
USA	California	San Jose	Fairchild Semiconductor International		Design Centers
USA	California	Irvine	Fairchild Semiconductor International		Office Facilities & Design center
USA	California	Hayward	Fairchild Semiconductor International		Office Facilities & Design center
USA	California	Sunnyvale	Finisar Corp.	92000	Office
USA	California	Fremont	Finisar Corp.	56000	Office
USA	California	San Francisco	First Solar Inc		Office
USA	California	San Jose	Flexium Interconnect		America office
					Flextronics facilities, Manufacturing, Design
					Centers
USA	California	Valencia	Flextronics		Flextronics facilities, Manufacturing, Design
					Centers, Industrial Parks, Service & Software
USA	California	Milpitas	Flextronics		Flextronics facilities, Manufacturing
USA	California	Morgan Hill	Flextronics		Flextronics facilities, Manufacturing
USA	California	San Carlos	Flextronics		Flextronics facilities, Manufacturing
					Corporate Headquarters, sales, marketing, finance,
					product design, manufacturing, service and repair,
USA	California	Livermore	FormFactor Inc	182,167	distribution, research and Storage
					Sales, marketing, finance, product design,
USA	California	San Jose	FormFactor Inc	39,894	research and development
					manufacturing, service and repair, distribution,
					Product design, manufacturing, service and repair,
USA	California	Carlsbad	FormFactor Inc	25,634	distribution, research and development

Source: Citi Research

Figure 931. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	California	Santa Clara	Fujifilm		
USA	California	Sunnyvale	Fujitsu		Fujitsu America, Inc.
USA	California	Palo Alto	Hewlett Packard		Office
USA	California	Roseville and San Di	Hewlett Packard		Product Development and Manufacturing
USA	California	Simi Valley	Hirose Electric		HIROSE Electric U.S.A., Inc.
USA	California	Santa Clara	Hirose Electric		San Jose Office
USA	California	Brisbane	Hitachi		Hitachi America Capital Ltd.
USA	California	Cupertino	Hitachi		Hitachi Chemical Co. America, Ltd.
USA	California	Mountain View	Hitachi		Hitachi Chemical Diagnostics, Inc.
USA	California	Irvine	Hitachi		Hitachi Chemical Research Center, Inc.
USA	California	Santa Clara	Hitachi		Hitachi Data Systems
USA	California	San Francisco	Hitachi		Hitachi Solutions America, Ltd.
USA	California	Torrance	Hitachi		Hitachi Transport System (America), Ltd.
USA	California		Hon Hai Precision		
USA	California	San Jose	Hosiden		San Jose Sales Office
USA	California	Santa Clara	Hoya Corporation		HOYA HOLDINGS, INC., HOYA CORPORATION USA
USA	California	Chino Hills	Hoya Corporation		Optics Division
USA	California	Los Angeles	Hoya Corporation		HOYA SURGICAL OPTICS, INC.
USA	California	Modesto	Hoya Corporation		HOYA VISION CARE, LOS ANGELES FACILITY
USA	California	San Diego	Hoya Corporation		HOYA VISION CARE, MODESTO FACILITY
					HOYA VISION CARE, SAN DIEGO FACILITY
USA	California	Los Angeles	Hoya Corporation		HOYA VISION CARE, LOS ANGELES DISTRIBUTION
USA	California	Walnut Creek	Huawei		
USA	California	San Diego	Huawei		
USA	California	Santa Clara	Ibiden		IBIDEN U.S.A. Corp. (Head Office)
					Regional Subsidiaries - Infineon Technologies North
					America Corp
USA	California	Milpitas	Infineon Technologies AG		
USA	California	Sunnyvale	Infina Corp.	211000	Office
USA	California	Santa Clara	Infoblox Inc.		127,000 office
USA	California	Santa Ana	Ingram Micro		400000 Headquarters
USA	California	Mira Loma	Ingram Micro	1150000	ALCs - Warehouse
USA	California	Elk Grove	Ingram Micro		ALCs - Logistic Centre
USA	California	San Jose	Innolux		Office
USA	California	Calabasas	Intel		
USA	California	Carlsbad	Intel		
USA	California	Folsom	Intel		
USA	California	Irvine	Intel		
USA	California	Menlo Park	Intel		
USA	California	Sacramento	Intel		
USA	California	San Diego	Intel		
USA	California	San Francisco	Intel		
USA	California	Santa Clara	Intel		
USA	California	El Segundo	International Rectifier Corp		
USA	California	Temecula	International Rectifier Corp		
USA	California	San Jose	International Rectifier Corp		
USA	California	Irvine	International Rectifier Corp		
USA	California	Milpitas	Intersil Corp.		166000 Headquarters & Design Centers
USA	California	Irvine	Jabil		6,000 Support
USA	California	San Jose	Jabil		181,000 Prototype Manufacturing
USA	California	Milpitas	JDSU Corp.		163000 Headquarters
USA	California	Sunnyvale	Juniper Networks Inc		1,800,000 Headquarters
USA	California	Santa Clara	Kinsus Interconnect Technology		
					Office, plant and
USA	California	Milpitas	KLA Tencor Corp	727,302	warehouse
USA	California	Hayward	KLA Tencor Corp		
USA	California	San Diego	Kyocera		Headquarters
					Telecommunications Equipment - KYOCERA
					Communications, Inc.
USA	California	San Diego	Kyocera		
					Information Equipment - KYOCERA Document
					Solutions Development America, Inc.
USA	California	Concord	Kyocera		
USA	California	San Diego	Kyocera		
					Components Business - KYOCERA America, Inc.
					Components Business - KYOCERA TYCOM
					Corporation
USA	California	Costa Mesa	Kyocera		Northern California Office
USA	California	San Jose	Kyocera		
USA	California	Fremont	Lam Research Corp		Headquarters
USA	California	Livermore	Lam Research Corp		Manufacturing
USA	California	San Jose	Lam Research Corp		Office
USA	California	San Jose	LG Display		Sales
USA	California	Cerritos	LG Display		Sales
USA	California	Carlsbad	LG Display		Sales
USA	California	Carlsbad	LG Electronics		LG Electronics Mobile Research. U.S.A., L.L.C
USA	California	San Jose	LG Innotek		LG Innotek USA Inc. (LGITUS)
USA	California	San Diego	LG Innotek		LG Innotek USA Inc. San Diego office (LGITUS)
					Executive and administrative offices, wafer
					fabrication,
					test and assembly operations, research and
					development, sales and marketing, and
					warehousing
USA	California	Milpitas	Linear Technology	430,000	and distribution
USA	California	Irvine	Linear Technology		Office
USA	California	San Diego	Linear Technology		Office
USA	California	Los Angeles	Linear Technology		Office
					Silicon valley campus, research and development,
					product marketing, sales management, technical
USA	California	Newark	Logitech International S A	264000	support and administration
USA	California	Fremont	Logitech International S A	46300	Former silicon valley campus
USA	California	Irvine	Logitech International S A	13500	Ultimate Ears Group
USA	California	Cupertino	MagnaChip Semiconductor Corp		Sales Office
USA	California	Santa Clara	Marvell	993,000	
					Corporate Headquarters, office space, engineering,
					manufacturing,
					administration, customer services, shipping, and
USA	California	San Jose	Maxim Integrated	435000	other
USA	California	San Jose	Maxim Integrated	80000	Wafer fabrication, office space and administration
USA	California	Irvine	Maxim Integrated		Office
USA	California	San Diego	Maxim Integrated		Office
USA	California	San Jose	MediaTek		MediaTek USA Inc. (San Jose)
USA	California	Irvine	MediaTek		MediaTek USA Inc. (Irvine)
USA	California		Motorola Solutions		Sales Office & Technology Center

Source: Citi Research

Figure 932. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	California	Rancho Dominguez	NEC		NEC Logistics America, Inc.
USA	California	San Jose	NEC		NEC Tokin America, Inc.
USA	California	Sunnyvale	NetApp Inc	1,700,000	Headquarters
USA	California	Rancho Cordova	Nidec		Factory and R&D
USA	California	Livermore	Nidec		Sales & Factory
USA	California	Santa Clara	Nidec		Sales
USA	California	Santa Clara	Nidec		Sales Support
USA	California	Torrance	Nidec		Sales
USA	California		Nidec		Manufacturing
USA	California	Sunnyvale	Nokia		Regional Office
USA	California	Santa Clara	NVIDIA		Headquarters
USA	California	San Jose	Oclaro Inc.	52000	Corporate headquarters, office space, manufacturing, research and development
USA	California	San Jose	Oclaro Inc.	25000	Administrative, manufacturing and research and development facilities
USA	California	San Jose	Olympus		Olympus Communication Technology of America, Inc.
USA	California	San Diego	OmniVision	207000	Corporate Headquarters
USA	California	Santa Clara	On Semiconductor	42,000	
USA	California	Laguna Hills	On Semiconductor		Sales Office
USA	California	San Jose	On Semiconductor		Sales Office
USA	California	San Diego	Panasonic		Semiconductor Sales office
USA	California	Cupertino	Panasonic		Semiconductor Sales office
USA	California	Cupertino	Panasonic		Cupertino Sales Office
USA	California	Cupertino	Panasonic		Sale / Marketing
USA	California	Fremont	Plexus	46,000	Engineering & Manufacturing Solutions
USA	California	San Diego	Plexus	198,000	Engineering & Manufacturing Solutions
USA	California	San Jose	Polycorn Inc.		Headquarter
USA	California	El Segundo	Polycorn Inc.		Office
USA	California	Tracy	Polycorn Inc.		Office
USA	California	Aliso Viejo	QLogic Corp	195000	Headquarters
USA	California	Roseville	QLogic Corp		
USA	California	Mountain View	QLogic Corp		
USA	California	San Diego	QUALCOMM Incorporated		
USA	California	Berkeley	QUALCOMM Incorporated		
USA	California	Carlsbad	QUALCOMM Incorporated		
USA	California	Irvine	QUALCOMM Incorporated		
USA	California	San Francisco	QUALCOMM Incorporated		
USA	California	San Jose	QUALCOMM Incorporated		
USA	California	Santa Clara	QUALCOMM Incorporated		
USA	California	Fremont	Quanta Computer		Quanta Computer USA Inc.
USA	California	Sunnyvale	Rambus Inc		Corporate Headquarters
USA	California	San Francisco	Rambus Inc		Research and development
USA	California	San Luis Obispo	REC Solar ASA		Solar Sales Office - North America Regional Office
USA	California	San Jose	RF Microdevices		Design Center
USA	California	Scotts Valley	RF Microdevices		Design Center
USA	California	Torrance	RF Microdevices		Design Center
USA	California	Carlsbad	RF Microdevices		Design Center
USA	California	Irvine	RF Microdevices		Design Center
USA	California	San Diego	RF Microdevices		Sales & Customer Support Center
USA	California	Campbell	Richtek Technology		US Office
USA	California	Menlo Park	Ricoh Co		R&D - Ricoh Innovations Corporation
USA	California	Cupertino	Ricoh Co		R&D - Ricoh Americas Corporation Advanced
USA	California	Tustin	Ricoh Co		Customer Technologies
USA	California		Ricoh Co		Manufacturing - Ricoh Electronics, Inc.
USA	California	Tustin	Ricoh Co		Manufacturing - Ricoh Development Of California, Inc.
USA	California	San Francisco	Riverbed Technology	204,716	Headquarters
USA	California	Sunnyvale	Riverbed Technology	67,000	
USA	California	Margarita	Riverbed Technology		
USA	California	Davis	Riverbed Technology		
USA	California	El Segundo	Riverbed Technology		
USA	California	Santa Clara	Riverbed Technology		
USA	California	San Diego	Rohm		Sales & R&D Office - ROHM Semiconductor U.S.A.,LLC
USA	California	San Jose	Rohm		Sales & R&D Office - ROHM Semiconductor U.S.A.,LLC
USA	California	Irvine	Samsung Electro-Mechanics		Overseas Sales Offices
USA	California	San Jose	Samsung Electro-Mechanics		Overseas Sales Offices
USA	California	San Jose	Samsung SDI		Americas Subsidiary ( SDIA )
USA	California				Product development and marketing and administrative
USA	California	Long Beach	Seagate Technology	895,000	
USA	California	Long Beach	Seiko Epson		Epson America, Inc.
USA	California	San Jose	Seiko Epson		Epson Accessories, Inc.
USA	California	San Jose	Seiko Epson		Epson Electronics America, Inc.
USA	California	San Jose	Seiko Epson		R&D Subsidiaries and Affiliates - Epson Research and Development, Inc.
USA	California	San Jose	Seiko Epson		R&D Subsidiaries and Affiliates - Epson Electronics America, Inc., San Jose ASIC Design Center
USA	California	San Jose	Semtech		
USA	California	San Jose	Semtech	10,000	
USA	California	San Diego	Semtech	35,000	
USA	California	Irvine	Semtech	26,300	
USA	California	Redondo Beach	Semtech		
USA	California	San Jose	Shinko Electric Industries		Head Office - SHINKO ELECTRIC AMERICA, INC.
USA	California	San Jose	Shinko Electric Industries		Sales Office - SHINKO ELECTRIC AMERICA, INC.
USA	California	San Jose	Silicon Laboratories, Inc		
USA	California	San Jose	SK Hynix		Headquarters, SK hynix America Inc. Pin - 3101
USA	California	San Jose	SK Hynix		Headquarters, SK hynix memory solutions Inc. Pin - 3103
USA	California	San Jose	Skyworks	42200	Design Center
USA	California	Santa Clara	Skyworks	63400	Design Center
USA	California	Irvine	Skyworks	111600	Manufacturing and office space
USA	California	Newbury Park	Skyworks	108400	Design Center
USA	California	Newbury Park	Skyworks		
USA	California	Rocklin	SMA Solar Technology		SMA America, LLC
USA	California	Cambridge	SolarWorld AG		Sales, Service & Technical Support
USA	California	San Jose	Spansion		Headquarters, Design Centers and Specialized Centers of Excellence

Source: Citi Research

Figure 933. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	California		SPIL		Assembly Service Providing
USA	California	San Jose	SPIL		Communications and Relationship Maintenance
USA	California	Sunnyvale	Spirent Communications Plc		Operational Head Office
USA	California	La Jolla	STMicroelectronics		Manufacturing & Design Center, Sales Office & Representative
USA	California	La Jolla	STMicroelectronics		Manufacturing & Design Center, Sales Office & Representative
USA	California	Santa Clara	STMicroelectronics		Sales Office & Representative
USA	California	Aliso Viejo	STMicroelectronics		Sales Office & Representative
USA	California	Rancho Cucamonga	Stratays Ltd	7583	North American sales office
USA	California	Belmont	Sun Edison		Headquarters
USA	California	McClellan	Sun Edison		
USA	California	San Clemente	Sun Edison		
USA	California	San Francisco	Sun Edison		
USA	California	Belmont	Sun Edison		
USA	California	San Francisco	Suntech Power Holdings		
USA	California	Fremont	Synnex Corporation		Warehouse,
USA	California	Ontario	Synnex Corporation		Warehouse
USA	California	Carson	Synnex Corporation		Sales
USA	California	San Jose	TDK Corporation		SAN JOSE District Office
USA	California	San Diego	TDK Corporation		SAN DIEGO District Office
USA	California	Fontana	Tech Data	436000	
USA	California	Santa Clara	Tellabs, Inc.		Business Units
USA	California	Agoura Hills	Teradyne	120,000	Semiconductor Test
USA	California	San Jose	Teradyne	128,000	Semiconductor Test
USA	California	Sunnyvale	Teradyne	75,000	Wireless Test
USA	California	Santa Clara	Texas Instruments		
USA	California	Fremont	Tokyo Electron		Fremont Office
USA	California	Irvine	Toshiba		Toshiba America Business Solutions
USA	California	Irvine	Toshiba		Toshiba America Electronic Components, Inc.
USA	California	Tustin	Toshiba		Toshiba America Medical Systems, Inc.
USA	California	Fresno	Toshiba		
USA	California	Hayward	Toshiba		
USA	California	Inland Empire	Toshiba		
USA	California	Los Angeles	Toshiba		
USA	California	Orange County	Toshiba		
USA	California	Petaluma	Toshiba		
USA	California	Sacramento	Toshiba		
USA	California	San Diego	Toshiba		
USA	California	San Francisco	Toshiba		
USA	California	San Jose	Toshiba		
USA	California	San Ramon	Toshiba		
USA	California	Oxnard	Toshiba		
USA	California	San Mateo	TPK		TPK US Office
USA	California	San Jose	Trina Solar Limited		Regional Headquarters
USA	California	San Jose	TriQuint	51500	Engineering, test and technical
USA	California	San Jose	TriQuint		Engineering, administration
USA	California	Santa Rosa	TriQuint	14050	and test
USA	California	Los Gatos	TriQuint	4100	Engineering and marketing
USA	California		TSMC		Offices
USA	California		UMC		Subsidiary
USA	California	Santa Clara	Vanguard International Semiconductor		Office
USA	California	Santa Clara	Vanguard International Semiconductor		Service and marketing Activity
USA	California	Camarillo	Veeco Instruments Inc	23000	Data Storage
USA	California	San Jose	Veeco Instruments Inc		Support Center
USA	California	Newark	Venture Corp.		
USA	California	Anaheim	Venture Corp.		
USA	California	Santa Clara	Vishay	227000	MOSFETS
USA	California	Ontario	Vishay	46000	Resistors & Inductors
USA	California	San Jose	Wintek		Marketing
USA	California	Cupertino	Wolfson		
USA	California	Laguna Hills	WPG Holding		
USA	California	San Jose	WPG Holding		Headquarters
USA	California	San Diego	WPG Holding		
USA	California	Los Angeles	WPG Holding		
USA	California	Santa Ana	Xerox		Manufacturing plant
USA	California	El Segundo	Xerox		Manufacturing plant
USA	California	Fremont	Xerox		Manufacturing plant
USA	California	Irvine	Xerox		Manufacturing plant
USA	California	Manhattan Beach	Xerox		Manufacturing plant
USA	California	Monrovia	Xerox		Manufacturing plant
USA	California	Newark	Xerox		Manufacturing plant
USA	California	Palo Alto	Xerox		Manufacturing plant
USA	California	Panorama City	Xerox		Manufacturing plant
USA	California	San Jose	Xilinx Inc	588,000	
USA	California	Los Angeles	Xilinx Inc		
USA	California	Irvine	Xilinx Inc		
USA	California	San Diego	Xilinx Inc		
USA	California	Sacramento	Xyratec	170,400	R&D
USA	California	Fremont	Xyratec	85,700	R&D
USA	California	Valencia	Xyratec	14,300	R&D
USA	California	San Francisco	Xyratec		Office
USA	California	San Francisco	Yingli Green Energy		Office
USA	California	Santa Clara	Zhen Ding Tech		Service center
USA	California	San Diego	ZTE Corp		Sales Office
USA	California	Sunnyvale	Advanced Micro Devices, Inc		
USA	California	Santa Clara	Alps Electric		Head Office
USA	California	San Diego	Alps Electric		San Diego Office
USA	California	San Diego	Altera Corp		
USA	California		Asahi Glass		Automotive glass parts (sales)
USA	California	San Francisco	Cisco Systems Inc		
USA	California	San Jose	F5 Networks		Office
USA	California	Irvine	Freescale Semiconductor Ltd.		
USA	California	San Jose	Freescale Semiconductor Ltd.		Office
USA	California	San Jose	Integrated Device Technology	263,000	
USA	California	Costa Mesa	Juniper Networks Inc		
USA	California	El Segundo	Juniper Networks Inc		

Source: Citi Research



Figure 934. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	California	Sacramento	Juniper Networks Inc		
USA	California	San Jose	Microchip Technology		
USA	California	Mission Viejo	Microchip Technology		
USA	California	Cypress	Mitsubishi Electric		Mitsubishi Electric US, Inc. (Corporate HQ, Elevators & Escalators, Photovoltaics)
USA	California	Santa Clara	Mitsubishi Electric		Santa Clara Office (Semiconductors)
USA	California	Irvine	Mitsubishi Electric		Mitsubishi Electric Visual Solutions America, Inc.
USA	California	La Mirada	Mitsubishi Electric		La Mirada, California Office
USA	California	Garden Grove	Mitsubishi Electric		Orange County Office
USA	California	Cupertino	Mitsumi Electric		Sales Office
USA	California	Santa Clara	Oclaro Inc.	10000	development facilities
USA	California	Camarillo	Semtech	87600	
USA	California	San Jose	SunPower Corporation	129000	Headquarters
USA	California	Richmond	SunPower Corporation	186000	Office
USA	California	Roseville	SunPower Corporation		Office
USA	California	Anaheim	SunPower Corporation		Office
USA	California	Solana Beach	Taiyo Yuden		San Diego Office
USA	California	San Jose	Taiyo Yuden		San Jose Office
USA	California	Irvine	Western Digital Corp		Corporate Headquarters
USA	California	Fremont	Western Digital Corp		
USA	California	San Jose	Western Digital Corp	2487000	Manufacturing of head wafers and head, media and product development
USA	California	San Jose	Western Digital Corp	648000	Research and development, administrative, marketing and sales
USA	California	San Jose	Western Digital Corp		
USA	California	Carlinas	WPG Holding		
USA	California	Chantilly	Synnex Corporation		Warehouse
USA	Colorado	Englewood	Arris Enterprises, Inc.	32,240	Office space
USA	Colorado	Colorado Springs	Cypress Semiconductor Corp	70,400	Administrative offices
USA	Colorado	Fort Collins	Hewlett Packard		Product Development and Manufacturing
USA	Colorado	Fort Collins	Advanced Energy Industries, Inc.		Advanced Energy Industries, Inc. - Headquarters
USA	Colorado	Highlands Ranch	Alcatel Lucent SA		
USA	Colorado	Broomfield	Altera Corp		
USA	Colorado	Bloomfield	Amphenol		Amphenol Commercial Products - North America
USA	Colorado	Boulder	Apple Inc		Retail Store
USA	Colorado	Broomfield	Apple Inc		Retail Store
USA	Colorado	Colorado Springs	Apple Inc		Retail Store
USA	Colorado	Denver	Apple Inc		Retail Store
USA	Colorado	Littleton	Apple Inc		Retail Store
USA	Colorado	Lone Tree	Apple Inc		Retail Store
USA	Colorado	Denver	Arris Enterprises, Inc.		
USA	Colorado	Englewood	Arrow Electronics	115000	Office
USA	Colorado	Denver	Arrow Electronics		Office
USA	Colorado	Westminster	Arrow Electronics		Office
USA	Colorado	Colorado Springs	AVX Corporation	15,000	Manufacturing -- PC
USA	Colorado	Denver	Belden		
USA	Colorado	Broomfield	Brocade Communications		
USA	Colorado	Greenwood Village	Brocade Communications		
USA	Colorado	Longmont	Brooks Automation Inc	60900	Manufacturing and R&D
USA	Colorado	Colorado Springs	Brooks Automation Inc		Office
USA	Colorado	Denver	Ciena Corp		
USA	Colorado	Colorado Springs	Cisco Systems Inc		
USA	Colorado	Centennial	Cisco Systems Inc		
USA	Colorado	Colorado Springs	Cypress Semiconductor Corp		
USA	Colorado	Boulder	EMC Corp		
USA	Colorado	Colorado Springs	EMC Corp		
USA	Colorado	Denver	EMC Corp		
USA	Colorado	Englewood	EMC Corp		
USA	Colorado	Louisville	EMC Corp		
USA	Colorado	Loveland	EMC Corp		
USA	Colorado	Longmont	Emulex Corp		Office
USA	Colorado	Colorado Springs	Entegris Inc	122,000	Manufacturing
USA	Colorado	Colorado Springs	Fairchild Semiconductor International		Design Centers
USA	Colorado	Broomfield	Huawei		
USA	Colorado	Boulder	Intel		
USA	Colorado	Fort Collins	Intel		
USA	Colorado	Longmont	Intel		
USA	Colorado	Colorado Springs	Jabil	8,000	Design
USA	Colorado	Denver	JDSU Corp.		Office
USA	Colorado	Boulder	Juniper Networks Inc		
USA	Colorado	Colorado Springs	Lexmark		Lexmark office
USA	Colorado	Boulder	Linear Technology	20,000	Research and development
USA	Colorado	Colorado Springs	Linear Technology		Office
USA	Colorado	Fort Collins	Maxim Integrated		Office
USA	Colorado	Fort Collins	Maxim Integrated		Office
USA	Colorado	Broomfield	Motorola Solutions		Sales Office
USA	Colorado	Broomfield	Murata		Development
USA	Colorado	Boulder	NetApp Inc		
USA	Colorado	Boulder	NVIDIA		Office
USA	Colorado	Louisville	OmniVision		
USA	Colorado	Louisville	Plexus	27,000	Engineering & Manufacturing Solutions
USA	Colorado	Westminster	Polycm Inc.		Office
USA	Colorado	Boulder	QUALCOMM Incorporated		
USA	Colorado	Boulder	RF Microdevices		Design Center
USA	Colorado	Broomfield	RF Microdevices		Design Center
USA	Colorado	Colorado Springs	Riverbed Technology		
USA	Colorado	Denver	Rohm		Sales Office - ROHM Semiconductor U.S.A.,LLC
USA	Colorado	Denver	Seagate Technology	528,000	Product development
USA	Colorado	Longmont	SMA Solar Technology		
USA	Colorado	Denver	STMicroelectronics		SMA America Production
USA	Colorado	Denver	Sun Edison		Sales Office & Representative
USA	Colorado	Louisville	TDK Corporation		DENVER Sales Office
USA	Colorado	Littleton	Tellabs, Inc.		Sales Office
USA	Colorado	Colorado Springs	Toshiba		
USA	Colorado	Denver	Toshiba		
USA	Colorado	Fort Collins	Veeco Instruments Inc	26000	Data Storage
USA	Colorado	Longmont	Western Digital Corp	43000	Research and development
USA	Colorado	Longmont	WPG Holding		
USA	Colorado	Longmont	Xilinx Inc	130,000	
USA	Colorado	Fort Collins	Advanced Micro Devices, Inc		

Source: Citi Research

Figure 935. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Colorado	Fort Collins	Advanced Micro Devices, Inc		
USA	Colorado	Broomfield	Brother Industries Ltd		Sales Facilities
USA	Colorado	Boulder	F5 Networks		Office
USA	Colorado	Longmont	Nidec		Sales
USA	Colorado	Boulder	Ricoh Co		Sales & Services - Ricoh Production Print Solutions LLC
USA	Colorado	Denver	Ricoh Co		Sales & Services - RICOH IMAGING AMERICAS CORPORATION
USA	Colorado	Fort Collins	Taiyo Yuden		Denver Office
USA	Colorado	Longmont	On Semiconductor		Sales Office
USA	Columbia	Maryland	On Semiconductor		Sales Office
USA	Columbia	Washington	QUALCOMM Incorporated		
USA	Columbia	Washington	Corning		Office
USA	Connecticut	Wallingford	Arris Enterprises, Inc.	82,155	Office space
USA	Connecticut	Meriden	Alcatel Lucent SA		
USA	Connecticut	Danbury	Apple Inc		Retail Store
USA	Connecticut	Farmington	Apple Inc		Retail Store
USA	Connecticut	Greenwich	Apple Inc		Retail Store
USA	Connecticut	New Haven	Apple Inc		Retail Store
USA	Connecticut	Stamford	Apple Inc		Retail Store
USA	Connecticut	Wallingford	Arrow Electronics		Office
USA	Connecticut	Wilton	ASML Holding NV	290625	
USA	Connecticut	Danbury	ATMI Inc		Headquarters
USA	Connecticut	Milford	Blackberry		
USA	Connecticut	West Hartford	Brocade Communications		
USA	Connecticut	Farmington	Cisco Systems Inc		
USA	Connecticut	Norwalk	Cisco Systems Inc		
USA	Connecticut	Fairfield	EMC Corp		
USA	Connecticut	Hamden	EMC Corp		
USA	Connecticut	Rocky Hill	EMC Corp		
USA	Connecticut	Wallingford	Hitachi		Hitachi Aloka Medical, Ltd.
USA	Connecticut	Norwalk	Hitachi		Hitachi Capital America Corp
USA	Connecticut	Bethel	Hoya Corporation		HOYA VISION CARE, BETHEL FACILITY
USA	Connecticut	Hartford	Hoya Corporation		HOYA VISION CARE, HARTFORD FACILITY
USA	Connecticut	JDSU Corp.	JDSU Corp.		Office
USA	Connecticut	Cheshire	Nidec		Sales
USA	Connecticut	Granby	Nidec		Sale
USA	Connecticut	Shelton	Vishay		Vishay Americas
USA	Connecticut		WPG Holding		
USA	Connecticut	Norwalk	Xerox		Office
USA	Connecticut	Stamford	Amphenol		Amphenol Nexus Technologies Division
USA	Connecticut	Danbury	Amphenol		Amphenol RF
USA	Connecticut	Wallingford	Amphenol		Amphenol Times Microwave, Inc.
USA	Connecticut	Hamden	Amphenol		Spectra Strip
USA	Connecticut	Wallingford	Amphenol		Times Fiber Communications, Inc.
USA	Connecticut	Stamford	Fujifilm		
USA	Connecticut	Berlin	Juniper Networks Inc		
USA	Delaware	Newark	Apple Inc		Retail Store
USA	Delaware	New Castle	Fujifilm		
USA	Delaware		Vanguard International Semiconductor		IC Business Investment
USA	District of C	Washington	Apple Inc		Retail Store
USA	Florida	Fort Lauderdale	AAC Technologies Holdings		Office
USA	Florida	Miramar	Alcatel Lucent SA		
USA	Florida	W Palm Beach	Amphenol		SV Microwave, Inc.
USA	Florida	Altamonte Springs	Apple Inc		Retail Store
USA	Florida	Aventura	Apple Inc		Retail Store
USA	Florida	Boca Raton	Apple Inc		Retail Store
USA	Florida	Brandon	Apple Inc		Retail Store
USA	Florida	Estero	Apple Inc		Retail Store
USA	Florida	Fort Lauderdale	Apple Inc		Retail Store
USA	Florida	Jacksonville	Apple Inc		Retail Store
USA	Florida	Miami	Apple Inc		Retail Store
USA	Florida	Miami	Apple Inc		Retail Store
USA	Florida	Miami Beach	Apple Inc		Retail Store
USA	Florida	Naples	Apple Inc		Retail Store
USA	Florida	Orlando	Apple Inc		Retail Store
USA	Florida	Orlando	Apple Inc		Retail Store
USA	Florida	Palm Beach Garden	Apple Inc		Retail Store
USA	Florida	Tampa	Apple Inc		Retail Store
USA	Florida	Wellington	Apple Inc		Retail Store
USA	Florida	Deerfield Beach	Arrow Electronics		Office
USA	Florida	Jacksonville	AVX Corporation	100,000	Manufacturing -- PC
USA	Florida	Hollywood	Belden		Sales Offices
USA	Florida	Surfside	Blackberry		
USA	Florida	Boca Raton	Canon		Diagnostic imaging solutions and medical systems integrator
USA	Florida	Doral	Ciena Corp		
USA	Florida	Jacksonville	Electronics For Imaging, Inc	8	office
USA	Florida	Boca Raton	EMC Corp		
USA	Florida	Coral Gables	EMC Corp		
USA	Florida	Jacksonville	EMC Corp		
USA	Florida	Maitland	EMC Corp		
USA	Florida	Surfside	EMC Corp		
USA	Florida	Tampa	EMC Corp		
USA	Florida	Largo	Hoya Corporation		HOYA VISION CARE, LARGO FACILITY
USA	Florida	Tampa	Jabil	110,000	Aftermarket, Storage, Support
USA	Florida	Tampa	Jabil	55,000	Storage
USA	Florida	Palm Bay	Intersil Corp.	529,000	Office & Design Centers
USA	Florida	St. Petersburg	Jabil	297,000	Manufacturing, Aftermarket, Support
USA	Florida	St. Petersburg	Jabil	150,000	Manufacturing, Aftermarket, Design
USA	Florida	JDSU Corp.	JDSU Corp.		Office
USA	Florida	Ft. Lauderdale	Juniper Networks Inc		
USA	Florida	Coral Gables	Lexmark		Lexmark International Inc.
USA	Florida	Lake Mary	Linear Technology		Office
USA	Florida	Wimauma	Linear Technology		Office
USA	Florida	Melbourne	Maxim Integrated		Office
USA	Florida		Motorola Solutions		Corporate & Regional Office
USA	Florida	Aventura	NetApp Inc		
USA	Florida	Orlando	NVIDIA		Office

Source: Citi Research

Figure 936. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Florida	Miami	Olympus		Sale and service of medical endoscopes and microscopes in Latin America
USA	Florida	Orlando	On Semiconductor		Sales Office
USA	Florida	Ocala	QUALCOMM Incorporated		
USA	Florida	Orlando	QUALCOMM Incorporated		
USA	Florida	Brooksville	RF Microdevices		MCM Manufacturing & Test
USA	Florida	Weston	Ricoh Co		Sales & Services - Ricoh Latin America, Inc.
USA	Florida	Miami	Synnex Corporation		Warehouse, Sales
USA	Florida	Sunrise	Tellabs, Inc.		Sales Office
USA	Florida	Miami Lakes	Toshiba		
USA	Florida	Orlando	Toshiba		
USA	Florida	Palm Beach	Toshiba		
USA	Florida	Tamarac	Toshiba		
USA	Florida	Tampa	Toshiba		
USA	Florida	Treasure Coast	Toshiba		
USA	Florida	Apopka	TriQuint	119,000	Wafer fabrication, engineering, administration, test and technical
USA	Florida	Belleair	Western Digital Corp	391,800	Manufacturing of head wafers and research and development
USA	Florida	Boca Raton	Western Digital Corp		
USA	Florida	Tampa	WPG Holding		
USA	Florida	Oviedo	Xilinx Inc		
USA	Florida	Heathrow	Xyratex	21,000	R&D
USA	Florida	Doral	Acer Inc		Acer Latin America, Inc. (Regional Office)
USA	Florida	Orlando	Advanced Micro Devices, Inc		
USA	Florida	Ft. Lauderdale	Cisco Systems Inc		
USA	Florida	Jacksonville	Cisco Systems Inc		
USA	Florida	Miami	Cisco Systems Inc		
USA	Florida	St. Petersburg	Cisco Systems Inc		
USA	Florida	Orlando	Cisco Systems Inc		
USA	Florida	Tallahassee	Cisco Systems Inc		
USA	Florida	Destin	Cisco Systems Inc		
USA	Florida	Miami	Foxconn International Holdings		Client/technology co-location facilities
USA	Florida	Miami	Hewlett Packard		Office
USA	Florida	Miami	Seiko Epson		Epson Latin America, L.L.C.
USA	Florida	Miami	Tech Data	273,045	
USA	Georgia	Atlanta	3D Systems Corp	17,000	on-demand parts services
USA	Georgia	Alpharetta	Alcatel Lucent SA		
USA	Georgia	Alpharetta	Apple Inc		Retail Store
USA	Georgia	Atlanta	Apple Inc		Retail Store
USA	Georgia	Atlanta	Apple Inc		Retail Store
USA	Georgia	Augusta	Apple Inc		Retail Store
USA	Georgia	Buford	Apple Inc		Retail Store
USA	Georgia	Suwanee	Arris Enterprises, Inc.	129,403	Office space
USA	Georgia	Atlanta	Arrow Electronics		Office
USA	Georgia	Duluth	Arrow Electronics		Office
USA	Georgia	Alpharetta	Asahi Glass		Regional headquarter and representative office, holding company
USA	Georgia	Alpharetta	Asahi Glass		Finance of group companies
USA	Georgia	Atlanta	Avnet	195,000	operations
USA	Georgia	Alpharetta	Blackberry		
USA	Georgia	Duluth	Broadcom		Office
USA	Georgia	Alpharetta	Brocade Communications		
USA	Georgia	Atlanta	Centrotherm Photovoltaics		centrotherm photovoltaics USA Inc.
USA	Georgia	Alpharetta	Ciena Corp		
USA	Georgia	Lawrenceville	Cisco Systems Inc		
USA	Georgia	Atlanta	Cisco Systems Inc		
USA	Georgia	Norcross	Electronics For Imaging, Inc	52	office
USA	Georgia	Atlanta	EMC Corp		
USA	Georgia	Alpharetta	EMC Corp		
USA	Georgia	Atlanta	EMC Corp		
USA	Georgia	Duluth	EMC Corp		
USA	Georgia	Kennesaw	Emulex Corp		Office
USA	Georgia	Atlanta	Flextronics		Flextronics facilities, Design Centers
USA	Georgia	Norcross	Hitachi		Hitachi Communication Technologies America, Inc.
USA	Georgia	Norcross	Hitachi		Hitachi Koki USA, Ltd. (Hitachi Power Tools)
USA	Georgia	Kennesaw	Hitachi		Hitachi Maxco, Ltd.
USA	Georgia	Suwanee	Hitachi		Hitachi HVB, Inc.
USA	Georgia	Lithia Springs	Hoya Corporation		HOYA VISION CARE, ATLANTA FACILITY
USA	Georgia	Atlanta	Huawei		
USA	Georgia	Atlanta	JDSU Corp.		Office
USA	Georgia	Atlanta	JDSU Corp.		Office
USA	Georgia	Alpharetta	Juniper Networks Inc		
USA	Georgia	Cumming	Linear Technology		Office
USA	Georgia	Norcross	Maxim Integrated		Office
USA	Georgia	Duluth	Microchip Technology		
USA	Georgia	Duluth	Microchip Technology		
USA	Georgia	Suwanee	Mitsubishi Electric		Atlanta-area Office (Cooling & Heating)
USA	Georgia	Duluth	Mitsubishi Electric		Duluth, Georgia Office
USA	Georgia	Duluth	Motorola Solutions		Sales Office
USA	Georgia	Smyrna	Murata		Regional Headquarters
USA	Georgia	Duluth	On Semiconductor		Sales Office
USA	Georgia	Atlanta	Polycorn Inc.		Office
USA	Georgia	Atlanta	QUALCOMM Incorporated		
USA	Georgia	Lawrenceville	Ricoh Co		Manufacturing - Ricoh Electronics, Inc. Georgia Plant
USA	Georgia	Atlanta	Rohm		Sales Office - ROHM Semiconductor U.S.A.,LLC
USA	Georgia	Atlanta	Synnex Corporation		Warehouse, Sales
USA	Georgia	Suwanee	Tech Data	208,000	
USA	Georgia	Norcross	Toshiba		
USA	Georgia	Atlanta	WPG Holding		Manufacturing plant
USA	Georgia	Atlanta	Xerox		Sales Office
USA	Georgia	Atlanta	ZTE Corp		Sales Office
USA	Georgia	Alpharetta	FUNAI ELECTRIC CO LTD		P&F USA, Inc.

Source: Citi Research

Figure 937. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Hawaii	Honolulu	Apple Inc		Retail Store
USA	Hawaii	Honolulu	Apple Inc		Retail Store
USA	Hawaii	Honolulu	Apple Inc		Retail Store
USA	Hawaii	Honolulu	Cisco Systems Inc		
USA	Hawaii	Honolulu	Xerox		Manufacturing plant
USA	Hawaii	Kailua Kona	SunPower Corporation		Office
USA	Hawaii	Big Island	Toshiba		
USA	Hawaii	Maui	Toshiba		
USA	Hawaii	Oahu	Toshiba		
USA	Hawaii	Honolulu	Fujitsu		Fujitsu Limited Hawaii Representative Office
USA	Huntsville	Alabama	LG Electronics		LG Electronics Alabama Inc.
USA	Idaho	Boise	Hewlett Packard		Product Development and Manufacturing
USA	Idaho	Boise	Apple Inc		Retail Store
USA	Idaho	Boise	Cisco Systems Inc		
USA	Idaho	Boise	EMC Corp		
USA	Idaho	Boise	Intel		
USA	Idaho	Boise	Jabil	3,000	Support
USA	Idaho	Boise	Lam Research Corp		Office
USA	Idaho	Meridian	KLA Tencor Corp		
USA	Idaho	Boise	Micron		R&D, including wafer fabrication; reticle manufacturing; test and module assembly
USA	Idaho	Pocatello	On Semiconductor	443,000	Front end Facilities
USA	Idaho	Nampa	Plexus	216,000	Engineering & Manufacturing Solutions
USA	Idaho	Boise	Toshiba Electron		Boise Office
USA	Idaho	Boise	Toshiba		
USA	Idaho	Boise	WPG Holding		
USA	Idaho	Boise	ASML Holding NV		
USA	Illinois	Schaumburg	Hitachi		Hitachi High-Technologies America, Inc.
USA	Illinois	Schaumburg	Toshiba		
USA	Illinois	Naperville	Alcatel Lucent SA		
USA	Illinois	Schaumburg	Altera Corp		
USA	Illinois	Rockford	Amphenol		Amphenol Antenna Solutions
USA	Illinois	Lisle	Amphenol		Amphenol Fiber Optic Products
USA	Illinois	Lincolnshire	Amphenol		Amphenol Mechconnect, Inc.
USA	Illinois	Lincolnshire	Amphenol		Amphenol T&M Antennas, Inc.
USA	Illinois	Rockford	Amphenol		Jaybeam Wireless - USA
USA	Illinois	Chicago	Apple Inc		Retail Store
USA	Illinois	Chicago	Apple Inc		Retail Store
USA	Illinois	Deer Park	Apple Inc		Retail Store
USA	Illinois	Naperville	Apple Inc		Retail Store
USA	Illinois	Northbrook	Apple Inc		Retail Store
USA	Illinois	Oak Brook	Apple Inc		Retail Store
USA	Illinois	Orland Park	Apple Inc		Retail Store
USA	Illinois	Schaumburg	Apple Inc		Retail Store
USA	Illinois	Skokie	Apple Inc		Retail Store
USA	Illinois	Lisle	Arris Enterprises, Inc.	63,922	Office space
USA	Illinois	Chicago	Arris Enterprises, Inc.		
USA	Illinois	Itasca	Arrow Electronics		Office
USA	Illinois	Rolling Meadows	Blackberry		
USA	Illinois	Schaumburg	Brocade Communications		
USA	Illinois	Schaumburg	Chem Industries		Chemicals/Electronic Materials Division
USA	Illinois	Ottawa	Ciena Corp	265,000	
USA	Illinois	Bloomington	Cisco Systems Inc		
USA	Illinois	Rosemont	Cisco Systems Inc		
USA	Illinois	Chicago	Cisco Systems Inc		
USA	Illinois	Rosemont	Cisco Systems Inc		
USA	Illinois	Buffalo Grove	Cypress Semiconductor Corp		
USA	Illinois	Rolling Meadows	Dainippon Screen		Dainippon Screen Graphics (Usa), Lic office
USA	Illinois	Chicago	Electronics For Imaging, Inc		
USA	Illinois	Chicago	EMC Corp		
USA	Illinois	Lisle	EMC Corp		
USA	Illinois	Chicago	FS Networks		Office
USA	Illinois	Champaign	Finisar Corp.	2500	Office
USA	Illinois	Hoffman Estates	Freescale Semiconductor Ltd.		Office
USA	Illinois	Chicago	Garmin Ltd.		Retail Store
USA	Illinois	Chicago	Hi-P International		Marketing &ESI Centers
USA	Illinois	Schaumburg	Hosiden		Head Office
USA	Illinois	Chicago	Hoya Corporation		HOYA VISION CARE, CHICAGO FACILITY
USA	Illinois	Columbia	Hoya Corporation		HOYA VISION CARE, ST. LOUIS FACILITY
USA	Illinois	Chicago	Huawei		
USA	Illinois	Carol Stream	Ingram Micro	600,000	ALCs - Logistic Centre
USA	Illinois	Champaign	Intel		
USA	Illinois	Libertyville	Intel		
USA	Illinois	Oakbrook Terrace	Intel		
USA	Illinois	Chicago	Juniper Networks Inc		
USA	Illinois	Lincolnshire	LG Electronics		Zenith Electronics LLC
USA	Illinois	Lincolnshire	LG Innotek		LG Innotek USA Inc. Chicago Office (LGITUS)
USA	Illinois	Schaumburg	Linear Technology		Office
USA	Illinois	Champaign	Maxim Integrated		Office
USA	Illinois	Itasca	Microchip Technology		
USA	Illinois	Vernon Hills	Mitsubishi Electric		Mitsubishi Electric Automation, Inc.
USA	Illinois	Lisle	Molex		
USA	Illinois	Grove	Molex		
USA	Illinois	Lincolnshire	Molex		
USA	Illinois	Schaumburg	Motorola Solutions		Corporate & Regional Office
USA	Illinois	Itasca	NEC		NEC Display Solutions of America
USA	Illinois	Lincolnshire	NEC		NEC Enterprise Communication Technologies, Inc.
USA	Illinois	Chicago	Nidec		R&D
USA	Illinois	Itasca	Nidec		Sales
USA	Illinois	Itasca	Nidec		Sales
USA	Illinois	Chicago	Nippon Electric Glass		Manufacturing Plant : Glass fiber, Heat-resistant glass, Super heat-resistant glass-ceramics, Glass for electronic devices
USA	Illinois	Chicago	OmniVision		
USA	Illinois	Hoffman Estates	On Semiconductor		Sales Office

Source: Citi Research



Figure 938. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Illinois	Chicago	Panasonic		Semiconductor Sales office
USA	Illinois	Buffalo Grove	Plexus	189,000	Engineering & Manufacturing Solutions
USA	Illinois	Rosemont	Polycorn Inc.		Office
USA	Illinois	Chicago	RF Microdevices		Sales & Customer Support Center
USA	Illinois	Champaign	Riverbed Technology		
USA	Illinois	Chicago	Rohm		Sales Office - ROHM Semiconductor U.S.A., LLC
USA	Illinois	Chicago	Samsung Electro-Mechanics		Overseas Sales Offices
USA	Illinois	Schaumburg	STMicroelectronics		Manufacturing & Design Center, Sales Office & Representative
USA	Illinois	Romeville	Synnex Corporation		Warehouse
USA	Illinois	Schaumburg	Taiyo Yuden		Sales Headquarters
USA	Illinois	Lincolnshire	TDK Corporation		TDK CORPORATION OF AMERICA
USA	Illinois	Naperville	Tellabs, Inc.		Headquarters
USA	Illinois	Buffalo Grove	Teradyne	95,000	Semiconductor Test
USA	Illinois	Arlington	Vtech Holdings		Regional Office - Electronic Learning Products
USA	Illinois	Elgin	WPG Holding		
USA	Illinois	Elgin	WPG Holding		
USA	Illinois	Elk Grove	Xerox		Manufacturing plant
USA	Illinois	Oak Brook	Xerox		Manufacturing plant
USA	Illinois	Chicago	Xilinx Inc		
USA	Illinois	Schaumburg	Xilinx Inc		
USA	Illinois	Chicago	ZTE Corp		Sales Office
USA	Indiana	Indianapolis	Apple Inc		Retail Store
USA	Indiana	Mishawaka	Apple Inc		Retail Store
USA	Indiana	Indianapolis	Arrow Electronics	100,000	Office
USA	Indiana	Indianapolis	Belden		
USA	Indiana	Richmond	Belden		Corporate Office & Manufacturing Plant
USA	Indiana	Indianapolis	Brocade Communications		
USA	Indiana	Carmel	Cisco Systems Inc		
USA	Indiana	Fort Wayne	EMC Corp		
USA	Indiana	Indianapolis	EMC Corp		
USA	Indiana	West Lafayette	EMC Corp		
USA	Indiana	Indianapolis	Hewlett Packard		Product Development and Manufacturing
USA	Indiana	Greensburg	Hitachi		Hitachi Powdered Metals (USA), Inc.
USA	Indiana		JDSU Corp.		Office
USA	Indiana	Carmel	Linear Technology		Office
USA	Indiana	Westfield	Maxim Integrated		Office
USA	Indiana	Princeton	Nidec		R&D
USA	Indiana	Indianapolis	Nidec		R&D
USA	Indiana	Fort Wayne	Nidec		Sales
USA	Indiana	Carmel	Silicon Laboratories, Inc		
USA	Indiana	Kokomo	STMicroelectronics		Sales Office & Representative
USA	Indiana	South Bend	Tech Data	336,000	
USA	Indiana	Huntington	Vishay	16,000	Resistors & Inductors
USA	Indiana		WPG Holding		
USA	Indiana	Noblesville	Microchip Technology		
USA	Indiana		Pegatron		Operation Sites
USA	Indiana	Fishers	On Semiconductor		Sales Office
USA	Indiana	Michigan	On Semiconductor		Sales Office
USA	Indiana	Kokomo	On Semiconductor		Sales Office
USA	Indiana	Shelbyville	Nidec		Sales
USA	Iowa	Des Moines	Hewlett Packard		Product Development and Manufacturing
USA	Iowa	Des Moines	Hewlett Packard		Product Development and Manufacturing
USA	Iowa	West Des Moines	Apple Inc		Retail Store
USA	Iowa	Des Moines	Brocade Communications		
USA	Iowa		Cisco Systems Inc		
USA	Iowa	Council Bluffs	Jabil	124,000	Aftermarket, Support, Storage
USA	Iowa	Cedar Rapids	Skyworks	42,900	Design Center
USA	Iowa		Toshiba		
USA	Iowa		WPG Holding		
USA	Ireland	Cork	EMC Corp	724,000	Office
USA	Kansas	Lawrence	Toshiba		
USA	Kansas	Overland Park	Alcatel Lucent SA		
USA	Kansas	Hays	Amphenol	30,000	Amphenol Adronics, Inc.
USA	Kansas	Leawood	Apple Inc		Retail Store
USA	Kansas	Overland Park	Arrow Electronics		Office
USA	Kansas	Overland Park	Brocade Communications		
USA	Kansas	Overland Park	Ciena Corp		
USA	Kansas	Overland Park	Cisco Systems Inc		
USA	Kansas	Overland Park	EMC Corp		
USA	Kansas	Olathe	Garmin Ltd.	1,120,000	Inc.
USA	Kansas	Gardner	Garmin Ltd.	148,320	
USA	Kansas	Gardner	Garmin Ltd.	47,254	aircraft hangar, flight test and certification facility
USA	Kansas	Gardner	Garmin Ltd.	52,794	aircraft hangar, flight test and certification facility
USA	Kansas	Olathe	Garmin Ltd.	48,625	call center operation
USA	Kansas	Overland Park	Huawei		
USA	Kansas	Overland Park	Juniper Networks Inc		
USA	Kansas	Shawnee	Lexmark		Prospective Software from Lexmark (Headquarters)
USA	Kansas	Wichita	NetApp Inc	300,000	
USA	Kansas	Wichita	NetApp Inc		
USA	Kansas	Overland Park	On Semiconductor		Sales Office
USA	Kansas	Schamburg	STMicroelectronics		Sales Office & Representative
USA	Kansas		WPG Holding		
USA	Kansas	Leawood	ZTE Corp		Sales Office
USA	Kentucky	Lexington	Apple Inc		Retail Store
USA	Kentucky	Louisville	Apple Inc		Retail Store
USA	Kentucky		Asahi Glass		Automotive glass
USA	Kentucky	Monticello	Belden		Manufacturing Facilities
USA	Kentucky	Louisville	Cisco Systems Inc		
USA	Kentucky	Louisville	Flextronics		Flextronics facilities, Service & Software
USA	Kentucky	Harrodsburg	Hitachi		Hitachi Automotive Systems Americas, Inc.

Source: Citi Research

Figure 939. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Kentucky	Louisville	Huawei		
USA	Kentucky	Louisville	Intel		
USA	Kentucky	Louisville	Jabil	140,000	Aftermarket
USA	Kentucky	Lexington	Lexmark		R&D Headquarters
USA	Kentucky	Hebron	Panasonic		Kentucky Sales Office
USA	Kentucky	Bowling Green	Toshiba		
USA	Kentucky	Lexington	Toshiba		
USA	Kentucky	Louisville	Toshiba		
USA	Kentucky	Somerset	Toshiba		
USA	Kentucky		WPG Holding		
USA	Kentucky		Corning		Office
USA	Kentucky	Louisville	EMC Corp		
USA	Kentucky	Maysville	Mitsubishi Electric		Maysville Plant
USA	Louisiana	Baton Rouge	Apple Inc		Retail Store
USA	Louisiana	Metairie	Apple Inc		Retail Store
USA	Louisiana	Metairie	EMC Corp		
USA	Louisiana	New Orleans	Hoya Corporation		HOYA VISION CARE, NEW ORLEANS FACILITY
USA	Louisiana	Monroe	Huawei		
USA	Louisiana		WPG Holding		
USA	Louisiana	Baton Rouge	Cisco Systems Inc		
USA	Louisiana		Cypress Semiconductor Corp		
USA	Louisville	Metairie	Cisco Systems Inc		
USA	Louisville	West Des Moines	Cisco Systems Inc		
USA	Louisville	Cedar Rapids	RF Microdevices		Design Center
USA	Maine	South Portland	Apple Inc		Retail Store
USA	Maine	Westbrook	ASML Holding NV		
USA	Maine	Biddeford	AVX Corporation	72,000	Manufacturing — PC
USA	Maine	South Portland	Fairchild Semiconductor International		office, Design Centers & manufacturing sites
USA	Maine	Lewiston	Hoya Corporation		HOYA VISION CARE, LEWISTON FACILITY
USA	Maine	South Portland	Texas Instruments		
USA	Maine		WPG Holding		
USA	Maine		Corning		Office
USA	Maine		EMC Corp		
USA	Maine	Ellicott City	Altera Corp		
USA	Maryland	Annapolis	Apple Inc		Retail Store
USA	Maryland	Bethesda	Apple Inc		Retail Store
USA	Maryland	Bethesda	Apple Inc		Retail Store
USA	Maryland	Columbia	Apple Inc		Retail Store
USA	Maryland	Towson	Apple Inc		Retail Store
USA	Maryland	Columbia	Arrow Electronics		Office
USA	Maryland	Annapolis	Brocade Communications		
USA	Maryland	Rockville	Canon		Life science solutions for use in diagnostics and medical instrumentation
USA	Maryland	Hanover	Ciena Corp	154,100	Headquarters
USA	Maryland	Glen Burnie	Ciena Corp		
USA	Maryland	Columbia	Cisco Systems Inc		
USA	Maryland	Columbia	EMC Corp		
USA	Maryland	Rockville	EMC Corp		
USA	Maryland	Annapolis	Infineon Corp.	12,000	Office
USA	Maryland	Annapolis	Infoblox Inc.	15,000	development activities
USA	Maryland		JDSU Corp.		Office
USA	Maryland	Columbia	Juniper Networks Inc		Sales Office & Technology Center
USA	Maryland		Motorola Solutions		
USA	Maryland	Bethesda	Riverbed Technology	82,000	
USA	Maryland	Cambridge	Sensata	157,000	Manufacturing
USA	Maryland	Adamstown	Skyworks	121,200	Manufacturing and office space
USA	Maryland	Beltsville	Sun Edison		
USA	Maryland	Pasadena	Western Digital Corp		
USA	Maryland		WPG Holding		
USA	Massachusetts	Westborough	Arris Enterprises, Inc.	87,319	Office
USA	Massachusetts	Andover	Hewlett Packard		Product Development and Manufacturing
USA	Massachusetts	Andover	3D Systems Corp	57,000	office and assembly space
USA	Massachusetts	Newton	AAC Technologies Holdings		Office
USA	Massachusetts	Burlington	Adtran		
USA	Massachusetts	Boxborough	Advanced Micro Devices, Inc		
USA	Massachusetts	Chelmsford	Altera Corp		
USA	Massachusetts	Devens	American Superconductor Corp.	35,500	Corporate & Grid Segments
USA	Massachusetts	Boston	Amkor Technology Inc		Sales Office
USA	Massachusetts	Brockton	Amphenol		Amphenol Alden
USA	Massachusetts				Corporate Headquarters, engineering, components
USA	Massachusetts	Norwood	Analog Devices, Inc	130,000	testing, sales and marketing offices
USA	Massachusetts	Wilmington	Analog Devices, Inc	586,200	Wafer fabrication, testing, engineering, marketing and administrative offices
USA	Massachusetts	Boston	Apple Inc		Retail Store
USA	Massachusetts	Braintree	Apple Inc		Retail Store
USA	Massachusetts	Burlington	Apple Inc		Retail Store
USA	Massachusetts	Cambridge	Apple Inc		Retail Store
USA	Massachusetts	Chestnut Hill	Apple Inc		Retail Store
USA	Massachusetts	Dedham	Apple Inc		Retail Store
USA	Massachusetts	Hingham	Apple Inc		Retail Store
USA	Massachusetts	Holyoke	Apple Inc		Retail Store
USA	Massachusetts	Natick	Apple Inc		Retail Store
USA	Massachusetts	Peabody	Apple Inc		Retail Store
USA	Massachusetts	Gloucester	Applied Materials Inc	446,000	Manufacturing; Research, Development, Engineering; Customer Support
USA	Massachusetts	Gloucester	Applied Materials Inc		Research, Development and Manufacturing
USA	Massachusetts	Boston	Arrow Electronics		Office
USA	Massachusetts	Wilmington	Arrow Electronics		Office
USA	Massachusetts	Woburn	ASE		
USA	Massachusetts	Andover	Blackberry		
USA	Massachusetts	Andover	Broadcom		Office
USA	Massachusetts	Andover	Broadcom		Office
USA	Massachusetts	Waltham	Brocade Communications		
USA	Massachusetts	Chelmsford	Brooks Automation Inc	214,000	Corporate Headquarters, training, manufacturing and R&D

Source: Citi Research

Figure 940. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Massachusetts	Chelmsford	Brooks Automation Inc	97000	Manufacturing
USA	Massachusetts	Boston	Ciena Corp		
USA	Massachusetts	Boston	Cisco Systems Inc		
USA	Massachusetts	Boston	Cisco Systems Inc		
USA	Massachusetts	Boxborough	Cisco Systems Inc		
USA	Massachusetts	Burlington	CSR Plc	54736	R&D, Sales and Administration
USA	Massachusetts	Boston	Delta Electronics		R&D Office
USA	Massachusetts	Billerica	E Ink Holdings		E Ink Corporation
USA	Massachusetts	Plymouth	Electronics For Imaging, Inc		Office
USA	Massachusetts	Hopkinton	EMC Corp	1,681,000	Office
USA	Massachusetts	Franklin	EMC Corp	1,210,000	Manufacturing
USA	Massachusetts	Bedford	EMC Corp	328,000	Office
USA	Massachusetts	Boston	EMC Corp		
USA	Massachusetts	Burlington	EMC Corp		
USA	Massachusetts	Cambridge	EMC Corp		
USA	Massachusetts	Southborough	EMC Corp		
USA	Massachusetts	Marlborough	EMC Corp		
USA	Massachusetts	Milford	EMC Corp		
USA	Massachusetts	Newton	EMC Corp		
USA	Massachusetts	Waltham	EMC Corp		
USA	Massachusetts	Wellesley Hills	EMC Corp		
USA	Massachusetts	Westwood	EMC Corp		
USA	Massachusetts	Billerica	Entegris Inc	175,000	Executive Offices, Research & Manufacturing
USA	Massachusetts	Bedford	Entegris Inc	84,200	Research & Manufacturing
USA	Massachusetts	Franklin	Entegris Inc	31,000	Research & Manufacturing
USA	Massachusetts	Boston	FS Networks		
USA	Massachusetts	Ipswich	Ibiden		Micro Mech, Inc
USA	Massachusetts	Hudson	Intel		
USA	Massachusetts	Leominster	International Rectifier Corp		
USA	Massachusetts	Tewksbury	International Rectifier Corp		
USA	Massachusetts	Chelmsford	Intersil Corp.		Sales office
USA	Massachusetts	Westford	Juniper Networks Inc	200,000	
USA	Massachusetts	Westwood	KLA Tencor Corp	116,908	Office and plant
USA	Massachusetts	Chelmsford	Linear Technology	30,000	administration
USA	Massachusetts	North Chelmsford	Linear Technology		Office
USA	Massachusetts	N. Chelmsford	Maxim Integrated	30000	Engineering, office space and administration
USA	Massachusetts	Woburn	MediaTek		MediaTek USA Inc. (Woburn)
USA	Massachusetts		Motorola Solutions		
USA	Massachusetts	Mansfield	Murata		Development
USA	Massachusetts	Waltham	NetApp Inc		
USA	Massachusetts	Westford	NVIDIA		Office
USA	Massachusetts	Acton	Oclaro Inc.	31000	Office space, manufacturing, research and development
USA	Massachusetts		Olympus		Development, manufacture, and sale of medical devices
USA	Massachusetts	Waltham	Olympus		Olympus NDT Inc
USA	Massachusetts	Hopkinton	Olympus		Olympus Biotech Corporation
USA	Massachusetts	Boxborough	On Semiconductor		Sales Office
USA	Massachusetts	Boxborough	On Semiconductor		Sales Office
USA	Massachusetts	Andover	Polycorn Inc.		Office
USA	Massachusetts	Burlington	Polycorn Inc.		Office
USA	Massachusetts	Marlborough	Polycorn Inc.		Office
USA	Massachusetts	Newton	Polycorn Inc.		Office
USA	Massachusetts	Westborough	Polycorn Inc.		Office
USA	Massachusetts	Andover	QUALCOMM Incorporated		
USA	Massachusetts	Boxborough	QUALCOMM Incorporated		
USA	Massachusetts	Marblehead	QUALCOMM Incorporated		
USA	Massachusetts	Cambridge	Riverbed Technology		
USA	Massachusetts	Boston	Rohm		Sales Office - ROHM Semiconductor U.S.A.,LLC
USA	Massachusetts	Attleboro	Sensata	433000	Manufacturing
USA	Massachusetts	Burlington	STMicroelectronics		Sales Office & Representative
USA	Massachusetts	Billerica	Stratysys Ltd	15000	Office space
USA	Massachusetts	North Reading	Teradyne	413,000	Semiconductor Test, Systems Test
USA	Massachusetts	North Reading	Teradyne	60,000	Group & Corporate
USA	Massachusetts				Corporate
USA	Massachusetts	Billerica	Tokyo Electron		Development and manufacturing of gas cluster
USA	Massachusetts	Boston	Toshiba		
USA	Massachusetts	Westborough	Toshiba		
USA	Massachusetts	Wilmington	Toshiba		
USA	Massachusetts	Chelmsford	TriQuint	14100	Engineering
USA	Massachusetts	Peabody	Veeco Instruments Inc	30000	Held for Sublease
USA	Massachusetts	Cambridge	Vtech Holdings		Liaison Office - Contract Manufacturing Services
USA	Massachusetts	Reading	Western Digital Corp		
USA	Massachusetts		WPG Holding		
USA	Massachusetts	Beverly	Amphenol		Amphenol PCD, Inc.
USA	Massachusetts	Boston	ARM Holdings PLC		Sales Office
USA	Massachusetts		Corning		Office
USA	Massachusetts	Bolton	Emulex Corp		Office
USA	Massachusetts	Burlington	Entegris Inc	16,000	Office
USA	Massachusetts	Woburn	Freescall Semiconductor Ltd.		
USA	Massachusetts	Bedford	Fujifilm		
USA	Massachusetts	Westford	Juniper Networks Inc		
USA	Massachusetts	Westborough	Microchip Technology		
USA	Massachusetts	Cambridge	Mitsubishi Electric		Mitsubishi Electric Research Laboratories, Inc.
USA	Massachusetts	Waltham	NEC		NetCracker Technology Corporation
USA	Massachusetts	Boston	RF Microdevices		Design Center
USA	Massachusetts	Woburn	Skyworks	158000	Corporate headquarters and manufacturing
USA	Melville	New York	Canon		All product segments
USA	Mexico	Mexico City	Brother Industries Ltd		Sales Facilities
USA	Mexico		FUNAI ELECTRIC CO LTD		P&F MEXICANA, S.A. DE C.V

Source: Citi Research

Figure 941. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Michigan	Auburn Hills	Alps Electric		Detroit Office
USA	Michigan	Grand Rapids	Amphenol		Amphenol Borisch Technology
USA	Michigan	Fraser	Amphenol		Amphenol Radsok Solutions
USA	Michigan		Amphenol		Amphenol Sine Systems - US Headquarters
USA	Michigan	Canton	Amphenol		Amphenol Tuchel Electronics-North America
USA	Michigan	Ann Arbor	Apple Inc		Retail Store
USA	Michigan		Apple Inc		Retail Store
USA	Michigan	Grand Rapids	Apple Inc		Retail Store
USA	Michigan	Novi	Apple Inc		Retail Store
USA	Michigan	Troy	Apple Inc		Retail Store
USA	Michigan	Plymouth	Arrow Electronics		Office
USA	Michigan				Development of new technologies and new products for processed automotive glass and performing engineering surveys
USA	Michigan	Novi	Asahi Glass		
USA	Michigan	Auburn Hills	Brocade Communications		
USA	Michigan	Southfield	Cheil Industries		Chemicals/Electronic Materials Division
USA	Michigan	Southfield	Cisco Systems Inc		
USA	Michigan	Grand Rapids	Cisco Systems Inc		
USA	Michigan		Corning		Office
USA	Michigan		Corning		Office
USA	Michigan	Auburn Hills	CSR Plc		
USA	Michigan	Detroit	CSR Plc	9400	R&D
USA	Michigan	Detroit	Delta Electronics		Detroit Office
USA	Michigan	Ypsilanti	Electronics For Imaging, Inc	70	office
USA	Michigan	Farmington Hills	EMC Corp		
USA	Michigan	Grand Rapids	EMC Corp		
USA	Michigan	Troy	EMC Corp		
USA	Michigan	Detroit	Flextronics		Flextronics facilities, Design Centers
USA	Michigan	Rochester Hills	Flextronics		Flextronics facilities, Design Centers
USA	Michigan	Copperville	Flextronics		Flextronics facilities, Manufacturing
USA	Michigan	Novi	Freescall Semiconductor Ltd.		Office
USA	Michigan	Plymouth	Fujitsu		Office
USA	Michigan	Livonia	Hirose Electric		Automotive Sales Office
USA	Michigan	Novi	Hosiden		Detroit Sales Office
USA	Michigan	Auburn Hills	Jabil	207,000	Manufacturing
USA	Michigan	Lake Orion	Jabil	45,000	Storage
USA	Michigan	Troy	Juniper Networks Inc		
USA	Michigan		LG Innotek		LG Innotek USA Inc. Detroit Office (LGITUS)
USA	Michigan		Linear Technology		Office
USA	Michigan	Troy	Mabuchi Motor		Sales Office
USA	Michigan	Brighton	Maxim Integrated		Office
USA	Michigan	Novi	Microchip Technology		
USA	Michigan	Northville	Mitsubishi Electric		Michigan Office
USA	Michigan	Detroit	Mitsubishi Electric		Detroit Office
USA	Michigan	Detroit	Mitsumi Electric		Sales Office & Head Office of US
USA	Michigan		Motorola Solutions		Sales Office
USA	Michigan	Auburn Hills	Nidec		Sales
USA	Michigan	Auburn Hills	Nidec		Sales
USA	Michigan	Ann Arbor	NVIDIA		Office
USA	Michigan	Detroit	Omnivision		
USA	Michigan	Detroit	Panasonic		Semiconductor Sales office
USA	Michigan	Farmington Hills	Panasonic		Automotive Sales Office
USA	Michigan	Woodhaven	QUALCOMM Incorporated		
USA	Michigan	Detroit	Rohm		Sales Office - ROHM Semiconductor U.S.A.,LLC
USA	Michigan	Livonia	STMicroelectronics		Manufacturing & Design Center, Sales Office & Representative
USA	Michigan	Livonia	STMicroelectronics		Sales Office & Representative
USA	Michigan	Livonia	TDK Corporation		DETROIT District Office
USA	Michigan	Farmington Hills	Toshiba		Harrison Toshiba Lighting
USA	Michigan	Grand Blanc	Toshiba		
USA	Michigan	Lansing	Toshiba		
USA	Michigan	Farmington Hills	Toshiba		
USA	Michigan	Ann Arbor	Wintek		Wintek Electro-Optics Corporation - Marketing, RD Center
USA	Michigan		WPG Holding		
USA	Michigan	Detroit	Xilinx Inc		Office
USA	Minnesota	Minneapolis	Juniper Networks Inc		
USA	Minnesota	Minnetonka	Altera Corp		
USA	Minnesota	Bloomington	Apple Inc		Retail Store
USA	Minnesota	Edina	Apple Inc		Retail Store
USA	Minnesota	Minneapolis	Apple Inc		Retail Store
USA	Minnesota	Minnetonka	Apple Inc		Retail Store
USA	Minnesota	Roseville	Apple Inc		Retail Store
USA	Minnesota	Minneapolis	Arrow Electronics		Office
USA	Minnesota	Eden Prairie	Arrow Electronics		Office
USA	Minnesota	Eagan	ASML Holding NV		
USA	Minnesota	Bloomington	ATMI Inc		Manufacturing & Operations
USA	Minnesota	Winona	Benchmark Electronics	181,000	
USA	Minnesota	Rochester	Benchmark Electronics	466,000	Minnesota Division, spread across 5 facilities
USA	Minnesota	Plymouth	Brocade Communications		
USA	Minnesota	Rochester	Brocade Communications		
USA	Minnesota	Bloomington	Cisco Systems Inc		
USA	Minnesota	Bloomington	Cypress Semiconductor Corp	337,000	Manufacturing, research and development
USA	Minnesota	Minneapolis	Electronics For Imaging, Inc	100	office
USA	Minnesota	Eden Prairie	EMC Corp		
USA	Minnesota	Minneapolis	EMC Corp		
USA	Minnesota	New Brighton	EMC Corp		
USA	Minnesota	Chaska	Entegris Inc	192,000	Research & Manufacturing
USA	Minnesota	Fridley	Entegris Inc	12,000	Research & Manufacturing
USA	Minnesota	Minneapolis	Entegris Inc		
USA	Minnesota	Northfield	Flextronics		Flextronics facilities, Manufacturing
USA	Minnesota	Edina	Intel		
USA	Minnesota	St. Paul	International Rectifier Corp		
USA	Minnesota	Edina	KLA Tencor Corp		
USA	Minnesota	Brooklyn Park	Kyocera		Minnesota Office
USA	Minnesota	Bloomington	Linear Technology		Office
USA	Minnesota		Motorola Solutions		Sales Office

Source: Citi Research

Figure 942. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Minnesota	Minneapolis	Nidec		Sales
USA	Minnesota	Edina	On Semiconductor		Sales Office
USA	Minnesota	Edina	On Semiconductor		Sales Office
USA	Minnesota	Shakopee	QLogic Corp	100000	
USA	Minnesota		Seagate Technology	1,085,000	development
USA	Minnesota	Edina	STMicroelectronics		Sales Office & Representative
USA	Minnesota	Eden Prairie	Stratays Ltd	288312	U.S. headquarters and manufacturing facility
USA	Minnesota	Minneapolis	Stratays Ltd	8475	research and development
USA	Minnesota	Fridley	Teradyne		Semiconductor Test Technology Centers
USA	Minnesota	Chaska	Tokyo Electron		Development, manufacturing and sales
USA	Minnesota	Duluth	Toshiba		
USA	Minnesota	Eagan	Toshiba		
USA	Minnesota	Rochester	Toshiba		
USA	Minnesota	St. Paul	Vecco Instruments Inc	111000	LED & Solar
USA	Minnesota	Edina	Vecco Instruments Inc		Support Center
USA	Minnesota	Marshall	Visay	22000	Resistors & Inductors
USA	Minnesota	Duluth	Visay	10000	Resistors & Inductors
USA	Minnesota	Rochester	Western Digital Corp	91800	Product development
USA	Minnesota		WPG Holding		
USA	Minnesota	Plymouth	Xilinx Inc		
USA	Mississippi	Ridgeland	Apple Inc		Retail Store
USA	Mississippi	Ridgeland	Cisco Systems Inc		
USA	Mississippi	Olive Branch	Logitech International S A	397000	Distribution center
USA	Mississippi	Columbus	Toshiba		
USA	Mississippi	Greenville	Toshiba		
USA	Mississippi	Greenwood	Toshiba		
USA	Mississippi	Jackson	Toshiba		
USA	Mississippi	Laurel	Toshiba		
USA	Mississippi	Meridian	Toshiba		
USA	Mississippi	Tupelo	Toshiba		
USA	Mississippi		WPG Holding		
USA	Mississippi		Synnex Corporation		Warehouse
USA	Missouri	Lee's Summit	Toshiba		
USA	Missouri	Kansas City	Apple Inc		Retail Store
USA	Missouri	St. Louis	Apple Inc		Retail Store
USA	Missouri	St. Louis	Apple Inc		Retail Store
USA	Missouri	Earth City	Arrow Electronics		Office
USA	Missouri	St. Louis	Belden		Headquarters
USA	Missouri	Chesterfield	Brocade Communications		
USA	Missouri	Chesterfield	Cisco Systems Inc		
USA	Missouri	Jefferson City	Cisco Systems Inc		
USA	Missouri	Creve Coeur	EMC Corp		
USA	Missouri	St. Louis	EMC Corp		
USA	Missouri	St. Louis	Juniper Networks Inc		
USA	Missouri	St. Louis	Motorola Solutions		Sales Office
USA	Missouri	St. Louis	Nidec		Sales & Techno Motor Division
USA	Missouri	St. Louis	Nidec		R&D
USA	Missouri	St. Louis	NVIDIA		Office
USA	Missouri	Saint Charles	On Semiconductor		Sales Office
USA	Missouri	Kansas City	STMicroelectronics		Sales Office & Representative
USA	Missouri	O'Fallon	Sun Edison		Headquarters
USA	Missouri		WPG Holding		
USA	Montana	Kalispell	Applied Materials Inc		
USA	Montana	Whitefish	EMC Corp		Research, Development and Manufacturing
USA	Montana	Helena	Toshiba		
USA	Montana	Missoula	Toshiba		
USA	Montana		WPG Holding		
USA	Nebraska	Omaha	Apple Inc		Retail Store
USA	Nebraska	Omaha	EMC Corp		
USA	Nebraska	Omaha	Toshiba		
USA	Nebraska	Columbus	Visay	158000	Resistors & Inductors
USA	Nebraska		WPG Holding		
USA	Nebraska	Omaha	Cisco Systems Inc		
USA	Nevada	Las Vegas	Apple Inc		Retail Store
USA	Nevada	Las Vegas	Apple Inc		Retail Store
USA	Nevada	Las Vegas	Apple Inc		Retail Store
USA	Nevada	Reno	Apple Inc		Retail Store
USA	Nevada	Henderson	Brocade Communications		
USA	Nevada	Las Vegas	Cisco Systems Inc		
USA	Nevada	Las Vegas	EMC Corp		
USA	Nevada				ales, marketing, product design, manufacturing, service and repair, distribution for non probe cards
USA	Nevada	Carson	FormFactor Inc	31,100	business
USA	Nevada	Las Vegas	QUALCOMM Incorporated		
USA	Nevada	Las Vegas	Toshiba		
USA	Nevada	Reno	Toshiba		
USA	Nevada		WPG Holding		
USA	Nevada		Cypress Semiconductor Corp		
USA	New Hampshire	Nashua	Advanced Micro Devices, Inc		
USA	New Hampshire	Nashua	Amphenol	35,000	Amphenol Backplane Systems
USA	New Hampshire	Nashua	Amphenol		Amphenol Global Interconnect Systems
USA	New Hampshire	Nashua	Amphenol		Amphenol Printed Circuits, Inc.
USA	New Hampshire	Nashua	Amphenol	80,000	Amphenol TCS
USA	New Hampshire	Nashua	Amphenol		North American Commercial Products
USA	New Hampshire	Nashua	Apple Inc		Retail Store
USA	New Hampshire	Salem	Apple Inc		Retail Store
USA	New Hampshire				Benchmark manufactures high quality printed circuit assemblies and fully integrated products.
USA	New Hampshire	Nashua	Benchmark Electronics	155,000	
USA	New Hampshire	Keene	Corning		Office
USA	New Hampshire	Laconia	Electronics For Imaging, Inc	30	office
USA	New Hampshire	West Lebanon	Electronics For Imaging, Inc	9	office
USA	New Hampshire	Meredith	Electronics For Imaging, Inc	163	office
USA	New Hampshire	Nashua	EMC Corp		
USA	New Hampshire	Merrimack	Intel		
USA	New Hampshire	Portsmouth	KLA Tencor Corp		
USA	New Hampshire	Auburn	Linear Technology	20,000	Research and development
USA	New Hampshire	Portsmouth	QUALCOMM Incorporated		
USA	New Hampshire	Nashua	Riverbed Technology		
USA	New Hampshire	Merrimack	Stratays Ltd	28590	Solidscape facilities, including manufacturing
USA	New Hampshire	Manchester	Taiyo Yuden		Boston Office
USA	New Hampshire	Bedford	TDK Corporation		NEW ENGLAND District Office
USA	New Hampshire	Bedford	Toshiba		
USA	New Hampshire	Dover	Visay	35000	Resistors & Inductors

Source: Citi Research

Figure 943. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	New Hampshire		WPG Holding		
USA	New Hampshire	Nashua	Xilinx Inc		
USA	New Hampshire	Nashua	Xilinx Inc		
USA	New Jersey	Murray Hill	Alcatel Lucent SA		
USA	New Jersey	Whippany	Alcatel Lucent SA		
USA	New Jersey	Roseland	Altera Corp		
USA	New Jersey	Atlantic City	Apple Inc		Retail Store
USA	New Jersey	Bridgewater	Apple Inc		Retail Store
USA	New Jersey	Cherry Hill	Apple Inc		Retail Store
USA	New Jersey	Edison	Apple Inc		Retail Store
USA	New Jersey	Freehold	Apple Inc		Retail Store
USA	New Jersey	Lawrence Township	Apple Inc		Retail Store
USA	New Jersey	Marlton	Apple Inc		Retail Store
USA	New Jersey	Paramus	Apple Inc		Retail Store
USA	New Jersey	Rockaway	Apple Inc		Retail Store
USA	New Jersey	Short Hills	Apple Inc		Retail Store
USA	New Jersey	Wayne	Apple Inc		Retail Store
USA	New Jersey	Woodcliff Lake	Apple Inc		Retail Store
USA	New Jersey	Parsippany	Arrow Electronics		Office
USA	New Jersey	Bedminster	Blackberry		
USA	New Jersey	Matawan	Broadcom		Office
USA	New Jersey	Bridgewater	Brother Industries Ltd		Sales Facilities
USA	New Jersey	Mortvale	Cisco Systems Inc		
USA	New Jersey	South Ieelin	Cisco Systems Inc		
USA	New Jersey	Moorestown	Cisco Systems Inc		
USA	New Jersey		Corning		Office
USA	New Jersey	Parsippany	Electronics For Imaging, Inc	9	office
USA	New Jersey	Basking Ridge	EMC Corp		
USA	New Jersey	Berkeley Heights	EMC Corp		
USA	New Jersey	East Brunswick	EMC Corp		
USA	New Jersey	Princeton	EMC Corp		
USA	New Jersey	South Plainfield	EMC Corp		
USA	New Jersey	Warren	EMC Corp		
USA	New Jersey	West Windsor	EMC Corp		
USA	New Jersey	Wayne	Emulex Corp		Office
USA	New Jersey		First Solar Inc		Office
USA	New Jersey	Allendale	Fujifilm		
USA	New Jersey	Fairfield	Fujitsu		
USA	New Jersey	Rutherford	FUNAI ELECTRIC CO LTD		Fujitsu General America, Inc
USA	New Jersey	Basking Ridge	Hitachi		FUNAI CORPORATION, INC.
USA	New Jersey	Bridgewater	Huawei		Hitachi Power Systems America, Ltd.
USA	New Jersey	Basking Ridge	Integrated Device Technology		
USA	New Jersey	Parsippany	Intel		
USA	New Jersey	Blauvelt	Xerox		Manufacturing plant
USA	New Jersey	Rockleigh	Xerox		Manufacturing plant
USA	New Jersey	Bridgewater	Internal Corp.		Design Centers
USA	New Jersey		JDSU Corp.		Office
USA	New Jersey	Bridgewater	Juniper Networks Inc		
USA	New Jersey	Mt. Laurel	Juniper Networks Inc		
USA	New Jersey	Ramsey	Konica Minolta Holdings		
USA	New Jersey	Fairfield	Kyocera		Information Equipment - KYOCERA Document Solutions America, Inc
USA	New Jersey		LG Electronics		LG Electronics Mobilecomm U.S.A., Inc.
USA	New Jersey		LG Electronics		LG Electronics U.S.A., Inc.
USA	New Jersey		Motorola Solutions		Sales Office
USA	New Jersey	Saddle Brook	NEC		NEC Financial Services, LLC.
USA	New Jersey	Princeton	NEC		NEC Laboratories America, Inc.
USA	New Jersey	Mount Laurel	On Semiconductor		Sales Office
USA	New Jersey	Newark	Panasonic		Semiconductor Sales office
USA	New Jersey	Newark	Panasonic		Head Office/New Jersey Sales Office
USA	New Jersey	Bridgewater	QUALCOMM Incorporated		
USA	New Jersey	Ridgefield Park	Samsung Electronics		USA - Samsung Electronics America, Inc.
USA	New Jersey	Shrewsbury	Silicon Laboratories, Inc		
USA	New Jersey	Newark	STMicroelectronics		Sales Office & Representative
USA	New Jersey	Pennsauken	Sun Edison		
USA	New Jersey	Hamilton	SunPower Corporation		Office
USA	New Jersey	Monroe	Synnex Corporation		Warehouse, Sales
USA	New Jersey	Iselin	TDK Corporation		NEW JERSEY Office
USA	New Jersey	Swedesboro	Tech Data	436000	
USA	New Jersey		WPG Holding		
USA	New Jersey	Hazlet	Xilinx Inc		
USA	New Jersey	Morristown	ZTE Corp		Sales Office
USA	New Mexico	Albuquerque	Apple Inc		Retail Store
USA	New Mexico	Albuquerque	ASML Holding NV		
USA	New Mexico	Albuquerque	Brocade Communications		
USA	New Mexico	Albuquerque	Cisco Systems Inc		
USA	New Mexico	Albuquerque	Cypress Semiconductor Corp		
USA	New Mexico	Los Alamos	EMC Corp		
USA	New Mexico	Rio Rancho	Intel		
USA	New Mexico	Albuquerque	KLA Tencor Corp		
USA	New Mexico	Alamogordo	Nidec		Manufacturing
USA	New Mexico	Hobbs	Toshiba		
USA	New Mexico		WPG Holding		
USA	New Mexico	Albuquerque	Xilinx Inc		
USA	New York	Sidney	Amphenol	675,000	Amphenol Aerospace Operations
USA	New York	Endicott	Amphenol		Amphenol Cables on Demand
USA	New York	Endicott	Amphenol		Amphenol High Speed Interconnects
USA	New York	Sidney	Amphenol	675,000	Amphenol Industrial Operations
USA	New York	Endicott	Amphenol		Amphenol Interconnect Products Corporation
USA	New York	Albany	Apple Inc		Retail Store
USA	New York	Buffalo	Apple Inc		Retail Store
USA	New York	Garden City	Apple Inc		Retail Store
USA	New York	Huntington Station	Apple Inc		Retail Store
USA	New York	Lake Grove	Apple Inc		Retail Store
USA	New York	Manhasset	Apple Inc		Retail Store
USA	New York	Nanuet	Apple Inc		Retail Store

Source: Citi Research

Figure 944. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	New York	New York	Apple Inc		Retail Store
USA	New York	New York	Apple Inc		Retail Store
USA	New York	New York	Apple Inc		Retail Store
USA	New York	New York	Apple Inc		Retail Store
USA	New York	New York	Apple Inc		Retail Store
USA	New York	Syracuse	Apple Inc		Retail Store
USA	New York	Victor	Apple Inc		Retail Store
USA	New York	White Plains	Apple Inc		Retail Store
USA	New York	Yonkers	Apple Inc		Retail Store
USA	New York	Islandia	Arrow Electronics		Office
USA	New York	Rochester	Arrow Electronics		Office
USA	New York	Ballston Lake	ASML Holding NV		
USA	New York	Fishkill	ASML Holding NV		
USA	New York	Olean	AVX Corporation	113,000	Manufacturing — PC
USA	New York	Huntington Station	AVX Corporation	94,000	Manufacturing/Research — PC
USA	New York	New York	Brocade Communications		
USA	New York	New York	Canon		Digital document technology and business process consulting services
USA	New York	Albany	Cisco Systems Inc		
USA	New York	Melville	Cisco Systems Inc		
USA	New York	Amherst	Cisco Systems Inc		
USA	New York	New York	Cisco Systems Inc		
USA	New York	Pittsford	Cisco Systems Inc		
USA	New York	Corning	Corning		Office
USA	New York	Diesel Location	Corning		Manufacturing
USA	New York	Erwin	Corning		Manufacturing
USA	New York	Canton Plant	Corning		Manufacturing
USA	New York	Erwin	Corning		Manufacturing
USA	New York	Corning	Corning		Manufacturing
USA	New York	Corning	Corning		Manufacturing
USA	New York	Corning	Corning		Office
USA	New York	Corning	Corning		Office
USA	New York	Corning	Corning		Office
USA	New York	Corning	Corning		Office
USA	New York	Amherst	EMC Corp		
USA	New York	Colonia	EMC Corp		
USA	New York	Melville	EMC Corp		
USA	New York	Pittsford	EMC Corp		
USA	New York	White Plains	EMC Corp		
USA	New York	New York	F5 Networks		Office
USA	New York	New York	F5 Networks		International Technology Center
USA	New York	Fujitsu	Fujitsu		
USA	New York	Fujitsu	Fujitsu		Office
USA	New York	Tarrytown	Hitachi		Hitachi America, Ltd.
USA	New York	White Plains	Hitachi		Hitachi Cable America, Inc.
USA	New York	Woodbury	Hitachi		Hitachi Kokusai Electric America, Ltd.
USA	New York	Purchase	Hitachi		Hitachi Metals America, Ltd.
USA	New York	Armonk	IBM (International Business Machines Corp)		Headquarters
USA	New York	Williamsville	Ingram Micro	374,500	Headquarters
USA	New York	Canandaigua	Xerox		Manufacturing plant
USA	New York	Farmington	Xerox		Manufacturing plant
USA	New York	Henrietta	Xerox		Manufacturing plant
USA	New York	Utica	Xerox		Manufacturing plant
USA	New York	Webster	Xerox		Manufacturing plant
USA	New York	Poughkeepsie	Jabil	40,000	Storage
USA	New York	Albany	Juniper Networks Inc		
USA	New York	New York	Juniper Networks Inc		
USA	New York	Hopewell Junction	KLA Tencor Corp		
USA	New York	Malta	KLA Tencor Corp		
USA	New York	Owego	Kyocera		NY Office
USA	New York	Albany	Lam Research Corp		Office
USA	New York	Clifton Park	Lam Research Corp		Office
USA	New York	Fishkill	Lam Research Corp		Office
USA	New York	Hauppauge	Microchip Technology		
USA	New York	New York	Mitsubishi Electric		New York Office (International Purchasing)
USA	New York	Motorola Solutions	Motorola Solutions		Corporate & Regional Office, Sales Office & Technology Center
USA	New York	Syracuse	Nidec		Manufacturing
USA	New York	Nidec	Nidec		Headquarters, IR Activity in America and an European Region
USA	New York	Glendale	Nidec		Factory
USA	New York	Melville	Nikon		
USA	New York	Horseheads	Oclaro Inc.	15,000	Administrative, manufacturing and research and development facilities
USA	New York	Jericho	On Semiconductor		Sales Office
USA	New York	Rochester	On Semiconductor		Sales Office
USA	New York	New York	Polycom Inc.		Office
USA	New York	Amherst	QUALCOMM Incorporated		
USA	New York	El Segundo	Riverbed Technology		
USA	New York	Kings Park	STMicroelectronics		Sales Office & Representative
USA	New York	Commack	Tamron Co Ltd		TAMRON USA, INC.
USA	New York	Hopewell Junction	Tokyo Electron		Fishkill Office
USA	New York	Malta	Tokyo Electron		Malta Office
USA	New York	Albany	Tokyo Electron		R&D for semiconductor production equipment
USA	New York	Albany	Toshiba		
USA	New York	Binghamton	Toshiba		
USA	New York	Buffalo	Toshiba		
USA	New York	Long Island	Toshiba		
USA	New York	Newburgh	Toshiba		
USA	New York	New York	Toshiba		
USA	New York	Rochester	Toshiba		
USA	New York	Syracuse	Toshiba		
USA	New York	Plainville	Veeco Instruments Inc	80,000	Data Storage and Corporate Headquarters
USA	New York	Poughkeepsie	Veeco Instruments Inc	9,000	LED & Solar
USA	New York	Kingston	Veeco Instruments Inc	44,000	LED & Solar
USA	New York	Niagara Falls	Victory		38,000 Resistors & Inductors
USA	New York	Ronkonkoma	WPG Holding		
USA	New York	Whitestone	Belden		Sales Offices
USA	New York	Horseheads	Belden		Manufacturing Facilities

Source: Citi Research

Figure 945. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	North Carolina	Raleigh	Alcatel Lucent SA		
USA	North Carolina	Raleigh	Altera Corp		
USA	North Carolina	Research Triangle	PaAmkor Technology Inc		Sales Office
USA	North Carolina	Winston Salem	Amphenol	54,000	Amphenol TCS Precision Metal Stamping & Insert Molding
USA	North Carolina	Hickory	Amphenol		C&S Antennas, Inc.
USA	North Carolina	Greensboro	Analog Devices, Inc.	47,600	Engineering and administrative offices
USA	North Carolina	Greensboro	Analog Devices, Inc.		Product testing, engineering and administrative
USA	North Carolina	Greensboro	Analog Devices, Inc.	98,700	offices
USA	North Carolina	Charlotte	Apple Inc		Retail Store
USA	North Carolina	Charlotte	Apple Inc		Retail Store
USA	North Carolina	Durham	Apple Inc		Retail Store
USA	North Carolina	Greensboro	Apple Inc		Retail Store
USA	North Carolina	Raleigh	Apple Inc		Retail Store
USA	North Carolina	Cary	Arms Enterprises, Inc.	151,500	Warehouse
USA	North Carolina	Morrisville	Arrow Electronics		Office
USA	North Carolina	Hillsborough	ASE		
USA	North Carolina	Cary	Blackberry		
USA	North Carolina	Durham	Broadcom		Office
USA	North Carolina	Durham	Brocade Communications		
USA	North Carolina	Research Triangle	PaCiena Corp		
USA	North Carolina	Research Triangle	PaCisco Systems Inc		
USA	North Carolina	Greensboro	Cisco Systems Inc		
USA	North Carolina	Charlotte	Cisco Systems Inc		
USA	North Carolina	Durham	Corning		Office
USA	North Carolina	Winston Salem	Corning		Office
USA	North Carolina	Hickory	Corning		Office
USA	North Carolina	Raleigh	Cypress Semiconductor Corp		
USA	North Carolina	Raleigh	Delta Electronics		Raleigh Office
USA	North Carolina	Apex	EMC Corp	390,000	Manufacturing
USA	North Carolina	Durham	EMC Corp	450,000	Office
USA	North Carolina	Charlotte	EMC Corp		
USA	North Carolina	Greensboro	EMC Corp		
USA	North Carolina	High Point	EMC Corp		
USA	North Carolina	Raleigh	EMC Corp		
USA	North Carolina	Research Triangle	PaEMC Corp		
USA	North Carolina	Asheville	Flextronics		Flextronics facilities, Manufacturing
USA	North Carolina	Charlotte	Flextronics	455,000	Flextronics facilities, Manufacturing
USA	North Carolina	Creedmoor	Flextronics	290,000	Flextronics facilities, Manufacturing
USA	North Carolina	Raleigh	Flextronics		Flextronics facilities, Service & Software
USA	North Carolina	Kernersville	Hitachi		Hitachi Construction Machinery Co., Ltd.
USA	North Carolina	China Grove	Hitachi		Hitachi Metals North Carolina, Ltd.
USA	North Carolina	Durham	HTC Corporation		Operations Office
USA	North Carolina	Cary	Integrated Device Technology		
USA	North Carolina	Durham	International Rectifier Corp		
USA	North Carolina	Morrisville	Intersil Corp.		Design Centers
USA	North Carolina	Raleigh	JDSU Corp.		Office
USA	North Carolina	Durham	Juniper Networks Inc		
USA	North Carolina	Hendersonville	Kyocera		Components Business - KYOCERA Industrial Ceramics Corporation
USA	North Carolina	Morrisville	Lenovo Group		Principal Operations, Research Centers and Sales Headquarters
USA	North Carolina	Greensboro	Lenovo Group		Manufacturing Centers
USA	North Carolina	Raleigh	Lenovo Group		Corporate/International Raleigh, USA
USA	North Carolina	Raleigh	Linear Technology	20,000	Research and development
USA	North Carolina	Cary	Linear Technology		Office
USA	North Carolina	Research Triangle	PaNetApp Inc	600,000	Sales Office
USA	North Carolina	Durham	NVIDIA		Office
USA	North Carolina	Raleigh	On Semiconductor		Sales Office
USA	North Carolina	Raleigh	Plexus	25,000	Engineering & Manufacturing Solutions
USA	North Carolina	Clemmons	QUALCOMM Incorporated		
USA	North Carolina	Raleigh	QUALCOMM Incorporated		
USA	North Carolina	Charlotte	RF Microdevices		Design Center
USA	North Carolina	Greensboro	RF Microdevices		Headquarters & Manufacturing Unit
USA	North Carolina	Cary	Riverbed Technology		
USA	North Carolina	Raleigh	Semtech		
USA	North Carolina	Raleigh	SK Hynix		Raleigh office
USA	North Carolina	Cary	STMicroelectronics		Sales Office & Representative
USA	North Carolina	Greensboro	TDK Corporation		GREENSBORO District Office
USA	North Carolina	Charlotte	Toshiba		Toshiba America Nuclear Energy Corporation (Headquarters)
USA	North Carolina	Research Triangle	Toshiba		Headquarters - Toshiba Global Commerce Solutions
USA	North Carolina	Asheville	Toshiba		
USA	North Carolina	Charlotte	Toshiba		
USA	North Carolina	Fayetteville	Toshiba		
USA	North Carolina	Greensboro	Toshiba		
USA	North Carolina	Hickory	Toshiba		
USA	North Carolina	Mt. Gilead	Toshiba		
USA	North Carolina	Raleigh	Toshiba		
USA	North Carolina	Wilmington	Toshiba		
USA	North Carolina	High Point	TriQuint	7,250	Engineering
USA	North Carolina	Raleigh	Xilinx Inc		
USA	North Carolina	Raleigh	Xilinx Inc		
USA	North Carolina	Morrisville	ZTE Corp		Sales Office
USA	North Carolina	Morrisville	Fujifilm		
USA	North Carolina	Chapel Hill	Rambus Inc		Research and development
USA	North Dakota	Dunseith	Benchmark Electronics	100,000	Dunseith utilizes the Benchmark Design for Excellence
USA	North Dakota	South Fargo	Cisco Systems Inc		
USA	North Dakota	Fargo	Toshiba		
USA	North Dakota	Grand Forks	Toshiba		
USA	North Dakota		WPG Holding		

Source: Citi Research

Figure 946. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Ohio	Dublin	Alps Electric		Ohio Office
USA	Ohio	Hudson	Alterra Corp		
USA	Ohio	Akron	Apple Inc		Retail Store
USA	Ohio	Cincinnati	Apple Inc		Retail Store
USA	Ohio	Columbus	Apple Inc		Retail Store
USA	Ohio	Columbus	Apple Inc		Retail Store
USA	Ohio	Westlake	Apple Inc		Retail Store
USA	Ohio	Woodmere	Apple Inc		Retail Store
USA	Ohio	Cleveland	Arrow Electronics		Office
USA	Ohio	Dayton	Arrow Electronics		Office
USA	Ohio	Solon	Arrow Electronics	224,000	Office
USA	Ohio		Asahi Glass		Automotive glass assembly
USA	Ohio	Grove City	Avnet	297,000	EM warehousing, integration and value-added operations
USA	Ohio	Groveport	Avnet	266,000	TS warehousing, integration and value-added operations
USA	Ohio	Columbus	Brocade Communications		
USA	Ohio	Cincinnati	Cisco Systems Inc		
USA	Ohio	Dublin	Cisco Systems Inc		
USA	Ohio	Richfield	Cisco Systems Inc		
USA	Ohio	Cincinnati	EMC Corp		
USA	Ohio	Dublin	EMC Corp		
USA	Ohio	Independence	EMC Corp		
USA	Ohio	Westerville	EMC Corp		
USA	Ohio	Perrysburg	First Solar Inc		Manufacturing
USA	Ohio	Groveport	FUNAI ELECTRIC CO LTD		FUNAI SERVICE CORPORATION
USA	Ohio	Twinsburg	Hitachi		Hitachi Medical Systems America, Inc.
USA	Ohio	Cleveland	Hoya Corporation		HOYA VISION CARE, CLEVELAND FACILITY
USA	Ohio	Dayton	Hoya Corporation		HOYA VISION CARE, DAYTON FACILITY
USA	Ohio	Columbus	Juniper Networks Inc		
USA	Ohio	Eaton	Lam Research Corp		Office
USA	Ohio	Columbus	Linear Technology		Office
USA	Ohio	Middleburg Heights	Linear Technology		Office
USA	Ohio	Independence	Microchip Technology		
USA	Ohio	Cincinnati	Mitsubishi Electric		Cincinnati, Ohio Office
USA	Ohio	Sidney	Mitsubishi Electric		Sidney, Ohio Office
USA	Ohio	Mason	Mitsubishi Electric		Mitsubishi Electric Automotive America, Inc.
USA	Ohio		Motorola Solutions		Sales Office
USA	Ohio	Minster	Nidec		Sales, Manufacturing, R&D and Factory
USA	Ohio	Minster	Nidec		Holding Company
USA	Ohio	Akron	Nidec		Sales & Factory
USA	Ohio	Independence	Nidec		Factory and R&D
USA	Ohio	Solon	Nidec		Production
USA	Ohio	Perry	Nidec		R&D
USA	Ohio	Brecksville	On Semiconductor		Sales Office
USA	Ohio	Englewood	Polycorn Inc.		Office
USA	Ohio	Brecksville	Rambus Inc		Research and development and prototyping facility
USA	Ohio	Grove City	Synnex Corporation		Warehouse
USA	Ohio	Akron	Toshiba		
USA	Ohio	Cleveland	Toshiba		
USA	Ohio	Cleveland	Western Digital Corp		
USA	Ohio	Brecksville	WPG Holding		
USA	Ohio	Xilix Inc	Xilix Inc		
USA	Oklahoma	Norman	Hitachi		Hitachi Computer Products (America), Inc.
USA	Oklahoma	Oklahoma	Apple Inc		Retail Store
USA	Oklahoma	Tulsa	Apple Inc		Retail Store
USA	Oklahoma	Tulsa	Arrow Electronics		Office
USA	Oklahoma	Oklahoma	Cisco Systems Inc		
USA	Oklahoma	Tulsa	Cisco Systems Inc		
USA	Oklahoma	Tulsa	EMC Corp		
USA	Oklahoma		Huawei		
USA	Oklahoma	Tulsa	Juniper Networks Inc		
USA	Oklahoma		Seagate Technology	150,000	Administrative
USA	Oklahoma		WPG Holding		
USA	Oklahoma	Oklahoma	Xerox		Manufacturing plant
USA	Oklahoma	Yukon	Xerox		Manufacturing plant
USA	Oregon	Beaverton	Arris Enterprises, Inc.	60,389	Office space/Manufacturing
USA	Oregon	Corvallis	Hewlett Packard		Product Development and Manufacturing
USA	Oregon	Brinson Blvd	AE Solar Energy		
USA	Oregon	Portland	Apple Inc		Retail Store
USA	Oregon	Tigard	Apple Inc		Retail Store
USA	Oregon	Tigard	Apple Inc		Retail Store
USA	Oregon	Beaverton	Arrow Electronics		Office
USA	Oregon		SIC Products:(manufacturing, sales, design engineering) CMP Slurry:(manufacturing, sales)		
USA	Oregon		Celestica	188,000	Portland Office
USA	Oregon	Portland	Delta Electronics		
USA	Oregon	Beaverton	EMC Corp		
USA	Oregon	Lake Oswego	EMC Corp		
USA	Oregon	Salem	Garmin Ltd.	115,000	office, development and manufacturing use
USA	Oregon	Salem	Garmin Ltd.	33,000	aircraft hangar, flight test and certification facility
USA	Oregon	Salem	Garmin Ltd.	43,870	office space
USA	Oregon	Eugene	Hoya Corporation		HOYA VISION CARE, EUGENE FACILITY
USA	Oregon	Milwaukee	Hoya Corporation		HOYA VISION CARE, PORTLAND FACILITY
USA	Oregon	Hillsboro	Integrated Device Technology	245,000	
USA	Oregon	Aloha	Intel		
USA	Oregon	Beaverton	Intel		
USA	Oregon	Hillsboro	Intel		
USA	Oregon	Wilsonville	Xerox		Manufacturing plant
USA	Oregon	Hillsboro	KLA Tencor Corp		
USA	Oregon	Tualatin	Lam Research Corp		Office
USA	Oregon	Hillsboro	Lam Research Corp		Office
USA	Oregon	Lake Oswego	Linear Technology		Wafer fabrication, engineering, office space and
USA	Oregon	Beaverton	Maxim Integrated	226,000	administration

Source: Citi Research

Figure 947. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Oregon	Hillsboro	Maxim Integrated	325,000	Engineering, manufacturing, office space and administration
USA	Oregon	Beaverton	Maxim Integrated		Office
USA	Oregon	Hillsboro	Maxim Integrated		Office
USA	Oregon	Gresham	Microchip Technology	826,500	Wafer Fabrication (Fab 4); R&D Center; Administrative Offices; and Warehousing
USA	Oregon	Hillsboro	NetApp Inc		
USA	Oregon	Beaverton	NVIDIA		Office
USA	Oregon	Lake Oswego	NVIDIA		Office
USA	Oregon	Gresham	On Semiconductor	518,000	Front end Facilities
USA	Oregon	Corvallis	Polycorn Inc.		Office
USA	Oregon	Portland	Seiko Epson		Manufacturing Subsidiaries and Affiliates - Epson Portland Inc.
USA	Oregon	Hillsboro	SolarWorld AG		Manufacturing
USA	Oregon	Portland	STMicroelectronics		Sales Office & Representative
USA	Oregon	Beaverton	Synnex Corporation		Warehouse, Sales
USA	Oregon	Tualatin	Teradyne		Semiconductor Test Technology Centers
USA	Oregon	Beaverton	Tokyo Electron		Portland Office
USA	Oregon				Headquarters, administration, test, technical, wafer
USA	Oregon	Hillsboro	TriQuint	260,000	fabrication and engineering
USA	Oregon				Wafer fabrication, engineering, administration,
USA	Oregon	Bend	TriQuint	14,100	test and technical
USA	Oregon	Beaverton	Vtech Holdings		Regional Office - Telecommunication Products
USA	Oregon		WPG Holding		
USA	Oregon	Portland	Xilinx Inc		
USA	Oregon	Portland	Xilinx Inc		
USA	Oregon	Beaverton	Xilinx Inc		
USA	Oregon	Portland	Advanced Micro Devices, Inc		
USA	Oregon	Hillsboro	ASML Holding NV		
USA	Oregon	Lake Oswego	Cisco Systems Inc		
USA	Oregon		Kyocera		Oregon Office
USA	Oregon	Portland	SunPower Corporation		Office
USA	Pennsylvania	Langhorne	3D Systems Corp	19,000	office and service space
USA	Pennsylvania	Ardmore	Apple Inc		Retail Store
USA	Pennsylvania	King of Prussia	Apple Inc		Retail Store
USA	Pennsylvania	Lancaster	Apple Inc		Retail Store
USA	Pennsylvania	Philadelphia	Apple Inc		Retail Store
USA	Pennsylvania	Pittsburgh	Apple Inc		Retail Store
USA	Pennsylvania	Pittsburgh	Apple Inc		Retail Store
USA	Pennsylvania	Pittsburgh	Apple Inc		Retail Store
USA	Pennsylvania	Pittsburgh	Apple Inc		Retail Store
USA	Pennsylvania	Whitehall	Apple Inc		Retail Store
USA	Pennsylvania	Willow Grove	Apple Inc		Retail Store
USA	Pennsylvania	State College	Arris Enterprises, Inc.	133,000	Office space
USA	Pennsylvania	Horsham	Arris Enterprises, Inc.		
USA	Pennsylvania	Philadelphia	Arris Enterprises, Inc.		
USA	Pennsylvania	Horsham	Arrow Electronics		Office
USA	Pennsylvania	Pittsburgh	Arrow Electronics		Office
USA	Pennsylvania				Fluoropolymers (PTFE/ETFE), Sales & Marketing of AGC Chemicals Products
USA	Pennsylvania	Malvern	Asahi Glass		
USA	Pennsylvania	Malvern	Brocade Communications		
USA	Pennsylvania	Malvern	Cisco Systems Inc		
USA	Pennsylvania	Pittsburgh	Cisco Systems Inc		
USA	Pennsylvania	Camp Hill	Cisco Systems Inc		
USA	Pennsylvania	Pittsburgh	Electronics For Imaging, Inc	18	office
USA	Pennsylvania	Camp Hill	EMC Corp		
USA	Pennsylvania	Conshohocken	EMC Corp		
USA	Pennsylvania	Pittsburgh	EMC Corp		
USA	Pennsylvania	Conshohocken	EMC Corp		
USA	Pennsylvania	Mountaintop	Fairchild Semiconductor International		Manufacturing Sites
USA	Pennsylvania	Horsham	Finisar Corp.	81,000	Office
USA	Pennsylvania				
USA	Pennsylvania	Tioga	Hitachi		Hitachi Metals Automotive Components USA, LLC
USA	Pennsylvania	Philadelphia	Huawei		
USA	Pennsylvania	Allentown	Intel		
USA	Pennsylvania	Bala Cynwyd	Intel		
USA	Pennsylvania	King of Prussia	Intel		
USA	Pennsylvania	Bensalem	Linear Technology		Office
USA	Pennsylvania		Motorola Solutions		Sales Office
USA	Pennsylvania	Cranberry Township	NetApp Inc		
USA	Pennsylvania	Center Valley	Olympus		Principal Business Bases
USA	Pennsylvania		Olympus		Business Center
USA	Pennsylvania				Regional HQ - Ricoh Americas Corporation - Sales & Services
USA	Pennsylvania	Malvern	Ricoh Co		
USA	Pennsylvania	Malvern	Riverbed Technology		
USA	Pennsylvania	Quakertown	STMicroelectronics		Sales Office & Representative
USA	Pennsylvania	Pittsburgh	STMicroelectronics		Sales Office & Representative
USA	Pennsylvania	Allentown	Toshiba		
USA	Pennsylvania	Kingston	Toshiba		
USA	Pennsylvania	Wyomissing	Toshiba		
USA	Pennsylvania	Philadelphia	Toshiba		
USA	Pennsylvania	Elizabethtown	Toshiba		
USA	Pennsylvania	Hanover	Toshiba		
USA	Pennsylvania	Pittsburg	Toshiba		
USA	Pennsylvania	Malvern	Vishay		Vishay Intertechnology, Inc
USA	Pennsylvania		WPG Holding		
USA	Pennsylvania	Harrisburg	Amphenol	35,000	Amphenol InterCon System
USA	Pennsylvania	Washington	Belden		Manufacturing Facilities
USA	Pennsylvania	Pittston	Corning		Office
USA	Pennsylvania	Pittsburgh	Corning		Office
USA	Pennsylvania	Allentown	Infinera Corp.	44,000	Office
USA	Pennsylvania	Jonestown	Ingram Micro	850,000	ALCs - Warehouse
USA	Pennsylvania	Pottstown	Integrated Device Technology		
USA	Pennsylvania	Warrendale	Mitsubishi Electric		Mitsubishi Electric Power Products Inc.
USA	Pennsylvania	Lancaster	STMicroelectronics		Sales Office & Representative
USA	Pennsylvania	Berwyn	TE Connectivity Ltd.		Headquarters & 27 manufacturing plants
USA	Puerto Rico	San Juan	Cisco Systems Inc		
USA	Puerto Rico		Hewlett Packard		Office
USA	Puerto Rico	Aguaadilla	Micron		Module assembly and test

Source: Citi Research

Figure 948. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Rhode Island	Providence	Apple Inc		Retail Store
USA	Rhode Island	East Greenwich	Huawei		
USA	Rhode Island	Warwick	International Rectifier Corp		
USA	Rhode Island		Manz AG		Sales & Service
USA	Rhode Island	East Providence	Polycom Inc.		
USA	Rhode Island	Warwick	Vishay	55,000	Resistors & Inductors
USA	Rhode Island	North Kingstown	Fujifilm		
USA	Somerset	New Jersey	Veeco Instruments Inc	80,000	LED & Solar
USA	Somerset	New Jersey	Veeco Instruments Inc	38,000	LED & Solar
USA	Somerset	New Jersey	Veeco Instruments Inc	14,000	LED & Solar
USA	South Carolina				headquarters, research and development and
USA	South Carolina	Rock Hill	3D Systems Corp	80,000	manufacturing facility
USA	South Carolina	Charleston	Apple Inc		Retail Store
USA	South Carolina	Greenville	Apple Inc		Retail Store
USA	South Carolina	Fountain Inn	AVX Corporation	300,000	Headquarters/Manufacturing/Warehouse
USA	South Carolina	Myrtle Beach	AVX Corporation	308,000	Manufacturing/Warehouse/Research — PC — CP
USA	South Carolina	Conway	AVX Corporation	71,000	Manufacturing/Office — PC
USA	South Carolina	Greenville	Cisco Systems Inc		
USA	South Carolina	Columbia	Cisco Systems Inc		
USA	South Carolina	Columbia	EMC Corp		
USA	South Carolina	Columbia	Flextronics	450,000	Flextronics facilities, Manufacturing
USA	South Carolina	Columbia	Intel		
USA	South Carolina	Greenville	NVIDIA		Office
USA	South Carolina	Greenville	Synnex Corporation		Sales, Headquarters
USA	South Carolina	Greenville	Toshiba		
USA	South Carolina	Greenville	Corning		Office
USA	South Carolina	Greenwood	Fujifilm		
USA	South Dakota	Sioux Falls	Cisco Systems Inc		
USA	South Dakota	Yankton	Vishay	58,000	Resistors & Inductors
USA	South Dakota	North Sioux City	Western Digital Corp		
USA	South Dakota		WPG Holding		
USA	Southbury	Connecticut	FormFactor Inc	143	Sales office
USA	Tennessee	La Vergne	Hewlett Packard		Product Development and Manufacturing
USA	Tennessee	Lawrenceburg	3D Systems Corp	35,000	office and printed parts service facilities
USA	Tennessee	Franklin	Apple Inc		Retail Store
USA	Tennessee	Germanatown	Apple Inc		Retail Store
USA	Tennessee	Knoxville	Apple Inc		Retail Store
USA	Tennessee	Knoxville	Apple Inc		Retail Store
USA	Tennessee	Kingsport	Asahi Glass		Soda ash (sales)
USA	Tennessee	Knoxville	Cisco Systems Inc		
USA	Tennessee	Brentwood	Cisco Systems Inc		
USA	Tennessee	Cordova	Cisco Systems Inc		
USA	Tennessee	Franklin	EMC Corp		
USA	Tennessee	Memphis	EMC Corp		
USA	Tennessee	Nashville	Flextronics		Flextronics facilities, Service & Software
USA	Tennessee	Knoxville	Hoya Corporation		HOYA VISION CARE, KNOXVILLE FACILITY
USA	Tennessee	Millington	Ingram Micro	85,000	ALCs - Logistic Centre
USA	Tennessee	Memphis	Jabil	1,201,000	Manufacturing, Aftermarket
USA	Tennessee		Motorola Solutions		Sales Office
USA	Tennessee		Quanta Computer		Quanta Computer Nashville, LLC.
USA	Tennessee		WPG Holding		
USA	Tennessee	Bartlett	Brother Industries Ltd		Production Facilities
USA	Tennessee		Corning		Office
USA	Tennessee	Memphis	Sharp Corp		SHARP ELECTRONICS CORPORATION [U.S.A.]
USA	Texas	Round Rock	Cypress Semiconductor Corp	100,000	Property held for sale
USA	Texas	Richardson	3D Systems Corp	14,000	consumer solutions services and software products
USA	Texas	Plano	Alcatel Lucent SA		
USA	Texas	San Antonio	Alcatel Lucent SA		
USA	Texas	Richardson	Altera Corp		
USA	Texas	Austin	Altera Corp		
USA	Texas	Dallas	Amkor Technology Inc		Sales Office
USA	Texas	Houston	Amphenol	40,000	Amphenol AssembleTech (Texas)
USA	Texas	Allen	Amphenol	50,000	Amphenol Fiber Systems International
USA	Texas	Midland	Amphenol		Amphenol Steward Enterprises
USA	Texas	Austin	Apple Inc		Retail Store
USA	Texas	Austin	Apple Inc		Retail Store
USA	Texas	Dallas	Apple Inc		Retail Store
USA	Texas	Dallas	Apple Inc		Retail Store
USA	Texas	El Paso	Apple Inc		Retail Store
USA	Texas	Fort Worth	Apple Inc		Retail Store
USA	Texas	Friendswood	Apple Inc		Retail Store
USA	Texas	Frisco	Apple Inc		Retail Store
USA	Texas	Houston	Apple Inc		Retail Store
USA	Texas	Houston	Apple Inc		Retail Store
USA	Texas	Houston	Apple Inc		Retail Store
USA	Texas	Houston	Apple Inc		Retail Store
USA	Texas	Plano	Apple Inc		Retail Store
USA	Texas	San Antonio	Apple Inc		Retail Store
USA	Texas	San Antonio	Apple Inc		Retail Store
USA	Texas	Southlake	Apple Inc		Retail Store
USA	Texas	Sugar Land	Apple Inc		Retail Store
USA	Texas	The Woodlands	Apple Inc		Retail Store
USA	Texas	Austin	Applied Materials Inc	1,864,000	Manufacturing
USA	Texas	Austin	ARM Holdings PLC		
USA	Texas	Keil	ARM Holdings PLC		
USA	Texas	Austin	Arrow Electronics		Office
USA	Texas	El Paso	Arrow Electronics		Office
USA	Texas	Houston	Arrow Electronics		Office
USA	Texas	Plano	Arrow Electronics		Office
USA	Texas	Austin	ASE		
USA	Texas	Austin	ASML Holding NV		
USA	Texas	Richardson	ATMI Holding NV		
USA	Texas		ATMI Inc		Sales & Customer Service
USA	Texas	Burnet	ATMI Inc		Materials Manufacturing
USA	Texas				EM warehousing, integration and value-added
USA	Texas	Coppell	Avnet	174,000	operations
USA	Texas	Angleton	Benchmark Electronics	110,000	facility

Source: Citi Research

Figure 949. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Texas	Irving	Blackberry		
USA	Texas	Austin	Brocade Communications		
USA	Texas	Frisco	Brocade Communications		
USA	Texas	The Woodlands	Brocade Communications		
USA	Texas	Austin	Brooks Automation Inc		Office
USA	Texas		Celestica	51,000	
USA	Texas	Richardson	Ciena Corp		
USA	Texas	Richardson	Cisco Systems Inc		
USA	Texas	Austin	Compal Electronics		Auscom Engineering Inc.
USA	Texas	El Paso	Cypress Semiconductor Corp		
USA	Texas	Austin	Cypress Semiconductor Corp		
USA	Texas	Houston	Cypress Semiconductor Corp		
USA	Texas	Arlington	Cypress Semiconductor Corp		
USA	Texas	Austin	Delta Electronics		Austin Office
USA	Texas	Houston	Delta Electronics		Houston Office
USA	Texas	Richardson	Delta Electronics		Delta Greentech (USA)
USA	Texas	Austin	EMC Corp		
USA	Texas	Coppell	EMC Corp		
USA	Texas	Dallas	EMC Corp		
USA	Texas	Frisco	EMC Corp		
USA	Texas	Houston	EMC Corp		
USA	Texas	Richardson	EMC Corp		
USA	Texas	San Antonio	EMC Corp		
USA	Texas	Austin	Emulex Corp		Office
USA	Texas	Decatur	Entegris Inc	359,000	Manufacturing
USA	Texas	Plano	Ericsson LM		Office
USA	Texas	Carrollton	Everlight		US HQ/Sales Office
USA	Texas		Fairchild Semiconductor International		Regional Sales and Customer Service Centers
USA	Texas	Allen	Finisar Corp.	160,000	Office
USA	Texas	Austin	Flextronics		Flextronics facilities, Design Centers,
USA	Texas	Plano	Flextronics		Manufacturing, Service & Software
USA	Texas	Irving	Flextronics		Flextronics facilities, Design Centers
USA	Texas	Dallas	Flextronics	320,000	Flextronics facilities, Manufacturing
USA	Texas	Longview	Flextronics		Flextronics facilities, Manufacturing
USA	Texas	Houston	Flextronics	150,000	Flextronics facilities, Manufacturing
USA	Texas	El Paso	Flextronics		Flextronics facilities, Service & Software
USA	Texas	Laredo	Flextronics		Flextronics facilities, Service & Software
USA	Texas	Austin	FormFactor Inc	2,025	Service and repair
USA	Texas	Richardson	Fujitsu		Fujitsu Network Communications Inc.
USA	Texas	Dallas	Hitachi		Texas Dallas - Headquarters
USA	Texas	Dallas	Hitachi		Hitachi Consulting
USA	Texas	Dallas	Hoya Corporation		HOYA VISION CARE, DALLAS FACILITY
USA	Texas	Dallas	Hoya Corporation		HOYA VISION CARE, SAN ANTONIO FACILITY
USA	Texas	San Antonio	Hoya Corporation		North American Headquarters
USA	Texas	Plano	Huawei		
USA	Texas	Carrollton	Ingram Micro	235,000	ALCs - Logistic Centre
USA	Texas	Carrollton	Xerox		Manufacturing plant
USA	Texas	Austin	Intel		
USA	Texas	Richardson	Intersil Corp.		Design Centers
USA	Texas	Austin	Intersil Corp.		Design Centers
USA	Texas	McAllen	Jabil	71,000	Aftermarket
USA	Texas	Plano	Jabil		Aftermarket, Support, Storage
USA	Texas	Round Rock	Jabil	65,000	
USA	Texas		JDSU Corp.		Office
USA	Texas	Dallas	Juniper Networks Inc		
USA	Texas	Austin	KLA Tencor Corp		
USA	Texas	Richardson	KLA Tencor Corp		
USA	Texas	Austin	Lam Research Corp		Office
USA	Texas	Austin	LG Display		Sales
USA	Texas	Houston	LG Display		Sales
USA	Texas	Plano	Linear Technology		Office
USA	Texas	Houston	Linear Technology		Office
USA	Texas	Austin	Logitech International S A	99,000	LifeSize operating segment
USA	Texas				Office space, engineering, manufacturing,
USA	Texas	Farmers Branch	Maxim Integrated	58,100	administration, bump facility,
USA	Texas				customer service, warehousing, shipping, and other
USA	Texas	San Antonio	Maxim Integrated	38,100	Wafer fabrication, office space and administration
USA	Texas	Austin	Maxim Integrated		Design Center
USA	Texas	Austin	Maxim Integrated		Sales Office
USA	Texas	Dallas	Maxim Integrated		Office
USA	Texas	San Antonio	Maxim Integrated		Office
USA	Texas	Austin	MediaTek		MediaTek USA Inc. (Austin)
USA	Texas	Addison	Microchip Technology		
USA	Texas		Motorola Solutions		Corporate & Regional Office
USA	Texas		Motorola Solutions		Sales Office
USA	Texas	Plano	Murata		Development & Sales
USA	Texas	Irving	NEC		NEC Corporation of America
USA	Texas	Houston	Nidec		Sales
USA	Texas	Dallas	Nidec		Sales
USA	Texas	Austin	Nidec		Sales
USA	Texas	Austin	NVIDIA		Office
USA	Texas	Richardson	NVIDIA		Office
USA	Texas	Plano	On Semiconductor		Sales Office
USA	Texas	Austin	On Semiconductor		Sales Office
USA	Texas	Austin	Polycom Inc.		Office
USA	Texas	Richardson	RF Microdevices		Design Center
USA	Texas	Austin	Riverbed Technology		
USA	Texas	Dallas	Riverbed Technology		
USA	Texas	The Woodlands	Riverbed Technology		
USA	Texas	Dallas	Rohm		Sales Office - ROHM Semiconductor U.S.A. LLC
USA	Texas	Richardson	Samsung Electronics		SAMSUNG Telecommunications America, LLC
USA	Texas	Houston	Samsung Techwin		Houston Design & Development Center, USA
USA	Texas				Manufacturing Subsidiaries and Affiliates - Epson El Paso, Inc.
USA	Texas	El Paso	Seiko Epson		

Source: Citi Research



Figure 950. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Texas	Dallas	Shinko Electric Industries		Sales Office - SHINKO ELECTRIC AMERICA, INC.
USA	Texas	Austin	Shinko Electric Industries		Sales Office - SHINKO ELECTRIC AMERICA, INC.
USA	Texas	Austin	Silicon Laboratories, Inc	441,000	
USA	Texas	Austin	SK Hynix		Austin Office
USA	Texas	Houston	SK Hynix		Houston Office
USA	Texas	Austin	Spansion		Manufacturing Facilities
USA	Texas	Houston	STMicroelectronics		Sales Office & Representative
USA	Texas	Coppell	STMicroelectronics		Sales Office & Representative
USA	Texas	Austin	STMicroelectronics		Sales Office & Representative
USA	Texas	Austin	SunPower Corporation		Office
USA	Texas	Dallas	Synnex Corporation		Warehouse, Sales
USA	Texas	Irving	Taiyo Yuden		Dallas District Office
USA	Texas	Richardson	TDK Corporation		
USA	Texas	Fort Worth	Tech Data	527000	
USA	Texas	Dallas	Tellabs, Inc.		Business Units
USA	Texas	Dallas	Texas Instruments		
USA	Texas	Sherman	Texas Instruments		
USA	Texas	Houston	Texas Instruments		
USA	Texas	Austin	Tokyo Electron		Headquarters
USA	Texas	Houston	Toshiba		Toshiba International Corporation
USA	Texas	Abilene	Toshiba		
USA	Texas	Austin	Toshiba		
USA	Texas	Corpus Christi	Toshiba		
USA	Texas	Dallas	Toshiba		
USA	Texas	El Paso	Toshiba		
USA	Texas	Fort Worth	Toshiba		
USA	Texas	Laredo	Toshiba		
USA	Texas	San Antonio	Toshiba		
USA	Texas	Victoria	Toshiba		
USA	Texas	Weslaco	Toshiba		
USA	Texas	Richardson	TriQuint	540000	Wafer fabrication, engineering, administration, test and technical
USA	Texas	Austin	Western Digital Corp		
USA	Texas	Houston	Western Digital Corp		
USA	Texas	Round Rock	Wistron Corporation		Customer sales support
USA	Texas	Dallas	Wistron Corporation		Service center
USA	Texas	Allen	WPG Holding		
USA	Texas	Austin	WPG Holding		
USA	Texas	Austin	Xilinx Inc		
USA	Texas	Dallas	Xilinx Inc		
USA	Texas	Plano	Xilinx Inc		
USA	Texas	Richardson	ZTE Corp		Sales Office
USA	Texas	Austin	AAC Technologies Holdings		Office
USA	Texas	Houston	Advanced Micro Devices, Inc		
USA	Texas	McAllen	Alps Electric		McAllen Office
USA	Texas	Irving	Cisco Systems Inc		
USA	Texas	Richardson	Cisco Systems Inc		
USA	Texas	Houston	Cisco Systems Inc		
USA	Texas	San Antonio	Cisco Systems Inc		
USA	Texas	Lubbock	Cisco Systems Inc		
USA	Texas	Plano	CSR Plc	43680	Office Operations and Sales
USA	Texas	Austin	Freescale Semiconductor Ltd.		Headquarters
USA	Texas	Houston	Hewlett Packard		Office
USA	Texas	Grapevine	Mitsubishi Electric		Grapevine (Dallas), Texas Office
USA	Texas	Austin	QUALCOMM Incorporated		
USA	Utah	Farmington	Apple Inc		Retail Store
USA	Utah	Murray	Apple Inc		Retail Store
USA	Utah	Salt Lake City	Apple Inc		Retail Store
USA	Utah	Salt Lake City	Applied Materials Inc		Research, Development and Manufacturing
USA	Utah	Salt Lake City	Arrow Electronics		Office
USA	Utah	Lehi	ASML Holding NV		
USA	Utah	Salt Lake City	Cisco Systems Inc		
USA	Utah	Draper	EMC Corp		
USA	Utah	Ogden	EMC Corp		
USA	Utah	Orem	EMC Corp		
USA	Utah	Park City	EMC Corp		
USA	Utah	Pleasant Grove	EMC Corp		
USA	Utah	Salt Lake City	EMC Corp		
USA	Utah	West Jordan	Fairchild Semiconductor International		Manufacturing Sites
USA	Utah	West Haven	Linear Technology		Office
USA	Utah	Lehi	Micron		Wafer fabrication
USA	Utah	Salt Lake City	NVIDIA		Office
USA	Utah	South Jordan	QUALCOMM Incorporated		
USA	Utah	Lehi	Tokyo Electron		Lehi Office
USA	Utah	Salt Lake City	WPG Holding		
USA	Utah	Corning			Office
USA	Vermont	South Burlington	Cisco Systems Inc		
USA	Vermont	Colchester	KLA Tencor Corp		
USA	Vermont	Burlington	Shinko Electric Industries		Sales Office - SHINKO ELECTRIC AMERICA, INC.
USA	Vermont	Bennington	Visbay	54000	Capacitors
USA	Vermont		WPG Holding		
USA	Virginia	Sandston	Hewlett Packard		Product Development and Manufacturing
USA	Virginia	Herndon	3D Systems Corp	36000	office and assembly space
USA	Virginia	Herndon	Alcatel Lucent SA		
USA	Virginia	Chatham	Amphenol		
USA	Virginia	Arlington	Apple Inc		Times Fiber Communications Inc.
USA	Virginia	Fairfax	Apple Inc		Retail Store
USA	Virginia	McLean	Apple Inc		Retail Store
USA	Virginia	Norfolk	Apple Inc		Retail Store
USA	Virginia	Reston	Apple Inc		Retail Store
USA	Virginia	Richmond	Apple Inc		Retail Store
USA	Virginia	Woodbridge	Apple Inc		Retail Store
USA	Virginia	Manassas	ASML Holding NV		
USA	Virginia	Herndon	Brocade Communications		
USA	Virginia	Chesapeake	Canon		Commercial lease financing for all Canon products

Source: Citi Research

Figure 951. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Virginia	Herndon	Cisco Systems Inc		
USA	Virginia	Richmond	Cisco Systems Inc		
USA	Virginia	Salem	Cisco Systems Inc		
USA	Virginia	Herndon	Cisco Systems Inc		
USA	Virginia	Alexandria	EMC Corp		
USA	Virginia	Glen Allen	EMC Corp		
USA	Virginia	Herndon	EMC Corp		
USA	Virginia	McLean	EMC Corp		
USA	Virginia	Reston	EMC Corp		
USA	Virginia	Chantilly	Emulex Corp		Office
USA	Virginia	Herndon	Emulex Corp		Office
USA	Virginia	Reston	Huawei		
USA	Virginia	Fairfax	Intel		
USA	Virginia	Herndon	Intel		
USA	Virginia	JDSU Corp.			Office
USA	Virginia	Richmond	Juniper Networks Inc		
USA	Virginia	Herndon	Juniper Networks Inc		
USA	Virginia	Manassas	KLA Tencor Corp		
USA	Virginia	Manassas	Micron		Wafer fabrication
USA	Virginia	Manassas	Motorola Solutions		Sales Office
USA	Virginia	Vienna	NetApp Inc		
USA	Virginia	Charlottesville	NVIDIA		Office
USA	Virginia	Newport News	On Semiconductor		Sales Office
USA	Virginia	Herndon	Polycorn Inc.		Office
USA	Virginia	Reston	Riverbed Technology		
USA	Virginia	Vienna	Tellabs, Inc.		Sales Office
USA	Virginia	Manassas	Tokyo Electron		Manassas Office
USA	Virginia	Herndon	WPG Holding		
USA	Virginia	Herndon	ZTE Corp		Sales Office
USA	Virginia	Herndon			Office
USA	Virginia	Arlington	Mitsubishi Electric		Washington, D.C. Office (Public Affairs)
USA	Virginia	Arlington	Mitsubishi Electric		Mitsubishi Electric America Foundation
USA	Washington		Hitachi		Hitachi, Ltd. (Liaison Office of Hitachi, Ltd.)
USA	Washington		Toshiba		Toshiba America Research, Inc.
USA	Washington		Toshiba		
USA	Washington		Cisco Systems Inc		
USA	Washington		Intel		Office
USA	Washington	Seattle	3D Systems Corp	30000	and printed parts service facilities
USA	Washington	Vancouver	Advanced Energy Industries, Inc		Advanced Energy Industries, Inc.
USA	Washington	Bellevue	Advanced Micro Devices, Inc		
USA	Washington	Kirkland	Altera Corp		
USA	Washington	Bellevue	Apple Inc		Retail Store
USA	Washington	Lynnwood	Apple Inc		Retail Store
USA	Washington	Seattle	Apple Inc		Retail Store
USA	Washington	Spokane	Apple Inc		Retail Store
USA	Washington	Tacoma	Apple Inc		Retail Store
USA	Washington	Tukwila	Apple Inc		Retail Store
USA	Washington	Olympia	ARM Holdings PLC		
USA	Washington	Seattle	ARM Holdings PLC		
USA	Washington	Kirkland	Arris Enterprises, Inc.	37,413	Office space
USA	Washington	Bellevue	Arrow Electronics		Office
USA	Washington	Bellevue	Blackberry		
USA	Washington	Seattle	Blackberry		
USA	Washington	Seattle	Blackberry		
USA	Washington	Seattle	Broadcom		Office
USA	Washington	Redmond	Brocade Communications		
USA	Washington	Spokane Valley	Ciena Corp		
USA	Washington	Bellevue	Cisco Systems Inc		
USA	Washington	Lacey	Cisco Systems Inc		
USA	Washington	Spokane	Cisco Systems Inc		
USA	Washington	Lynnwood	Cypress Semiconductor Corp	67,000	Administrative offices, research and development
USA	Washington	Bellevue	EMC Corp		
USA	Washington	Seattle	EMC Corp		
USA	Washington	Wenatchee	EMC Corp		
USA	Washington	Bothell	Emulex Corp		
USA	Washington	Seattle	FS Networks	300000	Headquarters
USA	Washington	Bellevue	FS Networks		Office
USA	Washington	Spokane	FS Networks		Office
USA	Washington	Spokane	FS Networks		Office
USA	Washington	First Solar Inc			Headquarters
USA	Washington	Bothell	Fujifilm		
USA	Washington	Washington	Fujitsu		Office
USA	Washington	Seattle	Hoya Corporation		HOYA VISION CARE, SEATTLE FACILITY
USA	Washington	Bellevue	HTC Corporation		Operations Office
USA	Washington	Seattle	HTC Corporation		Operations Office
USA	Washington	Bellevue	Huawei		
USA	Washington	Bellevue	Huawei		
USA	Washington	Bellevue	Intel		
USA	Washington	DuPont	Intel		
USA	Washington	Redmond	Intel		
USA	Washington	Bellevue	JDSU Corp.		Office
USA	Washington	Bellevue	Juniper Networks Inc		
USA	Washington	Vancouver	Lam Research Corp		Office
USA	Washington	Camas	Linear Technology	105,000	Wafer fabrication
USA	Washington	Bellevue	Linear Technology		Office
USA	Washington	Camas	Logitech International S A	44700	Ultimate Ears Group
USA	Washington	Motorola Solutions			Sales Office
USA	Washington	Battle Ground	Nidec		Sales
USA	Washington	Redmond	NVIDIA		Office
USA	Washington	Bellevue	QUALCOMM Incorporated		
USA	Washington	Seattle	QUALCOMM Incorporated		
USA	Washington	Bellevue	Shinko Electric Industries		Sales Office - SHINKO ELECTRIC AMERICA, INC.

Source: Citi Research

Figure 952. USA (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
USA	Washington	Redmond	STMicroelectronics		Sales Office & Representative
USA	Washington	Bellevue	Western Digital Corp		
USA	Washington	WPG Holding			
USA	Washington	Seattle	Xilinx Inc		
USA	Washington	Bothell	Xilinx Inc		
USA	Washington	Bellevue	ZTE Corp		Sales Office
USA	Wisconsin	Sussex	Altera Corp		
USA	Wisconsin	Middleton	American Superconductor Corp.	62000	Grid Segment
USA	Wisconsin	New Berlin	American Superconductor Corp.	50000	Wind & Grid Segments
USA	Wisconsin	Glendale	Apple Inc		Retail Store
USA	Wisconsin	Madison	Apple Inc		Retail Store
USA	Wisconsin	Wauwatosa	Apple Inc		Retail Store
USA	Wisconsin	Brookfield	Arrow Electronics		Office
USA	Wisconsin	Brookfield	Brocade Communications		
USA	Wisconsin	Madison	Cisco Systems Inc		
USA	Wisconsin	Madison	EMC Corp		
USA	Wisconsin	Pewaukee	EMC Corp		
USA	Wisconsin	Waukesha	EMC Corp		
USA	Wisconsin	Eau Claire	Intel		
USA	Wisconsin		Linear Technology		Office
USA	Wisconsin	Darlington	Nidec		Manufacturing
USA	Wisconsin	Evansville	On Semiconductor		Sales Office
USA	Wisconsin	Neenah	Plexus	277,000	Engineering & Manufacturing Solutions
USA	Wisconsin	Appleton	Plexus	272,000	Engineering & Manufacturing Solutions
USA	Wisconsin	Neenah	Plexus	105,000	Engineering & Manufacturing Solutions
USA	Wisconsin	Neenah	Plexus	104,000	Engineering & Manufacturing Solutions
USA	Wisconsin	Neenah	Plexus	39,000	Engineering & Manufacturing Solutions
USA	Wisconsin		Toshiba		
USA	Wisconsin	Milwaukee	Vishay	42000	Resistors & Inductors
USA	Wisconsin		WPG Holding		
USA	Wyoming		WPG Holding		
USA		Chicago	AAC Technologies Holdings		Office
USA		Meriden	Alcatel Lucent SA	45,000	Manufacturing
USA		San Juan	Alcatel Lucent SA		
USA		New York	Ciena Corp		
USA		Ottawa	Ciena Corp		
USA			Corning		Office
USA		Texas	Cypress Semiconductor Corp		
USA		Washington	EMC Corp		
USA		West	EMC Corp		
USA		Houston	Hewlett Packard		Office
USA		Palo Alto	Hewlett Packard		Laboratories
USA					AAP St. Marys Corp. (A unit of Hitachi Metals America, Ltd.)
USA		St. Mary	Hitachi		
USA			LG Electronics		Zenith Electronics Corporation of Pennsylvania
USA		Allen	Micron		Design
USA		Folsom	Micron		Design
USA		Kirkland	Micron		Design
USA		Longmont	Micron		Design
USA		Minneapolis	Micron		Design
USA		San Diego	Micron		Design
USA		San Jose	Micron		Design
USA		Fremont	Micron		Headquarters
USA		Nampa	Micron		Manufacturing
USA		Houston	Micron		Sales
USA		Meridian	Micron		Sales
USA		Round Rock	Micron		Sales
USA			Nikon		
USA			Nikon		
USA			Nikon		
USA			Pioneer Corporation		Pioneer Finetech Corporation
USA			Pioneer Corporation		Pioneer North America, Inc.
USA			Pioneer Corporation		Pioneer Electronics (USA) Inc.
USA			Pioneer Corporation		Pioneer Automotive Technologies, Inc.
USA			Pioneer Corporation		Discovision Associates
USA			Pioneer Corporation		Pioneer Speakers, Inc.
USA			Pioneer Corporation		Pioneer International (Miami) Inc.
USA			Pioneer Corporation		Pioneer Advanced Solutions, Inc.
USA			Powertech Technology		Sales and marketing
USA					Backplanes, Cables, Enclosures, Logistics/Post-Manufacturing Repair/Warranty, Design & JDM, Modular Solutions, New Product Introduction, Optical Solutions, PCB Fabrication, PCBA & System
USA		Multiple locations	Sanmina	2,918,982	Assembly & Precision Machining
USA					Manufacturing Subsidiaries and Affiliates - Epson
USA		Minnesota	Seiko Epson		Seattle, Inc.
USA			Sensata		Business Centre
USA			Sony Corp		Sony Corp. of America
USA		New York	Sun Edison		
USA		New York	Toshiba		Toshiba Nuclear Energy Holdings (US), Inc.
USA		New York	WPG Holding		
USA		New York	Yingli Green Energy		Office

Source: Citi Research

Figure 953. Canada

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Canada	Alberta	Calgary	Synnex Corporation		Warehouse
Canada	Alberta	Edmonton	Hewlett Packard		Office
Canada	Alberta	Calgary	Hewlett Packard		Office
Canada	Alberta	Calgary	EMC Corp		
Canada	Alberta	Edmonton	EMC Corp		
Canada	Alberta	Calgary	Lexmark		Lexmark sales offices
Canada	Alberta	Edmonton	Lexmark		Lexmark sales offices
Canada	Alberta	Calgary	Alcatel Lucent SA		
Canada	Alberta	Edmonton	Alcatel Lucent SA		
Canada	Alberta	Calgary	Juniper Networks Inc		
Canada	Alberta	Calgary	Brocade Communications		
Canada	British Columbia	Burnaby	Arrow Electronics		Office
Canada	British Columbia	Vancouver	Tech Data	77772	
Canada	British Columbia	Richmond	Synnex Corporation		
Canada	British Columbia	Richmond	Hewlett Packard		Office
Canada	British Columbia	Vancouver	EMC Corp		
Canada	British Columbia	Burnaby	Lexmark		Lexmark sales offices
Canada	British Columbia	Vancouver	Blackberry		
Canada	British Columbia	Burnaby	Alcatel Lucent SA		
Canada	British Columbia	Burnaby	Ericsson LM		Office
Canada	British Columbia	Vancouver	Juniper Networks Inc		
Canada	British Columbia	Vancouver	Intel		
Canada	British Columbia	Victoria	Intel		
Canada	British Columbia	Vancouver	Hoya Corporation		HOYA LENS CANADA, INC., VANCOUVER FACILITY
Canada	British Columbia	Vancouver	Seiko Epson		R&D Subsidiaries and Affiliates - Epson Research
Canada	Calgary	Alberta	Arrow Electronics		Office
Canada	Calgary		Semtech		
Canada	California	Ontario	Everlight		Sales Office
Canada	Halifax	Bedford	Ingram Micro		
Canada	Halifax	Bedford	Ingram Micro		
Canada	Halifax	Nova Scotia	Alcatel Lucent SA		
Canada	Halifax	Burlington	EMC Corp		
Canada	Manitoba	Kanata	TSMC		Offices
Canada	Manitoba	Winnipeg	Amphenol		Amphenol Technical Products International
Canada	Manitoba	Winnipeg	EMC Corp		
Canada	Manitoba	Winnipeg	Alcatel Lucent SA		
Canada	Manitoba	Winnipeg	Hewlett Packard		Office
Canada	New Brunswick	Fredericton	Blackberry		
Canada	Nova Scotia	Halifax	Synnex Corporation		Warehouse
Canada	Nova Scotia		Hewlett Packard		Office
Canada	Nova Scotia	Bedford	Blackberry		
Canada	Nova Scotia	Halifax	Alcatel Lucent SA		
Canada	Ontario	Toronto	Amphenol		Amphenol Canada Corporation
Canada	Ontario	Amphenol	Amphenol		Times Fiber Canada Ltd.
Canada	Ontario	Toronto	Celestica	888,000	
Canada	Ontario	Toronto	Arrow Electronics	264717	Office
Canada	Ontario	Concord	Arrow Electronics		Office
Canada	Ontario	Kanata	Arrow Electronics		Office
Canada	Ontario	Mississauga	Arrow Electronics		Office
Canada	Ontario	Mississauga	Ingram Micro	500000	
Canada	Ontario	Mississauga	Tech Data	257683	
Canada	Ontario	Toronto	Synnex Corporation		Sales
Canada	Ontario	Markham	Synnex Corporation		
Canada	Ontario	Guelph	Synnex Corporation		SYNNEX Canada
Canada	Ontario	Markham	IBM (International Business Machines Corp)		IBM Canada Ltd.
Canada	Ontario	Mississauga	Hewlett Packard		Manufacturing plant
Canada	Ontario	Kanata	Hewlett Packard		Office
Canada	Ontario	Toronto	Hewlett Packard		Office
Canada	Ontario	Kanata	EMC Corp		
Canada	Ontario	Mississauga	EMC Corp		
Canada	Ontario	Ottawa	EMC Corp		
Canada	Ontario	Toronto	EMC Corp		
Canada	Ontario	Mississauga	NetApp Inc		
Canada	Ontario	Toronto	Xerox		Office
Canada	Ontario	Mississauga	Xerox		Manufacturing plant
Canada	Ontario	Oakville	Xerox		Manufacturing plant
Canada	Ontario	Toronto	Xerox		
Canada	Ontario	Richmond Hill	Electronics For Imaging, Inc	15	office
Canada	Ontario	Richmond Hill	Lexmark		Lexmark sales offices & Headquarters
Canada	Ontario	Ottawa	Lexmark		Lexmark sales offices
Canada	Ontario	Waterloo	Blackberry		
Canada	Ontario	Cambridge	Blackberry		
Canada	Ontario	Mississauga	Blackberry		
Canada	Ontario	Ottawa	Blackberry		
Canada	Ontario	Kanata	Blackberry		
Canada	Ontario	Toronto	Blackberry		
Canada	Ontario		Motorola Solutions		Sales Office
Canada	Ontario	Mississauga	Apple Inc		Retail Store
Canada	Ontario	Markham	Apple Inc		Office
Canada	Ontario	Toronto	Applied Materials Inc		Research & Development
Canada	Ontario	Mississauga	Microchip Technology		
Canada	Ontario	Oakville	On Semiconductor		Sales Office
Canada	Ontario	Waterloo	On Semiconductor		Sales Office
Canada	Ontario	Burlington	Semtech		
Canada	Ontario	Kanata	Semtech		
Canada	Ontario	Toronto	Semtech		
Canada	Ontario	Ottawa	Adtran		
Canada	Ontario	Toronto	Adtran		
Canada	Ontario	Ottawa	Alcatel Lucent SA		
Canada	Ontario	Markham	Alcatel Lucent SA		
Canada	Ontario	Mississauga	Ericsson LM		Office
Canada	Ontario	Ottawa	Ericsson LM		Office
Canada	Ontario	Mississauga	Ericsson LM		Office
Canada	Ontario	Toronto	FS Networks		Office
Canada	Ontario	Kanata	Juniper Networks Inc		
Canada	Ontario	Kanata	Juniper Networks Inc		
Canada	Ontario	Mississauga	Juniper Networks Inc		
Canada	Ontario	Mississauga	Riverbed Technology		
Canada	Ontario	Markham	Advanced Micro Devices, Inc	240,000	
Canada	Ontario	Markham	Advanced Micro Devices, Inc	215,000	
Canada	Ontario	Markham	Advanced Micro Devices, Inc	65,000	
Canada	Ontario	Ottawa	Altera Corp		
Canada	Ontario	Toronto	Altera Corp		
Canada	Ontario	Ottawa	Freescale Semiconductor Ltd.		Design Center & Sales

Source: Citi Research



Figure 954. Canada (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Canada	Ontario	Toronto	Freescale Semiconductor Ltd.	Office	
Canada	Ontario	Markham	Intel		
Canada	Ontario	Waterloo	Intel		
Canada	Ontario	Kanata	Intel		
Canada	Ontario	Toronto	Intel		
Canada	Ontario	Kanata	QUALCOMM Incorporated		
Canada	Ontario	Markham	QUALCOMM Incorporated		
Canada	Ontario	Toronto	QUALCOMM Incorporated		
Canada	Ontario	Windsor	QUALCOMM Incorporated		
Canada	Ontario	Toronto	Xilinx Inc		
Canada	Ontario	Ottawa	Xilinx Inc		
Canada	Ontario	Mississauga	SMA Solar Technology		SMA Canada, Inc
Canada	Ontario	Mississauga	LG Display		Sales
Canada	Ontario	Mississauga	LG Electronics		LG Electronics Canada, Inc.
Canada	Ontario	Mississauga	SAMSUNG Electronics		SAMSUNG Electronics Canada, Inc.
Canada	Ontario	Markham	Mitsubishi Electric		Mitsubishi Electric Sales Canada Inc.
Canada	Ontario	Mississauga	Acer Inc		Acer America Corp. (Canada)
Canada	Ontario	Mississauga	Acer Inc		Tech Support
Canada	Ontario	Markham	ASUSTeK COMPUTER INC		Canada Branch Office
Canada	Ontario	Mississauga	NEC		NEC Canada, Inc.
Canada	Ontario	North York	Lenovo Group		Lenovo (Canada) Inc.
Canada	Ontario	Mississauga	Advanced Energy Industries, Inc		AEI Canada, Inc.
Canada	Ontario	Sarnia	First Solar Inc		Office
Canada	Ontario	Toronto	Sun Edison		
Canada	Ontario	Toronto	Trina Solar Limited		Trina Solar (Canada) Inc
Canada	Ontario	Mississauga	Kyocera		Information Equipment - KYOCERA Document
Canada	Ontario		Murata		Development
Canada	Ontario	Toronto	Shinko Electric Industries		Sales Office - SHINKO ELECTRIC AMERICA, INC.
Canada	Ontario	Kitchener	Taiyo Yuden		Canada Office
Canada	Ontario	Toronto	TDK Corporation		TDK-EPC Corporation of Canada
Canada	Ontario	Mississauga	Canon		All product segments
Canada	Ontario	Toronto	Hoya Corporation		HOYA LENS CANADA, INC., TORONTO FACILITY
Canada	Ontario	Richmond Hill	Olympus		Sales of product lines except imaging products and
Canada	Ontario	Mississauga	Ricoh Co		Sales & Services - Ricoh Canada, Inc.
Canada	Ontario	Mississauga	Ricoh Co		Sales & Services - RICOH IMAGING CANADA INC.
Canada	Ontario		Seiko Epson		Epson Canada, Ltd.
Canada	Ontario	Mississauga	Asahi Glass		Automotive glass assembly
Canada	Ontario	Mississauga	Sharp Corp		SHARP ELECTRONICS OF CANADA LTD. [Canada]
Canada	Ontario	Toronto	Fujitsu		Fujitsu Canada, Inc.
Canada	Ontario	Scarborough	Fujitsu		Fujitsu Ten Canada Inc.
Canada	Ontario		Brocade Communications		
Canada	Ontario	Toronto	Brocade Communications		
Canada	Ontario	Thornhill	STMicroelectronics		Manufacturing & Design Center, Sales Office &
Canada	Ontario	Nepean	STMicroelectronics		Sales Office & Representative
Canada	Ontario	Mississauga	STMicroelectronics		Sales Office & Representative
Canada	Ontario	Toronto	ZTE Corp		Sales Office
Canada	Ontario	Kanata	Huawei		R&D
Canada	Ontario	Kitchener	Xyratex		Office
Canada	Ontario	Markham	Molex		
Canada	Ontario	Mississauga	Panasonic		Semiconductor Sales office
Canada	Ontario	Mississauga	Panasonic		Canada Branch Office
Canada	Ontario	Mississauga	Hitachi		Nuclear and IBC Affairs
Canada	Ontario	Quebec	Hitachi		Canada Office
Canada	Ontario	Rexdale	Hitachi		Hitachi High-Technologies Canada, Inc.
Canada	Ontario	Calgary	Hitachi		Hitachi ID Systems, Inc.
Canada	Ontario	Scarborough	Hitachi		Hitachi Kokusai Electric Canada, Ltd.
Canada	Ontario		Hitachi		Hitachi High-Technologies Canada, Inc.
Canada	Ontario		Hitachi		Hitachi Koki (Power Tools) Canada
Canada	Ontario	Markham	Casio		CASIO CANADA LTD.
Canada	Ontario	Markham	Pioneer Corporation		Pioneer Electronics of Canada, Inc
Canada	Quebec	Saint Hubert	Amphenol		Amphenol Air LB- NA
Canada	Quebec		Arrow Electronics		Office
Canada	Quebec	Dorval	Arrow Electronics		Office
Canada	Quebec	Montreal	Ingram Micro		
Canada	Quebec	Montreal	Synnex Corporation		Sales
Canada	Quebec	Quebec	Hewlett Packard		Office
Canada	Quebec	Kirkland	Hewlett Packard		Office
Canada	Quebec	Brossard	Lexmark		Lexmark sales offices
Canada	Quebec	Sainte-Foy	Lexmark		Lexmark sales offices
Canada	Quebec		Motorola Solutions		Sales Office
Canada	Quebec	Point Claire	On Semiconductor		Sales Office
Canada	Quebec	Montreal	Teradyne		Semiconductor Test Technology Centers
Canada	Quebec	Montreal	Adtran		
Canada	Quebec	Montreal	Alcatel Lucent SA		
Canada	Quebec	Montreal	Ciena Corp		
Canada	Quebec	Montreal	Ericsson LM		Office
Canada	Quebec	Montreal	Juniper Networks Inc		
Canada	Quebec	Montreal	Riverbed Technology		
Canada	Quebec	Brossard	Intel		
Canada	Quebec	Montreal	QUALCOMM Incorporated		
Canada	Quebec	Montreal	Xilinx Inc		
Canada	Quebec	Montreal	Hoya Corporation		HOYA LENS CANADA, INC., MONTREAL FACILITY
Canada	Quebec	Montreal	Olympus		Manufacture and service of advanced UT and ICT
Canada	Quebec	Montreal	Fujitsu		Fujitsu Conseil (Canada) Inc. / Fujitsu Consulting
Canada	Quebec	Montreal	Brocade Communications		
Canada	Quebec	Montreal	Belden		

Source: Citi Research

Figure 955. Canada (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Canada	Saskatchewan	Saskatoon	Hitachi		Headquarters
Canada	Ontario	Richmond	Ingram Micro	125000	
Canada	Westmorland	Moncton	EMC Corp		
Canada		Calgary	Jabil	11,000	Aftermarket
Canada		Toronto	Jabil	55,000	Aftermarket
Canada					Flextronics facilities, Design Centers, Service & Software
Canada		Toronto	Flextronics		
Canada		Ottawa	Flextronics		Flextronics facilities, Design Centers
Canada		Quebec	Amphenol		Amphenol TAT Technologies
Canada		Ottawa	Sanmina	183,698	Design & JDM, New Product Introduction, Optical
Canada		Ottawa	Ingram Micro		
Canada		Toronto	Coquitlam		Tech Data
Canada		Ottawa	Tech Data		
Canada		Montreal	EMC Corp		
Canada		Montreal	EMC Corp		
Canada		Vancouver	NetApp Inc		
Canada		Winnipeg	Cisco Systems Inc		
Canada		Brossard	Apple Inc		Retail Store
Canada		Burlington	Apple Inc		Retail Store
Canada		Burnaby	Apple Inc		Retail Store
Canada		Calgary	Apple Inc		Retail Store
Canada		Coquitlam	Apple Inc		Retail Store
Canada		Edmonton	Apple Inc		Retail Store
Canada		Halifax	Apple Inc		Retail Store
Canada		Laval	Apple Inc		Retail Store
Canada		London	Apple Inc		Retail Store
Canada		Markham	Apple Inc		Retail Store
Canada		Montreal	Apple Inc		Retail Store
Canada		Newmarket	Apple Inc		Retail Store
Canada		Ottawa	Apple Inc		Retail Store
Canada		Pointe-Claire	Apple Inc		Retail Store
Canada		Quebec	Apple Inc		Retail Store
Canada		Richmond	Apple Inc		Retail Store
Canada		Surrey	Apple Inc		Retail Store
Canada		Toronto	Apple Inc		Retail Store
Canada		Vancouver	Apple Inc		Retail Store
Canada		Waterloo	Apple Inc		Retail Store
Canada		Winnipeg	Apple Inc		Retail Store
Canada		Burlington	On Semiconductor	95,400	Front End/ Back end Facilities
Canada		Ottawa	Teradyne		Semiconductor Test Technology Centers
Canada		Ontario	Ciena Corp		
Canada		Kanata	Infinera Corp.	6000	Office
Canada		Ontario	JDSU Corp.		Office
Canada		Vancouver	JDSU Corp.		Office
Canada		Ottawa	Oclaro Inc.	4000	Administrative, manufacturing and research and
Canada		San Jose	Polycorn Inc.		Office
Canada		Toronto	Polycorn Inc.		Office
Canada			Marvell		
Canada		Toronto	Samsung Electro-Mechanics		Overseas Sales Offices
Canada		Toronto	AAC Technologies Holdings		Office
Canada			WPG Holding		
Canada		Markham	IBiden		IBIDEN Canada Inc
Canada		Richmond	Kyocera		Information Equipment - KYOCERA Document
Canada		Dorval	Kyocera		Information Equipment - KYOCERA Document
Canada		Quezon	Nidec		R&D
Canada		Vancouver	Nidec		Sales
Canada			Nikon		
Canada			Nikon		
Canada			Nikon		
Canada			Seiko Epson		R&D Subsidiaries and Affiliates - Epson Canada
Canada			Sony Corp		Sony of Canada Ltd.
Canada		Toronto	CSR Plc	5965	Sublet
Canada		Burnaby	Infoblox Inc.		Facilities for development activities
Canada		Richmond	Vtech Holdings		Regional Office - Telecommunication Products
Canada		Ontario	Belden		Manufacturing Facilities
Canada		Markham	Huawei		
Canada		Toronto	Hitachi		Hitachi Data Systems-Toronto
Canada		Quebec	Brother Industries Ltd		Sales Facilities
Canada		Markham	Toshiba		Corporate Headquarters

Source: Citi Research

**Figure 957. Mexico (Continued)**

Source: Citi Research

Figure 958. America - Other

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Aruba		Oranjestad	IBM (International Business Machines Corp)		IBM World Trade Corporation
Aruba			Xerox		Office
Bahamas		Nassau	IBM (International Business Machines Corp)		IBM Bahamas Ltd
Bahamas		Freeport	Xerox		Office
Bahamas		Nassau	Xerox		Office
Bahamas		Nassau	Fujitsu		Branch
Barbados		Sain Michael	IBM (International Business Machines Corp)		IBM World Trade Corporation, IBM Business
Barbados		St. Michael	Xerox		Partners
Barbados			Xerox		Office
Barbados			Fujitsu		Branch
Bermuda		Hamilton	Marvell		Registered Office
Bermuda		Hamilton	TPV Technology		
Brazil		Belo Horizonte	Jabil	155,000	Manufacturing
Brazil		Manaus	Jabil	170,000	Prototype Manufacturing
Brazil		Sorocaba	Jabil	39,000	Manufacturing
Brazil		Válhinos	Jabil	51,000	Aftermarket
Brazil		Sao Paulo	Flextronics		Flextronics facilities, Manufacturing
Brazil		Sorocaba	Flextronics		Flextronics facilities, Manufacturing, Industrial
Brazil		Manaus	Flextronics		Parks, Service & Software
Brazil		San Jose Dos Campo	Amphenol		Flextronics facilities, Manufacturing
Brazil		Sao Paulo	Amphenol		Amphenol do Brasil Ltda
Brazil		Sao Paulo	Amphenol		Amphenol do Brasil Ltda
Brazil		Campinas	Sensata		Amphenol TTC do Brasil Ltda.
Brazil					Business Centre
Brazil		Multiple locations	Sanmina	265,933	Logistics/Post-Manufacturing Repair/Warranty &
Brazil					PCBA & System Assembly
Brazil		Campinas	Benchmark Electronics	49,000	
Brazil		Sao Paulo	Arrow Electronics		Office
Brazil		Rio Grande do Sul	Arrow Electronics		Office
Brazil		Porto Alegre	Tech Data	61350	
Brazil		Sao Paulo	IBM (International Business Machines Corp)		IBM Brasil
Brazil		Sao Paulo	Hewlett Packard		Office
Brazil		Rio de Janeiro	Hewlett Packard		Office
Brazil		Rio Grande do Sul	Hewlett Packard		Office
Brazil		Rio de Janeiro	EMC Corp		
Brazil		Sao Paulo	EMC Corp		
Brazil		Minas Gerais	EMC Corp		
Brazil		Belo Horizonte	EMC Corp		
Brazil		Parana	EMC Corp		
Brazil		Curitiba	EMC Corp		
Brazil		Rio Grande do Sul	EMC Corp		
Brazil		Porto Alegre	EMC Corp		
Brazil		Rio de Janeiro	EMC Corp		
Brazil		Sao Paulo	EMC Corp		
Brazil		Rio de Janeiro	NetApp Inc		
Brazil		Sao Paulo	NetApp Inc		
Brazil		Sao Paulo	NetApp Inc		
Brazil		Brasilia	NetApp Inc		
Brazil		Mexico City	NetApp Inc		
Brazil		Rio de Janeiro	Xerox		
Brazil		Resende	Xerox		Office
Brazil		Sao Paulo	Electronics For Imaging, Inc	15	Manufacturing plant
Brazil			Corning		Office
Brazil		Brasilia	Cisco Systems Inc		
Brazil		Barra da Tijuca	Cisco Systems Inc		
Brazil		Sao Paulo	Cisco Systems Inc		
Brazil		Sao Paulo	Blackberry		
Brazil		Barueri	Motorola Solutions		Corporate & Regional Office
Brazil		Sao Paulo	Motorola Solutions		Sales Office
Brazil		Sao Paulo	Apple Inc		Office
Brazil		Sao Paulo	Linear Technology		Office
Brazil		Sao Paulo	On Semiconductor		Sales Office
Brazil		Sao Paulo	Silicon Laboratories, Inc		
Brazil			Adtran		
Brazil		Sao Paulo	Arris Enterprises, Inc.		
Brazil		Sao Paulo	Alcatel Lucent SA		
Brazil		Rio de Janeiro	Alcatel Lucent SA		
Brazil		Sao Paulo	Ciena Corp		
Brazil		Sao Paulo	Ericsson LM		Office
Brazil		Indaiatuba	Ericsson LM		Office
Brazil		Sao Paulo	Ericsson LM		Office
Brazil		Sao Paulo	Ericsson LM		Office
Brazil		Sao Paulo	FS Networks		Office
Brazil		Sao Paulo	FS Networks		Office
Brazil		Sao Paulo	JDSU Corp.		Office
Brazil		Rio de Janeiro	JDSU Corp.		Office
Brazil		Rio de Janeiro	Juniper Networks Inc		
Brazil		Sao Paulo	Juniper Networks Inc		
Brazil		Sao Paulo	Polycom Inc.		Office
Brazil		Sao Paulo	Riverbed Technology		
Brazil		Sao Paulo	Tellabs, Inc.		Sales Office
Brazil		Sao Paulo	Advanced Micro Devices, Inc		
Brazil		Sao Paulo	Freescall Semiconductor Ltd.		Office
Brazil		Sao Paulo	Intel		
Brazil		Sao Paulo	NVIDIA		Office
Brazil		Sao Paulo	QUALCOMM Incorporated		
Brazil		Brasilia	QUALCOMM Incorporated		
Brazil					LG Electronics do Brasil Ltda., Marketing &
Brazil		Sao Paulo	LG Electronics		Production
Brazil		Sao Paulo	Samsung Electro-Mechanics		Overseas Sales Offices
Brazil		Sao Paulo	Samsung Electronics		Brazil - Samsung Medison Do Brasil Ltda.
Brazil		Sao Paulo	Mitsubishi Electric		Ltda. - Head Office
Brazil		Barueri	Mitsubishi Electric		Barueri Office
Brazil		Cidade Monções	Acer Inc		AGP Tecnologia em Informática do Brasil Ltda
Brazil		Sao Paulo	NEC		NEC Latin America S.A.
Brazil		Sao Paulo	Compal Electronics		Compaed Eletrônica do Brasil Indústria e
Brazil		Sao Paulo	Delta Electronics		Comércio Ltda.
Brazil		Sao Paulo	Delta Electronics		Sales Office
Brazil		Sao Paulo	Delta Electronics		Administration & Factory
Brazil		Sao Paulo	Foxconn International Holdings		Mass Production Facilities
Brazil		Sao Paulo	Hon Hai Precision		Handset assembly, PC component
Brazil		Sao Paulo	Pegatron		Operation Sites
Brazil		Sao Paulo	Wistron Corporation		Service center
Brazil		Sao Paulo	Lenovo Group		
Brazil		Sao Paulo	Sun Edison		
Brazil		Sao Paulo	WPG Holding		
Brazil		Barueri	Kyocera		Information Equipment - KYOCERA Document Solutions Brazil Ltda.

Source: Citi Research

Figure 959. America – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Brazil		Sao Paulo	Kyocera		Solar Business - KYOCERA Solar do Brasil Ltda.
Brazil		Sao Paulo	Murata		Sao Paulo Office
Brazil		Sao Paulo	TDK Corporation		TDK DO BRASIL IND. E COM. LTDA.
Brazil		Amazonas	TDK Corporation		TDK DA AMAZONIA IMP. E COM. LTDA.
Brazil			Canon		Digital cameras
Brazil		Sao Paulo	Canon		Business machines, digital cameras, inkjet printers
Brazil		Rio de Janeiro	Hoya Corporation		OPTOTAL HOYA LIMITADA.
Brazil		Sao Paulo	Olympus		Olympus Optical do Brasil, Ltda
Brazil			Nikon		
Brazil			Nikon		
Brazil		Rio de Janeiro	Ricoh Co		Sales & Services - Ricoh Brasil, S.A.
Brazil		Sao Paulo	Seiko Epson		Epson do Brasil Indústria e Comércio Ltda.
Brazil					Epson Rio De Janeiro Importadora e Exportadora
Brazil		Rio De Janeiro	Seiko Epson		Ltda
Brazil					Manufacturing Subsidiaries and Affiliates - Epson
Brazil		Sao Paulo	Seiko Epson		Paulista Ltda.
Brazil		Sao Paulo	Asahi Glass		Float glass, Automotive glass, and Mirror
Brazil					SHARP BRAZIL COMÉRCIO E DISTRIBUIÇÃO DE
Brazil		Sao Paulo	Sharp Corp		ARTIGOS ELETRÔNICOS LTDA [Brazil]
Brazil		Sao Paulo	Sony Corp		Sony Brasil Ltda.
Brazil		Sao Paulo	Fujifilm		
Brazil		Sao Paulo	Fujitsu		Fujitsu do Brasil Ltda.
Brazil		Sao Paulo	Brocade Communications		
Brazil		Brasilia	Brocade Communications		
Brazil		Rio de Janeiro	Brocade Communications		
Brazil		Joinville	STMicroelectronics		Sales Office & Representative
Brazil		Sao Paulo	STMicroelectronics		Sales Office & Representative
Brazil		Manaus	STMicroelectronics		Sales Office & Representative
Brazil		Sao Paulo	Stratus Ltd		
Brazil		Sao Paulo	TE Connectivity Ltd.		1 Manufacturing Plant
Brazil		Brasilia	ZTE Corp		Sales Office
Brazil		Sao Paulo	ZTE Corp		Sales Office
Brazil		Sao Paulo	ZTE Corp		Sales Office
Brazil		Sao Paulo	Belden		Sales Office
Brazil		Sao Paulo	Emulex Corp		Office
Brazil		Rio de Janeiro	Huawei		
Brazil		Curitiba	Huawei		
Brazil		Sao Paulo	Huawei		Latin America Headquarters
Brazil		Brasilia	Huawei		
Brazil		Sao Paulo	Molex		
Brazil		Sao Paulo	Panasonic		Semiconductor Sales Office
Brazil		Sao Paulo	Panasonic		Brazil Representative Office
Brazil		Sao Paulo	Hitachi		Hitachi Brasil Ltda.
Brazil		Indaiatuba	Hitachi		Hitachi Koki do Brasil Ltda.
Brazil		Santa Rita do Sapuca	Hitachi		Hitachi Koksai Linear Equipamentos Eletrônicos
Brazil		Arujá	Hitachi		Hitachi-Mycom Manutenção E Soluções Ltda.
Brazil			Pioneer Corporation		Pioneer do Brasil Ltda.
Brazil			Pioneer Corporation		Pioneer Yorkey do Brasil Ltda.
Brazil		Sao Paulo	Brother Industries Ltd		Sales Facilities
Brazil		Curitiba	Toshiba		Factory
Brazil		Sao Paulo	Toshiba		Sao Paulo Office
Brazil		Santo Amaro	Toshiba		Semp Toshiba
Brazil		Salvador	Toshiba		Semp Toshiba Sa Bahia
Brazil		Manaus	Toshiba		Semp Toshiba Amazonas Sa
Brazil		Barueri	Toshiba		Toshiba Medical do Brasil Ltda.
Brazil		Santiago	Tech Data	25830	
Brazil		Santiago	IBM (International Business Machines Corp)		IBM de Chile SAC
Brazil			Hewlett Packard		Office
Brazil		Santiago	EMC Corp		
Brazil		Santiago	NetApp Inc		
Brazil		Santiago	Xerox		Office
Brazil		Santiago	Cisco Systems Inc		
Brazil		Santiago	Arris Enterprises, Inc.		
Brazil		Santiago	Alcatel Lucent SA		
Brazil		Santiago	Ericsson LM		Office
Brazil		Santiago De Chile	Intel		
Brazil		Santiago	SMA Solar Technology		SMA South America SpA
Brazil		Santiago	LG Electronics		LG Electronics Inc. Chile Ltda
Brazil		Santiago	NEC		NEC Chile S.A.
Brazil		Santiago	Lenovo Group		
Brazil		Santiago	First Solar Inc		Office
Brazil		Santiago	Sun Edison		
Brazil		Santiago	Trina Solar Limited		Trina Solar (Chile) SpA
Brazil		Santiago	Canon		All product segments (with some exceptions)
Brazil		Santiago	Ricoh Co		Sales & Services - Ricoh Chile, S.A.
Brazil		Santiago	Seiko Epson		Epson Chile S.A.
Brazil		Santiago	Fujitsu		Fujitsu Chile
Brazil		Santiago	Brocade Communications		
Brazil		Santiago	ZTE Corp		Sales Office
Brazil		Santiago	Huawei		
Brazil		Santiago	Hitachi		Hitachi Data Systems (Chile)
Brazil		Santiago	Brother Industries Ltd		Sales Facilities
Brazil		Colombia	Sanmina	1,390	Logistics/Post-Manufacturing Repair/Warranty
Brazil		Colombia	IBM (International Business Machines Corp)		IBM de Colombia
Brazil		Colombia	Hewlett Packard		Office
Brazil		Colombia	EMC Corp		
Brazil		Colombia	NetApp Inc		
Brazil		Colombia	Xerox		
Brazil		Colombia	Lexmark		Office
Brazil		Colombia	Lexmark International		Lexmark International
Brazil		Colombia	Cisco Systems Inc		
Brazil		Colombia	Cisco Systems Inc		
Brazil		Colombia	Motorola Solutions		Corporate & Regional Office
Brazil		Colombia	Alcatel Lucent SA		
Brazil		Colombia	Ericsson LM		Office
Brazil		Colombia	FS Networks		Office
Brazil		Colombia	Juniper Networks Inc		
Brazil		Colombia	Riverbed Technology		

Source: Citi Research

Figure 960. America – Other (Continued)

Colombia	Distrito Capital de Bogota	Intel	
Colombia		LG Electronics	LG Electronics Colombia Ltda, Marketing
Colombia	Bogota	NEC	NEC de Colombia S.A.
Colombia	Bogota	Wistron Corporation	Service center
Colombia	Bogota	Lenovo Group	
Colombia	Cisneros	Nidec	Sales
Colombia	Bogota	Ricoh Co	Sales & Services - Ricoh Colombia, S.A.
Colombia	Bogota	Seiko Epson	Epson Colombia Ltda.
Colombia	Bogota	Fujifilm	
Colombia	Bogota	Fujitsu	FUJITSU LIMITED SUCURSAL DE COLOMBIA
Colombia	Bogota	ZTE Corp	Sales Office
Colombia	Bogota	Huawei	
Colombia		Toshiba	
Costa Rica	San Jose	Tech Data	
Costa Rica	Heredia	IBM (International Business Machines Corp)	IBM Costa Rica
Costa Rica		EMC Corp	
Costa Rica	San Jose	Xerox	Office
Costa Rica	Escazu	Cisco Systems Inc	
Costa Rica	Heredia	Terradyne	42,000 Semiconductor Test
Costa Rica	San Jose	Alcatel Lucent SA	
Costa Rica	San Jose	Ericsson LM	Office
Costa Rica	Heredia	Intel	
Costa Rica	San Jose	Olympus	Service Center
Costa Rica	San Jose	Ricoh Co	Sales & Services - Ricoh Costa Rica, S.A.
Costa Rica	San Jose	Seiko Epson	
Costa Rica	San Jose	ZTE Corp	Sales Office
Costa Rica			Test, assembly and
Costa Rica	San Jose	TriQuint	62700 administration
Dominica		Xerox	Office
Dominican Republic	Haina	Sensata	62000 Manufacturing
Dominican Republic	Santo Domingo	Vishay	16000 Resistors & Inductors
Dominican Republic	Santo Domingo	Xerox	Office
Dominican Republic	Santo Domingo	Cisco Systems Inc	
Dominican Republic	Santo Domingo	Alcatel Lucent SA	
Dominican Republic	Santo Domingo	Ericsson LM	Office
Dominican Republic	Santo Domingo	ZTE Corp	Sales Office
Ecuador	Quito	IBM (International Business Machines Corp)	IBM del Ecuador C.A.
Ecuador		Hewlett Packard	
Ecuador	Quito	Xerox	Office
Ecuador	Guayaquil	Xerox	Office
Ecuador	Pichincha	Quito	Cisco Systems Inc
Ecuador	Pichincha	Quito	Alcatel Lucent SA
Ecuador	Pichincha	Quito	Intel
Ecuador		Quito	ZTE Corp
Ecuador		Quito	Huawei
El Salvador	San Salvador	AVX Corporation	420,000 Manufacturing — PC
El Salvador	Antiguo Cuscatlan	Xerox	Office
El Salvador	San Salvador	Cisco Systems Inc	
El Salvador	San Salvador	Alcatel Lucent SA	
El Salvador	San Salvador	Ericsson LM	Office
El Salvador	San Salvador	Ricoh Co	Sales & Services - Ricoh El Salvador, S.A. de C.V.
El Salvador	San Salvador	ZTE Corp	Sales Office
Equatorial Guinea	Malabo	ZTE Corp	Sales Office
Greenland	Narsarsuaq	Xerox	Office
Grenada	St George	Xerox	Office
Guatemala		Xerox	Office
Guatemala	Trafalgar Nivel	Alcatel Lucent SA	
Guatemala	Guatemala City	Ericsson LM	Office
Guatemala	Guatemala City	Ricoh Co	Sales & Services - Ricoh Guatemala, S.A.
Guatemala		Seiko Epson	Epson Guatemala, S.A.
Guatemala		ZTE Corp	Sales Office
Guyana	Georgetown	Xerox	Office
Haiti	Port au Prince	Xerox	Office
Haiti	Port-Au-Prince	Ericsson LM	Office
Haiti	Pétionville	ZTE Corp	Sales Office
Honduras	Tegucigalpa	Xerox	Office
Honduras	San Pedro Sula	Xerox	Office
Honduras	Colonias Lomas del N	Alcatel Lucent SA	
Honduras	Tegucigalpa	Ericsson LM	Office
Jamaica	Kingston	IBM (International Business Machines Corp)	IBM World Trade Corporation
Jamaica	Kingston	Xerox	Office
Jamaica		Fujitsu	Headquarters
Jamaica	Kingston	ZTE Corp	Sales Office
Nicaragua	Managua	Xerox	Office
Nicaragua	Managua	Alcatel Lucent SA	
Nicaragua	Managua	ZTE Corp	Sales Office
Panama	Panama City	Xerox	Office
Panama		Cisco Systems Inc	
Panama		Alcatel Lucent SA	
Panama	Panama City	Ericsson LM	Office
Panama	Panama City	LG Electronics	LG Electronics Panama SA, Marketing
Panama		Canon	All product segments (with some exceptions)
Panama	Curundu	Ricoh Co	Sales & Services - Ricoh Panama, S.A.
Panama	Panama City	ZTE Corp	Sales Office
Panama		Huawei	
Panama		Pioneer Corporation	Pioneer International Latin America S.A.
Paraguay		IBM (International Business Machines Corp)	IBM Paraguay
Paraguay	Codigo	Xerox	Office
Paraguay	Asunción	Ericsson LM	Office
Paraguay	Asunción	ZTE Corp	Sales Office

Source: Citi Research

Figure 961. America – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Peru		Lima	Tech Data	41622	
Peru		Lima	IBM (International Business Machines Corp)		IBM de Peru
Peru	San Isidro		Hewlett Packard		Office
Peru	San Isidro		EMC Corp		
Peru		Lima	Xerox		Office
Peru		Lima	Cisco Systems Inc		
Peru		Lima	Alcatel Lucent SA		
Peru		Lima	Intel		
Peru		Lima	LG Electronics		LG Electronics Peru S.A., Marketing
Peru		Lima	Lenovo Group		
Peru		Lima	Ricoh Co		Sales & Services - Ricoh Del Peru S.A.C.
Peru		Lima	Seiko Epson		Epson Peru, S.A.
Peru		Lima	ZTE Corp		Sales Office
Peru		Lima	Huawei		
Peru		Lima	Brother Industries Ltd		Sales Facilities
Puerto Rico		Guaynabo	EMC Corp		
Puerto Rico	San Juan		Ericsson LM		Office
Puerto Rico	San Juan		Ricoh Co		Sales & Services - Ricoh Puerto Rico, Inc.
Suriname	Paramaribo		IBM (International Business Machines Corp)		IBM World Trade Corporation
Suriname	Paramaribo		Xerox		Office
Uruguay	Montevideo		Tech Data	31900	
Uruguay	Montevideo		IBM (International Business Machines Corp)		
Uruguay	Montevideo		Xerox		Office
Uruguay	Canelones		Blackberry		
Uruguay	Montevideo		Alcatel Lucent SA		
Uruguay	Montevideo		ZTE Corp		Sales Office
Uruguay	Montevideo		Huawei		
Uruguay	Montevideo		Logitech International S A	12500	Distribution center
Venezuela	Caracas		IBM (International Business Machines Corp)		IBM de Venezuela S.A.
Venezuela	Caracas		Hewlett Packard		Office
Venezuela	Caracas		EMC Corp		
Venezuela			NetApp Inc		
Venezuela			Xerox		Office
Venezuela	Caracas		Nokia		Regional Office
Venezuela	Caracas		Cisco Systems Inc		
Venezuela	Caracas		Alcatel Lucent SA		
Venezuela	Caracas		Ericsson LM		Office
Venezuela	Caracas		Intel		
Venezuela	Caracas		LG Electronics		LG Electronics Venezuela S.A, Marketing
Venezuela	Caracas		NEC		NEC de Venezuela, C.A.
Venezuela	El Hatillo		Lenovo Group		
Venezuela	Edf		Nidec		Sales
Venezuela	Caracas		Seiko Epson		Epson Venezuela, SAL
Venezuela	Caracas		ZTE Corp		Sales Office
Venezuela	Caracas		Huawei		
Venezuela	Caracas		Toshiba		Toshiba de Venezuela C.A.

Source: Citi Research

Figure 962. China

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
China	Anhui	Hefei	Alcatel Lucent SA		
China	Anhui	Hefei	EMC Corp		
China	Anhui	Fuyang	Nokia		Regional Office
China	Anhui		Nokia		Regional Office
China	Anhui		Delta Electronics		Delta Electronics (Wuhu) Ltd.
China	Baon District	Shenzhen City	Flexium Interconnect		Shenzhen Office
China	Central Pudong		AAC Technologies Holdings		Creative Center
China	Changning	Shanghai	Cisco Systems Inc		
China	Chaoyang	Beijing	AAC Technologies Holdings		Sales office China Mainland - North China Branch
China	Chaoyang	Beijing	Cisco Systems Inc		
China	Chaoyang	Beijing	Centrotherm Photovoltaics		centrotherm photovoltaics Technology Shanghai Co. Ltd. Beijing Office
China	Chaoyang	Beijing	Alps Electric		Head Office
China	Chongqing		Hewlett Packard		Product Development and Manufacturing
China	Chongqing		Cisco Systems Inc		
China	Chongqing		Nokia		Regional Office
China	Fujian	Xiamen	Amphenol	50,000	Amphenol AssembleTech (Xiamen) Co., Ltd.
China	Fujian	Fuzhou	Intel		
China	Fujian		NEC		NEC TOKIN Electronics (Xiamen) Corporation
China	Fujian	Xiamen	AU Optronics		Office
China	Fujian	Xiamen	Lenovo Group		Mobile Phone R&D Centre
China	Fujian	Xiamen	Parasonic		
China	Fujian	Fuzhou	EMC Corp		
China	Fujian	Quanzhou	Nokia		Regional Office
China	Fujian	Xiamen	Nokia		Regional Office
China	Fujian	Fuzhou	Cisco Systems Inc		
China	Fujian	Fuzhou	Alcatel Lucent SA		
China	Fujian	Xiamen	Manz AG		Service
China	Fujian	Xiamen	TPK		TPK Touch Solutions (Xiamen) Inc., Optera Technology (Xiamen) Co., Ltd., Ray-Star Technology (Xiamen) Inc., Ray-Star System Solutions (Xiamen) Inc., TPK Touch Systems (Xiamen) Inc., TPK Lens Solutions Inc., Ray-Star Optical (Xiamen) Inc., PK Glass Solutions
China	Fujian	Xiamen	Taiyo Yuden		Xiamen Office
China	Fujian	Xiamen	Hi-P International		Manufacturing sites
China	Fujian	Shenzhen	NetApp Inc		
China	Fujian	Shenzhen	Samsung Electro-Mechanics		Overseas Sales Offices
China	Fujian	Shenzhen	Western Digital Corp		
China	Fuzhou		LG Innotek		LG Innotek Fuzhou Co.,Ltd. (LGITFZ)
China	Fuzhou		Nokia		
China	Gangnam-gu	Seoul	Canon		
China	Gansu	Lanzhou	Nokia		Regional Office
China	Gansu	Lanzhou	Alcatel Lucent SA		
China	Guangdong	Jianmen	Panasonic		Panasonic Electronic Devices (Jiangmen) Co., Ltd.
China	Guangdong	Shenzhen	Everlight		Sales Office
China	Guangdong	Shenzhen	Zhen Ding Tech		HQ/Manufacturing Plant
China	Guangdong	Zhongshan	Ju Teng		Subsidiary (Lian-Yi Precision (Zhongshan) Inc.)
China	Guangdong	Zhuhai	Amphenol		Electronics facilities, Manufacturing, Industrial Parks
China	Guangdong	Zhuhai	Amphenol	129,000	Amphenol Tech Co., Ltd. Ind. Ops.
China	Guangdong	Zhuhai	Vishay		Resistors & Inductors
China	Guangdong	Zhuhai	Arrow Electronics		Office
China	Guangdong	Shenzhen	EMC Corp		
China	Guangdong	Guangzhou	NetApp Inc		
China	Guangdong	Guangzhou	NetApp Inc		
China	Guangdong	Shenzhen	NetApp Inc		
China	Guangdong	Dongguan	Xerox		Manufacturing plant
China	Guangdong	Foshan	Nokia		Regional Office
China	Guangdong	Tianhe	Nokia		Regional Office
China	Guangdong	Shantou	Nokia		Regional Office
China	Guangdong	Shenzhen	Nokia		Regional Office
China	Guangdong	Shenzhen	Cisco Systems Inc		
China	Guangdong	Shenzhen	KIA Tencor Corp	33,571	Office and plant
China	Guangdong	Shenzhen	Maxim Integrated		Office
China	Guangdong	Zhuhai	Microchip Technology		
China	Guangdong	Shenzhen	Semtech		
China	Guangdong	Shenzhen	Teradyne		Local Sales and Support Office
China	Guangdong	Shenzhen	Arris Enterprises, Inc.	29,078	Office space
China	Guangdong	Guangzhou	Alcatel Lucent SA		
China	Guangdong	Shenzhen	Ciena Corp		
China	Guangdong	Guangzhou	Intel		
China	Guangdong	Shenzhen	Intel		
China	Guangdong	Shenzhen	Manz AG		Service
China	Guangdong	Guangzhou	LG Display		Production
China	Guangdong	Shenzhen	LG Display		Sales
China	Guangdong		LG Innotek		LG Innotek Huizhou Co.,Ltd. (LGITHZ)
China	Guangdong	Dongguan	Samsung Electro-Mechanics		Overseas Production Subsidiaries
China	Guangdong	Guangzhou	Mitsubishi Electric		Mitsubishi Electric (Guangzhou) Compressor Co., Ltd.
China	Guangdong	Dongguan	Largan Precision		
China	Guangdong	Dongguan	Wintek		Larga Precision Co.,Ltd
China	Guangdong	Shenzhen	Innolux		Production, RD Center, Office
China	Guangdong	Foshan	Innolux		Office
China	Guangdong	Shenzhen	E Ink Holdings		Office
China	Guangdong	Shenzhen	Lenovo Group		Development Lab
China	Guangdong	Huiyang	Lenovo Group		Manufacturing Centers
China	Guangdong	Shenzhen	Advanced Energy Industries, Inc		Advanced Energy Industries (Shenzhen) Co., Ltd.
China	Guangdong	Guangzhou	Alps Electric		Guangzhou Branch
China	Guangdong	Dongguan	Hosiden		China Hosiden Co., Ltd.
China	Guangdong	Dongguan	Hosiden		China Hosiden Co., Ltd.(LCD Factory)
China	Guangdong	Zhuhai	Kyocera		Zhuhai Office - Kyocera Taikang alloy tool (Zhuhai) Co., Ltd
China	Guangdong	Dongguan	Kyocera		Dongguan Shilong KYOCERA Co.,Ltd.
China	Guangdong	Dongguan	Kyocera		KYOCERA Document Technology (Dongguan) Co., Ltd.
China	Guangdong	Dongguan	Kyocera		KYOCERA OPTEC (Dongguan) Co., Ltd.
China	Guangdong	Shenzhen	Murata		Production
China	Guangdong	Guangzhou	Murata		Development & Sales
China	Guangdong	Zhuhai	Rohm		Sales Office - ROHM Semiconductor (Shenzhen) Co.,Ltd.

Source: Citi Research

Figure 963. China (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
China	Guangdong	Shenzhen	Taiyo Yuden		Sales Office
China	Guangdong	Dongguan	Taiyo Yuden		Manufacturing Base
China	Guangdong	Zhuhai	Nidec		Sales
China	Guangdong	Shenzhen	Mitsumi Electric		Sales Office
China	Guangdong	Zhuhai	Mitsumi Electric		ZHUHAI MITSUMI ELECTRIC CO., LTD.
China	Guangdong	Shenzhen	Mabuchi Motor		Sales Office
China	Guangdong	Dongguan	Mabuchi Motor		Design and Development/Factory for Motors,
China	Guangdong	Dongguan	Mabuchi Motor	80000	Parts, and Production Equipment
China	Guangdong	Dongguan	Mabuchi Motor	22000	Factory for Parts
China	Guangdong	Dongguan	Mabuchi Motor	118000	Factory for Motors
China	Guangdong	Shenzhen	Canon		Business machines, business machine peripherals, industrial-use printers, optical equipment
China	Guangdong	Shenzhen	Canon		Digital cameras, digital video camcorders, laser printers, contact image sensors
China	Guangdong	Zhongshan	Canon		Laser printers
China	Guangdong	Foshan	Asahi Glass		Automotive glass fabrication and sales
China	Guangdong	Guangzhou	Asahi Glass		Glass substrates for HDD
China	Guangdong	Guangzhou	Nippon Electric Glass		Manufacturing Plant
China	Guangdong	Dongguan	Vtech Holdings		Manufacturing Facilities - Telecommunication Products
China	Guangdong	Qingyuan	Vtech Holdings		Manufacturing Facilities - Telecommunication Products
China	Guangdong	Shenzhen	Silitech Technology		
China	Guangdong	Dongguan	Molex		Dongguan Plant 1,2
China	Guangdong	Zhong Shan City	FUNAI ELECTRIC CO LTD		H.F.T. INDUSTRIAL LTD
China	Guangdong	Shenzhen	FUNAI ELECTRIC CO LTD		Funai Electric R&D (Shenzhen) Co.,Ltd.
China	Guangdong	Shenzhen	Foxconn Technology		
China	Guangdong	Provind Shenzhen	Zhen Ding Tech		Service center
China	Guangxi	Nanning	Nokia		Regional Office
China	Guangxi	Nanning	Alcatel Lucent SA		
China	Guangzhou		Cisco Systems Inc		
China	Guizhou	Guiyang	Nokia		Regional Office
China	Guizhou	Zunyi	Nokia		Regional Office
China	Guizhou	Guiyang	Alcatel Lucent SA		
China	Haidian	Beijing	Ingram Micro		
China	Haidian	Beijing	Intersil Corp.		Sales office
China	Haidian	Beijing	Infirera Corp.	22000	Office
China	Haidian	Beijing	SMA Solar Technology		SMA Beijing Commercial Company Ltd.
China	Haidian	Beijing			Language, document and image processing technologies, Asian localization, software development
China	Haidian	Beijing	Canon		
China	Haidian	Beijing	Western Digital Corp		
China	Hainan	Haikou	Nokia		Regional Office
China	Hainan	Haikou	Alcatel Lucent SA		
China	Hangzhou		Plexus	106,000	Manufacturing Solutions
China	Hangzhou		NEC		NEC System Technologies (Hangzhou), Ltd.
China	Hebei	Langfang	Foxconn International Holdings		R&D - Mass Production Facilities - Client/technology co location facilities
China	Hebei	Qinhuangdao	Zhen Ding Tech		Manufacturing Plant
China	Hebei	Baoding	Nokia		Regional Office
China	Hebei	Cangzhou	Nokia		Regional Office
China	Hebei	Shijiazhuang	Nokia		Regional Office
China	Hebei	Shijiazhuang	Alcatel Lucent SA		
China	Hebei	Qinhuangdao	LG Electronics		Qingdao LG Inspur Digital Communication Co., Ltd.
China	Hebei	Qinhuangdao	Asahi Glass		Production
China	Hebei	Langfang	Hon Hai Precision		Automotive glass fabrication and sales
China	Heilongjiang	Harbin	Intel		Manufacturing Plant for Handset assembly
China	Heilongjiang	Daqing	Nokia		
China	Heilongjiang	Harbin	Nokia		Regional Office
China	Heilongjiang	Qiqihar	Nokia		Regional Office
China	Henan	Zhengzhou	Alcatel Lucent SA		
China	Henan	Xinxiang	LG Display		
China	Henan	Zhengzhou	Hon Hai Precision		Sales
China	Henan	Zhengzhou	EMC Corp		Manufacturing Plant for Apple iphone
China	Henan	Zhengzhou	Nokia		
China	Henan	Luoyang	Nokia		Regional Office
China	Henan	Zhengzhou	Nokia		Regional Office
China	Henan	Zhengzhou	Alcatel Lucent SA		
China	Heping District	Tianjin	Everlight		Sales Office
China	Hexi	Tianjin	Applied Materials Inc		Sales and Services

Source: Citi Research

Figure 964. China (Continued)

China	Huangsu	Shanghai	Asahi Glass	Providing AGC Group companies with functional services	
China	Hubei	Wuhan	Intel		
China	Hubei	Wuhan	Dainippon Screen	Wuhan Office	
China	Hubei	Wuhan	EMC Corp		
China	Hubei	Wuhan	Nokia	Regional Office	
China	Hubei	Wuhan	Cisco Systems Inc		
China	Hubei	Wuhan	KLA Tencor Corp		
China	Hubei	Wuhan	Alcatel Lucent SA		
China	Hubei	Wuhan	NEC	Wuhan FiberHome Mobile Communication Inc.	
China	Hubei	Wuhan	NEC	Wuhan NEC Fiber Optic Communications Industry Co., Ltd.	
China	Huli District	Xiamen	Everlight	Sales office	
China	Hunan	Changsha	EMC Corp		
China	Hunan	Chenzou	Delta Electronics	Delta Electronics (Chenzhou) Co., Ltd.	
China	Hunan		Nokia	Regional Office	
China	Hunan	Changsha	Alcatel Lucent SA		
China	Inner Mongolia	Hohhot	Nokia	Regional Office	
China	Inner Mongolia	Botou	Nokia	Regional Office	
China	Inner Mongolia	Chifeng	Nokia	Regional Office	
China	Inner Mongolia	Hohhot	Alcatel Lucent SA		
China	Inner Mongolia	Ordos	Dainippon Screen	Ordos Office	
China	Jiangsu	Changzhou	Amphenol	Amphenol TCS - Changzhou	
China	Jiangsu	Suzhou	Fairchild Semiconductor International	Manufacturing Sites	
China	Jiangsu	Nanjing	Alcatel Lucent SA		
China	Jiangsu	Nanjing	Intel		
China	Jiangsu	Wuxi	SK Hynix	Headquarters, SK hynix Semiconductor Sales Ltd.	
China	Jiangsu		NEC	NEC AccessTechnica (Suzhou) Co., Ltd.	
China	Jiangsu	Wujiang	Delta Electronics	Delta Electronics (Jiangsu) Ltd.	
China	Jiangsu	Suzhou	Pegatron	Operation Sites	
China	Jiangsu	Suzhou	AU Optonics	Office	
China	Jiangsu	Suzhou	Wintek	Production	
China	Jiangsu	Wujiang	Radiant Opto-Electronics	3 offices + 3 factories	
China	Jiangsu	Nanjing	Radiant Opto-Electronics	1 office + 1 Factory	
China	Jiangsu	Nanjing	Innolux	Office	
China	Jiangsu	Suzhou	Unimicron	Plant	
China	Jiangsu	Suzhou	Alps Electric	Suzhou Branch	
China	Jiangsu	Wuxi	Shinko Electric Industries	Plants & Facilities - SHINKO ELECTRIC INDUSTRIES (WUXI) CO., LTD	
China	Jiangsu		Mabuchi Motor	147000 Sales Office & Factory for Motors	
China	Jiangsu	Changzhou	Fujitsu	Fujitsu Components (Changzhou) Co., Ltd	
China	Jiangsu	Wuxi	Fujitsu	Fujitsu Electronic Components (Shanghai) Co., Ltd.	
China	Jiangsu	Suzhou	Fujitsu	Fujitsu Quality Laboratory (Suzhou) Ltd.	
China	Jiangsu	Suzhou	Molex	Suzhou Sales Office	
China	Jiangsu	Huailan	Zhen Ding Tech	Manufacturing Plant	
China	Jiangsu	Changzhou	Amphenol	Amphenol (Changzhou) Connector Systems Co., Ltd.	
China	Jiangsu	Nanjing	EMC Corp		
China	Jiangsu	Nanjing	Nokia	Regional Office	
China	Jiangsu	Nantong	Nokia	Regional Office	
China	Jiangsu	Wuxi	Nokia	Regional Office	
China	Jiangsu	Wuxi	Nokia	Regional Office	
China	Jiangsu	Xuzhou	Nokia	Regional Office	
China	Jiangsu	Yancheng	Nokia	Regional Office	
China	Jiangsu	Nanjing	Cisco Systems Inc		
China	Jiangsu	Wuxi	Applied Materials Inc	Sales and Services	
China	Jiangsu	Wuxi	KLA Tencor Corp		
China	Jiangsu	Suzhou City	JDSU Corp.	Office	
China	Jiangsu	Suzhou	Manz AG	7,17,586.85 Production, Sales & Service	
China	Jiangsu	Wuxi	Manz AG	Service	
China	Jiangsu	Huailan	Manz AG	Service	
China	Jiangsu	Jiangyin	Manz AG		
China	Jiangsu	Wuxi	SK Hynix	Headquarters, SK hynix Semiconductor (China) Ltd.	
China	Jiangsu	Kunshan	LG Electronics	LG Electronics (Kunshan) Co., Ltd, Production	
China	Jiangsu	Taizhou	LG Electronics	TAIZHOU LG ELECTRONICS REFRIGERATION CO., LTD, Production	
China	Jiangsu		Samsung Electro-Mechanics	Overseas Production Subsidiaries	
China	Jiangsu		Cheil Industries	Chemicals/Electronic Materials Division	
China	Jiangsu		Mitsubishi Electric Shihlin Automotive	Mitsubishi Electric Shihlin Automotive ChangZhou Co., Ltd.	
China	Jiangsu	Wujiang	Largan Precision	Suzhou Largan Co.,Ltd	
China	Jiangsu	Nanjing	MediaTek	MediaTek (Nanjing) Inc.	
China	Jiangsu		MediaTek	MediaTek (Suzhou) Inc.	
China	Jiangsu	Yangzhou	Quanta Computer	Tech-Full (Changshu) Computer Co., Ltd	
China	Jiangsu	Kunshan	E Ink Holdings	Transcend Optonics	
China	Jiangsu		ASE		
China	Jiangsu	Wuxi	Kyocera	KYOCERA Chemical (Wuxi) Co., Ltd.	
China	Jiangsu	Suzhou	Murata	Production and Sales	
China	Jiangsu	Wujiang	Taiyo Yuden	Sales Headquarters/Manufacturing	
China	Jiangsu	Suzhou	Mitsumi Electric	WUJIANG MITSUMI ELECTRONICS CO., LTD.	
China	Jiangsu	Suzhou	Canon	Office imaging products related software	
China	Jiangsu	Suzhou	Canon	Color and monochrome MPFs	
China	Jiangsu		Tokyo Electron	Manufacturing and parts repair	
China	Jiangsu	Kunshan	Asahi Glass	Glass related plant engineering and miscellaneous procurement,sales(including Import,export)etc	

Source: Citi Research

Figure 965. China (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
China	Jiangsu	Kunshan	Asahi Glass		Glass substrates for TFT-LCDs
China	Jiangsu	Shenzhen	Asahi Glass		Glass substrates for TFT-LCDs
China	Jiangsu	Kunshan	Belden		Sales Offices
China	Jiangsu	Nantong	Hi-P International		Manufacturing sites
China	Jiangsu	Suzhou	Hi-P International		Manufacturing sites
China	Jiangsu	Changshu	Silitech Technology		
China	Jiangsu	Suzhou	Xyratec		Office
China	Jiangsu	Suzhou	Panasonic		Manufacturing locations
China	Jiangsu	Nanjing	Panasonic		Sales Office
China	Jiangsu	Kunshan	Foxconn Technology		
China	Jiangsu Province	Suzhou	Everlight		Sales Office
China	Jiangsu Province		Lam Research Corp		Office
China	Jiangsu Province	Kunshan City	Flexium Interconnect		Kunshan Plant (Manufacturing)
China	Jiangsu Province	Wu Jiang	Ju Teng		Subsidiary (Everyday Computer Components (Suzhou) Co., Ltd.)
China	Jiangsu Province	Wu Jiang	Ju Teng		Subsidiary (Suzhou Dazhi Communication Accessory Co., Ltd.)
China	Jiangsu Province	Kunshan City	Ju Teng		Subsidiary (Chengyang Precision Mold (Kunshan) Co., Ltd.)
China	Jiangsu Province	Kunshan City	Ju Teng		Subsidiary (WIS Precision (Kunshan) Co., Ltd Co., Ltd.)
China	Jiangsu Province	Jurong City	Ju Teng		Subsidiary (Compal Precision Module (Jiangsu) CO.,LTD.)
China	Jiangsu Province	Taichou	Ju Teng		Subsidiary (WIS Precision (Taichou) Co., Ltd.)
China	Jiangsu Province	Suzhou city	Ju Teng		Subsidiary (WUJIANG DADING PRECISION MOULD CO., LTD. )
China	Jiangsu Province	Suzhou	Everlight		Sales office
China	Jiangxi	Yingtan	Mabuchi Motor	74000	Factory for Parts
China	Jiangxi	Ganzhou	Mabuchi Motor	129000	Factory for Motors
China	Jiangxi	Nanchang	Alcatel Lucent SA		
China	Jilin	Changchun	Nokia		Regional Office
China	Jilin	Changchun	Alcatel Lucent SA		
China	Jilin	Changchun	Rohm		Sales Office - ROHM Semiconductor Trading (Dalian) Co.,Ltd.
China	Kunming		Nokia		Regional Office
China	Liaoning		Lam Research Corp		Office
China	Liaoning	Dalian	Microchip Technology		
China	Liaoning	Dalian	Intel		
China	Liaoning	Shenyang	Intel		
China	Liaoning		NEC		NEC Neusoft Information Technologies Co., Ltd.
China	Liaoning	Dalian	Canon		Design and production of automated labor-saving equipment; processing of parts
China	Liaoning	Yingkou	Zhen Ding Tech		Manufacturing Plant
China	Liaoning	Shenyang	EMC Corp		
China	Liaoning	Dalian	NetApp Inc		
China	Liaoning		Nokia		Regional Office
China	Liaoning	Nanjing	Nokia		Regional Office
China	Liaoning	Shenyang	Alcatel Lucent SA		
China	Liaoning	Yinkou	Manz AG		
China	Liaoning		Mitsubishi Electric		Service
China	Liaoning	Wafangdian	Mabuchi Motor	59000	Mitsubishi Electric Dalian Industrial Products Co., Ltd.
China	Liaoning	Dalian	Nides		Factory for Motors
China	Longgang	Shenzhen	Brother Industries Ltd		Manufacturing Production Facilities
China	Minhang	Shanghai	Nippon Electric Glass		Manufacturing Plant : Glass for LCD substrates
China	Nanchang		Nokia		Regional Office
China	Nanchang		Nokia		Regional Office
China	Nanshan	Shenzhen	AAC Technologies Holdings		Headquarter
China	Nanshan		Vtech Holdings		Regional Office - Electronic Learning Products
China	Ningxia		Nokia		Regional Office
China	Ningxia	Yinchuan	Alcatel Lucent SA		
China	Panyu	Guangzhou	Everlight		Sales Office
China	Pudong	Shanghai	Amkor Technology Inc	993,000	Packaging and test services; wafer bump services
China	Pudong	Shanghai	Semtech		
China	Pudong	Shanghai	Teradyne	44,000	Semiconductor Test & Systems Test Group
China	Pudong	Shanghai	Lam Research Corp		Office
China	Pudong	Shanghai	AAC Technologies Holdings		Sales office China Mainland - East China Branch
China	Pudong	Shanghai	Alps Electric		Shanghai Branch
China	Pudong	Shanghai	Omnivision		
China	Qinghai	Xining	Alcatel Lucent SA		
China	Shaaxi	Xi'an	Intel		
China	Shaaxi	Xi'an	Taiyo Yuden		Xi'an Office
China	Shaaxi	Xi'an	Amphenol		Amphenol CNT (Xi'an) Technology Co., Ltd.
China	Shaaxi	Xi'an	Nokia		Regional Office
China	Shaaxi	Xi'an	Nokia		Regional Office
China	Shaaxi	Xi'an	Cisco Systems Inc		
China	Shaaxi	Xi'an	Applied Materials Inc		Engineering and Development Center
China	Shaaxi	Xi'an	Linear Technology		Office
China	Shaaxi	Xi'an	Alcatel Lucent SA		
China	Shandong	Jinan	Cisco Systems Inc		
China	Shandong	Qingdao	LG Electronics		LG Electronics Air-Conditioning(Shandong) Co., Ltd., Production
China	Shandong	Yantai	LG Electronics		LG INSUPUR DIGITAL MOBILE COMMUNICATIONS CO.,LTD, Production
China	Shandong	Qingdao	LG Electronics		Qingdao LG Insupur Digital Communication Co., Ltd. Production

Source: Citi Research

Figure 966. China (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
China	Shandong		LG Innotek		LG Innotek Yantai Co., Ltd. (LGITYT)
China	Shandong		ASE	446000	Packaging and testing
China	Shandong	Qingdao	Hosiden		Hosiden Technology (Qingdao) Co., Ltd.
China	Shandong	Qingdao	Hosiden		Qingdao Hosiden Electronics Co., Ltd.
China	Shandong	Qingdao	Mitsumi Electric		QINGDAO MITSUMI ELECTRONICS CO., LTD.
China	Shandong		Asahi Glass		
China	Shandong	Yantai	Hon Hai Precision		Manufacturing Plant for Game console for Nintendo & Sony; TV assembly
China	Shandong	Jinan	EMC Corp		
China	Shandong	Jinan	Nokia		Regional Office
China	Shandong	Linyi	Nokia		Regional Office
China	Shandong	Qingdao	Nokia		Regional Office
China	Shandong	Weifang	Nokia		Regional Office
China	Shandong	Qingdao	Alcatel Lucent SA		
China	Shandong	Jinan	Alcatel Lucent SA		
China	Shandong	Qingdao	Panasonic		Sales Office
China	Shandong		NVIDIA		Office
China	Shandong	Taiyuan	Foxconn Technology		
China	Shandong	Taiyuan	Alcatel Lucent SA		
China	Shandong	Taiyuan	Hon Hai Precision		Handset components
China	Shandong	Shenzhen	LG Electronics		LG Electronics(Shenyang)Inc., Production
China	Shandong	Shenzhen	Xerox		Manufacturing plant
China	Shandong	Shenzhen	KLA Tencor Corp		
China	Shandong	Shenzhen			Subsidiary (JUTENG(NEI JIANG)Communication Accessory Co.,Ltd.)
China	Sichuan	Nei Jiang	Ju Teng		
China	Sichuan	Chengdu	Ingram Micro		
China	Sichuan	Chengdu	EMC Corp		
China	Sichuan	Chengdu	NetApp Inc		
China	Sichuan		Nokia		Regional Office
China	Sichuan	Yibin	Nokia		Regional Office
China	Sichuan	Chengdu	Cisco Systems Inc		
China	Sichuan	Chengdu	Linear Technology		Office
China	Sichuan	Chengdu	Alcatel Lucent SA		
China	Sichuan	Chengdu	Altera Corp		
China	Sichuan	Chengdu	Intel		
China	Sichuan	Chengdu	Lenovo Group		Branch of Lenovo Corporate Research
China	Sichuan	Chengdu	Taiyo Yuden		Chengdu Office
China	Sichuan	Chengdu	Hi-P International		Manufacturing sites
China	Sichuan	Chengdu	Molex		Chengdu Plant
China	Sichuan	Suzhou	Benchmark Electronics	326,000	
China	Sichuan	Tangshan	Nokia		Regional Office
China	Sichuan	TEDA West District	Samsung Electro-Mechanics		Overseas Branch Production Plants
China	Sichuan	Tianhe	Ingram Micro		
China	Sichuan	Tucheng	Hon Hai Precision		Head Office
China	Sichuan	Wuzhong	Silitech Technology		
China	Sichuan	Xiamen	Plexus	124,000	Manufacturing Solutions
China	Sichuan	Xiang'an District	Flexium Interconnect		
China	Sichuan	Xining	Nokia		Regional Office
China	Sichuan	Xinjiang	Cisco Systems Inc		
China	Sichuan	Xinjiang	Nokia		Regional Office
China	Sichuan	Xinjiang	Nokia		Regional Office
China	Sichuan	Xinjiang	Alcatel Lucent SA		
China	Sichuan	Xinjiang	Intel		
China	Sichuan	Xinjiang	EMC Corp		
China	Sichuan	Yunnan	Amphenol		Amphenol (Qingji) Technologies Co. Ltd.
China	Sichuan	Yunnan	Intel		
China	Sichuan	Yunnan	EMC Corp		
China	Sichuan	Yunnan	Nokia		Regional Office
China	Sichuan	Yunnan	Alcatel Lucent SA		
China	Sichuan	Zhejiang	Nokia		Regional Office
China	Sichuan	Zhejiang	Alps Electric		Hangzhou Branch
China	Sichuan	Zhejiang	Dainippon Screen		Dainippon Screen Mt (Hangzhou) Co., Ltd.
China	Sichuan	Zhejiang	EMC Corp		
China	Sichuan	Zhejiang	Nokia		Regional Office
China	Sichuan	Zhejiang	Nokia		Regional Office
China	Sichuan	Zhejiang	Cisco Systems Inc		
China	Sichuan	Zhejiang	Alcatel Lucent SA		
China	Sichuan	Zhejiang	Manz AG		Service
China	Sichuan	Zhejiang	Innolux		Office
China	Sichuan	Zhejiang	Nidec		Manufacturing
China	Sichuan	Beijing	Jabil	4,000	Design
China	Sichuan	Huangpu	Jabil	2,613,000	Manufacturing
China	Sichuan	Huangpu	Jabil	1,031,000	Manufacturing, Training
China	Sichuan	Nanjing	Jabil	135,000	Manufacturing
China	Sichuan	Shanghai	Jabil	494,000	Manufacturing, Design, Aftermarket
China	Sichuan	Shanghai	Jabil	6,000	Support
China	Sichuan	Shenzhen	Jabil	795,000	Manufacturing
China	Sichuan	Suzhou	Jabil	159,000	Manufacturing
China	Sichuan	Suzhou	Jabil	437,000	Manufacturing, Aftermarket
China	Sichuan	Tianjin	Jabil	159,000	Manufacturing
China	Sichuan	Tianjin	Jabil	1,622,000	Manufacturing
China	Sichuan	Wuxi	Jabil	462,000	Manufacturing, Design, Support, Storage
China	Sichuan	Wuxi	Jabil	2,188,000	Manufacturing, Design, Support, Storage
China	Sichuan	Yantai	Jabil	212,000	Manufacturing
China	Sichuan	Shenzhen	Flextronics		Flextronics facilities, Design Centers, Manufacturing
China	Sichuan	Beijing	Flextronics		Flextronics facilities, Design Centers
China	Sichuan	Shanghai	Flextronics		Flextronics facilities, Design Centers, Manufacturing
China	Sichuan	Dongguan	Xilinx Inc		Flextronics facilities, Manufacturing
China	Sichuan	Ganzhou	Xilinx Inc		Flextronics facilities, Manufacturing
China	Sichuan	Chengdu	Xilinx Inc		Flextronics facilities, Manufacturing
China	Sichuan	Nanjing	Xilinx Inc	196,037	Flextronics facilities, Manufacturing, Industrial Parks
China	Sichuan	Wuzhong	Xilinx Inc		Flextronics facilities, Manufacturing, Industrial Parks
China	Sichuan	Suzhou	Manz AG		
China	Sichuan	Chengdu	Amphenol		Amphenol Commercial Products (Chengdu) Co. Ltd.
China	Sichuan	Shenzhen	Amphenol		Amphenol East Asia Elect. Tech. Shenzhen Co., Ltd.
China	Sichuan	Shenzhen	Amphenol		Amphenol Fiber Optic China
China	Sichuan	Tianjin	Amphenol		Amphenol HTEC Tianjin Ltd
China	Sichuan	Shenzhen	Amphenol		Amphenol Kai Jack (Shenzhen) Co., Ltd.
China	Sichuan	Shenzhen	Amphenol		Amphenol PCD Shenzhen Co., Ltd.
China	Sichuan	Shenzhen	Amphenol		Amphenol RF Asia
China	Sichuan	Shenzhen	Amphenol		Amphenol Shou Min Industry Company
China	Sichuan	Shenzhen	Amphenol		Amphenol Sine Systems - China
China	Sichuan	Taoyuan	Amphenol		Amphenol Taiwan Corp.
China	Sichuan	Shanghai	Amphenol		Amphenol TCS - Shanghai
China	Sichuan	Shenzhen	Amphenol		Amphenol Technology (Shenzhen) Co. Ltd.
China	Sichuan	Jiangsu	Amphenol		Amphenol TFC (Changzhou Communications Equipment Co., Ltd.)
China	Sichuan	Shanghai	Amphenol		Amphenol Times Microwave Shanghai
China	Sichuan	Jiangsu	Amphenol		Amphenol Tuchel Electronics - China

Source: Citi Research

Figure 967. China (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
China	Jiangsu		Amphenol		Changzhou Amphenol Fuyang Communication Equip
China	Shanghai		Amphenol		East Asia Connector Services Ltd.
China	Shenzhen		Amphenol		ETD Amphenol Fiber Technology (Shenzhen) Co., Ltd.
China	Guangzhou		Amphenol		Guangzhou Amphenol Electronics Communications C
China	Guangzhou		Amphenol		Guangzhou Amphenol Sincere Flex Circuits Co. Ltd.
China	Guangzhou		Amphenol		Guangzhou FEP Automotive Electric Co., Ltd.
China	Hangzhou		Amphenol		Hangzhou Amphenol Phoenix Telecom Parts Co., Ltd
China	Kunshan		Amphenol		Kunshan Amphenol Zhengri Electronics Co., Ltd.
China	Shanghai		Amphenol		Shanghai Amphenol Airwave
China	Tianjin		Amphenol		Tianjin Amphenol Kae Co., Ltd
China	Baoying		Sensata	440000	Manufacturing
China	Changzhou		Sensata	252000	Manufacturing
China	Shanghai		Sensata		Manufacturing
China	Multiple locations	Sanmina		2,813,996	Backplanes, Cables, Enclosures, Logistics/Post-Manu
China	Multiple Locations	Celestica		1,198,000	
China	Tianjin	Vishay		374000	Diodes
China	Shanghai	Vishay		195000	Optoelectronic Components
China	Xi'an	Vishay		121000	MOSFETS and Diodes
China	Danshui	Vishay		446000	Capacitors
China	Shanghai	Vishay		217000	MOSFETS
China	Tianjin	AVX Corporation		520,000	Manufacturing — PC
China	Tianjin	AVX Corporation		355,000	Manufacturing — PC
China	Shanghai	Arrow Electronics			Office
China	Beijing	Arrow Electronics			Office
China	Changchun	Arrow Electronics			Office
China	Chengdu	Arrow Electronics			Office
China	Chongqing	Arrow Electronics			Office
China	Fuzhou	Arrow Electronics			Office
China	Guangzhou	Arrow Electronics			Office
China	Nanjing	Arrow Electronics			Office
China	Ningbo	Arrow Electronics			Office
China	Qingdao	Arrow Electronics			Office
China	Shenyang	Arrow Electronics			Office
China	Shenzhen	Arrow Electronics			Office
China	Suzhou	Arrow Electronics			Office
China	Tianjin	Arrow Electronics			Office
China	Wuhan	Arrow Electronics			Office
China	Xiamen	Arrow Electronics			Office
China	Xi'an	Arrow Electronics			Office
China	Zhengzhou	Arrow Electronics			Office
China	Shanghai	Ingram Micro		57049	
China	Beijing	IBM (International Business Machines Corp)			IBM China Company Limited
China	Hong Kong	IBM (International Business Machines Corp)			IBM China/Hong Kong Limited
China	Macau	IBM (International Business Machines Corp)			IBM World Trade Corporation
China	Beijing	Hewlett Packard			Laboratories
China	Beijing	Hewlett Packard			Office
China	Shanghai	Hewlett Packard			Office
China	Guangzhou	Hewlett Packard			Office
China	Shenyang	Hewlett Packard			Office
China	Nanjing	Hewlett Packard			Office
China	Wuhan	Hewlett Packard			Office
China	Xi'an	Hewlett Packard			Office
China	Chengdu	Hewlett Packard			Office
China	Shenzhen	Hewlett Packard			Office
China	Macau	Hewlett Packard			Office
China	Beijing	EMC Corp			
China	Chongqing	EMC Corp			
China	Guangzhou	EMC Corp			
China	Qingdao	EMC Corp			
China	Shanghai	EMC Corp			
China	Beijing	NetApp Inc			
China	Shanghai	NetApp Inc			
China	Shanghai	Xerox			Office
China	Shanghai	Electronics For Imaging, Inc		9 office	
China	Fushan	Electronics For Imaging, Inc		7 office	
China	Beijing	Lexmark			Lexmark China Office
China	Shanghai	Lexmark			Lexmark China Office
China	Guangzhou	Lexmark			Lexmark China Office
China	Chengdu	Lexmark			Lexmark China Office
China	Shanghai	Corning			Office
China	Beijing	Corning			Office
China	Beijing	Nokia			Regional Office
China	Shanghai	Nokia			Regional Office
China	Chengdu	Nokia			Regional Office
China	Tianjin	Nokia			Regional Office
China	Shanghai	Cisco Systems Inc			
China	Beijing	Blackberry			
China	Guangzhou	Blackberry			
China	Shanghai	Blackberry			
China	Shenzhen	Blackberry			
China	Tianjin	Blackberry			
China	Beijing	Motorola Solutions			Sales Office
China	Shanghai	Motorola Solutions			Sales Office
China	Shenzhen	Motorola Solutions			Sales Office
China	Shanghai	Apple Inc			Retail Store
China	Beijing	Apple Inc			Retail Store
China	Shenzhen	Apple Inc			Retail Store
China	Beijing	Apple Inc			Office
China	Shanghai	Apple Inc			Office
China	Shanghai	Analog Devices, Inc		42500	Engineering
China	Beijing	Analog Devices, Inc		33000	Engineering
China	Shanghai	Applied Materials Inc			Main Office
China	Beijing	Applied Materials Inc			Sales and Services
China	Suzhou	Applied Materials Inc			Sales and Services
China	Shanghai	ATMI Inc			Sales & Customer Service

Source: Citi Research



Figure 968. China (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
China	Shanghai	Shanghai	Brooks Automation Inc		Office
China	Shanghai	Shanghai	Entegris Inc		Office
China	Beijing	Beijing	Entegris Inc		Office
China	Xi'an	Xi'an	Entegris Inc		Office
China	Shanghai	Fairchild Semiconductor International		R & D Sites	
China	Beijing	Fairchild Semiconductor International		R & D Sites	
China	Shenzhen	Fairchild Semiconductor International		Office Facilities	
China	Suzhou	FormFactor Inc		9,700	Sales, marketing, finance, manufacturing, product d
China	Shanghai	FormFactor Inc		418	Sales office
China	Beijing	International Rectifier Corp			
China	Shanghai	International Rectifier Corp			
China	Shenzhen	International Rectifier Corp			
China	Xi'an	International Rectifier Corp			
China	Shenzhen	Intersil Corp.		Office	
China	Shanghai	Intersil Corp.		Office	
China	Shanghai	Intersil Corp.		Sales office	
China	Shenzhen	Intersil Corp.		Sales office	
China	Beijing	KLA Tencor Corp			
China	Shanghai	KLA Tencor Corp			
China	Tianjin	KLA Tencor Corp			
China	Beijing	Lam Research Corp		Office	
China	Hubei	Lam Research Corp		Office	
China	Xi'an	Lam Research Corp		Office	
China	Beijing	Linear Technology		Office	
China	Shanghai	Linear Technology		Office	
China	Shenzhen	Linear Technology		Office	
China	Wuhan	Linear Technology		Office	
China	Shanghai	MagnaChip Semiconductor Corp		Sales Office	
China	Shenzhen	MagnaChip Semiconductor Corp		Sales Office	
China	Beijing	Maxim Integrated		Office	
China	Shanghai	Maxim Integrated		Office	
China	Shenzhen	Microchip Technology			
China	Nanjing	Microchip Technology			
China	Guangzhou	Microchip Technology			
China	Shandong	Microchip Technology			
China	Sichuan	Microchip Technology			
China	Wuhan	Microchip Technology			
China	Xiamen	Microchip Technology			
China	Xi'an	Microchip Technology			
China	Beijing	Microchip Technology			
China	Shanghai	Microchip Technology			
China	Leshan	On Semiconductor		363,000	Back end Facilities
China	Shenzhen	On Semiconductor		208,000	Back end Facilities
China	Beijing	On Semiconductor			Sales Office
China	Shanghai	On Semiconductor			Sales Office
China	Shenzhen	On Semiconductor			Sales Office
China	Shenzhen	Silicon Laboratories, Inc			
China	Beijing	Adtran			
China	Beijing	Arris Enterprises, Inc.			
China	Shanghai	Arris Enterprises, Inc.			
China	Pudong	Alcatel Lucent SA		142,000	Office and Manufacturing
China	Songjiang	Alcatel Lucent SA		25,000	Manufacturing
China	Pudong	Alcatel Lucent SA			
China	Chongqing	Alcatel Lucent SA			
China	Beijing	Alcatel Lucent SA			
China	Shanghai	Alcatel Lucent SA			
China	Beijing	Ericsson LM			Office
China	Beijing	F5 Networks			Office
China	Guangzhou	F5 Networks			Office
China	Shanghai	F5 Networks			Office
China	Wuxi	Finisar Corp.		603000	Office
China	Shanghai	Finisar Corp.		180000	Office
China	Shenzhen	Finisar Corp.		16000	Office
China	Beijing	JDSU Corp.			Office
China	Shenzhen	JDSU Corp.			Office
China	Chengdu	JDSU Corp.			Sales Office
China	Guangzhou	JDSU Corp.			Sales Office
China	Shanghai	JDSU Corp.			Sales Office
China	Beijing	Juniper Networks Inc			
China	Guangzhou	Juniper Networks Inc			
China	Shanghai	Juniper Networks Inc			
China	Hong kong	Juniper Networks Inc			
China	Shenzhen	Oclaro Inc.		247000	Office space, manufacturing, research and develop
China	Shanghai	Oclaro Inc.		24000	Administrative, manufacturing and research and dev
China	Beijing	Polycorn Inc.			Office
China	Chengdu	Polycorn Inc.			Office
China	Guangzhou	Polycorn Inc.			Office
China	Jinan	Polycorn Inc.			Office
China	Shanghai	Polycorn Inc.			Office
China	Shenyang	Polycorn Inc.			Office
China	Xi'an	Polycorn Inc.			Office
China	Shanghai	Riverbed Technology			
China	Beijing	Riverbed Technology			
China	Beijing	Tellabs, Inc.			Sales Office
China	Shanghai	Tellabs, Inc.			Business Units
China	Beijing	Advanced Micro Devices, Inc			
China	Shanghai	Advanced Micro Devices, Inc			
China	Shenzhen	Advanced Micro Devices, Inc			
China	Suzhou	Advanced Micro Devices, Inc		422000	
China	Beijing	Altera Corp			
China	Shenzhen	Altera Corp			
China	Shanghai	Altera Corp			
China	Beijing	Broadcom			Office
China	Shanghai	Broadcom			Office
China	Shanghai	Broadcom			Office

Source: Citi Research

Figure 969. China (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
China	Shanghai	Shanghai	Cypress Semiconductor Corp	29,000	Research and development
China	Beijing	Beijing	Cypress Semiconductor Corp		
China	Shanghai	Shanghai	Cypress Semiconductor Corp		
China	Shenzhen	Shenzhen	Cypress Semiconductor Corp		
China	Tianjin	Tianjin	Freescale Semiconductor Ltd.		Manufacturing Site
China	Tianjin	Tianjin	Freescale Semiconductor Ltd.		Office
China	Suzhou	Suzhou	Freescale Semiconductor Ltd.		Office
China	Shenzhen	Shenzhen	Freescale Semiconductor Ltd.		Office
China	Beijing	Beijing	Freescale Semiconductor Ltd.		Office
China	Pudong New Area	Pudong New Area	Freescale Semiconductor Ltd.		Office
China	Chengdu	Chengdu	Freescale Semiconductor Ltd.		Office
China	Xi'an	Xi'an	Micron		Module assembly and test
China	Shanghai	Shanghai	Micron		Design
China	Xiamen	Xiamen	Micron		Design
China	Xi'an	Xi'an	Micron		Manufacturing
China	Beijing	Beijing	Micron		Sales
China	Shanghai	Shanghai	Micron		Sales
China	Shenzhen	Shenzhen	Micron		Sales
China	Beijing	Beijing	Marvell	115,000	
China	Shanghai	Shanghai	Intel		
China	Chongqing	Chongqing	Intel		
China	Beijing	Beijing	NVIDIA		Office
China	Shanghai	Shanghai	NVIDIA		Office
China	Shenzhen	Shenzhen	NVIDIA		Office
China	Tianjin	Tianjin	NVIDIA		Office
China	Beijing	Beijing	QUALCOMM Incorporated		
China	Shanghai	Shanghai	QUALCOMM Incorporated		
China	Shenzhen	Shenzhen	QUALCOMM Incorporated		
China	Xi'an	Xi'an	QUALCOMM Incorporated		
China	Macau	Macau	QUALCOMM Incorporated		
China	Beijing	Beijing	Spansion		Spanson Beijing office
China	Shanghai	Shanghai	Spansion		Spanson Semiconductor (China) Ltd. (Shanghai Branch), Design Centers and Specialized Centers of Excellence
China	Shanghai	Shanghai	Spansion		Spanson Semiconductor Trading (Shanghai) Co., LTD, Design Centers and Specialized Centers of Excellence
China	Shenzhen	Shenzhen	Spansion		Spanson Semiconductor Trading (Shanghai) Co., LTD Shenzhen Branch
China	Shenzhen	Shenzhen	Texas Instruments		
China	Chengdu	Chengdu	Texas Instruments		
China	Shanghai	Shanghai	Texas Instruments		
China	Xi'an	Xi'an	Xilinx Inc		
China	Beijing	Beijing	Xilinx Inc		
China	Chengdu	Chengdu	Xilinx Inc		
China	Nanjing	Nanjing	Xilinx Inc		
China	Beijing	Beijing	Xilinx Inc		
China	Shanghai	Shanghai	Xilinx Inc		
China	Shenzhen	Shenzhen	Xilinx Inc		
China	Shanghai	Shanghai	Meyer Burger Technology AG		Meyer Burger Machinery Co. Ltd
China	Shanghai	Shanghai	Meyer Burger Technology AG		Meyer Burger Trading Shanghai Co. Ltd, Service Contacts
China	Shanghai	Shanghai	Meyer Burger Technology AG		centrotherm photovoltaics Technology Shanghai Co. Ltd.
China	Shanghai	Shanghai	Meyer Burger Technology AG		Headquarters, SK hynix Semiconductor (Shanghai) Co. Ltd.
China	Beijing	Beijing	SK Hynix		Beijing Office
China	Shenzhen	Shenzhen	SK Hynix		Shen Zhen Office
China	Chongqing	Chongqing	SK Hynix		Chongqing Office
China	Yantai	Yantai	LG Display		Production
China	Nanjing	Nanjing	LG Display		Production
China	Shanghai	Shanghai	LG Display		Sales
China	Beijing	Beijing	LG Electronics		China Holdings Company - Holdings
China	Hangzhou	Hangzhou	LG Electronics		LG Electronics (Hangzhou) Co., Ltd, Production
China	Tianjin	Tianjin	LG Electronics		LG Electronics (Kunshan) Co., Ltd, Production
China	Huizhou	Huizhou	LG Electronics		LG Electronics Huizhou Ltd., Production
China	Nanjing	Nanjing	LG Electronics		LG Electronics Nanjing Display Co., Ltd, Production
China	Nanjing	Nanjing	LG Electronics		Nanjing LG-Panda Appliances Co., Ltd., Production
China	Shanghai	Shanghai	LG Electronics		Shanghai LG ElectronicsCo. Ltd., Production
China	Tianjin	Tianjin	LG Electronics		Tianjin Lijie Cartridge Heater Co., Ltd, Production
China	China	China	LG Innotek		LG Innotek Guangzhou Co., Ltd. (LGITGZ)
China	Shanghai	Shanghai	LG Innotek		LG Innotek Trading (Shanghai) Co., LTD (LGITSH)
China	Shenzhen	Shenzhen	LG Innotek		LG Innotek Trading (Shanghai) Co., LTD, Shenzhen
China	Beijing	Beijing	LG Innotek		LG Innotek Trading (Shanghai) Co., LTD, Beijing
China	Tianjin	Tianjin	Samsung Electro-Mechanics		Overseas Production Subsidiaries
China	Suzhou	Suzhou	Samsung Electro-Mechanics		Overseas Branch Production Plants
China	Shanghai	Shanghai	Samsung Electro-Mechanics		Overseas Sales Offices
China	Beijing	Beijing	Samsung Electro-Mechanics		Overseas Sales Offices
China	Beijing	Beijing	Samsung Electronics		China - Samsung (CHINA) Investment Electronics Co.,Ltd.
China	Shenzhen	Shenzhen	Samsung SDI		Shenzhen Subsidiary ( SSDI )
China	Shanghai	Shanghai	Samsung SDI		Shanghai Subsidiary ( SSDD )
China	Tianjin	Tianjin	Samsung SDI		Tianjin Subsidiary ( TSDI )
China	Beijing	Beijing	Samsung SDI		Beijing Office
China	Shanghai	Shanghai	Samsung Techwin		Shanghai Office
China	Tianjin	Tianjin	Samsung Techwin		Tianjin Office
China	Shanghai	Shanghai	Cheil Industries		Chemicals/Electronic Materials Division
China	Tianjin	Tianjin	Cheil Industries		Chemicals/Electronic Materials Division
China	Shenzhen	Shenzhen	Cheil Industries		Chemicals/Electronic Materials Division
China	Beijing	Beijing	Mitsubishi Electric		Mitsubishi Electric (China) Co., Ltd.

Source: Citi Research



Figure 970. China (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai	Mitsubishi Electric		Shanghai Branch, Mitsubishi Electric (China) Co., Ltd.
China		Shanghai	Mitsubishi Electric		Mitsubishi Electric & Electronics (Shanghai) Co., Ltd.
China		Beijing	Mitsubishi Electric		Beijing Branch, Mitsubishi Electric & Electronics (Shanghai) Co., Ltd.
China		Guangzhou	Mitsubishi Electric		Guangzhou Office, Mitsubishi Electric & Electronics (Shanghai) Co., Ltd.
China		Shaanxi	Mitsubishi Electric		XD-Mitsubishi Electric Switchgear Co., Ltd.
China		Shanghai	Mitsubishi Electric		Mitsubishi Electric Shanghai Electric Elevator Co., Ltd.
China		Shanghai	Mitsubishi Electric		Mitsubishi Electric Air-Conditioning & Visual Information Systems (Shanghai) Ltd.
China		Shanghai	Mitsubishi Electric		Shanghai Mitsubishi Electric & Shangling Air-Conditioner and Electric Appliance Co., Ltd.
China		Shanghai	Mitsubishi Electric		Mitsubishi Electric Automation (China) Ltd.
China		Shanghai	Acer Inc		Acer Computer (Shanghai) Ltd. - China (Regional Headquarters)
China		Beijing	NEC		NEC (China) Co., Ltd.
China		Guilin	NEC		NEC Telecommunications Co., Ltd.
China		Beijing	NEC		NEC Advanced Software Technology (Beijing) Co., Ltd.
China		Beijing	NEC		NEC Energy Devices (Wujiang) Co., Ltd.
China			NEC		NEC Fielding Information Technology Service (Beijing)
China			NEC		NEC Information Systems (Shanghai), Ltd.
China			NEC		NEC Laboratories China
China		Shanghai	NEC		NEC Lighting (Shanghai) Co., Ltd.
China		Beijing	NEC		NEC Solutions (China) Co., Ltd.
China		Shanghai	NEC		NEC Unified Solutions (Shanghai) Co., Ltd.
China		Shenzhen	NEC		NEC Viewtechnology Trading (Shenzhen), Ltd.
China		Suzhou	Catcher Technology	1291669	Catcher (Suzhou, China)
China		Suzhou	Catcher Technology	4975079	Catcher S&Q (Suzhou, China)
China		Dongguan	Chicony Electronics		Chicony Electronics ( Mainland China II ) Co., Ltd.
China		Wujiang	Chicony Electronics		Chicony Electronics ( Mainland China III ) Co., Ltd.
China		Beijing	Chicony Electronics		Chicony Sales Office
China		Chongqing	Chicony Electronics		Chicony Electronics ( Mainland China V ) Co., Ltd.
China		Nanjing	Compal Electronics		Compal Information Research & Development (Nanjing) Co., Ltd.
China		Kunshan	Compal Electronics		Compal Electronics, (China) Co., Ltd., Compal Electronics Technology (Kunshan) Co., Ltd.
China		Shanghai	Delta Electronics		Delta Electronics (Shanghai) Co., Ltd., Headquarters
China		Nanjing	Delta Electronics		Delta Electronics (Shanghai) Co., Ltd., Nanjing Branch
China		Dongguan	Delta Electronics		Delta Electronics (Dongguan) Co., Ltd.
China		Shanghai	Delta Electronics		Delta Greentech (China) Co., Ltd., Headquarters
China		Tianjin	Delta Electronics		Delta Green Tianjin Industries Co., Ltd.
China		Nanjing	Compal Communications		Office
China		Nanjing	Compal Communications		Office
China		Beijing	Foxconn International Holdings		R&D - Mass Production Facilities - Client/technology co location facilities
China		Tianjin	Foxconn International Holdings		R&D - Mass Production Facilities - Client/technology co location facilities
China		Hangzhou	Foxconn International Holdings		R&D - Mass Production Facilities - Client/technology co location facilities
China		Shenzhen	Foxconn International Holdings		R&D - Mass Production Facilities - Client/technology co location facilities
China		Shenzhen	Richtek Technology		Shenzhen Office
China		Shanghai	Richtek Technology		Shanghai Office
China		Beijing	Richtek Technology		Beijing Office
China		Shanghai	MediaTek		MediaTek (Shanghai) Inc.
China		Shenzhen	MediaTek		MediaTek (Shenzhen) Inc.
China		Wuhan	MediaTek		MediaTek (Wuhan) Inc.
China		Beijing	MediaTek		MediaTek (Beijing) Inc.
China		Hefei	MediaTek		MediaTek (Hefei) Inc.
China		Chengdu	MediaTek		MediaTek (Chengdu) Inc.
China		Chongqing	Pegatron		Operation Sites
China		Shanghai	Pegatron		Operation Sites
China		Shanghai	Quanta Computer		Quanta Shanghai Manufacture City
China		Chongqing	Quanta Computer		Tech-Front (Chongqing) Computer Co., Ltd.
China		Zhongshan	Wistron Corporation		Manufacturing center, Technology campus, R&D center
China		Kunshan	Wistron Corporation		Manufacturing center, Technology campus, R&D center, service center
China		Shanghai	Wistron Corporation		R&D center
China		Taizhou	Wistron Corporation		Manufacturing center
China		Wuhan	Wistron Corporation		R&D center
China		Beijing	Wistron Corporation		Customer sales support, R&D center
China		Chengdu	Wistron Corporation		Manufacturing center
China		Chongqing	Wistron Corporation		Manufacturing center
China		Shanghai	AU Optonics		Office
China		Guangzhou	Radiant Opto-Electronics		1 office + 1 Factory
China		Shanghai	Innolux		Office
China		Beijing	Lenovo Group		Principal Operations, Lenovo BU R&D Centre, Sales Headquarters and Manufacturing Centers
China		Beijing	Lenovo Group		Lenovo Corporate R&D Centre
China		Shanghai	Lenovo Group		Notebook/Mobile Phone Development Centre
China		Shanghai	ASE	1431000	Design and production/Manufacturing
China		Suzhou	ASE	433000	Packaging and testing
China		Kunshan	ASE	1489000	Packaging and testing
China		Shenzhen	ASE	611000	Manufacturing
China		Shanghai	ASE	680000	Manufacturing
China		Shanghai	ASE	909000	Packaging and testing
China		Kunshan	ASE	388000	
China		Nantou	ASE	383000	
China		Suzhou	ASE		
China		Shanghai	Advanced Energy Industries, Inc		Advanced Energy Industries, Inc., Shanghai
China		Suzhou	Kireus Interconnect Technology		
China		Beijing	First Solar Inc		Office
China		Wuxi	Suntech Power Holdings		
China		Changzhou	Trina Solar Limited		Corporate Headquarters
China		Shanghai	Trina Solar Limited		

Source: Citi Research

Figure 971. China (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
China		Shanghai	Yingli Green Energy		Headquarters
China		Shanghai	TSMC		Offices
China		Shenzhen	Unimicron		Plant
China		Kun Shan	Unimicron		Plant
China		Kunshan	Nan Ya PCB		Office
China		Xiamen	Novatek		Office
China		Suzhou	Novatek		Sales and Marketing
China		Xi'an	Novatek		Design, Testing and Consulting
China		Shanghai	Novatek		Testing and Consulting
China		Shenzhen	Novatek		Office
China		Chengdu	Novatek		Office
China		Suzhou	Powertech Technology		Plant
China		Suzhou	Powertech Technology		Semiconductor Testing Design
China		Suzhou	SPL		Manufacturing
China		Wuxi	Tripod Technology		Plant
China		Qingdao	WPG Holding		
China		Wuhan	WPG Holding		
China		Fuzhou	WPG Holding		
China		Chuhai	WPG Holding		
China		Shenzhen	WPG Holding		
China		Xi'an	WPG Holding		
China		Hangzhou	WPG Holding		
China		Xiamen	WPG Holding		
China		Shanghai	WPG Holding		
China		Nanjing	WPG Holding		
China		Chongqing	WPG Holding		
China		Guangzhou	WPG Holding		
China		Beijing	WPG Holding		
China		Suzhou	WPG Holding		
China		Changsha	WPG Holding		
China		Dongguan	WPG Holding		
China		Shenyang	WPG Holding		
China		Chengdu	WPG Holding		
China		Ningbo	WPG Holding		
China		Dalian	Alps Electric		Dalian Branch
China		Shenzhen	Alps Electric		Shenzhen Branch
China		Beijing	Hirose Electric		Beijing Branch
China		Shanghai	Hirose Electric		Bo Hirose Electric Trading (Shanghai) Co., Ltd.
China		Shenzhen	Hirose Electric		Hirose Technology (Shenzhen) Co., Ltd.
China		Dongguan	Hirose Electric		Domestic Subsidiaries
China		Suzhou	Hirose Electric		Domestic Subsidiaries
China		Weihai	Hirose Electric		Domestic Subsidiaries
China		Shanghai	Hosiden		Hosiden Electronics (Shanghai) Co., Ltd. - Sales Division
China		Shenzhen	Hosiden		Hosiden (Shenzhen) Co., Ltd. - Sales Division
China		Tianjing	Hosiden		Manufacturing Division
China		Beijing	Ibiden		IBIDEN Electronics (Beijing) Co., Ltd.
China		Shanghai	Ibiden		IBIDEN Electronics (Shanghai) Co., Ltd.
China		Shanghai	Ibiden		IBIDEN Electronics Technology (Shanghai) Co., Ltd.
China		Shanghai	Ibiden		Components Business - KYOCERA TYCOM Carbide Tools (Zhuhai) Co., LTD.
China		Shanghai	Kyocera		KYOCERA (China) Sales & Trading Corporation
China		Shanghai	Kyocera		Shanghai KYOCERA Electronics Co., Ltd.
China		Tianjin	Kyocera		KYOCERA (Tianjin) Solar Energy Co., Ltd.
China		Shanghai	Kyocera		KYOCERA Document Solutions (China) Corporation
China		Shanghai	Kyocera		KYOCERA Management Consulting Service (Shanghai) Co., Ltd.
China		Shanghai	Kyocera		Shanghai KYOCERA Sales & Trading Corporation
China		Shanghai	Kyocera		Tianjin AVX/KYOCERA International Trading Co., Ltd.
China		Beijing	Kyocera		AVX/KYOCERA (Shanghai) International Trading Co. Ltd.
China		Shanghai	Kyocera		KYOCERA Communication Systems (Shanghai) Co., Ltd.
China		Pudong	Kyocera		KYOCERA Connector Products Hong Kong Ltd.
China		Kowloon	Kyocera		KYOCERA Chemical (Hong Kong) Ltd.
China		Kowloon	Kyocera		Regional Headquarters
China		Shanghai	Murata		Sales Office
China		Tianjin	Murata		Sales Office
China		Beijing	Murata		Sales Office
China		Shanghai	Murata		Sales Office
China		Shenzhen	Murata		Sales Office
China		Shanghai	Murata		Development
China		Dalian	Rohm		Sales Office - ROHM Semiconductor Trading (Dalian) Co., Ltd.
China		Shanghai	Rohm		Sales, QA & R&D Office - ROHM Semiconductor (Shanghai) Co., Ltd.
China		Beijing	Rohm		Sales & R&D Office - ROHM Semiconductor (Shanghai) Co., Ltd.
China		Ningbo	Rohm		Sales Office - ROHM Semiconductor (Shanghai) Co., Ltd.
China		Qingdao	Rohm		Sales Office - ROHM Semiconductor (Shanghai) Co., Ltd.
China		Nanjing	Rohm		Sales Office - ROHM Semiconductor (Shanghai) Co., Ltd.
China		Suzhou	Rohm		Sales Office - ROHM Semiconductor (Shanghai) Co., Ltd.
China		Hangzhou	Rohm		Sales Office - ROHM Semiconductor (Shanghai) Co., Ltd.
China		Tianjin	Rohm		Sales Office - ROHM Semiconductor (Shanghai) Co., Ltd.
China		Wuhan	Rohm		Sales Office - ROHM Semiconductor (Shanghai) Co., Ltd.
China		Wuxi	Rohm		Sales Office - ROHM Semiconductor (Shanghai) Co., Ltd.
China		Xi'an	Rohm		Sales Office - ROHM Semiconductor (Shanghai) Co., Ltd.
China		Shenzhen	Rohm		Sales & R&D Office - ROHM Semiconductor (Shenzhen) Co., Ltd.
China		Chengdu	Rohm		Sales Office - ROHM Semiconductor (Shenzhen) Co., Ltd.
China		Chongqing	Rohm		Sales Office - ROHM Semiconductor (Shenzhen) Co., Ltd.
China		Dongguan	Rohm		Sales Office - ROHM Semiconductor (Shenzhen) Co., Ltd.
China		Guangzhou	Rohm		Sales Office - ROHM Semiconductor (Shenzhen) Co., Ltd.
China		Huizhou	Rohm		Sales Office - ROHM Semiconductor (Shenzhen) Co., Ltd.

Source: Citi Research

Figure 972. China (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
China	Xiamen	Rohm			Sales Office - ROHM Semiconductor (Shenzhen) Co., Ltd.
China	Tianjin	Rohm			Overseas Manufacturing Centers - ROHM Semiconductor (China) Co., Ltd.
China	Dalian	Rohm			Overseas Manufacturing Centers - ROHM Electronics Dalian Co., Ltd.
China	Tianjin	Rohm			Overseas Manufacturing Centers - ROHM Mechatech (Tianjin) Co., Ltd.
China	Shanghai	Shinko Electric Industries			Head Office - SHANGHAI SHINKO TRADING LTD.
China	Chengdu	Shinko Electric Industries			Sales Office - SHANGHAI SHINKO TRADING LTD.
China	Shanghai	Taiyo Yuden			Sales Office
China	Beijing	TDK Corporation			Beijing Office
China	Tianjin	TDK Corporation			Tianjin Office/Manufacturing
China	Beijing	TDK Corporation			TDK CHINA CO., LTD.
China	Shenzhen	TDK Corporation			
China	Guangzhou	TDK Corporation			
China	Shanghai	TDK Corporation			TDK(SHANGHAI) INTERNATIONAL TRADING CO., LTD., SHANGHAI Sales Office
China	Suzhou	TDK Corporation			SUZHOUS Sales Office
China	Tianjin	TDK Corporation			TIANJIN Sales Office
China	Qingdao	Nidec			QINGDAO Sales Office
China	Shenzhen	Nidec			Sales
China	Shenzhen	Nidec			Sales
China	Shenzhen	Nidec			Sales
China	Shanghai	Nidec			Sales
China	Chongqing	Nidec			Sales
China	Dalian	Nidec			Manufacturing
China	Dalian	Nidec			Sales
China	Qingdao	Nidec			Sales
China	Wuhan	Nidec			Sales
China	Dongguan	Nidec			R&D
China	Free Zone	Nidec			Manufacturing
China	Shanghai	Mitsumi Electric			Sales Office
China	Beijing	Mitsumi Electric			Sales Office
China	Tianjin	Mitsumi Electric			TIANJIN MITSUMI ELECTRIC CO., LTD.
China	Shanghai	Mabuchi Motor			Sales Office
China	Chongqing	Mabuchi Motor			Sales Office - CHONGQING BRANCH
China	Dalian	Mabuchi Motor			213000 Factory for Motors and parts
China	Dalian	Canon			Production and recycling of toner cartridges; production of laser printers
China	Beijing	Canon			All product segments
China	Shanghai	Canon			Sales of semiconductor equipment, LCD equipment, components
China	Shanghai	Dainippon Screen			Head Office - Dainippon Screen Electronics (Shanghai) Co., Ltd.
China	Dalian	Dainippon Screen			Dalian Office
China	Beijing	Dainippon Screen			Beijing Office
China	Wuxi	Dainippon Screen			WuXi Office
China	Shenzhen	Dainippon Screen			Shenzhen Office
China	Shanghai	Dainippon Screen			Head Office
China	Guangzhou	Dainippon Screen			Guang Zhou branch
China	Shanghai	Hoya Corporation			HOYA LENS SHANGHAI LTD. SHANGHAI Head Office
China	Shanghai	Hoya Corporation			HOYA LENS SHANGHAI LTD. SHANGHAI Lab
China	Guangzhou	Hoya Corporation			HOYA LENS GUANGZHOU LTD.
China	Shanghai	Hoya Corporation			HOYA HEALTHCARE(SHANGHAI) CO., LTD.
China	Suzhou	Hoya Corporation			HOYA MICROELECTRONICS (SUZHOU) LTD.
China	Suzhou	Hoya Corporation			HOYA OPTICAL TECHNOLOGY(SUZHOU) LTD.
China	Shandong	Hoya Corporation			HOYA OPTICAL TECHNOLOGY (WEIHAI) CO., LTD.
China	Shandong	Hoya Corporation			HOYA OPTO-ELECTRONICS QINGDAO LTD.
China	Shenzhen	Olympus			Manufacture of imaging products
China	Beijing	Olympus			Head office operations in China, Micro-Imaging System Division, Industrial Endoscope Dept.
China	Shanghai	Olympus			Sale of imaging products in China
China	Guangzhou	Olympus			Manufacture of imaging products
China	Nikon	Nikon			
China	Nikon	Nikon			
China	Nikon	Nikon			
China	Nikon	Nikon			
China	Shanghai	Ricoh Co			Sales & Services - Ricoh China Co., Ltd.
China	Shanghai	Ricoh Co			Sales & Services - Ricoh Electronic Technology Co., Ltd. (China)
China	Shanghai	Ricoh Co			Sales & Services - Ricoh International (Shanghai) Co., Ltd.
China	Shanghai	Ricoh Co			Sales & Services - RICOH IMAGING CHINA CO., LTD.
China	Beijing	Ricoh Co			R&D - Ricoh Software Research Center (Beijing) Co., Ltd.
China	Shanghai	Ricoh Co			R&D - Ricoh Imaging Technology (Shanghai) Co., Ltd.
China	Shanghai	Ricoh Co			R&D - Ricoh Electronic Devices Shanghai Co., Ltd.
China	Shenzhen	Ricoh Co			Manufacturing - Ricoh Asia Industry (Shenzhen) Ltd.
China	Shanghai	Ricoh Co			Manufacturing - Shanghai Ricoh Digital Equipment Co., Ltd.
China	Shanghai	Ricoh Co			Manufacturing - Shanghai Ricoh Office Equipment Co., Ltd.
China	Guangdong	Ricoh Co			Manufacturing - Ricoh Components & Products (Shenzhen) Ltd.
China	Beijing	Ricoh Co			Manufacturing - Ricoh Thermal Media (Beijing) Co., Ltd.
China	Wuxi	Ricoh Co			Manufacturing - Ricoh Thermal Media (Wuxi) Co., Ltd.
China	Beijing	Seiko Epson			Regional Headquarters - Epson (China) Co., Ltd.

Source: Citi Research

Figure 973. China (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
China	Tianjin	Seiko Epson			Manufacturing Subsidiaries and Affiliates - Tianjin Epson Co., Ltd.
China	Zhenjiang	Seiko Epson			Manufacturing Subsidiaries and Affiliates - Epson Surface Engineering (Zhenjiang) Co. Ltd.
China	Suzhou	Seiko Epson			Manufacturing Subsidiaries and Affiliates - Epson Precision Suzhou Co., Ltd.
China	Shanghai	Seiko Epson			Manufacturing Subsidiaries and Affiliates - Shanghai Epson Magnetics Co., Ltd.
China	Fujian	Seiko Epson			Manufacturing Subsidiaries and Affiliates - Fujian Epson Co., Ltd.
China	Shenzhen	Seiko Epson			Manufacturing Subsidiaries and Affiliates - Epson Engineering (Shenzhen) Ltd.
China	Shenzhen	Seiko Epson			Manufacturing Subsidiaries and Affiliates - E&G Electronic (Shenzhen) Ltd.
China	Wuxi	Seiko Epson			Manufacturing Subsidiaries and Affiliates - Epson Wuxi Co., Ltd.
China	Shenzhen	Seiko Epson			Manufacturing Subsidiaries and Affiliates - Epson Precision (Shenzhen) Ltd.
China	Guangdong	Tamron Co Ltd			TAMRON OPTICAL (FOSHAN) CO., LTD.
China	Shanghai	Tamron Co Ltd			TAMRON OPTICAL (SHANGHAI) CO., LTD.
China	Shanghai	Tokyo Electron			Service and sales
China	Shanghai	Asahi Glass			Import and sales of Fluoro Chemicals and E&E products, Export of Chinese chemical materials
China	Shanghai	Asahi Glass			Manufacturing and sales of for construction, automotive various float glasses, mirror, and heat-reflective glass
China	Shanghai	Asahi Glass			Manufacturing and sales of automotive various float glasses
China	Shenzhen	Asahi Glass			Processing of ultra thin soda lime glass (cutting and chamfering)
China	Beijing	Asahi Glass			Activity for AGC Group business expansion in China
China	Macau	Sharp Corp			SHARP-ROXY (HONG KONG) LTD. MACAU AUTHORIZED SERVICE STATION (Macau)
China	Shanghai	Sony Corp			SHARP ELECTRONICS SALES (CHINA) CO., LTD.
China	Beijing	HTC Corporation			[China] Sony (China) Limited
China	Shanghai	HTC Corporation			Operations Office
China	Shanghai	Fujifilm			Operations Office
China	Suzhou	Fujifilm			
China	Beijing	Fujitsu			Fujitsu (China) Co., Ltd.
China	Fujian	Fujitsu			Fujian Fujitsu Communication Software Co., Ltd.
China	Shanghai	Fujitsu			Fujitsu (China) Holdings Co., Ltd.
China	Xi'an	Fujitsu			Fujitsu (Xi'an) System Engineering Co., Ltd.
China	Chengdu	Fujitsu			Fujitsu Semiconductor Design (Chengdu) Co. Ltd.
China	GuangZhou	Fujitsu			Fujitsu South China Limited (Guangzhou office)
China	Shenzhen	Fujitsu			Fujitsu South China Limited (Shenzhen office)
China	Tianjin	Fujitsu			R&D
China	Shanghai	3D Systems Corp			3D Systems Corp
China	Beijing	ARM Holdings PLC			ARM Holdings PLC
China	Beijing	ARM Holdings PLC			ARM Holdings PLC
China	Shenzhen	ARM Holdings PLC			ARM Holdings PLC
China	Tianjin	ASML Holding NV			ASML Holding NV
China	Shanghai	ASML Holding NV			ASML Holding NV
China	Beijing	Brocade Communications			Brocade Communications
China	Shanghai	Brocade Communications			Brocade Communications
China	Guangzhou	Brocade Communications			Brocade Communications
China	Shenzhen	Brocade Communications			Brocade Communications
China	Beijing	CSR Pte			CSR Pte
China	Shanghai	CSR Pte			CSR Pte
China	Shenzhen	CSR Pte			CSR Pte
China	Beijing	Infineon Technologies AG			Infineon Technologies AG
China	Shanghai	Infineon Technologies AG			Infineon Technologies AG
China	Shenzhen	Infineon Technologies AG			Infineon Technologies AG
China	Wuxi	Infineon Technologies AG			Infineon Technologies AG
China	Shanghai	Aixtron			8,127 Sales, Services
China	Suzhou	Aixtron			5,780 Sales, Services
China	Yangzhou	Aixtron			969 Sales, Services
China	Suzhou	Seagate Technology			1,103,000 Manufacture of drives
China	Wuxi	Seagate Technology			716,000 Manufacture of drives and drive subassemblies
China	Shenzhen	Seagate Technology			Seagate Technology
China	Shanghai	STMicroelectronics			STMicroelectronics
China	Beijing	STMicroelectronics			STMicroelectronics
China	Suzhou	STMicroelectronics			STMicroelectronics
China	Shenzhen	STMicroelectronics			STMicroelectronics
China	Shanghai	STMicroelectronics			STMicroelectronics
China	Shanghai	Stratays Ltd			3227 Objet Shanghai Ltd. office space
China	Shanghai	TE Connectivity Ltd.			16 Manufacturing Plants
China	Shanghai	Venture Corp.			216959.184 Residential, Office & Industrial Usage
China	Shenzhen	Venture Corp.			
China	Shanghai	Wolfson			Wolfson
China	Shenzhen	Wolfson			Wolfson
China	Shanghai	Western Digital Corp			273900 Manufacturing of media
China	Shenzhen	Western Digital Corp			248000 Administrative
China	Shenzhen	Western Digital Corp			641000 Manufacturing of hard drives
China	Shenzhen	Western Digital Corp			263000 Manufacturing of HGAs
China	Suzhou	American Superconductor Corp.			165000 Wind Segment

Source: Citi Research

Figure 974. China (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
China		Beijing	Belden		Sales Offices
China		Shanghai	Belden		Sales Offices
China		Beijing	Emulex Corp		Office
China		Shanghai	Emulex Corp		Office
China		Tianjin	Hi-P International		Manufacturing sites
China		Shanghai	Hi-P International		Manufacturing sites
China		Shenzhen	Huawei		
China		Suzhou	Logitech International S A	627900	High-volume manufacturing
China		Suzhou	Logitech International S A	245200	High-volume manufacturing
China		Shanghai	Logitech International S A	22200	Sales and marketing
China		Shenzhen	Logitech International S A	11700	Sales and marketing
China		Shenzhen	Logitech International S A	32000	Distribution center
China		Shanghai	OmniVision		
China		Beijing	OmniVision		
China		Shenzhen	OmniVision		
China		Beijing	QLogic Corp		
China		Shenzhen	RF Microdevices		Sales & Customer Support Center
China		Shanghai	RF Microdevices		Sales & Customer Support Center; Design Center
China		Beijing	RF Microdevices		Sales & Customer Support Center
China		Beijing	Skyworks		
China		Shanghai	Skyworks		
China		Shenzhen	Skyworks		
China		Shanghai	TriQuint	5850	Engineering and marketing
China		Shanghai	Veeco Instruments Inc	18700	Customer Training Center
China		Shanghai	Veeco Instruments Inc		
China		Beijing	Molex		Beijing Sales Office
China		Shanghai	Molex		Shanghai Plant & Sales Office
China		Shenzhen	Molex		Shenzhen Sales Office
China		Tianjin	Molex		Tianjin Sales Office
China		Tianjin	Panasonic		Panasonic Industrial Devices (Tianjin) Co., Ltd.
China		Qingdao	Panasonic		Panasonic Industrial Devices (Qingdao) Co., Ltd.
China		New Taipei	Panasonic		Technology Domain Business
China		Beijing	Panasonic		Semiconductor Sales office
China		Tianjin	Panasonic		Semiconductor Sales office
China		Dalian	Panasonic		Semiconductor Sales office
China		Shanghai	Panasonic		Semiconductor Sales office
China		Shenzhen	Panasonic		Semiconductor Sales office
China		Suzhou	Panasonic		Semiconductor Production Plants
China		Shanghai	Panasonic		Semiconductor Production Plants
China		Beijing	Panasonic		Manufacturing locations
China		Shenzhen	Panasonic		Manufacturing locations
China		Beijing	Panasonic		Sales Office
China		Shanghai	Panasonic		Sales Office
China		Tianjin	Panasonic		Sales Office
China		Guangzhou	Panasonic		Sales Office
China		Shenzhen	Panasonic		Sales Office
China		Shenyang	Panasonic		Sales Office
China		Dalian	Panasonic		Sales Office
China		Zhengzhou	Panasonic		Sales Office
China		Xi'an	Panasonic		Sales Office
China		Chengdu	Panasonic		Sales Office
China		Wuhan	Panasonic		Sales Office
China		Chongqing	Panasonic		Sales Office
China		Hangzhou	Panasonic		Sales Office
China		Xiamen	Panasonic		Sales Office
China		Guangzhou	Panasonic		Sale / Marketing, Production
China		Suzhou	Panasonic		Sale / Marketing, Production
China		Shanghai	Panasonic		Sale / Marketing, Production
China		Beijing	Hitachi		Head Office
China		Shanghai	Hitachi		Hitachi (China) Co., Ltd. Shanghai Branch
China		Guangzhou	Hitachi		Hitachi (China) Co., Ltd. Guangzhou Branch
China		Shenzhen	Hitachi		Hitachi (China) Co., Ltd. Shenzhen Branch
China		Chengdu	Hitachi		Hitachi (China) Co., Ltd. Chengdu Branch
China		Xi'an	Hitachi		Hitachi (China) Co., Ltd. Xi'an Branch
China		Dalian	Hitachi		Hitachi (China) Co., Ltd. Dalian Branch
China		Qingdao	Hitachi		Hitachi (China) Co., Ltd. Qingdao Branch
China		Shenzhen	Everlight		Shenzhen Office

Source: Citi Research

Figure 975. China (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
China		Beijing	Zhen Ding Tech		Service center
China		Shanghai	Zhen Ding Tech		Service center
China					Subsidiary (Ju Teng Electronics (Shanghai) Co., Ltd.)
China		Shanghai	Ju Teng		Subsidiary (Dynamic Apex Macao Commercial Offshore Limited)
China		Beijing	Ju Teng		Pioneer China Holding Co., Ltd.
China			Pioneer Corporation		Pioneer Corporation
China			Pioneer Corporation		Pioneer Technology (Dongguan) Co., Ltd.
China			Pioneer Corporation		Pioneer Technology (Shanghai) Co., Ltd.
China			Pioneer Corporation		Pioneer Electronics (Shanghai Export Zone) Co. Ltd.
China			Pioneer Corporation		Pioneer (HK) Ltd.
China			Pioneer Corporation		Pioneer Industrial Components (Hong Kong) Co., Ltd.
China			Pioneer Corporation		Dongguan Monetech Electronic Co., Ltd.
China			Pioneer Corporation		Dongguan Monetech Pai Yue Electronic Co., Ltd.
China			Pioneer Corporation		Shanghai Pioneer Speakers Co., Ltd.
China			Pioneer Corporation		Mogami Hong Kong Co., Ltd.
China			Pioneer Corporation		Mogami Dongguan Electronics Co., Ltd.
China			Pioneer Corporation		Pioneer Suntec (Shanghai) Electronic Technology Co., Ltd.
China			Pioneer Corporation		INCREMENT P Shanghai Co., Ltd.
China			Pioneer Corporation		Pioneer Digital Design And Manufacturing (Hong Kong) Ltd.
China			Pioneer Corporation		Mogami Hong Kong Co., Ltd.
China			Pioneer Corporation		Pioneer Trading (Shenzhen) Co., Ltd.
China		Guangdong	Brother Industries Ltd		Production Facilities
China		Xi'an Shaanxi	Brother Industries Ltd		Production Facilities
China		Longgang District,	Brother Industries Ltd		Production Facilities
China		Shanghai	Brother Industries Ltd		Sales Facilities
China		Shanghai	Brother Industries Ltd		Sales Facilities
China		Hangzhou	Brother Industries Ltd		others
China		Shanghai	REC Solar ASA		Solar sourcing
China					Manufacturing Plant for Handset assembly for Nokia
China		Beijing	Hon Hai Precision		Manufacturing Plant for Handset components for Samsung & Moto
China		Tianjin	Hon Hai Precision		Manufacturing Plant for TV assembly; PC components
China		Jiangsu	Hon Hai Precision		Networking
China		Shanghai	Hon Hai Precision		Desktop production
China		Hubei	Hon Hai Precision		Various IT products; Apple products
China		Shenzhen	Hon Hai Precision		Notebook assembly for HP
China		Chongqing	Hon Hai Precision		For Apple iPad
China		Chengdu	Hon Hai Precision		
China		Hsinchu City	Hon Hai Precision		

Source: Citi Research

Figure 976. Japan

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Japan	Aichi	Toyota	EMC Corp		Retail Store
Japan	Aichi		Apple Inc		
Japan	Aichi		Freescall Semiconductor Ltd.	Office	
Japan	Aichi	Nagoya	Intel		
Japan	Aichi	Nagoya	Alps Electric		Nagoya Office
Japan	Aichi	Nagoya	Nidec		
Japan	Aichi		Konica Minolta Holdings		Mizuho site
Japan	Aichi		Konica Minolta Holdings		Mikawa site
Japan	Aichi		Konica Minolta Holdings		Aichi north office
Japan	Aichi	Takahama	Ibiden		Kinuura Plant
Japan	Aichi	Ibi-gun	Ibiden		Higashi-Yokoyama Power Plant
Japan	Aichi	Ibi-gun	Ibiden		Hirose Power Plant
Japan	Aichi	Ibi-gun	Ibiden		Kawakami Power Plant
Japan	Aichi	Kasugai	Panasonic		Manufacturing and sales companies
Japan	Aichi	Nagoya	Brother Industries Ltd		Production Facilities
Japan	Aichi	Nagoya	Brother Industries Ltd		Sales Facilities
Japan	Aichi	Nagoya	Brother Industries Ltd		Sales Facilities
Japan	Aichi	Nagoya	Brother Industries Ltd		others
Japan	Akita	Yurihoro-shi	Nidec		Manufacturing
Japan	Akita	Yurihoro-shi	Nidec		Sales Offices
Japan	Akita		Mitsumi Electric		Akita Business Division
Japan	Aomori	Hirosaki	Canon		Micromotors, toner cartridges and optical semicond
Japan	Aomori		Olympus		Manufacture of medical endoscope related products
Japan	Chiba		Brooks Automation Inc		Service Center
Japan	Chiba		Wistron Corporation		Service center
Japan	Chiba		STMicroelectronics		Warehouses
Japan	Chiba		ASE	415,000	Packaging and testing
Japan	Chiba	Matsudo City	Matsumoto		Sales Office - Headquarters
Japan	Chiba		Konica Minolta Holdings		Chiba office
Japan	Chiyoda-ku	Tokyo	Ciena Corp		
Japan	Chubu		Hitachi		Chubu Branch
Japan	Chubu	Nagoya	EMC Corp		
Japan	Chubu	Nagoya	NetApp Inc		
Japan	Chubu	Nagoya	Cisco Systems Inc		
Japan	Chubu	Nagoya	Hosiden		Nagoya Sales Office
Japan	Chugoku	Hiroshima	EMC Corp		
Japan	Fukui	Obama	Nidec		Head Office
Japan	Fukui	Obama	Nidec		R&D
Japan	Fukui	Obama	Nidec		R&D
Japan	Fukui	Obama	Nidec		Sales Offices
Japan	Fukui		Nippon Electric Glass		Manufacturing Plant : Glass for display devices (thin
Japan	Fukui	Fukui City	Panasonic		Circuit Components Business Division Morita
Japan	Fukui	Awara-shi	Panasonic		Circuit Components Business Division Kanazu
Japan	Fukui	Tsuruga	Panasonic		Electromechanical Components Business Division
Japan	Fukuoka	Fukuoka-city	Alps Electric		Alps Office
Japan	Fukuoka	Izuka	Nidec		R&D
Japan	Fukuoka	Chikugo-city	Nidec		Manufacturing
Japan	Fukuoka	Izuka	Nidec		Manufacturing
Japan	Fukushima	Shirakawa City	KLA Tencor Corp		
Japan	Fukushima	Iwaki-city	Alps Electric		Iwaki Office
Japan	Fukushima	Nihonmatsu	Nidec		Sales Offices
Japan	Fukushima	Koriyama	Nidec		Multifunctional Bases
Japan	Fukushima	Koriyama	Nidec		Sales Offices
Japan	Fukushima	Motomiya	Panasonic		Electromechanical Components Business Division
Japan	Fukushima	Koriyama	Panasonic		Production
Japan	Gifu	Okazaki	Nidec		Sales Offices
Japan	Gifu	Okazaki	Ibiden		Training Center & Head Office
Japan	Gifu	Okazaki	Ibiden		Okazaki Plant
Japan	Gifu	Okazaki	Ibiden		Okazaki Central Plant
Japan	Gifu	Okazaki	Ibiden		Aoyanagi Plant
Japan	Gifu	Okazaki	Ibiden		Gama Plant
Japan	Gifu	Anpachi-gun	Ibiden		Godo Plant
Japan	Gifu	Ibi-gun	Ibiden		Okazaki-Kita Plant
Japan	Gifu	Okazaki	Ibiden		IBIDEN Electronics Industries Co., Ltd
Japan	Gifu	Okazaki	Ibiden		IBIDEN Greentec Co., Ltd.
Japan	Gifu	Okazaki	Ibiden		IBIDEN Chemicals Co., Ltd
Japan	Gifu	Okazaki	Ibiden		IBIDEN Co., Ltd
Japan	Gifu	Okazaki	Ibiden		IBIDEN Graphite Co., Ltd.
Japan	Gifu	Okazaki	Ibiden		IBIDEN Industries Co., Ltd.
Japan	Gifu	Ikedo-cho	Ibiden		IBIDEN Jushi Co., Ltd
Japan	Gifu	Motosu	Ibiden		IBIDEN Bussan Co., Ltd
Japan	Gifu	Okazaki	Ibiden		IBIDEN Engineering Co., Ltd
Japan	Gifu	Okazaki	Ibiden		IBITECH Co., Ltd
Japan	Gifu	Okazaki	Ibiden		IBIDEN CARIER TECHNO Corp
Japan	Gifu	Okazaki	Ibiden		IBIDEN KENSO Co., Ltd
Japan	Gunma	Takasaki	Rohm		Sales Office
Japan	Gunma	Takasaki	Taiyo Yuden		Global Center/Sales Offices/R&D
Japan	Gunma	Takasaki	Taiyo Yuden		Haruna Plant
Japan	Gunma	Agatsuma	Taiyo Yuden		Nakanjo Plant
Japan	Gunma	Sawa	Taiyo Yuden		Tamamura Plant
Japan	Gunma	Takasaki	Taiyo Yuden		Yasutabara Plant/Development
Japan	Gunma	Kiryu-shi	Nidec		Multifunctional Bases
Japan	Gunma	Kiryu-shi	Nidec		R&D
Japan	Gunma	Kiryu-shi	Nidec		Sales Offices
Japan	Gunma	Kiryu-shi	Nidec		Sales Offices
Japan	Gunma	Kiryu-shi	Nidec		Sales and Services
Japan	Hiroshima	Hiroshima	Applied Materials Inc		
Japan	Hiroshima	Higashihiroshima	KLA Tencor Corp		
Japan	Hiroshima	Hiroshima	Alps Electric		Hiroshima Office
Japan	Hiroshima	Hatohori	Cisco Systems Inc		
Japan	Hiroshima	Fukuyama City	FUNAI ELECTRIC CO LTD		CHUGOKU FUNAI ELECTRIC CO., LTD
Japan	Hokkaido	Sapporo	Cisco Systems Inc		
Japan	Hokkaido	Chitose	Panasonic		Circuit Components Business Division
Japan	Hokkaido	Obihiro	Panasonic		Manufacturing locations
Japan	Hokuriku	Hokuriku	Hitachi		Hokuriku Branch
Japan	Honshu	Osaka	Applied Materials Inc		Sales and Services
Japan	Honshu	Osaka	AU Optronics		Office

Source: Citi Research

Figure 977. Japan (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Japan	Hyogo	Tatsuno	Panasonic		Manufacturing locations
Japan	Hyogo	Akashi	Taiyo Yuden		Akashi Device R&D Center
Japan	Hyogo	Itami	Konica Minolta Holdings		Itami site
Japan	Hyogo	Kobe	Konica Minolta Holdings		Kobe site
Japan	Hyogo	Kobe	Konica Minolta Holdings		Kobe second site
Japan	Hyogo	Kobe	Konica Minolta Holdings		Seihin site
Japan	Hyogo	Toyooka	Panasonic		Circuit Components Business Division Tajima
Japan	Hyogo	Himeji	Toshiba		Himeji Operations
Japan	Hyogo	Taishi	Toshiba		Himeji Operations - Semiconductor
Japan	Ibaraki	Tsukuba	Intel		
Japan	Ibaraki		Mitsumi Electric		Interface Equipment Business Division
Japan	Ibaraki	Yuki	Canon		Optical crystals (for cameras, telescopes), vapor deposition materials
Japan	Ibaraki	Bando	Canon		Recycling of toner cartridges; reuse and recycling of business machines
Japan	Ibaraki	Kasama	Canon		Design and production of precise plastic molding
Japan	Ibaraki	Mito	Rohm		Sales Office
Japan	Ibaraki		Canon		Semiconductor production-related equipment, design and manufacturing of production equipment
Japan	Ibaraki		Canon		Toner cartridges and advanced functional polymer components
Japan	Ibaraki	Tsukuba	Canon		Regional Office
Japan	Ibaraki	Tsukuba	Canon		FUNAI ELECTRIC ADVANCED APPLIED TECHNOLOGY
Japan	Ibaraki	Tsukuba City	FUNAI ELECTRIC CO LTD		RESEARCH INSTITUTE INC
Japan	Iwate	Kitakami	Amkor Technology Inc	211,000	Packaging and test services
Japan	Iwate	Ichinoseki	Nidec		Manufacturing
Japan	Iwate	Oshu	Tokyo Electron		Head Office - Development and manufacturing of thermal processing systems
Japan	Iwate	Wuxi	Xyratec		Office
Japan	Kanagawa	Minamitama	Panasonic		Manufacturing locations
Japan	Kanagawa	Kumamoto	Applied Materials Inc		Sales and Services
Japan	Kanagawa	Yokohama	KLA Tencor Corp		
Japan	Kanagawa	Kawasaki	Spansion		Headquarters, Design Centers and Specialized Centers of Excellence
Japan	Kanagawa	Yokohama	Spansion		Spansion Microcontroller & Analog Business Group
Japan	Kanagawa	Yokohama	MediaTek		Kanagawa office (Shin-Yokohama)
Japan	Kanagawa	Kawasaki	Innolux		Office
Japan	Kanagawa	Fujisawa-shi	Advanced Energy Industries, Inc		Advanced Energy Japan K.K.
Japan	Kanagawa	Atsugi	Alps Electric		Atsugi Office
Japan	Kanagawa	Zama City	Nidec		Multifunctional Bases
Japan	Kanagawa	Zama City	Nidec		R&D
Japan	Kanagawa	Ayase-shi	Nidec		Manufacturing
Japan	Kanagawa	Zama City	Nidec		Sales Offices
Japan	Kanagawa	Zama City	Nidec		Sales Offices
Japan	Kanagawa	Zama City	Nidec		Sales Offices
Japan	Kanagawa	Kawasaki	Nidec		Sales Offices
Japan	Kanagawa	Kawasaki	Mitsumi Electric		Operation Base
Japan	Kanagawa	Kawasaki	Canon		Semiconductor/electronic equipment, vacuum components
Japan	Kanagawa	Kawasaki	Konica Minolta Holdings		Kanagawa office
Japan	Kanagawa	Kawasaki	Olympus		Distribution center
Japan	Kanagawa	Yamato	Molex		Molex Japan Co., Ltd.
Japan	Kanagawa	Yokohama	Zhen Ding Tech		Service center
Japan	Kanagawa	Yamato	Lenovo Group		Switchboard
Japan	Kanagawa	Yokohama	Hosiden		Tokyo Branch
Japan	Kanagawa	Yokohama	Taiyo Yuden		Development Base
Japan	Kanagawa	Yokohama	Konica Minolta Holdings		Atsugi site
Japan	Kanagawa	Fujisawa	Nippon Electric Glass		Manufacturing Plant : Glass for medical and laboratory use, Glass for LCDs
Japan	Kanagawa	Kawasaki-shi	Pioneer Corporation		PIONEER CORPORATION - WORLD HEADQUARTERS
Japan	Kanagawa	Kawasaki-shi	Kawasaki Office		Kawasaki Office, Microelectronics Center, Semiconductor System Engineering Center, Hamakawasaki Operations, Ukishima Works, Komukai Complex
Japan	Kanagawa	Yokohama	Toshiba		Yokohama Complex, Ofuna Office, Keihin Product Operations, West Turbine Works
Japan	Kanagawa	Kansai	Hirose Electric		Kansai Branch
Japan	Kansai	Osaka	Hitachi		Kansai Branch
Japan	Kansai	Osaka	EMC Corp		Kansai Branch
Japan	Kansai	Osaka	NetApp Inc		Kansai Branch
Japan	Kansai	Osaka	Cisco Systems Inc		Kansai Branch
Japan	Kansai	Osaka	Hosiden		Head Office
Japan	Kansai	Osaka	Mitsumi Electric		Sales Office
Japan	Kanto	Kanto	Hitachi		Kanto Branch
Japan	Kumamoto	Kikuchi-gun	KLA Tencor Corp		
Japan	Kyoto	Kyotomachi	Panasonic		Panasonic Industrial Devices Nitto Co., Ltd.
Japan	Kyoto	Kameoka	Panasonic		Semiconductor Production Plants
Japan	Kyoto	Nagaokakyō	Panasonic		Semiconductor Production Plants
Japan	Kyushu	Fukuoka	Mitsumi Electric		Sales Office & Business Division
Japan	Kyushu	Fukuoka	EMC Corp		
Japan	Kyushu	Fukuoka	NetApp Inc		
Japan	Kyushu	Maebashi	On Semiconductor		
Japan	Mie	Yokkaichi-shi	Applied Materials Inc	59,043	Front end Facilities
Japan	Mie	Yokkaichi	KLA Tencor Corp		Sales and Services
Japan	Mie	Yokkaichi	Lam Research Corp		Office
Japan	Mie	Iga	Canon		Chemical products for copying machines and printers

Source: Citi Research

**Figure 978. Japan (Continued)**

Country	State	City	Company Name	Size (sq ft)	Description/Comments (manufacturing, office)
Japan	Mie	Watai	Panasonic	1,724,600	Manufacturing locations
Japan	Mie	Yokkaichi	Panasonic		Sale / Marketing
Japan	Mie	Yokkaichi	Panasonic		Sale / Marketing
Japan	Mie		Kyocera		Tamaki Plant
Japan	Mie	Matsusaka	Panasonic		Printed Circuit Board Business Division
Japan	Mie	Tamaki	Panasonic		Circuit Components Business Division Built-in Sensor Group
Japan	Mie	Matsusaka	Panasonic		Electromechanical Components Business Division;
Japan	Mie	Taki-gun	Brother Industries Ltd		Power Module Division; Speaker Division
Japan	Mie		Toshiba		Mie Operations
Japan	Minato		Trina Solar Limited		Trina Solar (Japan) Limited
Japan	Miyagi	Sendai	Cisco Systems Inc	R&D	
Japan	Miyagi	Sendai	KLA Tencor Corp		
Japan	Miyagi	Oaki	Nidec		R&D
Japan	Miyagi	Sendai	Taiyo Yuden		Sales Offices
Japan	Miyagi		Konica Minolta Holdings		Praça Office
Japan	Miyagi	Sendai	Olympus		Sendai Sales Office
Japan	Miyagi				Head Office - Development and manufacturing of plasma etch systems
Japan	Miyagi	Matsushima	Tokyo Electron		Branch Office - Matsushima Plant
Japan	Miyagi	Sendai	Tokyo Electron		Regional Office
Japan	Moriguchi Region		Panasonic		Head Office
Japan	Nagano	Matsumoto	Intel	R&D	
Japan	Nagano	Suwa-gun	Nidec		Multifunctional Bases
Japan	Nagano	Ueda City	Nidec		Head Office
Japan	Nagano	Komagane-city	Nidec		Multifunctional Bases
Japan	Nagano	Ina-shi	Nidec		Multifunctional Bases
Japan	Nagano	Chino-shi	Nidec		R&D
Japan	Nagano	Suwa-gun	Nidec		R&D
Japan	Nagano	Suwa-gun	Nidec		Manufacturing
Japan	Nagano	Azumino	Nidec		Manufacturing
Japan	Nagano	Chikuma	Nidec		Manufacturing
Japan	Nagano	Shiojiri	Nidec	R&D	Multifunctional Bases
Japan	Nagano	Komagane	Nidec		Sales Offices
Japan	Nagano	Ina-shi	Nidec		Sales Offices
Japan	Nagano	Kamirina-gun	Nidec		Sales Offices
Japan	Nagano	Suwa-gun	Nidec		Sales Offices
Japan	Nagano	Suwa-shi	Nidec		Sales Offices
Japan	Nagano	Siojiri	Nidec		Sales Offices
Japan	Nagano	Suwa-gun	Nidec		Multifunctional Bases
Japan	Nagano	Suwa-gun	Nidec		Multifunctional Bases
Japan	Nagasaki		Canon		Digital cameras
Japan	Niigata	Myoko	Shinko Electric Industries	1,724,600	Araki Plant
Japan	Niigata	Agano	Shinko Electric Industries		Kyogase Plant
Japan	Niigata				Development for Canon products (software/firmware)
Japan	Niigata	Chuo-ku	Canon		
Japan	Niigata	Mitsuke	Canon		Manufacturing equipment of OLED panel and thin-film photovoltaic cell, vacuum process equipment
Japan	Niigata		Konica Minolta Holdings		Niigata Office
Japan	Niigata		Olympus		Niigata Sales Office
Japan	Niigata		On Semiconductor		Front end Facilities
Japan	Niigata	Murakami-city	Hisoden		Manufacturing Division
Japan	Niigata	Minami-Uonuma	Nidec		Multifunctional Bases
Japan	Niigata	Minami-Uonuma	Nidec	1,724,600	Sales Offices
Japan	Niigata	Oita	KLA Tencor Corp		
Japan	Oita	Kunisaki	Canon		Digital cameras, digital video camcorders, EF lenses and others
Japan	Oita	Kitsuki	Canon		Chemical products for copying machines and printers
Japan	Oita	Hita City	Canon		Advanced functional polymer components for toner cartridges
Japan	Oita		Canon		Parts for digital cameras and others
Japan	Oita		Shinko Electric Industries		Sales Office
Japan	Oita		Konica Minolta Holdings		Oita Office
Japan	Oita		Toshiba		Oita Operations
Japan	Okayama	Tsuyama	Panasonic		Electromechanical Components Business Division;
Japan	Osaka	Osaka	KLA Tencor Corp	R&D	Input Devices Division
Japan	Osaka	odogawa-ku	Microchip Technology		
Japan	Osaka	Chuo-ku	Juniper Networks Inc		
Japan	Osaka	Osaka	Nidec		Sales Offices
Japan	Osaka	Nishi-ku	Nidec		Sales Offices
Japan	Osaka	Chuo-ku	Nidec		Sales Offices
Japan	Osaka	Kita-ku	Nidec		Sales Offices
Japan	Osaka	Kyoto	Nidec		Sales Offices
Japan	Osaka	Kyoto	Nidec		Sales Offices
Japan	Osaka	Kyoto	Nidec		Sales Offices
Japan	Osaka	Kyoto	Nidec	R&D	Sales Offices
Japan	Osaka	Kyoto	Nidec		Sales Offices
Japan	Osaka	Kyoto	Nidec		Sales Offices
Japan	Osaka	Kyoto	Nidec		Sales Offices
Japan	Osaka	Kyoto	Nidec		Sales Offices
Japan	Osaka	Kyoto	Nidec		Sales Offices
Japan	Osaka	Kyoto	Nidec		Sales Offices
Japan	Osaka	Daito city	FUNAI ELECTRIC CO LTD		HEAD OFFICE
Japan	Osaka	Higasi-Osaka	FUNAI ELECTRIC CO LTD		FUNAI SERVICE CO., LTD
Japan	Osaka	Osaka City	FUNAI ELECTRIC CO LTD		FUNAI GENERAL SERVICE CO., LTD
Japan	Saga	Kiama	KLA Tencor Corp	R&D	
Japan	Saitama	Iruma city	Nidec		
Japan	Saitama	Kawaguchi	Nidec	Sales Offices	
Japan	Saitama	Chichibu	Canon	Magnetic/business machine components, document scanners, portable data terminals	
Japan	Saitama	Misato	Canon	Business machines, business machine peripherals, industrial-use printers, chemical products	
Japan	Saitama	Kodama-gun	Canon	Contact image sensors, printed wiring boards, inkjet cartridges, medical equipment	
Japan	Saitama	Iruma	Kyocera	KYOCERA Chemical Corporation	
Japan	Saitama		Taiyo Yuden	Development Base	
Japan	Saitama		Tamron Co Ltd	Head Office, Domestic Sales Office	
Japan	Saitama	Fukaya	Toshiba	Fukaya Complex	
Japan	Shiga	Echi-gun	Hisoden	Hisoden F.D. Corporation	
Japan	Shiga	Echi-gun	Hisoden	Hisoden Plastics Corporation	
Japan	Shiga	Echi-gun		Multifunctional Bases	
Japan	Shiga	Echi-gun	Nidec	Sales Offices	

**Figure 979. Japan (Continued)**

Country	State	City	Company Name	Size (sq ft)	Description/Comments (Manufacturing, office)
Japan	Shiga	Kusatsu	Canon		Precision automation and semiconductor equipment
Japan	Shiga	Nagahama	Canon		Toner cartridges, parts for laser printers, a-si drums
Japan	Shiga	Otsu	Nippon Electric Glass		Manufacturing Plant : Glass for CCFL, Glass for electronic devices, Heat-resistant glass, Glass for lighting applications, Glass for thermos bottles, Glass for radiation shielding
Japan	Shiga	Nagahama	Nippon Electric Glass		Manufacturing Plant : Glass for LCDs, Glass for PDPs, Glass for building materials
Japan	Shiga	Notogawa	Nippon Electric Glass		Manufacturing Plant : Glass for LCDs, Glass for PDPs, Glass for building materials
Japan	Shiga	Kusatsu	Nippon Electric Glass		Glass for electronic devices
Japan	Shiga	Kyocera	Kyocera		Manufacturing Plant : KYOCERA Display Corporation
Japan	Shiga	Kyocera	Kyocera		KYOCERA SLC Technologies Corporation
Japan	Shiga	Yasu	Dainippon Screen		Yasu Plant
Japan	Shiga	Hikone	Dainippon Screen		Hikone Plant
Japan	Shiga	Dainippon Screen	Dainippon Screen		Taga Plant
Japan	Shiga	Kusatsu	Panasonic		
Japan	Shizuoka	Hamamatsu	Alps Electric		Hamamatsu Office
Japan	Shizuoka	Konica Minolta Holdings	Konica Minolta Holdings		Shizuoka office
Japan	Tochigi	Utsunomiya	Alps Electric		Utsunomiya Office
Japan	Tochigi	Sano-city	Nidec		R&D
Japan	Tochigi	Otawara	Panasonic		Manufacturing and sales companies
Japan	Tohoku	Hitachi	Hitachi		Tohoku branch
Japan	Tokyo	FUNAI ELECTRIC CO LTD	FUNAI ELECTRIC CO LTD		TOKYO BRANCH OFFICE
Japan	Toyama	Chiyoda-Ku	KLA Tencor Corp		
Japan	Toyama	Toyama	Lam Research Corp		Office
Japan	Toyama	Toyama	Konica Minolta Holdings		Toyama office
Japan	Toyama	Tonami	Panasonic		Capacitor Business Division Film Capacitor Division
Japan	Virginia	Newport News	Canon		Toner cartridges, toner for copying machines, OEM products and molding dies
Japan	Wakayama	Adiragawa	Hosiden		Manufacturing Division
Japan	Wakayama		Panasonic		Wakayama Plant
Japan	Yamagata	Tsuruoka	Applied Materials Inc		Sales and Services
Japan	Yamagata		ASE		
Japan	Yamagata		Mitsumi Electric		Yamagata Business Division
Japan	Yamagata	Yonezawa	Enterpris Inc		
Japan	Yamagata	Higashine-shi	Kyocera		KYOCERA Crystal Device Corporation
Japan	Yamaguchi		Konica Minolta Holdings		Yamaguchi office
Japan	Yamanashi	Sudama	Nidec		Manufacturing
Japan	Yamanashi		Konica Minolta Holdings		Kofu
Japan	Yamanashi	Nirasaki	Tokyo Electron		Head Office - Yamanashi Plant
Japan	Yamanashi	Nirasaki	Tokyo Electron		Yamanashi Plant (Hosaka)
Japan	Yamanashi	Minami-Alps	Panasonic		Panasonic Industrial Devices Yamanashi Co., Ltd.
Japan	Yodogawa	Osaka	Enterpris Inc		
Japan	Yodogawa	Osaka	Nippon Electric Glass		Sales Headquarters
Japan	Yokohama	Midori	Kyocera		KYOCERA Connector Products Corporation
Japan		Gotemba	Jabil		138,000 Manufacturing
Japan		Hachioji	Jabil		20,000 Manufacturing
Japan		Tokyo	Jabil		2,000 Support
Japan		Ibaraki	Jabil		Electronics facilities, Manufacturing
Japan		Shiga	Amphenol		Amphenol Japan, Ltd.
Japan		Kanagawa	Amphenol		Amphenol Japan-infocom
Japan		Yokohama	Amphenol		Amphenol TCS Japan
Japan		Oyama	Sensata		7400 Manufacturing
Japan		Saitama-Ken	Sensata		Business Centre
Japan		Shizuoka-ken	Sensata		Business Centre
Japan		Multiple Locations	Celestica		274,000 Manufacturing — PC
Japan		Adogawa	AVX Corporation		206,000 Manufacturing — PC
Japan		Tokyo	Arrow Electronics		Office
Japan		Tokyo	IBM (International Business Machines Corp)		IBM Japan Ltd
Japan		Tokyo	Hewlett Packard		Office
Japan		Tokyo	Hewlett Packard		Product Development and Manufacturing
Japan		Hachioji	Hewlett Packard		Office
Japan		Central Branch Ushij	Hewlett Packard		Office
Japan		Osaka	Hewlett Packard		Office
Japan		Sapporo	Hewlett Packard		Office
Japan		Sendai	Hewlett Packard		Office
Japan		Fukuoka	Hewlett Packard		Office
Japan		Tokyo	EMC Corp		
Japan		Kawasaki	EMC Corp		
Japan		Shizuoka	EMC Corp		
Japan		Tokyo	EMC Corp		
Japan		Tokyo	EMC Corp		
Japan		Tokyo	EMC Corp		
Japan		Tokyo	NetApp Inc		
Japan		Toyota	NetApp Inc		
Japan		Tokyo	Xerox		Office
Japan		Kashiwazakishi	Xerox		Manufacturing plant
Japan		Suzuka	Xerox		Manufacturing plant
Japan		Tokyo	Electronics For Imaging, Inc		office
Japan		Tokyo	Corning		
Japan		Tokyo	Cisco Systems Inc		
Japan		Fukuoka	Cisco Systems Inc		
Japan		Tokyo	Blackberry		
Japan		Minato	Motorola Solutions		Corporate & Regional Office
Japan		Tokyo	Motorola Solutions		Sales Office
Japan		Osaka	Motorola Solutions		Sales Office
Japan		Fukuoka	Apple Inc		Retail Store
Japan		Hokkaido	Apple Inc		Retail Store
Japan		Miyagi	Apple Inc		Retail Store
Japan		Osaka	Apple Inc		Retail Store
Japan		Tokyo	Apple Inc		Retail Store
Japan		Tokyo	Apple Inc		Office
Japan		Tokyo	Amkor Technology Inc		Sales Office

Source: Citi Research

Source: Citi Research

Figure 980. Japan (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Japan		Tokyo	Analog Devices, Inc	36,000	Engineering
Japan		Tokyo	Applied Materials Inc		Main Office
Japan		Kyoto	Applied Materials Inc		Sales and Services
Japan		Tokyo	ATMI Inc		Sales & Customer Service
Japan		Yokohama	Brooks Automation Inc		Headquarters
Japan		Yokohama	Brooks Automation Inc		Technical Center
Japan		Yokkaichi	Brooks Automation Inc		Service Center
Japan		Osaka	Brooks Automation Inc		Sales Office
Japan		Kumamoto	Brooks Automation Inc		Service Center
Japan		Hiroshima	Brooks Automation Inc		Service Center
Japan		Yonezawa	Entegris Inc	196,000	Manufacturing
Japan		Tokyo	Entegris Inc		
Japan		Fukuoka	Entegris Inc		
Japan		Yamagata	Entegris Inc		
Japan		Tokyo	Fairchild Semiconductor International		Regional Sales and Customer Service Centers
Japan		Yokohama	FormFactor Inc	8,777	Field service, and repair center
Japan		Tokyo	FormFactor Inc		Sales office, marketing, product design, research
Japan		Hiroshima	FormFactor Inc	1,615	Repair center
Japan		Osaka	International Rectifier Corp		
Japan		Nagoya	International Rectifier Corp		
Japan		Tokyo	International Rectifier Corp		
Japan		Tokyo	Intersil Corp.		Office
Japan		Kyoto	Intersil Corp.		Office and
Japan		Yokohama	KLA Tencor Corp	37,418	warehouse
Japan		Tokyo	KLA Tencor Corp		
Japan		Kanagawa	Lam Research Corp		Office
Japan		Oita	Lam Research Corp		Office
Japan		Hiroshima	Lam Research Corp		Office
Japan		Kumamoto	Lam Research Corp		Office
Japan		Nagoya	Linear Technology		Office
Japan		Osaka	Linear Technology		Office
Japan		Tokyo	Linear Technology		Office
Japan		Osaka	MagnaChip Semiconductor Corp		Sales Office
Japan		Tokyo	Maxim Integrated		Office
Japan		Osaka	Maxim Integrated		Office
Japan		Tokyo	Microchip Technology		
Japan		Saitama	On Semiconductor	377,000	Back end Facilities
Japan		Tokyo	On Semiconductor		Sales Office
Japan		Tokyo	Semtech		
Japan		Osaka	Semtech		
Japan		Beijing	Semtech		
Japan		Tokyo	Silicon Laboratories, Inc		
Japan		Kumamoto	Teradyne	79,000	Semiconductor Test
Japan		Tokyo	Arris Enterprises, Inc.		
Japan		Tokyo	Alcatel Lucent SA		
Japan		Tokyo	Ericsson LM		Office
Japan		Tokyo	F5 Networks		Office
Japan		Tokyo	Infineon Corp.	2,000	Office
Japan		Tokyo	JDSU Corp.		Office
Japan		Tokyo	JDSU Corp.		Sales Office
Japan		Tokyo	Juniper Networks Inc		
Japan		Sagamihara-shi	Oclaro Inc.	342,000	Office space, manufacturing, research and development
Japan		Komoro	Oclaro Inc.	35,000	Office space, manufacturing, research and development
Japan		Kanazawa-ku	Oclaro Inc.	3,000	development facilities
Japan		Tokyo	Oclaro Inc.	1,000	development facilities
Japan		Tokyo	Polycom Inc.		Office
Japan		Tokyo	Riverbed Technology		
Japan		Tokyo	Tellabs, Inc.		Sales Office
Japan		Tokyo	Advanced Micro Devices, Inc		
Japan		Tokyo	Altera Corp		
Japan		Osaka	Altera Corp		
Japan		Tokyo	Broadcom		Office
Japan		Osaka	Cypress Semiconductor Corp		
Japan		Tokyo	Cypress Semiconductor Corp		
Japan		Tokyo	Freescall Semiconductor Ltd.		Office
Japan		Hiroshima	Micron		Wafer fabrication
Japan		Akita	Micron		Module assembly and test
Japan		Tokyo	Micron		Design
Japan		Tsukuba	Micron		Design
Japan		Osaka	Micron		Sales
Japan		Tokyo	Micron		Sales
Japan		Tokyo	Marvell		
Japan		Tokyo	Intel		
Japan		Osaka	Intel		
Japan		Tokyo	NVIDIA		Office
Japan		Osaka	QUALCOMM Incorporated		
Japan		Tokyo	QUALCOMM Incorporated		
Japan		Aizu	Texas Instruments		
Japan		Mito	Texas Instruments		
Japan		Hiji	Texas Instruments		
Japan		Tokyo	Texas Instruments		
Japan		Tokyo	Xilinx Inc		
Japan		Tokyo	Xilinx Inc		
Japan		Osaka	Xilinx Inc		
Japan		Tokyo	Meyer Burger Technology AG		Correns Corporation
Japan		Tokyo	SMA Solar Technology		SMA Japan K.K.
Japan		Tokyo	Centrotherm Photovoltaics		Sales partner, Hakuto Co. Ltd.
Japan		Tokyo	SK Hynix		Headquarters, SK hynix Japan Inc.
Japan		Osaka	SK Hynix		Osaka Office
Japan		Tokyo	LG Display		Sales
Japan		Tokyo	LG Electronics		LG Electronics Japan co., LTD, Marketing
Japan		Tokyo	LG Innotek		LG Innotek Co.,Ltd. Japan (LGITJP)
Japan		Tokyo	LG Innotek		LG Innotek Co.,Ltd. Japan R&D Center

Source: Citi Research

Figure 981. Japan (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Japan		Tokyo	Samsung Electro-Mechanics		Overseas Sales Offices
Japan		Shizuoka	Samsung Electro-Mechanics		Overseas Sales Offices
Japan		Osaka	Samsung Electro-Mechanics		Overseas Sales Offices
Japan		Tokyo	Samsung Electronics		Japan - Samsung Electronics Japan Co.,Ltd.
Japan		Tokyo	Samsung SDI		Tokyo Subsidiary
Japan		Tokyo	Cheil Industries		Chemicals/Electronic Materials Division
Japan		Osaka	Cheil Industries		Chemicals/Electronic Materials Division
Japan		Tokyo	Mitsubishi Electric		Mitsubishi Electric Corporation (Head Office)
Japan		Tokyo	AAC Technologies Holdings		Office
Japan		Tokyo	Acer Inc		Acer Japan Corp
Japan		Tokyo	Chicony Electronics		Chicony Electronics Japan
Japan		Tokyo	Delta Electronics		Tokyo Office
Japan		Tokyo	Delta Electronics		Nishimagome Office
Japan		Tokyo	Delta Electronics		Shibaura Office
Japan		Osaka	Delta Electronics		Osaka Office
Japan		Tokyo	Richtek Technology		Japan Office
Japan		Tokyo	Pegatron		Operation Sites
Japan		Tokyo	AU Optonics		Office
Japan		Tokyo	TPK		TPK Japan Office
Japan		Tokyo	E Ink Holdings		E Ink / Hydys Japan Office
Japan		Yokohama	ASE		REFUOL Japan K.K.
Japan		Tokyo	Advanced Energy Industries, Inc		
Japan		Tokyo	Sun Edison		
Japan		Tokyo	Suntech Power Holdings		
Japan		Tokyo	Yingli Green Energy		Yingli Green Energy Japan Corporation, Ltd.
Japan		Kanagawa	TSMC		Offices
Japan		Osaka City	UMC		Wafer production
Japan		Tokyo	Novatek		Office
Japan		Tokyo	Novatek		Manufacturing and Marketing
Japan		Tokyo	WPG Holding		
Japan		Yokohama	WPG Holding		
Japan		Osaka	WPG Holding		
Japan		Tokyo	SunPower Corporation		Office
Japan		Tokyo	Alps Electric		Head Office
Japan		Osaka	Alps Electric		Kansai Branch
Japan		Tokyo	Hirose Electric		Head Office
Japan		Tokyo	Hirose Electric		Yokohama Center
Japan		Kikuna	Hirose Electric		Kikuna Center
Japan		Chubu	Hirose Electric		Chubu Sales Office
Japan		Miyako	Hirose Electric		Domestic Subsidiaries
Japan		Koriyama	Hirose Electric		Domestic Subsidiaries
Japan		Osaka	Hosiden		Hosiden Seiko Corporation
Japan		Iseaki city	Hosiden		Manufacturing Division
Japan		Fukuoka	Hosiden		Manufacturing Division
Japan		Tokyo	Ibiden		Tokyo Branch
Japan		Osaka	Ibiden		Osaka Branch
Japan		Tokyo	Kyocera		Tokyo Office
Japan		Osaka	Kyocera		KYOCERA Document Solutions Inc.
Japan		Osaka	Kyocera		Hirakata Plant
Japan		Kyoto	Kyocera		KYOCERA Communication Systems Co., Ltd.
Japan		Kyoto	Kyocera		KYOCERA Solar Corporation
Japan		Tokyo	Kyocera		KYOCERA Circuit Solutions, Inc.
Japan		Tokyo	Kyocera		KYOCERA Realty Development Co., Ltd.
Japan		Tokyo	Kyocera		KYOCERA Optec Co., Ltd.
Japan		Osaka	Kyocera		KYOCERA Medical Corporation
Japan		Tokyo	Kyocera		KYOCERA Document Solutions Japan Inc.
Japan		Tokyo	Kyocera		KYOCERA MARUZEN Systems Integration Co., Ltd.
Japan		Kagoshima	Kyocera		International Golf Resort KYOCERA Co., Ltd.
Japan		Kagoshima	Kyocera		Hotel KYOCERA
Japan		Kyoto	Rohm		Sales Headquarters
Japan		Tokyo	Rohm		Sales Office
Japan		Yokohama	Rohm		Sales & R&D Office
Japan		Nagoya	Rohm		Sales & R&D Office
Japan		Fukuoka	Rohm		Sales Office
Japan		Hiroshima	Rohm		Sales Office
Japan		Nagano	Rohm		Sales Office
Japan		Hachioji	Rohm		Sales Office
Japan		Sendai	Rohm		Sales Office
Japan		Hamamatsu	Rohm		Manufacturing Centers - ROHM Hamamatsu Co., Ltd.
Japan		Okayama	Rohm		Manufacturing & Distribution Centers - ROHM Wako Co., Ltd.
Japan		Fukuoka	Rohm		Manufacturing Centers - ROHM Apollo Co., Ltd.
Japan		Kyoto	Rohm		Manufacturing Centers - ROHM Mechatronics Co., Ltd.
Japan		Nagano	Shinko Electric Industries		Head Office
Japan		Nagano	Shinko Electric Industries		Wakaho Plant
Japan		Nagano	Shinko Electric Industries		Takaoka Plant
Japan		Nagano	Shinko Electric Industries		SHINKO R&D Center
Japan		Nagano	Shinko Electric Industries		Kurita Sogo Center
Japan		Fukushima	Shinko Electric Industries		Aizu Branch
Japan		Tokyo	Shinko Electric Industries		Sales Office
Japan		Osaka	Shinko Electric Industries		Sales Office
Japan		Sendai	Shinko Electric Industries		Sales Office
Japan		Nagano	Shinko Electric Industries		Sales Office
Japan		Nagoya	Shinko Electric Industries		Sales Office
Japan		Fukuoka	Shinko Electric Industries		Sales Office
Japan		Tokyo	Taiyo Yuden		Head Office
Japan		Nagoya	Taiyo Yuden		Sales Offices
Japan		Osaka	Taiyo Yuden		Sales Offices
Japan		Fukuoka	Taiyo Yuden		Sales Offices
Japan		Tokyo	TDK Corporation		Headquarters
Japan		Tottori	Nidec		Head Office
Japan		Kyoto	Nidec		Head Office
Japan		Kyoto	Nidec		Head Office
Japan		Kyoto	Nidec		Multifunctional Bases
Japan		Tokyo	Nidec		Head Office
Japan		Tokyo	Nidec		Multifunctional Bases
Japan		Tokyo	Nidec		Multifunctional Bases
Japan		Tokyo	Nidec		Head Office
Japan		Kyoto	Nidec		Multifunctional Bases

Source: Citi Research

**Figure 982. Japan (Continued)**

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Japan		Kyoto	Nidec	R&D	
Japan		Kyoto	Nidec	R&D	
Japan		Tokyo	Nidec	R&D	
Japan		Nagoya	Nidec	Multifunctional Bases	
Japan		Nagoya	Nidec	Sales Offices	
Japan		Nagoya	Nidec	Sales Offices	
Japan		Tokyo	Nidec	Sales Offices	
Japan		Tokyo	Nidec	Sales Offices	
Japan		Tokyo	Nidec	Multifunctional Bases	
Japan		Tokyo	Nidec	Multifunctional Bases	
Japan		Tokyo	Nidec	Multifunctional Bases	
Japan		Tokyo	Mitsumi Electric	Head Office - SALES	
Japan		Kariya	Mitsumi Electric	Sales Office	
Japan		Kyoto	Mitsumi Electric	Sales Office	
Japan		Sumoto	Mitsumi Electric	Sales Office	
Japan		Hiroshima	Mitsumi Electric	Sales Office	
Japan		Chitose	Mitsumi Electric	Chitose Business Division	
Japan		Tokyo	Canon	Development assistance for Canon products (SOC, MPF, imaging and communication)	
Japan		Miyazaki	Canon	Digital cameras, electronics packaging	
Japan		Fukushima	Canon	Commercial photo printers, print heads and ink tanks; analysis of software	
Japan		Tokyo	Canon	Marketing of Canon products and related solution services in Japan	
Japan		Tokyo	Canon	Consultation, sales, support and service of Canon products and related solutions	
Japan		Tokyo	Canon	Print-on-demand (POD) service and Canon MDS on contract service	
Japan		Chiba City	Canon	Customer support services for call centers and consumer products	
Japan		Osaka	Canon	Sales of medical devices, healthcare equipment, medical related consumables, medical imaging systems	
Japan		Kyoto	Dainippon Screen	Head Office	
Japan		Kyoto	Dainippon Screen	Rakusai Site	
Japan		Kyoto	Dainippon Screen	Kumiyama Plant	
Japan		Tokyo	Dainippon Screen	Kudan Office	
Japan		Tokyo	Dainippon Screen	Monzennakacho Site	
Japan		Tokyo	Konica Minolta Holdings	Head Office	
Japan		Tokyo	Konica Minolta Holdings	Manouchi Trust Tower	
Japan		Tokyo	Konica Minolta Holdings	Shinjuku Nomura Building	
Japan		Hino	Konica Minolta Holdings	Tokyo Hino site	
Japan		Hachioji	Konica Minolta Holdings	Tokyo Hachioji site	
Japan		Toyokawa	Konica Minolta Holdings	Toyokawa site	
Japan		Kansai	Konica Minolta Holdings	Kansai Branch	
Japan		Osaka	Konica Minolta Holdings	Takatsuki site	
Japan		Osaka	Konica Minolta Holdings	Sakai site	
Japan		Sayama	Konica Minolta Holdings	Osaka Sayama site	
Japan		Tokyo	Konica Minolta Holdings	Development, manufacture and sale	
Japan		Tokyo	Konica Minolta Holdings	Printing, binding, and processing	
Japan		Tokyo	Konica Minolta Holdings	Medical imaging equipment / medical equipment	
Japan		Hokkaido	Konica Minolta Holdings	Hokkaido Branch	
Japan		Tomakomai	Konica Minolta Holdings	Tomakomai office	
Japan		Hakodate	Konica Minolta Holdings	Hakodate office	
Japan		Kushiro	Konica Minolta Holdings	Kushiro office	
Japan		Asahikawa	Konica Minolta Holdings	Asahikawa office	
Japan		Kitami	Konica Minolta Holdings	Kitami office	
Japan		Aomori	Konica Minolta Holdings	Aomori office	
Japan		Morioka	Konica Minolta Holdings	Morioka office	
Japan		Akita	Konica Minolta Holdings	Akita office	
Japan		Yamagata	Konica Minolta Holdings	Yamagata office	
Japan		Koriyama	Konica Minolta Holdings	Koriyama office	
Japan		Tokyo	Konica Minolta Holdings	Kanto Branch	
Japan		Matsudo	Konica Minolta Holdings	Matsudo office	
Japan		Funabashi	Konica Minolta Holdings	Funabashi office	
Japan		Atsugi	Konica Minolta Holdings	Atsugi office	
Japan		Saitama	Konica Minolta Holdings	Saitama office	
Japan		Nagasaki	Konica Minolta Holdings	Nagasaki office	
Japan		Utsunomiya	Konica Minolta Holdings	Utsunomiya office	
Japan		Maebashi	Konica Minolta Holdings	Maebashi office	
Japan		Mito	Konica Minolta Holdings	Mito office	
Japan			Konica Minolta Holdings	Chubu Branch	
Japan		Gifu	Konica Minolta Holdings	Gifu office	
Japan		Hamamatsu	Konica Minolta Holdings	Hamamatsu sales office	
Japan		Kanazawa	Konica Minolta Holdings	Kanazawa office	
Japan		Nagano	Konica Minolta Holdings	Nagano office	
Japan		Tsu	Konica Minolta Holdings	Triple sales office	
Japan		Kariya	Konica Minolta Holdings	Kariya office	
Japan		Toyohashi	Konica Minolta Holdings	Toyohashi office	
Japan		Kansai	Konica Minolta Holdings	Kansai Branch	
Japan		Osaka	Konica Minolta Holdings	Minami Osaka sales office	
Japan		Itami	Konica Minolta Holdings	Hanshin office	
Japan		Himeji	Konica Minolta Holdings	Himeji office	
Japan		Hyogo	Konica Minolta Holdings	Hyogo Office	
Japan		Kyoto	Konica Minolta Holdings	Kyoto Office	
Japan		Wakayama	Konica Minolta Holdings	Wakayama office	
Japan		Takamatsu	Konica Minolta Holdings	Takamatsu office	
Japan		Matsuyama	Konica Minolta Holdings	Matsuyama office	
Japan		Fukuyama	Konica Minolta Holdings	Fukuyama office	
Japan		Kure	Konica Minolta Holdings	Wu office	
Japan		Okayama	Konica Minolta Holdings	Okayama office	
Japan		Tottori	Konica Minolta Holdings	Tottori Office	
Japan		Matsue	Konica Minolta Holdings	Matsue office	
Japan		Fukuoka	Konica Minolta Holdings	Kyushu Branch	
Japan		Kitakyushu	Konica Minolta Holdings	Kitakyushu Branch	
Japan		Kurume	Konica Minolta Holdings	Kurume office	
Japan		Nagasaki	Konica Minolta Holdings	Nagasaki office	
Japan		Kumamoto	Konica Minolta Holdings	Kumamoto office	
Japan		Miyazaki	Konica Minolta Holdings	Miyazaki office	
Japan		Kagoshima	Konica Minolta Holdings	Kagoshima office	
Japan		Okinawa	Konica Minolta Holdings	Okinawa office	

**Figure 983. Japan (Continued)**

Country	State	City	Company Name	Size (sq ft)	Description/Comments (manufacturing, office)
Japan		Tokyo	Hoya Corporation		HOYA CORPORATION, HOYA Group Corporate Communications
Japan		Tokyo	Hoya Corporation		HOYA SURGICAL OPTICS Japan, Headquarters & HOYA SERVICE CORPORATION
Japan		Tokyo	Hoya Corporation		HOYA Medical Research Center
Japan		Tokyo	Hoya Corporation		HOYA TECHNOLOGICAL CORPORATION, International Sales Department
Japan		Tokyo	Hoya Corporation		HOYA TECHNOLOGICAL CORPORATION, R & D Department
Japan		Tochigi	Hoya Corporation		HOYA TECHNOLOGICAL CORPORATION, Mashiko Factory
Japan		Saitama	Hoya Corporation		HOYA CANDEO OPTRONICS CORPORATION
Japan		Tokyo	Olympus		Principal Business Bases
Japan		Tokyo	Olympus		Manufacture and sale of medical equipment and other medical devices
Japan		Nagano	Olympus		Development, manufacture, and repair of products related to industrial videoscopes
Japan		Fukushima	Olympus		Manufacture of medical and industrial endoscopes
Japan		Tokyo	Olympus		Sasazuka Facility
Japan		Tokyo	Olympus		Ishikawa & Utsumi Facility
Japan		Sapporo	Olympus		Sapporo Branch
Japan		Yokohama	Olympus		Yokohama Sales Office
Japan		Matsumoto	Olympus		Matsumoto Sales Office
Japan		Shizuoka	Olympus		Shizuoka Sales Office
Japan		Nagoya	Olympus		Nagoya Branch
Japan		Kanazawa	Olympus		Kanazawa Sales Office
Japan		Osaka	Olympus		Osaka Branch
Japan		Hiroshima	Olympus		Hiroshima Sales Office
Japan		Matsuyama	Olympus		Matsuyama Sales Office
Japan		Fukuoka	Olympus		Fukuoka Branch
Japan		Tokyo	Olympus		Hinode Plant
Japan		Fukushima	Olympus		Shirakawa Facility
Japan		Kyoto	Olympus		Kyoto Sales Office
Japan		Okayama	Olympus		Okayama Sales Office
Japan		Kagoshima	Olympus		Kagoshima Sales Office
Japan			Nikon		
Japan			Nikon		
Japan			Nikon		
Japan			Nikon		
Japan		Tokyo	Ricoh Co		Sales & Services - Ricoh Japan/Corporation
Japan		Tokyo	Ricoh Co		Sales & Services - Ricoh Imaging Company, Ltd.
Japan		Kanagawa	Ricoh Co		R&D - Ricoh Technology Center
Japan		Osaka	Ricoh Co		R&D - Ikeda Office
Japan		Miyagi	Ricoh Co		R&D - General Electronics R&D Center
Japan		Yokohama	Ricoh Co		R&D - Research and Development Center
Japan		Tokyo	Ricoh Co		R&D - Ricoh Institute of Sustainability and Business
Japan		Kanagawa	Ricoh Co		R&D - Ricoh Technologies Co., Ltd.
Japan		Kanagawa	Ricoh Co		Manufacturing - Atsugi Plant
Japan		Numazu	Ricoh Co		Manufacturing - Numazu Plant
Japan		Fukui	Ricoh Co		Manufacturing - Fukui Plant
Japan		Hyogo	Ricoh Co		Manufacturing - Yashiro Plant
Japan		Kanagawa	Ricoh Co		Manufacturing - Service Parts Center
Japan		Hanamaki	Ricoh Co		Manufacturing - Ricoh Optical Industries Co., Ltd.
Japan		Miyagi	Ricoh Co		Manufacturing - Hasama Ricoh, Inc.
Japan		Kanagawa	Ricoh Co		Manufacturing - Ricoh Industry Co., Ltd.
Japan		Nagoya	Ricoh Co		Manufacturing - Ricoh Elmem Corporation
Japan		Tottori	Ricoh Co		Manufacturing - Ricoh Microelectronics Co., Ltd.
Japan		Tokyo	Ricoh Co		Operations - Ricoh Company, Ltd.
Japan		Tokyo	Ricoh Co		Operations - Ohnori Office
Japan		Tokyo	Ricoh Co		Operations - Ricoh System Center
Japan		Kanagawa	Ricoh Co		Operations - Shin-Yokohama Office
Japan		Osaka	Tamron Co Ltd		Domestic Sales Office
Japan		Hiroaki	Tamron Co Ltd		Production Facilities
Japan		Aomori	Tamron Co Ltd		Production Facilities
Japan		Tokyo	Tokyo Electron		World Headquarters, sales, marketing and R&D
Japan		Fuchu City	Tokyo Electron		Branch Office, Sales Office
Japan		Kumamoto	Tokyo Electron		Head Office - Koshi Plant
Japan		Kanagawa	Tokyo Electron		Sales Office
Japan		Osaka	Tokyo Electron		Osaka Branch Office
Japan		Sapporo	Tokyo Electron		Regional Office
Japan		Tokyo	Asahi Glass		Head Office
Japan		Tokyo	Asahi Glass		Information technology application service, computer aided engineering
Japan		Tokyo	Asahi Glass		Sales of various refractories and fine ceramics, design, construction, consulting and data analysis of glass tanks and various industrial furnaces
Japan		Tokyo	Asahi Glass		Fluorinated coatings
Japan		Yonezawa	Asahi Glass		Glass substrates for flat-panel displays[FPD]
Japan		Koriyama	Asahi Glass		Glass frit and paste for electronics, optoelectronics products for components such as optical pickups and synthetic silica glass for semiconductor manufacturing
Japan		Chiba City	Asahi Glass		Plant engineering/maintenance, Environmental and anti-pollution plants/equipment
Japan		Tokyo	Asahi Glass		Sales of processed glass products
Japan		Tokyo	Asahi Glass		Factoring, loan to group companies
Japan		Tokyo	Asahi Glass		Sales and installation of glass and building materials and Production and sales of functional glass
Japan		Tokyo	Asahi Glass		ETFE films for greenhouse and membrane structure
Japan		Tokyo	Asahi Glass		Accident insurance brokerage, soliciting life insurance, revolving leases
Japan		Tokyo	Asahi Glass		Arranging the delivery service by trucks, domestic sea freight, freight system development, international air and sea freight, subcontracting of administrative job for distribution, distribution consulting

Source: Citi Research

Source: Citi Research



Figure 984. Japan (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Japan		Sagamihara City	Asahi Glass		Glass-fiber-reinforced plastics
Japan		Fukuoka	Asahi Glass		Manufacturing of molded aspherical glass lenses
Japan		Taketoyo	Asahi Glass		Manufacturing and sales of Polycarbonate sheet and film
Japan		Tokyo	Asahi Glass		Polyurethane waterproofing materials, Flooring materials
Japan		Tokyo	Asahi Glass		Undertaking surveys, research and development, consulting and dispatch of engineering staff
Japan		Chigasaki City	Asahi Glass		Liquid crystal materials, Cathode materials for batteries, Polishing compounds, Fluorinated surfactants
Japan		Kitakyushu	Asahi Glass		Fine silica, Sodium silicate, Methyl bromide
Japan		Yokohama-shi	Asahi Glass		Cleaning of buildings and dormitories, gardening and tree planting, recovery, classification and recycle of waste( A subsidiary for hiring disabled )
Japan		Shizuoka	Asahi Glass		Glass products for electronics and industrial use, science and medical uses products
Japan		Kawasaki	Asahi Glass		Glass-related plant engineering
Japan		Obama	Asahi Glass		Pharmaceutical intermediates and other finechemicals
Japan		Tokyo	Nippon Electric Glass		Sales Headquarters
Japan			Sharp Corp		SHARP CORPORATION, Customer Assistance Center [Japan]
Japan		Minato	Sony Corp		Sony Corporation
Japan		Shinagawa	Sony Corp		Sony City Osaka
Japan		Shinagawa	Sony Corp		Gotenyama Technology Center
Japan		Koto	Sony Corp		Ariake Business Center
Japan		Kanagawa	Sony Corp		Atsugi Technology Center
Japan		Kanagawa	Sony Corp		Atsugi Technology Center No.2
Japan		Fujisawa	Sony Corp		Shonan Technology Center
Japan		Tagajo	Sony Corp		Sendai Technology Center
Japan		Azumino	Sony Corp		Nagano Business Center
Japan		Tokyo	Fujifilm		
Japan		Tokyo	Fujitsu		Headquarters
Japan		Kawasaki	Fujitsu		Research & Manufacturing Facilities
Japan			3D Systems Corp		
Japan		Yokohama	ARM Holdings PLC		
Japan		Tokyo	ASML Holding NV		
Japan		Tokyo	Brocade Communications		Brocade Communications Systems K.K.
Japan		Osaka	Brocade Communications		
Japan		Tokyo	CSR Plc	10215	Sales
Japan		Tokyo	Infineon Technologies AG		Headquarters - Infineon Technologies Japan K.K.
Japan		Nagoya	Infineon Technologies AG		Office
Japan		Osaka	Infineon Technologies AG		Office
Japan		Tokyo	Infoblox Inc.		sales support offices
Japan		Tokyo	Aixtron	5,748	Sales, Services
Japan		Tokyo	STMicroelectronics		Sales Office & Representative
Japan		Nagoya	STMicroelectronics		Sales Office & Representative
Japan		Osaka	STMicroelectronics		Sales Office & Representative
Japan		Tokyo	Stratysys Ltd	862	Objet Japan Co., Ltd. office space
Japan		Osaka	Stratysys Ltd		
Japan			TE Connectivity Ltd.	2	Manufacturing Plants
Japan		Osaka	Vtech Holdings		Regional Office - Electronic Learning Products
Japan		Tokyo	Vtech Holdings		Liaison Office - Contract Manufacturing Services
Japan		Yokohama	Wolfson		
Japan		Osaka	Wolfson		
Japan		Tokyo	Western Digital Corp		
Japan			Western Digital Corp	578000	Manufacturing of head wafers and head development
Japan		Odawara	Western Digital Corp	661000	Product development
Japan		Fujisawa	Western Digital Corp		Sales Office
Japan		Tokyo	ZTE Corp		Sales Offices
Japan		Tokyo	Belden		Office
Japan		Tokyo	Emulex Corp		
Japan		Tokyo	Huawei		Sales, logistics, finance, administration and human resources
Japan		Tokyo	Logitech International S A	10100	
Japan		Tokyo	Logitech International S A	33000	Distribution center
Japan		Yokohama	OmniVision		
Japan		Osaka	OmniVision		
Japan		Tokyo	QLogic Corp		
Japan		Tokyo	RF Microdevices		Sales & Customer Support Center
Japan		Tokyo	Skyworks		
Japan		Tokyo	TriQuint	2000	Engineering and marketing
Japan		Tokyo	Veeco Instruments Inc		
Japan		Tokyo	Xyratex		Office
Japan		Uji	Panasonic		Capacitor Business Division; Conductive Polymer Capacitor Division; Aluminum Capacitor Division Uji
Japan		Yamaguchi	Panasonic		Capacitor Business Division Aluminum Capacitor Division Yamaguchi
Japan		Matsue	Panasonic		Capacitor Business Division Film Capacitor Division
Japan		Osaka	Panasonic		Circuit Components Business Division
Japan		Okayama	Panasonic		Semiconductor Production Plants
Japan			Panasonic		Semiconductor Production Plants
Japan		Kyoto	Panasonic		Semiconductor Production Plants
Japan		Kagoshima	Panasonic		Semiconductor Production Plants
Japan		Osaka	Panasonic		Suminoe Plant
Japan		Kasai	Panasonic		Kasai Plant
Japan		Sumoto	Panasonic		Sumoto Plant
Japan		Tokushima	Panasonic		Tokushima Plant
Japan		Osaka	Panasonic		Daito Region
Japan		Seishin	Panasonic		Seishin Region
Japan		Tokyo	Panasonic		Tokyo Region
Japan		Tokyo	Hitachi		Headquarters
Japan		Shinagawa	Hitachi		Headquarters
Japan		Hokkaido	Hitachi		Hokkaido Branch
Japan		Yokohama	Hitachi		Yokohama Branch
Japan		Hiroshima	Hitachi		China Branch

Source: Citi Research

Figure 985. Japan (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Japan		Takamatsu	Hitachi		Shikoku Regional Office
Japan		Sawara	Hitachi		Kyushu Branch
Japan		Sapporo	Hitachi		Hitachi Urban support Hokkaido Branch
Japan		Tokyo	Hitachi		Hitachi Transport System
Japan		Tokyo	Everlight		Sales office
Japan		Yamagata	Pioneer Corporation		Tohoku Pioneer Corporation
Japan			Pioneer Corporation		Mogami Denki Corporation
Japan			Pioneer Corporation		Tohoku Pioneer EG Corporation
Japan		Yamanashi	Pioneer Corporation		Pioneer Micro Technology Corporation
Japan		Aomori	Pioneer Corporation		Towada Pioneer Corporation
Japan		Saitama	Pioneer Corporation		Pioneer FA Corporation
Japan			Pioneer Corporation		Pioneer Investment Corporation
Japan		Kawasaki	Pioneer Corporation		Increment P Corporation
Japan		Kawasaki	Pioneer Corporation		Pioneer Service Network Corporation
Japan			Pioneer Corporation		Pio Tec, Inc.
Japan			Pioneer Corporation		Pioneer Digital Design And Manufacturing Corporation
Japan			Pioneer Corporation		Pioneer OLED Lighting Devices Corporation
Japan			Pioneer Corporation		Pioneer Sales and Marketing Corporation
Japan			Pioneer Corporation		Pioneer Home Electronics Corporation
Japan			Pioneer Corporation		Pioneer Solutions Corporation
Japan			Pioneer Corporation		Pioneer Tokyo Service, Inc.
Japan			Pioneer Corporation		TPS Corporation
Japan			Pioneer Corporation		Pioneer System Technologies Corporation
Japan			Pioneer Corporation		Pioneer Welfare Services Co., Ltd.
Japan		Tokyo	Rambus Inc		Business development
Japan		Tokyo	REC Solar ASA		Solar Sales Office
Japan		Tokyo	Toshiba		Hamamatsucho
Japan		Ome	Toshiba		Ome Complex
Japan		Yokkaichi	Toshiba		Yokkaichi Operations
Japan		Fuchu	Toshiba		Fuchu Complex
Japan		Kashiwazaki	Toshiba		Kashiwazaki Operations

Source: Citi Research



Figure 986. South Korea

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
South Korea	Cheongwon-gun	Ochang-eub	Chell Industries		Chemicals/Electronic Materials Division
South Korea	Chungbuk	Cheongju	Nidec		Development, Manufacturing, Sales and Maintenance
South Korea	Chungcheongbuk-do	Cheongju	Applied Materials Inc		Sales and Services
South Korea	Chungcheongbuk-do	Cheongju	SK Hynix		
South Korea	Chungcheongbuk-do	Cheongju	LG Electronics		LG Electronics Cheongju Plant
South Korea	Chungcheongbuk-do	Cheongju	LG Innotek		
South Korea	Chungcheongbuk-do	Cheongju	Dainippon Screen		Cheongju Service Station
South Korea	Chungcheongbuk-do	Cheongju	Tokyo Electron		Cheongju Office
South Korea	Chungcheongbuk-do	Cheongju	Asahi Glass		Glass substrates for TFT-LCDs
South Korea	Chungcheongnam-do	Cheonan	Corning		Manufacturing
South Korea	Chungcheongnam-do	Cheonan	Applied Materials Inc		Sales and Services
South Korea	Chungcheongnam-do	Cheonan	Lam Research Corp		Office
South Korea	Chungcheongnam-do	Cheonan	Samsung SDI		Samsung SDI Cheonan
South Korea	Chungcheongnam-do	Cheonan	Tokyo Electron		Cheonan Office
South Korea	Cyungbuk	Gumi	Chell Industries		Chemicals/Electronic Materials Division
South Korea	Dong	Daegu	Cisco Systems Inc		Hitachi Chemical Electronic Materials (South Korea)
South Korea	Gangnam	Seoul	Hitachi		
South Korea	Gangnam-gu	Seoul	Cisco Systems Inc		
South Korea	Gangseo	Busan	Samsung Electro-Mechanics		Bussan Plant
South Korea	Gangwon	Wonju	Entegris Inc		
South Korea	Geumcheon	Seoul			LG-Hitachi Water Solutions Co
South Korea	Geumcheon-gu	Seoul	Taiyo Yuden		Seoul Office
South Korea	Geumchon	Paju	Tokyo Electron		Paju Office
South Korea	Gyeongbuk	Daegu	IBIDEN Graphite Korea Co., Ltd.		
South Korea	Gyeonggi-do	Seoul	Amphenol		Amphenol Commercial Interconnect Korea Co., Ltd.
South Korea	Gyeonggi-do	Seongnam-si	Applied Materials Inc		Main Office
South Korea	Gyeonggi-do	Hwaseong	Applied Materials Inc		Sales and Services
South Korea	Gyeonggi-do	Icheon	Applied Materials Inc		Sales and Services
South Korea	Gyeonggi-do	Paju-si	Applied Materials Inc		Sales and Services
South Korea	Gyeonggi-do	Seoul	Intersil Corp.		Sales Office
South Korea	Gyeonggi-do	Hwaseong	KLA Tencor Corp		Office
South Korea	Gyeonggi-do	Hwaseong	Lam Research Corp		Office
South Korea	Gyeonggi-do	Hwaseong	Lam Research Corp		Office
South Korea	Gyeonggi-do	Icheon	Lam Research Corp		Office
South Korea	Gyeonggi-do	Suwon	QUALCOMM Incorporated		Spansion
South Korea	Gyeonggi-do	Seongnam	Spansion		Spansion International, Inc. - Korea Branch
South Korea	Gyeonggi-do	Suwon-si	Centrotherm Photovoltaics		Centrotherm photovoltaics Korea Ltd.
South Korea	Gyeonggi-do	Icheon	SK Hynix		Headquarters
South Korea	Gyeonggi-do	Seongnam-si	SK Hynix		Flash Solution Design Center
South Korea	Gyeonggi-do				LG Electronics Anyang Institute, LG Electronics
South Korea	Gyeonggi-do				Digital Park
South Korea	Gyeonggi-do	Ansan	LG Innotek		Field of Research performed at Patterning - Thermal Solution - Optical - Software - Simulation
South Korea	Gyeonggi-do	Paju	LG Innotek		
South Korea	Gyeonggi-do	Suwon	Samsung Electro-Mechanics		Headquarters - Suwon Plant
South Korea	Gyeonggi-do	Yongin	Samsung SDI		Samsung SDI Headquarters
South Korea	Gyeonggi-do	Seongnam-si	Samsung Techwin		Headquarters, R&D Center
South Korea	Gyeonggi-do	Uiwang-si	Chell Industries		Chemicals/Electronic Materials Division
South Korea	Gyeonggi-do	Suwon	AAC Technologies Holdings		Office
South Korea	Gyeonggi-do	Seongnam	Richtek Technology		Korea Office
South Korea	Gyeonggi-do	Bundang-gu	MediaTek		MediaTek Korea Inc. (Seongnam)
South Korea	Gyeonggi-do	Icheon	E Ink Holdings		Hydis Technologies
South Korea	Gyeonggi-do	Paju	ASE	810000	Packaging and Testing
South Korea	Gyeonggi-do		WPG Holding		
South Korea	Gyeonggi-do	Suwon-si	Hostiden		Suwon Sales Office
South Korea	Gyeonggi-do	Icheon	Dainippon Screen		Icheon Service Station
South Korea	Gyeonggi-do	Hwaseong	Dainippon Screen		Hwaseong Service Station
South Korea	Gyeonggi-do	Yongin	Olympus		Olympus Korea Service Co., Ltd.
South Korea	Gyeonggi-do	Seongnam	Tokyo Electron		Bundang Office
South Korea	Gyeonggi-do	Hwaseong	Tokyo Electron		Balan Factory
South Korea	Gyeonggi-do	Hwaseong	Tokyo Electron		Hwaseong Office
South Korea	Gyeonggi-do	Paju	Nippon Electric Glass		Manufacturing Plant : Glass for LCD substrates
South Korea	Gyeonggi-do	Pyeongtaek-si	Veeco Instruments Inc		
South Korea	Gyeongsangbuk-do	Gumi	Corning		Manufacturing
South Korea	Gyeongsangbuk-do	Gumi	Applied Materials Inc		Sales and Services
South Korea	Gyeongsangbuk-do	Gumi	Intel		
South Korea	Gyeongsangbuk-do	Gumi	LG Electronics		LG Electronics Gumi Plant
South Korea	Gyeongsangbuk-do	Gumi	LG Innotek		
South Korea	Gyeongsangbuk-do	Gumi	LG Innotek		Touch Window, Electronic Material, Lead Frame
South Korea	Gyeongsangbuk-do	Gumi	LG Innotek		Photo Mask, Tape Substrate
South Korea	Gyeongsangbuk-do	Gumi	Tokyo Electron		Gumi Office
South Korea	Gyeongsangbuk-do	Gumi	Asahi Glass		Glass substrates for TFT-LCDs
South Korea	Gyeongsangbuk-do	Gumi	Nippon Electric Glass		Manufacturing Plant : Substrate glass for LCDs
South Korea	Gyeongsangnam-do		LG Electronics		LG Electronics Changwon Plant
South Korea	Gyeongsangnam-do	Changwon	Hostiden		Manufacturing Division
South Korea	Gyeongsangnam-do	Changwon	Taiyo Yuden		Sales Office/Manufacturing/Development
South Korea	Gyeongsangnam-do	Tongyeong	Taiyo Yuden		Manufacturing Base
South Korea	Gyeongsangnam-do	Sachon	Taiyo Yuden		
South Korea	Gyunggi-do	Hwasung	ASML Holding NV		ASML Holding NV
South Korea	Gyunggi-do	Ichon	ASML Holding NV		ASML Holding NV
South Korea	Gyunggi-do	Seongnam	CSR Plc		
South Korea	Gyunggi-do	Sungnam-si	Wolfson		
South Korea	Gyunggi-do	Ansan	Molex		Molex Korea Co., Ltd.
South Korea	Jeollanamdo	Yeosu-si	Chell Industries		Chemicals/Electronic Materials Division
South Korea	Jeollanamdo	Suncheon	Shinko Electric Industries		Plants & Facilities - KOREA SHINKO
South Korea	Jongno	Seoul	Hitachi		Hitachi Transport System
South Korea	Jung Gu	Busan	Cisco Systems Inc		
South Korea	Kyenggi-do	Osan-si	LG Innotek		
South Korea	Kyonggi	Icheon	Tokyo Electron		Icheon Office
South Korea	Kyonggi	Seongnam	Entegris Inc		
South Korea	Kyonggi	Bucheon	Fairchild Semiconductor International		Design Centers
South Korea	Kyonggi	Bucheon	Fairchild Semiconductor International		Manufacturing Sites
South Korea	Kyonggi	Hwasung	Amphenol		Amphenol MPC Korea Limited
South Korea	Kyunggi		Cypress Semiconductor Corp		

Source: Citi Research

Figure 987. South Korea (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
South Korea	Kyunggi		ASE		
South Korea	Kyunggi	Sungnam-si	Advanced Energy Industries, Inc		AE Korea, Ltd.
South Korea	Kyunggi	Suwon City	Zhen Ding Tech		Service center
South Korea	Kyunggi-do		ASML Holding NV		
South Korea	Magpo	Seoul	Hitachi		LG Hitachi Ltd.
South Korea	Seochcho District	Seoul	Samsung Electro-Mechanics		Seoul Office
South Korea	Youngdeungpo-gu	Seoul	Cisco Systems Inc		
South Korea		Sungnam-si	Jabil	1,000	Support
South Korea		Bucheon	Amphenol		Amphenol DaeShin Elect and Precision Co., Ltd
South Korea		Ansan	Amphenol		Amphenol Korea Air Electronics 119-69 Sasa-Dong
South Korea		Chung Nam-do	Amphenol		U-JIN Cable Industrial Co. Ltd.
South Korea		Seoul	Sensata	133000	Manufacturing
South Korea		Chongcheongnam	Sensata		Business Centre
South Korea		Seoul	Celestica		
South Korea		Seoul	Arrow Electronics		Office
South Korea		Guro	Arrow Electronics		Office
South Korea		Seoul	IBM (International Business Machines Corp)		IBM Korea, Inc.
South Korea		Seoul	Hewlett Packard		Office
South Korea		Seoul	Hewlett Packard		Office
South Korea		Gwacheon	Hewlett Packard		Office
South Korea		Daegu	Hewlett Packard		Office
South Korea		Suwon	Hewlett Packard		Office
South Korea		Busan	Hewlett Packard		Office
South Korea		Cheonan	Hewlett Packard		Office
South Korea		Guangzhou	Hewlett Packard		Office
South Korea		Seoul	EMC Corp		
South Korea		Seoul	EMC Corp		
South Korea			EMC Corp		
South Korea		Cheonan	EMC Corp		
South Korea		Daejeon	EMC Corp		
South Korea		Seoul	EMC Corp		
South Korea		Seoul	NetApp Inc		
South Korea		Seoul	Xerox		Office
South Korea		Seoul	Lexmark		Lexmark
South Korea		Seoul	Corning		Office
South Korea		Daejeon	Cisco Systems Inc		
South Korea		Incheon	Cisco Systems Inc		
South Korea		Seoul	Blackberry		
South Korea		Seoul	Motorola Solutions		Sales Office
South Korea		Gwangju	Amkor Technology Inc	1,218,000	Packaging and test services; wafer bump services
South Korea		Seoul	Amkor Technology Inc		Packaging services; package and process
South Korea		Puypung	Amkor Technology Inc	698,000	development
South Korea		Incheon	Amkor Technology Inc	404,000	Packaging and test services
South Korea		Gyeonggi-do	ATMI Inc	432,000	Sales & Customer Service
South Korea		Yongin	Brooks Automation Inc	49600	Manufacturing, R&D and sales & support
South Korea		Wonju	Entegris Inc	35,000	Manufacturing
South Korea		Seoul	Fairchild Semiconductor International		Regional Sales and Customer Service Centers
South Korea		Hwasung	Fairchild Semiconductor International		Warehouse space
South Korea		Gyeonggi-do	FormFactor Inc	7,979	Sales office, product design, field service, and
South Korea		Gyeonggi-do	FormFactor Inc	1,000	Sales office, field service, and repair center
South Korea		Seoul	International Rectifier Corp		
South Korea		Icheon	KLA Tencor Corp		
South Korea		Seoul	Linear Technology		Office
South Korea		Cheongju	MagnaChip Semiconductor Corp		Manufacturing
South Korea		Gumi	MagnaChip Semiconductor Corp		Manufacturing
South Korea		Seoul	MagnaChip Semiconductor Corp		Sales Office
South Korea		Gyeongsangbuk-do	Maxim Integrated		Office
South Korea		Seoul	Maxim Integrated		Design Center
South Korea		Seoul	Maxim Integrated		Sales office
South Korea		Seoul	Microchip Technology		
South Korea		Gyeonggi-do	On Semiconductor		Sales Office
South Korea		Seoul	Semtech		
South Korea		Seoul	Silicon Laboratories, Inc		
South Korea		Seoul	Teradyne		Local Sales and Support Office
South Korea		Seoul	Arris Enterprises, Inc.		
South Korea		Seoul	Alcatel Lucent SA		
South Korea		Seoul	Alcatel Lucent SA		
South Korea		Seoul	Ciena Corp		Office
South Korea		Seoul	Ericsson LM		Office
South Korea		Seoul	F5 Networks		Office
South Korea		Gwangju	Finisar Corp.	34500	Office
South Korea		Gwangju	Finisar Corp.	24000	Office
South Korea		Seoul	JDSU Corp.		Office
South Korea		Seoul	Juniper Networks Inc		
South Korea		Daejeon	Oclaro Inc.	7000	Administrative, manufacturing and research and
South Korea		Seoul	Polycom Inc.		Office
South Korea		Seoul	Riverbed Technology		
South Korea		Seoul	Tellabs, Inc.		Sales Office
South Korea		Seoul	Advanced Micro Devices, Inc		
South Korea		Seoul	Altera Corp		
South Korea		Seoul	Broadcom		Office
South Korea		Seoul	Freescale Semiconductor Ltd.		Office
South Korea		Seoul	Micron		Design & Sales
South Korea		Seoul	Marvell		
South Korea		Seoul	Intel		
South Korea		Seoul	Intel		
South Korea		Seoul	NVIDIA		Office
South Korea		Seoul	QUALCOMM Incorporated		
South Korea		Seoul	Xilinx Inc		
South Korea		Seoul	Xilinx Inc		
South Korea		Yoido-dong	Xilinx Inc		

Source: Citi Research

Figure 988. South Korea (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
South Korea		Daejeon	Manz AG		Sales & Service
South Korea		Seoul	SMA Solar Technology		SMA Technology Korea Co., Ltd.
South Korea		Seoul	SK Hynix		Marketing & Sales Division
South Korea		Seoul	LG Display		Headquarters, Sales & Financial Administration
South Korea		Seoul	LG Display	48400000	Paju Plant, Production
South Korea		Seoul	LG Display		Gumi Plant, Production
South Korea		Seoul	LG Electronics		Headquarters + 7 Offices
South Korea		Incheon	LG Electronics		LG Electronics Incheon Campus
South Korea		Seoul	LG Innotek		Overseas Marketing - Management and Managerial
South Korea		Gwangju	LG Innotek		
South Korea		Sejong	Samsung Electro-Mechanics		Sejong Plant
South Korea		Seoul	Samsung Electronics		HQ - Samsung Electronics
South Korea		Ulsan	Samsung SDI		Samsung SDI Ulsan
South Korea		Seoul	Mitsubishi Electric		Mitsubishi Electric Korea Co., Ltd.
South Korea		Seoul	Mitsubishi Electric		Mitsubishi Elevator Korea Co., Ltd.
South Korea		Seoul	Mitsubishi Electric		Mitsubishi Electric Automation Korea Co., Ltd.
South Korea		Seoul	Acer Inc.		Acer Asia Pacific
South Korea		Seoul	NEC		NEC Corporation of Korea
South Korea		Seoul	NEC		NEC TOKIN Korea, Co., Ltd.
South Korea		Seoul	Delta Electronics		Delta Electronics
South Korea		Seoul	Foxconn International Holdings		R&D
South Korea		Seoul	MediaTek		MediaTek Korea Inc.(Seoul)
South Korea		Seoul	AU Optonics		Office
South Korea		Seoul	TPK		TPK Korea Office
South Korea		Seoul	ASE		
South Korea		Seoul	Sun Edison		
South Korea		Seoul	Suntech Power Holdings		
South Korea		Seoul	Trina Solar Limited		Trina Solar (Korea) Ltd
South Korea		Seoul	TSMC		Offices
South Korea		Seoul	UMC		Subsidiary
South Korea		Seoul	WPG Holding		Office
South Korea		Seoul	Sunpower Corporation		Head Office
South Korea		Gwangju	Alps Electric		Head Office
South Korea		Seoul	Alps Electric		Seoul Office
South Korea		Busan	Alps Electric		Busan Office
South Korea		Suwon-si	Alps Electric		Suwon-si Office
South Korea		Seoul	Hirose Electric		Domestic Subsidiaries
South Korea		Seoul	Ibiden		IBIDEN Korea Co., Ltd.
South Korea		Seoul	Kyocera		KYOCERA Korea Co., Ltd.
South Korea		Incheon	Kyocera		KYOCERA Precision Tools Korea Co., Ltd.
South Korea		Seoul	Kyocera		KYOCERA Document Solutions Korea Co., Ltd.
South Korea		Seoul	Kyocera		AVX/KYOCERA Yuhon Hoesa
South Korea		Seoul	Murata		Sales Office
South Korea		Seoul	Rohm		Sales & QA Office - ROHM Semiconductor Korea
South Korea		Cheonan	Rohm		Sales Office - ROHM Semiconductor Korea
South Korea		Gumi	Rohm		Sales Office - ROHM Semiconductor Korea
South Korea		Changwon	Rohm		Sales Office - ROHM Semiconductor Korea
South Korea		Suwon	Rohm		Sales Office - ROHM Semiconductor Korea
South Korea		Seoul	Rohm		Overseas Manufacturing Centers - ROHM Korea
South Korea		Seoul	Shikoku Electric Industries		Sales Office - KOREA SHINKO TRADING CO., LTD.
South Korea		Seoul	TDK Corporation		TDK Korea Corporation
South Korea		Gyeonggi	Nidec		R&D, manufacturing and Sales
South Korea		Seoul	Nidec		Manufacturing
South Korea		Seoul	Mitsumi Electric		Sales Office
South Korea		Seoul	Mabuchi Motor		Sales Office
South Korea		Seoul	Dainippon Screen		Head Office - Dainippon Screen (Korea) Co., Ltd.
South Korea		Cheonan	Dainippon Screen		Cheonan Service Station
South Korea		Seoul	Hoya Corporation		HOYA LENS KOREA CO., LTD.
South Korea		Gyeonggi	Hoya Corporation		HOYA ELECTRONICS KOREA CO., LTD
South Korea		Seoul	Olympus		Sale of imaging products and medical endoscopes
South Korea		Seoul	Nikon		
South Korea		Seoul	Nikon		
South Korea		Seoul	Nikon		
South Korea		Seoul	Ricoh Co		Sales & Services - Ricoh Korea Co., Ltd.
South Korea		Seoul	Seiko Epson		Epson Korea Co., Ltd.
South Korea		Seoul	Seiko Epson		Representative Offices/Branches - Seiko Epson
South Korea		Gumi	Asahi Glass		Glass substrates for PDP
South Korea		Seoul	Sony Corp		Sony Korea Corporation
South Korea		Seoul	Fujifilm		
South Korea		Chungcheongnam	Fujifilm		
South Korea		Seoul	Fujitsu		Fujitsu Semiconductor Korea Limited
South Korea		Suncheon-city	Fujitsu		Office
South Korea		Seoul	3D Systems Corp		11000 development, marketing sales and service
South Korea		Seoul	ARM Holdings PLC		
South Korea		Seoul	Brocade Communications		Brocade Korea Ltd.
South Korea		Gumi	CSR Plc		2170 Sales and Customer Support
South Korea		Seoul	CSR Plc		17222 Sales and Customer Support
South Korea		Seoul	Infineon Technologies AG		Regional Subsidiaries - Infineon Korea
South Korea		Seoul	Aixtron		11,108 Sales, Services
South Korea		Suwon	Seagate Technology		220,000 Product development
South Korea		Seoul	STMicroelectronics		Manufacturing & Design Center, Sales Office &
South Korea		Seoul	Stratysys Ltd		
South Korea		Seoul	TE Connectivity Ltd.		1 Manufacturing Plant
South Korea		Johor	Western Digital Corp		270600 Manufacturing of substrates

Source: Citi Research

Figure 989. South Korea (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
South Korea		Seoul	ZTE Corp		Sales Office
South Korea		Seoul	Belden		Sales Offices
South Korea		Seoul	Huawei		
South Korea		Seoul	Omnivision		
South Korea		Seoul	RF Microdevices		Sales & Customer Support Center
South Korea		Seoul	Skyworks		22900 Design Center
South Korea		Seoul	TriQuint		6700 Engineering and marketing
South Korea		Yongin	Veeco Instruments Inc		56000 Sales Office, Customer Training Center & R&D
South Korea		Seoul	Panasonic		Semiconductor Sales office
South Korea		Seoul	Panasonic		Sales Office
South Korea		Seoul	Panasonic		Sale / Marketing
South Korea		Seoul	Hitachi		Hitachi South Korea Ltd.
South Korea		Seoul	Everlight		Sales Office
South Korea		Seoul	Pioneer Corporation		Pioneer Korea Corporation
South Korea		Seoul	Brother Industries Ltd		Sales Facilities
South Korea		Seoul	Rambus Inc		Business development
South Korea		Seoul	Toshiba		Toshiba Elevator South Korea Inc.
South Korea		Seoul	Toshiba		Toshiba Electronics South Korea Corporation
South Korea		Seoul	Toshiba		Toshiba TEC South Korea Co., Ltd.
South Korea		Seoul	Toshiba		Toshiba Digital Media Network South Korea Corporation

Source: Citi Research

Figure 990. Taiwan

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Taiwan	Hsinchu	Jubei City	FormFactor Inc	9,309	Sales office, product design, field service and repair center
Taiwan	Hsinchu	Jubei City	Intel		centrotherm photovoltaics Asia Pte. Ltd. Taiwan
Taiwan	Hsinchu	Zhubei	Centrotherm Photovoltaics		Branch
Taiwan	Hsinchu	Zhubei	Vanguard International Semiconductor		Office
Taiwan	Hsinchu	Zhubei	Asahi Glass		Sales of electronics materials
Taiwan	Hsinchu	Zhubei	Brooks Automation Inc	28600	Sales & support
Taiwan	Hsinchu	Zhubei	Unimicron		Plant
Taiwan	Hsinchu	Zhubei	Fujifilm		
Taiwan	Hsin-shih	Tainan	ASML Holding NV		HQ
Taiwan	Kaohsiung County	Kaohsiung	Flexium Interconnect		
Taiwan	Miaoli	Zhunan	Innolux		Headquarters + Jhunan Operation Center + T3
Taiwan	Miaoli		Powertech Technology		Semiconductor Assembly and testing
Taiwan	Nantou		ASE	110000	Packaging services
Taiwan	Nantou		ASE	1009000	
Taiwan	Tainan		Ju Teng		Subsidiary (Hong Ya Technology Inc. )
Taiwan	Taoyuan	Chung li	Manz AG	3,55,209.04	Production, Sales & Service
Taiwan	Taoyuan		AU Optronics		Offices
Taiwan	Taoyuan		Young Fast		Headquarters
Taiwan					Zhongli Ding'an Rd Office, Zhongli Zhongbei Rd
Taiwan	Taoyuan	Zhongli City	TPK		Office
Taiwan	Taoyuan		Innolux		Innolux Corporation-Fab Pingjien
Taiwan	Taoyuan		E Ink Holdings		E Ink Linkou Office
Taiwan	Taoyuan		Unimicron		
Taiwan	Taoyuan		Hitachi		Yungtay-Hitachi Construction Machinery Co., Ltd.
Taiwan	Taoyuan	Lung Tan	Amkor Technology Inc	353,000	Packaging and test services; wafer bump services
Taiwan	Taoyuan	Chungli	ASE	1842000	Packaging and Testing
Taiwan	Taoyuan	Luchu Hsiang	Nan Ya PCB		Office
Taiwan	Taoyuan		SPL		R & D
Taiwan	Taoyuan	Ping-jen	Tripod Technology		Plant
Taiwan	Taoyuan	Guishan	Dainippon Screen		Linkou Customer Service
Taiwan	Taoyuan		Fujitsu		Office
Taiwan	Taoyuan		ASML Holding NV	96875	
Taiwan	Taoyuan	Chungli City	CSR Plc	4340	Operations
Taiwan	Taoyuan		Panasonic		Technology Domain Business
Taiwan	Taoyuan County	Pingzhen City	Flexium Interconnect		Taoyuan Office
Taiwan	Wuchi	Taichung	Nippon Electric Glass		Manufacturing Plant : Glass for LCD substrates
Taiwan	Xinshi District	Tainan	Entegris Inc		
Taiwan	Xinyi		Cisco Systems Inc		
Taiwan	Xinzhuang	New Taipei	Ju Teng		Subsidiary (GI-Li Co., Ltd. )
Taiwan	Hsinchu		Jabil	21,000	Design
Taiwan	Taichung	Jabil		419,000	Manufacturing, Design, Support, Storage
Taiwan	Taichung	Jabil		247,000	Manufacturing, Support, Storage
Taiwan	Taipei	Jabil		12,000	Design, Support, Storage
Taiwan	Taipei		Flextronics		Flextronics facilities, Design Centers
Taiwan	Taoyuan		Amphenol		Amphenol East Asia Limited-Taiwan
Taiwan	New Taipei		Amphenol		Amphenol LTW Technology Co., Ltd.
Taiwan	Taoyuan		Amphenol		SAA Taiwan
Taiwan	Taipei		Celestica		
Taiwan	Taipei	Vishay		366000	Diodes
Taiwan	Kaohsiung	Vishay		52000	MOSFETs
Taiwan	Kaohsiung		Arrow Electronics		Office
Taiwan	Hsinchu		Arrow Electronics		Office
Taiwan	Taipei		Arrow Electronics		Office
Taiwan	Taipei		IBM (International Business Machines Corp)		IBM Taiwan Corporation
Taiwan	Taipei		Hewlett Packard		Office
Taiwan	Taichung		Hewlett Packard		Office
Taiwan	Kaohsiung		Hewlett Packard		Office
Taiwan	Taipei		EMC Corp		
Taiwan	Taipei		NetApp Inc		
Taiwan	Taipei		Xerox		Office
Taiwan					American Lexmark International, Inc. Taiwan
Taiwan	Taipei		Lexmark		Branch
Taiwan	Taipei		Corning		Office
Taiwan	Taichung		Corning		Manufacturing
Taiwan	Tainan		Corning		Manufacturing
Taiwan	Taipei		Nokia		Regional Office
Taiwan	Taipei		Motorola Solutions		Sales Office
Taiwan	Hsinchu		Amkor Technology Inc	496,000	Packaging and test services; wafer bump services
Taiwan	Tainan		Applied Materials Inc	320,000	Manufacturing and Customer Support
Taiwan	Hsinchu		Applied Materials Inc		Main Office
Taiwan	Taichung		Applied Materials Inc		Sales and Services
Taiwan	Tainan		Applied Materials Inc		Sales and Services
Taiwan	Taoyuan City		Applied Materials Inc		Sales and Services
Taiwan	Tainan		Applied Materials Inc		Manufacturing
Taiwan	Hsinchu		ATMI Inc		Sales & Customer Service
Taiwan	Hsinchu		ATMI Inc		Technology Development Center
Taiwan	Tainan		Brooks Automation Inc		Office
Taiwan	Hsinchu		Entegris Inc	20,000	
Taiwan	Hsinchu		Entegris Inc		
Taiwan	Hsinchu		Entegris Inc		
Taiwan					Office facilities, warehouse and design center
Taiwan	Taipei		Fairchild Semiconductor International		

Source: Citi Research

Figure 991. Taiwan (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Taiwan		Hsinchu	FormFactor Inc		
Taiwan	Taipei		International Rectifier Corp	1,267	Sales office, field service, and repair center
Taiwan	Taipei		Intersil Corp.		Sales office
Taiwan	Hsinchu		KLA Tencor Corp	73,676	Office
Taiwan	Taoyuan City		KLA Tencor Corp		
Taiwan	Tainan		KLA Tencor Corp		
Taiwan	Taichung		KLA Tencor Corp		
Taiwan	Kaohsiung		KLA Tencor Corp		
Taiwan	Hsinchu		Lam Research Corp		Office
Taiwan	Taoyuan City		Lam Research Corp		Office
Taiwan	Taichung		Lam Research Corp		Office
Taiwan	Tainan		Lam Research Corp		Office
Taiwan	Taipei		Magnachip Semiconductor Corp		Sales Office
Taiwan	Taipei		Maxim Integrated		Design Center
Taiwan	Taipei		Maxim Integrated		Sales Office
Taiwan	Taipei		Microchip Technology		
Taiwan	SBIP Hsinchu		Microchip Technology		
Taiwan	Kaohsiung		Microchip Technology		
Taiwan	Taiwan		On Semiconductor		Sales Office
Taiwan	Taipei		Semtech		
Taiwan	Taipei		Silicon Laboratories, Inc		
Taiwan	Hsinchu		Teradyne	43,000	Semiconductor Test & Systems Test Group
Taiwan	Taoyuan City		Teradyne		Local Sales and Support Office
Taiwan	Taipei		Alcatel Lucent SA		
Taiwan	Taipei		Ericsson LM		Office
Taiwan	Taipei		FS Networks		Office
Taiwan	Taipei		JDSU Corp.		Sales Office
Taiwan	Taipei		Juniper Networks Inc		
Taiwan	Taipei		Polycom Inc.		Office
Taiwan	Taipei		Riverbed Technology		
Taiwan	Hsinchu		Advanced Micro Devices, Inc		
Taiwan	Kaohsiung		Advanced Micro Devices, Inc		
Taiwan	Taipei		Advanced Micro Devices, Inc		
Taiwan	Taipei		Altera Corp		
Taiwan	Hsinchu		Broadcom		Office
Taiwan	Taipei		Broadcom		Office
Taiwan	Hsinchu		Cypress Semiconductor Corp		
Taiwan	Taipei		Cypress Semiconductor Corp		
Taiwan	Taichung		Micron		Wafer fabrication
Taiwan	Taipei		Micron		Sales
Taiwan	Kaohsiung		Intel		
Taiwan	Taipei		Intel		
Taiwan	Taipei		NVIDIA		Office
Taiwan	Hsinchu		NVIDIA		Office
Taiwan	Hsinchu		QUALCOMM Incorporated		
Taiwan	Longtan		QUALCOMM Incorporated		
Taiwan	New Taipei		QUALCOMM Incorporated		
Taiwan	Taipei		QUALCOMM Incorporated		
Taiwan	Taipei		Qualcomm		Spanion International, Inc. - Taiwan Branch
Taiwan	Taipei		Texas Instruments		
Taiwan	Taichung		Xilinx Inc		
Taiwan	Taipei		Xilinx Inc		
Taiwan	Taichung		Manz AG		service
Taiwan	Tainan		Manz AG		Service
Taiwan	Taipei		SK Hynix		Headquarters, SK hynix Semiconductor Taiwan Inc.
Taiwan	Taipei		SK Hynix		Headquarters, SK hynix flash solutions Taiwan Ltd.
Taiwan	Zhubei		LG Display		Sales
Taiwan	Taipei		LG Electronics		LG Electronics Taiwan Taipei Co.,Ltd., Marketing
Taiwan	Taipei		LG Innotek		LG Innotek Taiwan Co., Ltd (LGITTW)
Taiwan	Taipei		Samsung Electro-Mechanics		Overseas Sales Offices
Taiwan	Taipei		Samsung SDI		Taiwan Branch
Taiwan	Taipei		Chell Industries		Chemicals/Electronic Materials Division
Taiwan	Taipei		Mitsubishi Electric		Mitsubishi Electric Taiwan Co., Ltd.
Taiwan	Taipei		AAC Technologies Holdings		Office
Taiwan	Taipei		Acer Inc		Acer Inc - Taiwan (World & Regional Headquarters)
Taiwan	Taipei		ASUSTek COMPUTER INC		ASUSTek COMPUTER INC. (Taiwan), Headquarters
Taiwan	Taipei		NEC		NEC Logistics Taiwan Ltd.
Taiwan	Taipei		NEC		NEC Taiwan Ltd.
Taiwan	Taipei		NEC		NEC TOKIN Taiwan Co.,Ltd.
Taiwan	Tainan		Catcher Technology	785765	Catcher Headquarters
Taiwan	Tainan		Catcher Technology	52645	Catcher (Tainan Technology Based Industrial Park)
Taiwan	New Taipei		Chicony Electronics		Chicony Electronics Co., Ltd.
Taiwan	Taipei		Compal Electronics		Compal Electronics, Inc.
Taiwan	Taipei		Delta Electronics		Taipei Headquarters
Taiwan	Taipei		Delta Electronics		Taipei (Yangguang)
Taiwan	Taoyuan City		Delta Electronics		Taoyuan Plant 1
Taiwan	Taoyuan City		Delta Electronics		Taoyuan Plant 2
Taiwan	Taoyuan City		Delta Electronics		Taoyuan R&D Center
Taiwan	Taoyuan City		Delta Electronics		Chungli Plant 1
Taiwan	Taoyuan City		Delta Electronics		Chungli Plant 2

Source: Citi Research

Figure 992. Taiwan (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Taiwan	Taichung		Delta Electronics		Taichung Branch Office
Taiwan	Tainan		Delta Electronics		Tainan Plant
Taiwan	Taipei		Compal Communications		Headquarter
Taiwan	Taipei		Foxconn International Holdings		R&D
Taiwan	Taichung		Larga Precision		Larga Precision Co.,Ltd
Taiwan	Chupeh		Richtek Technology		Headquarters
Taiwan	Taipei		Richtek Technology		Taipei Office
Taiwan	Hsinchu		MediaTek		Headquarters
Taiwan	Jhubei City		MediaTek		Ralink Technology Corporation (Jhubei)
Taiwan	Taipei		MediaTek		MediaTek Inc. (Taipei office)
Taiwan	Taipei		Pegatron		Operation Sites
Taiwan	Taoyuan City		Pegatron		Operation Sites
Taiwan			Quanta Computer Inc		Quanta Computer Inc
Taiwan	Taipei		Wistron Corporation		Global R&D center
Taiwan	Hsinchu		Wistron Corporation		Global Manufacturing center, Global service center
Taiwan	Hsinchu		Simplo Technology		
Taiwan	Hsinchu		AU Optronics		Headquarters
Taiwan	Taichung		AU Optronics		Offices
Taiwan	Taipei		Young Fast		Headquarters
Taiwan	Taichung		Wintek		Headquarters - Marketing, Production, RD Center
Taiwan	Youth		Wintek		Production
Taiwan	Taipei		TPK		Headquarters
Taiwan	New Taipei		TPK		Xinzhuan Office
Taiwan	New Taipei		TPK		Wuji Office
Taiwan	New Taipei		TPK		Bangiao Office
Taiwan	Kaohsiung		Radiant Opto-Electronics		Headquarters + 6 factories
Taiwan	Tainan		Innolux		6 Offices
Taiwan	Kaohsiung		Innolux		Office
Taiwan	Taipei		Innolux		2 Offices
Taiwan	Hsinchu		E Ink Holdings		Headquarters - E Ink Holdings
Taiwan	Taipei		E Ink Holdings		E Ink Taipei Office
Taiwan	Kaohsiung		ASE	3946000	Packaging facility
Taiwan	Kaohsiung		ASE	864000	Testing
Taiwan	Chungli		ASE	62000	Wafer probing testing
Taiwan	Taichung		ASE	161000	Packaging and testing
Taiwan	Hsinchu		ASE		
Taiwan	Hsinchu		Chipbond Technology		
Taiwan	Kaohsiung		Chipbond Technology		
Taiwan	Taipei		Advanced Energy Industries, Inc		Advanced Energy Taiwan, Ltd.
Taiwan	Shinwu		Kinsus Interconnect Technology		
Taiwan	YangMei		Kinsus Interconnect Technology		
Taiwan	Hsinchu		TSMC		Headquarters
Taiwan	Tainan		TSMC		Offices
Taiwan	Taichung		TSMC		Offices
Taiwan	Hsinchu		UMC		Wafer production
Taiwan	Hsinchu		UMC		Wafer production
Taiwan	Taoyuan City		UMC		Cell production
Taiwan	Taichung		UMC		
Taiwan	Tainan		UMC		R&D
Taiwan	Hsinchu		UMC		
Taiwan	Taipei		UMC		Office
Taiwan	Tainan		UMC		
Taiwan	Hsinchu		UMC		Wafer production
Taiwan	Taipei		Nan Ya PCB		Office
Taiwan	Hsinchu		Novatek		Headquarters
Taiwan	Taipei		Novatek		Sales Office
Taiwan	Hsinchu		Novatek		
Taiwan	Hsinchu		Powertech Technology		Headquarters
Taiwan	Taichung		SPIL		Headquarters & Da Fong Facility
Taiwan	Hsinchu		SPIL		Branch Company
Taiwan	Changhua		SPIL		Changhua Facility
Taiwan	Taipei		WPG Holding		Headquarters
Taiwan	Taipei		Alps Electric		Head Office
Taiwan	Taipei		Hirose Electric		Taiwan-Electronics Co., Ltd.
Taiwan	Taipei		Hosiden		Taiwan Hosiden Co., Ltd.
Taiwan	Kaohsiung		Ibiden		IBIDEN Taiwan Co., Ltd
Taiwan	Taipei		Kyocera		KYOCERA Document Solutions Taiwan Corporation
Taiwan	Taichung		Murata		Production and Sales
Taiwan	Taipei		Rohm		Sales Office - ROHM Semiconductor Taiwan Co., Ltd.
Taiwan	Kaohsiung		Rohm		Sales Office - ROHM Semiconductor Taiwan Co., Ltd.
Taiwan	Taipei		Shinko Electric Industries		Head Office - TAIWAN SHINKO ELECTRONICS CO., LTD.
Taiwan	Kaohsiung		Shinko Electric Industries		Sales Office - TAIWAN SHINKO ELECTRONICS CO., LTD.
Taiwan	Taipei		Taiyo Yuden		Sales Office/Manufacturing/Development
Taiwan	Tainan		TDK Corporation		TDK TAIWAN CORPORATION
Taiwan	Kaohsiung		Nidec		R&D
Taiwan	Taichung		Nidec		Manufacturing
Taiwan	Taipei		Mitsumi Electric		Manufacturing
Taiwan	Kaohsiung		Mitsumi Electric		Sales Office
Taiwan	Kielung		Mitsumi Electric		TAIWAN MITSUMI CO., LTD.
Taiwan	Hsinchu		Mabuchi Motor	41000	Equipment
Taiwan	Kaohsiung		Mabuchi Motor	31000	Factory for Parts and Production Equipment
Taiwan	Taichung		Canon		Digital cameras, network cameras, EF lenses, multimedia projector lenses and other lenses, precision-metal molds
Taiwan	Taipei		Canon		All product segments
Taiwan	Hsinchu		Canon		Industrial equipment, semiconductor equipment
Taiwan	Hsinchu		Dainippon Screen		Head Office - Dainippon Screen Electronics (Taiwan) Co., Ltd.
Taiwan	Taichung		Dainippon Screen		Taichung Customer Service Center
Taiwan	Tainan		Dainippon Screen		Tainan Customer Service Center
Taiwan	Taipei		Dainippon Screen		Dainippon Screen (Taiwan) Co., Ltd.
Taiwan	Taipei		Hoya Corporation		HOYA LENS TAIWAN LTD.
Taiwan	Miaoli		Hoya Corporation		HOYA MICROELECTRONICS TAIWAN CO., LTD.
Taiwan	Taichung		Olympus		Olympus Taiwan Co., Ltd

Source: Citi Research

Figure 993. Taiwan (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Taiwan			Nikon		
Taiwan			Nikon		
Taiwan	Taipei		Ricoh Co		Sales & Services - Ricoh Taiwan Co., Ltd
Taiwan	Taipei		Seiko Epson		Epson Taiwan Technology & Trading Ltd.
Taiwan	Hsinchu		Tokyo Electron		Service, sales & R&D
Taiwan	Doulu city		Asahi Glass		Glass substrates for TFT-LCDs
Taiwan	Taipei		Sharp Corp		SHARP CORPORATION (TAIWAN) [Taiwan]
Taiwan			Sony Corp		Sony Taiwan Limited.
Taiwan	New Taipei		HTC Corporation		Operations Office
Taiwan	Taoyuan City		HTC Corporation		Operations Office
Taiwan	Taipei		Fujitsu		Fujitsu Components Asia Pte. Ltd.
Taiwan	Taipei		ARM Holdings PLC		
Taiwan	Hsinchu		ARM Holdings PLC		
Taiwan	Hsinchu		ASML Holding NV		Head Office
Taiwan	Taipei		Brocade Communications		Brocade Communications Systems Taiwan Ltd.
Taiwan	Taipei		CSR Pte	32087	R&D, Sales and Administration
Taiwan	Hsinchu		CSR Pte	6121	Sales
Taiwan	Taipei		Garmin Ltd.	249,326	Facilities - Garmin (Asia) Corporation
Taiwan	Tao-Yang		Garmin Ltd.	223,469	
Taiwan	Tao-Yang		Garmin Ltd.	580,000	
Taiwan	Taipei		Infineon Technologies AG		Regional Subsidiaries - Infineon Taiwan
Taiwan	Hsinchu		Aixtron	20,376	Sales, Services
Taiwan	Tainan		Aixtron	2,185	Sales
Taiwan	Taipei		STMMicroelectronics		Sales Office & Representative
Taiwan	Taipei		Wolfson		
Taiwan	Bang Pa In		Western Digital Corp	1665200	HGAs, and research and development
Taiwan	Taipei		ZTE Corp		Sales Office
Taiwan	Taipei		Emulex Corp		Office
Taiwan	Taipei		Hi-P International		Marketing & RESI Centers
Taiwan	Hsinchu		Logitech International S A	116500	assurance and administration
Taiwan	Dayuan Township		Logitech International S A	18100	Distribution center
Taiwan	Taipei		OmniVision		
Taiwan	Hsinchu		OmniVision		
Taiwan	Taoyuan City		QLogic Corp		
Taiwan	Taipei		RF Microdevices		Sales & Customer Support Center
Taiwan	Taipei		Silitech Technology		
Taiwan	Taipei		Skyworks		
Taiwan	Taipei		TriQuint	2600	Engineering and marketing
Taiwan	Hsinchu		Veeco Instruments Inc	13500	Sales Office, Process Development, & Customer Training Center
Taiwan	Taipei Hsein		Molex		Wafer Plant & Sales Office
Taiwan	Taipei		Panasonic		Semiconductor Sales office
Taiwan	Taipei		Panasonic		Sales Office
Taiwan	Hsinchu		Panasonic		Sale / Marketing, Production
Taiwan	Taipei		Hitachi		Taiwan Hitachi Asia Pacific Co., Ltd.
Taiwan	Taipei		Hitachi		Hitachi Metals Admet, Ltd.Taipei Branch
Taiwan	Taipei		Hitachi		Hitachi Asia (Taiwan) Co., Ltd.
Taiwan	Taipei		Hitachi		Hitachi Chemical International Co., (Taiwan) Ltd.
Taiwan	Taipei		Hitachi		Hitachi Cable Asia, Ltd. Taipei Branch
Taiwan	Taipei		Hitachi		Hitachi High-Technologies Taiwan Corporation
Taiwan	Taipei		Hitachi		Hitachi, Ltd. Mechanisms Branch
Taiwan	Hsinchu		Hitachi		Hitachi Transport System (Taiwan) Ltd.
Taiwan	Hsinchu		Epistar		Global Headquarters (Fab N3)
Taiwan	Hsinchu		Epistar		Fab N1
Taiwan	Hsinchu		Epistar		Fab N2
Taiwan	Hsinchu		Epistar		Fab N5
Taiwan	Hsinchu		Epistar		Fab N8
Taiwan	Hsinchu		Epistar		Fab N6
Taiwan	Tainan		Epistar		Fab S1
Taiwan	New Taipei		Everlight		Fab S3
Taiwan	New Taipei		Everlight		HQ
Taiwan	Taoyuan		Zhen Ding Tech		Taipei Headquarters
Taiwan	Taipei		Pioneer Corporation		R&D Center
Taiwan	Kaohsiung		Brother Industries Ltd		Pioneer High Fidelity Taiwan Co., Ltd.
Taiwan	Taipei City		Brother Industries Ltd		Production Facilities
Taiwan	Taipei		Rambus Inc		Sales Facilities
Taiwan	New Taipei		Hon Hai Precision		Business development
Taiwan	Taipei		Toshiba		Taiwan Toshiba International Procurement Corporation
Taiwan	Taipei		Toshiba		Toshiba Digital Media Network Taiwan Corporation
Taiwan	Taipei		Toshiba		Toshiba Memory Semiconductor Taiwan Corporation
Taiwan	Taipei		Toshiba		Toshiba Electronics Taiwan Corporation
Taiwan	Taipei		Toshiba		Harrison Toshiba Lighting Taiwan Co., Ltd.
Taiwan	Tucheng		Foxconn Technology		Headquarter and R&D center

Source: Citi Research

Figure 994. Asia - Other

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Afghanistan		Karachi	IBM (International Business Machines Corp)		
Azerbaijan		Baku	Xerox		Office
Azerbaijan		Baku	Ericsson LM		Office
Azerbaijan		Baku	ZTE Corp		Sales Office
Bahrain		Manama	Huawei		
Bahrain		Manama	EMC Corp		
Bahrain		Seef	Xerox		Office
Bahrain		Manama	Huawei		
Bangladesh		Dhaka	IBM (International Business Machines Corp)		Bangladesh Head Office
Bangladesh		Dhaka	Xerox		Office
Bangladesh		Dhaka	Nokia		Regional Office
Bangladesh		Dhaka	Ericsson LM		Office
Bangladesh		Dhaka	Intel		
Bangladesh		Dhaka	ASUSTeK COMPUTER INC		AsusTek Computer Inc.
Bangladesh		Dhaka	NEC		
Bangladesh		Dhaka	ZTE Corp		Sales Office
Bangladesh		Dhaka	Huawei		
Bhutan		Thimphu	Xerox		Office
Cambodia		Phnom Penh	Alcatel Lucent SA		
Cambodia		Phnom Penh	Ericsson LM		Office
Cambodia		Phnom Penh	ZTE Corp		Sales Office
Cambodia		Phnom Penh	Huawei		
Georgia		Tbilisi	Ericsson LM		Office
Georgia		Tbilisi	ZTE Corp		Sales Office
Georgia		Tbilisi	Huawei		
Hong Kong		Kowloon	Amphenol		Amphenol Greater China and Japan Sales
Hong Kong		Kowloon	Amphenol		Amphenol Mobile Consumer Products Group HQ
Hong Kong			Sammina	31,457	
Hong Kong			Arrow Electronics		Office
Hong Kong		Kowloon	Ingram Micro	17,000	
Hong Kong	Quarry Ba	Taikoo Shing	EMC Corp		
Hong Kong			Xerox		Office
Hong Kong		Kowloon	Motorola Solutions		Corporate & Regional Office
Hong Kong		Kowloon Tong	Apple Inc		Retail Store
Hong Kong			Apple Inc		Office
Hong Kong		Kowloon	Fairchild Semiconductor International		Regional Sales and Customer Service Centers
Hong Kong		Kowloon	International Rectifier Corp		
Hong Kong		Kwai Chung	KLA Tencor Corp		
Hong Kong		Kwai Fong	Linear Technology		Office
Hong Kong		Kowloon	MagnaChip Semiconductor Corp		Sales Office
Hong Kong		Kowloon	Maxim Integrated		Office
Hong Kong		Kowloon	Microchip Technology		
Hong Kong		Shatin	On Semiconductor		Sales Office
Hong Kong		Tsim Sha Tsui	Silicon Laboratories, Inc		
Hong Kong			Adtran		
Hong Kong	Quarry Bay		Alcatel Lucent SA		
Hong Kong		North Point	Ciena Corp		
Hong Kong	Quarry Bay		Ericsson LM		Office
Hong Kong			Infinera Corp.	3,000	Office
Hong Kong			Riverbed Technology		
Hong Kong		Kowloon	Altera Corp		
Hong Kong			Marvell		
Hong Kong			Intel		
Hong Kong			NVIDIA		Office
Hong Kong		Kowloon	Novatek		Manufacturing and Marketing
Hong Kong	Tsuen Wan		WPG Holding		
Hong Kong	Tuen Mun		WPG Holding		
Hong Kong		Kowloon	Alps Electric		Head Office
Hong Kong		Kowloon	Hirose Electric		HIROSE ELECTRIC HONGKONG TRADING CO.,LTD.
Hong Kong		Kowloon	Hosiden		Hong Kong Hosiden Ltd. - Sales Division
Hong Kong		Kowloon	IBIDEN HONG KONG Co., Ltd.		
Hong Kong			Kyocera		Components Business - Kyocera Talkang (Hong Kong)
Hong Kong		Kowloon	Kyocera		KYOCERA (Hong Kong) Sales & Trading Limited
Hong Kong		Tsuen Wan	Kyocera		KYOCERA Document Solutions Asia Limited
Hong Kong		Tsuen Wan	Kyocera		KYOCERA Tycom (H.K.) Limited
Hong Kong		Kowloon	Murata		Sales Office
Hong Kong		Kowloon	Rohm		Sales Office - ROHM Semiconductor Hong Kong Co.,L
Hong Kong		Kowloon	Taiyo Yuden		Sales Office/Manufacturing
Hong Kong		Kwai Chung	Canon		Personal information products and others
Hong Kong		Kowloon	Canon		All product segments
Hong Kong		Hoi Shing Road	Dainippon Screen		Hong Kong Head Office
Hong Kong		Kowloon	Olympus		Principal Business Bases
Hong Kong		Kwai Fong	Fujifilm		
Hong Kong		Tsuen Wan	Fujifilm		
Hong Kong			Fujitsu		Fujitsu Components Hong Kong Co., Limited
Hong Kong		Kowloon	ZTE Corp		Sales Office
Hong Kong		Kowloon	Huawei		
Hong Kong			Hitachi (Hong Kong) Limited		
Hong Kong		Kowloon	Hitachi		Hitachi Maxell Global Ltd.
Hong Kong	New Territories,	Tsuen Wan	Hitachi		Hitachi Koki Asia Co., Ltd.
Hong Kong	New Territories	Sheung Shui	Hitachi		Hitachi High-Technologies Hong Kong Ltd.
Hong Kong	New Territories	Shatin	Hitachi		Vantec Hitachi Transport System (Hong Kong) Ltd.
Hong Kong	Causeway Bay		Hitachi		Hitachi Data Systems Ltd.
Hong Kong		Kowloon	Everlight		Sales Office
Hong Kong			Ju Teng		HQ
Hong Kong	N.T		FUNAI ELECTRIC CO LTD		FUNAI ELECTRIC (H.K.), LTD
Hong Kong		Tsim Sha Tsui	Brother Industries Ltd		Sales Facilities
Hong Kong		Kowloon Bay	Brother Industries Ltd		others
India		Chennai	Jabil	284,000	
India		Gurgaon	Jabil	31,000	Aftermarket, Storage, Support
India		Jaipur	Jabil	6,000	Storage
India		Mumbai	Jabil	3,000	Support
India		Pune	Jabil	262,000	Manufacturing
India		Chennai	Jabil		Electronics facilities, Manufacturing, Industrial Parks
India		Pune	Amphenol		Amphenol Interconnect India
India	Andhra Pradesh	Satyavedu	Amphenol		Amphenol MCP India Pvt. Ltd.
India	Tamil Nadu	Kancheepuram	Amphenol		Amphenol Omnicom India Private Limited
India		Chennai	Sammina	240,700	Design & JDM, Logistics/Post-Manufacturing Repair/

Source: Citi Research

Figure 995. Asia - Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
India	Uttar Pradesh	Loni	Vishay	350,000	Resistors & Inductors and Capacitors
India	Maharashtra	Mumbai	Vishay	34,000	Diodes
India		Bangalore	Arrow Electronics		Office
India		Chennai	Arrow Electronics		Office
India		Cochin	Arrow Electronics		Office
India		Hyderabad	Arrow Electronics		Office
India		Mumbai	Arrow Electronics		Office
India		New Delhi	Arrow Electronics		Office
India		Pune	Arrow Electronics		Office
India	Maharashtra	Mumbai	Ingram Micro		
India		Delhi/NCR	Ingram Micro		
India	Tamil Nadu	Chennai	Ingram Micro		
India		Bangalore	Ingram Micro		
India	West Bengal	Kolkata	Ingram Micro		
India	Andhra Pradesh	Hyderabad	Ingram Micro		
India	Gujarat	Ahmedabad	Ingram Micro		
India	Maharashtra	Pune	Ingram Micro		
India	Tamil Nadu	Coimbatore	Ingram Micro		
India	Kerala	Cochin	Ingram Micro		
India	Uttar Pradesh	Lucknow	Ingram Micro		
India	Odisha	Bhubaneswar	Ingram Micro		
India	Punjab	Ludhiana	Ingram Micro		
India	Rajasthan	Jaipur	Ingram Micro		
India	Madhya Pradesh	Indore	Ingram Micro		
India		Pondicherry	Ingram Micro		
India	Tamil Nadu	Madurai	Ingram Micro		
India	Andhra Pradesh	Vizag	Ingram Micro		
India	Karnataka	Hubli	Ingram Micro		
India	Kerala	Trivandrum	Ingram Micro		
India	Assam	Guwahati	Ingram Micro		
India	Punjab	Chandigarh	Ingram Micro		
India	Uttarakhand	Dehradun	Ingram Micro		
India	Maharashtra	Goa	Ingram Micro		
India	Madhya Pradesh	Bhopal	Ingram Micro		
India	Gujarat	Baroda	Ingram Micro		
India	Maharashtra	Nagpur	Ingram Micro		
India	Gujarat	Surat	Ingram Micro		
India	Chhattisgarh	Raipur	Ingram Micro		
India		Jammu	Ingram Micro		
India	Jharkhand	Ranchi	Ingram Micro		
India	Bihar	Patna	Ingram Micro		
India	Jharkhand	Jamshedpur	Ingram Micro		
India		Bangalore	IBM (International Business Machines Corp)		IBM India Pvt Ltd
India	Uttarakhand	Udhm Singh Nagar	Hewlett Packard		Product Development and Manufacturing Laboratories
India		Bangalore	Hewlett Packard		Office
India	Karnataka	Bangalore	Hewlett Packard		Office
India	Gujarat	Ahmedabad	Hewlett Packard		Office
India	Tamil Nadu	Chennai	Hewlett Packard		Office
India		Delhi	Hewlett Packard		Office
India	Andhra Pradesh	Hyderabad	Hewlett Packard		Office
India	Haryana	Gurgaon	Hewlett Packard		Office
India	Uttarakhand	Rudrapur	Hewlett Packard		Office
India	West Bengal	Kolkata	Hewlett Packard		Office
India	Maharashtra	Mumbai	Hewlett Packard		Office
India	Maharashtra	Pune	Hewlett Packard		Office
India	Karnataka	Bangalore	EMC Corp		
India	Karnataka	Bangalore	EMC Corp		
India	Tamil Nadu	Chennai	EMC Corp		
India	Haryana	Gurgaon	EMC Corp		
India	Andhra Pradesh	Hyderabad	EMC Corp		
India	West Bengal	Kolkata	EMC Corp		
India	Maharashtra	Mumbai	EMC Corp		
India	Maharashtra	Pune	EMC Corp		
India	Andhra Pradesh	Secunderabad	EMC Corp		
India	Karnataka	Bangalore	NetApp Inc	1,053,400	
India		New Delhi	NetApp Inc		
India	Tamil Nadu	Chennai	NetApp Inc		
India	Andhra Pradesh	Hyderabad	NetApp Inc		
India	West Bengal	Kolkata	NetApp Inc		
India	Maharashtra	Mumbai	NetApp Inc		
India	Haryana	Gurgaon	NetApp Inc		
India	Maharashtra	Pune	NetApp Inc		
India	Haryana	Gurgaon	Xerox		Office
India	Gujarat	Ahmedabad	Xerox		Office
India	Karnataka	Bangalore	Xerox		Office
India		Chandigarh	Xerox		Office
India	Tamil Nadu	Chennai	Xerox		Office
India	Andhra Pradesh	Hyderabad	Xerox		Office
India	West Bengal	Kolkata	Xerox		Office
India	Uttar Pradesh	Lucknow	Xerox		Office
India	Maharashtra	Mumbai	Xerox		Office
India	Maharashtra	Pune	Xerox		Office
India	Uttar Pradesh	Rampur	Xerox		Office
India		Bangalore	Electronics For Imaging, Inc	76	office
India		Bangalore	Lexmark		Lexmark Bangalore Office
India	Haryana	Gurgaon	Corning		Office
India	Haryana	Gurgaon	Nokia		Regional Office
India	Karnataka	Bangalore	Cisco Systems Inc		Sales office & R&D Office
India	Tamil Nadu	Chennai	Cisco Systems Inc		Sales Office
India	West Bengal	Kolkata	Cisco Systems Inc		Sales Office
India	Maharashtra	Mumbai	Cisco Systems Inc		Sales Office
India	Haryana	Gurgaon	Cisco Systems Inc		Sales Office
India	Maharashtra	Pune	Cisco Systems Inc		Sales Office
India	Andhra Pradesh	Hyderabad	Cisco Systems Inc		Sales Office
India		Delhi	Blackberry		
India	Maharashtra	Mumbai	Blackberry		
India	Haryana	Gurgaon	Motorola Solutions		Corporate & Regional Office
India	Karnataka	Bangalore	Motorola Solutions		Sales Office

Source: Citi Research

**Figure 996. Asia – Other (Continued)**

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
India		Bangalore	Apple Inc		Office
India	Karnataka	Bangalore	Analog Devices, Inc	54000	Engineering
India	Karnataka	Bangalore	Applied Materials Inc		
India	Tamil Nadu	Chennai	Applied Materials Inc		
India	Uttar Pradesh	Noida	Applied Materials Inc		
India		Pune	Fairchild Semiconductor International		Design Centers
India	Karnataka	Bangalore	International Rectifier Corp		
India	Karnataka	New Delhi	International Rectifier Corp		
India	Karnataka	Bangalore	Intersil Corp		Sales Office
India	Tamil Nadu	Chennai	KLA Tencor Corp	33,366	Office
India	Karnataka	Bangalore	Lam Research Corp		Office
India	Karnataka	Bangalore	Linear Technology		Office
India	Karnataka	Bangalore	Maxim Integrated		Office
India	Gujarat	Gandhinagar	Maxim Integrated		Office
India	Karnataka	Bangalore	Microchip Technology	67174	
India		New Delhi	Microchip Technology		
India	Maharashtra	Pune	Microchip Technology		
India	Odisha	Bhubaneswar	Semtech		
India	Tamil Nadu	Chennai	Teradyne		Semiconductor Test Technology Centers
India	Andhra Pradesh	Madhapur	Adtran		
India	Karnataka	Bangalore	Arris Enterprises, Inc.		
India	Haryana	Gurgaon	Arris Enterprises, Inc.		
India	Karnataka	Bangalore	Alcatel Lucent SA		
India	Karnataka	Chennai	Alcatel Lucent SA		
India	Haryana	Gurgaon	Alcatel Lucent SA		
India	Maharashtra	Mumbai	Alcatel Lucent SA		
India	Haryana	Gurgaon	Ciena Corp		
India	Maharashtra	Mumbai	Ciena Corp		
India	Haryana	Gurgaon	Ericsson LM		Office
India	Karnataka	Bangalore	F5 Networks		Office
India	Maharashtra	Mumbai	F5 Networks		Office
India		New Delhi	F5 Networks		Office
India		Hyderabad	Finisar Corp.	6200	Office
India	Karnataka	Bangalore	Infineon Corp.	51000	Office
India	Haryana	Gurgaon	JD5U Corp.		Sales Office
India	Maharashtra	Mumbai	JD5U Corp.		Sales Office
India	Maharashtra	Pune	JD5U Corp.		Sales Office
India		Bengaluru	JD5U Corp.		Sales Office
India	Karnataka	Bangalore	Juniper Networks Inc		
India	Tamil Nadu	Chennai	Juniper Networks Inc		
India	Maharashtra	Mumbai	Juniper Networks Inc		
India		New Delhi	Juniper Networks Inc		
India	Haryana	Gurgaon	Polycym Inc.		Sales and Marketing Office
India	Karnataka	Bangalore	Polycym Inc.		Office
India		Hyderabad	Polycym Inc.		Office
India	West Bengal	Kolkata	Polycym Inc.		Office
India	Maharashtra	Mumbai	Polycym Inc.		Office
India	Karnataka	Bangalore	Riverbed Technology		
India		New Delhi	Riverbed Technology		
India	Maharashtra	Mumbai	Riverbed Technology		
India		Bengaluru	Tellabs, Inc.		Sales Office
India	Haryana	Gurgaon	Tellabs, Inc.		Business Units
India		New Delhi	Advanced Micro Devices, Inc		
India	Maharashtra	Mumbai	Advanced Micro Devices, Inc		
India	Karnataka	Bangalore	Advanced Micro Devices, Inc		
India	Andhra Pradesh	Hyderabad	Advanced Micro Devices, Inc		
India	Karnataka	Bangalore	Altera Corp		
India		Bangalore	Broadcom		Office
India		Bangalore	Broadcom		Office
India		Mumbai	Broadcom		Office
India	Karnataka	Bangalore	Cypress Semiconductor Corp	193,000	Research and development
India		Noida	Freescale Semiconductor Ltd.	Office	
India	Karnataka	Bangalore	Freescale Semiconductor Ltd.	Office	
India		Hyderabad	Freescale Semiconductor Ltd.	Office	
India		Ulsor	Micron		Sales
India	Andhra Pradesh	Secunderabad	Marvell		
India	Karnataka	Bangalore	Intel		
India	Uttar Pradesh	Noida	Intel		
India		Chandigarh	Intel		
India		New Delhi	Intel		
India	Gujarat	Ahmedabad	Intel		
India	Kerala	Kochi	Intel		
India	Maharashtra	Mumbai	Intel		
India	Maharashtra	Pune	Intel		
India	Tamil Nadu	Chennai	Intel		
India	West Bengal	Kolkata	Intel		
India	Karnataka	Bangalore	NVIDIA		Office
India	Andhra Pradesh	Hyderabad	NVIDIA		Office
India	Maharashtra	Mumbai	NVIDIA		Office
India	Maharashtra	Pune	NVIDIA		Office
India	Andhra Pradesh	Hyderabad	QUALCOMM Incorporated		
India		Delhi	QUALCOMM Incorporated		
India	Karnataka	Bangalore	QUALCOMM Incorporated		
India	Maharashtra	Mumbai	QUALCOMM Incorporated		
India	Tamil Nadu	Chennai	QUALCOMM Incorporated		
India	Karnataka	Bangalore	Texas Instruments		
India		Bangalore	Xilinx Inc		
India	Andhra Pradesh	Hyderabad	Xilinx Inc		
India		New Delhi	Manz AG		Sales & Service
India	Maharashtra	Pune	Meyer Burger Technology AG		Meyer Burger India Private Ltd, Service Contacts
India	Maharashtra	Mumbai	Meyer Burger Technology AG		Neotronics international
India	Maharashtra	Mumbai	SMA Solar Technology		SMA Solar India Pvt. Ltd
India	Karnataka	Bangalore	Sensitherm Photovoltaics		centrotherm photovoltaics India Pte. Ltd.
India	Karnataka	Bangalore	SK Hynix		Headquarters, SK hynix Semiconductor India Pvt. Ltd
India	Uttar Pradesh	NOIDA	LG Electronics		LG Electronics India Pvt. Ltd., Marketing & Product

Source: Citi Research

**Figure 997. Asia – Other (Continued)**

Country	State	City	Company Name	Size (sq ft)	Description/Comments (manufacturing, office)
India		New Delhi	Samsung Electro-Mechanics		Overseas Sales Offices
India	Karnataka	Bangalore	Samsung Electro-Mechanics		Overseas Sales Offices
India	Haryana	Gurgaon	Samsung Electronics		India - Samsung India Electronics Private Limited
India		New Delhi	Samsung SDI		India Office
India	Tamil Nadu	Chennai	Cheil Industries		Chemicals/Electronic Materials Division
India	Haryana	Gurgaon	Cheil Industries		Chemicals/Electronic Materials Division
India	Haryana	Gurgaon	Mitsubishi Electric		Mitsubishi Electric India Pvt. Ltd., Gurgaon Head Office
India		New Delhi	Mitsubishi Electric		Delhi Registered Office
India	Karnataka	Bangalore	Mitsubishi Electric		Bangalore Sales Office
India	Maharashtra	Pune	Mitsubishi Electric		Pune FAID Head Office
India	Maharashtra	Pune	Mitsubishi Electric		Pune Sales Office
India	Maharashtra	Mumbai	Mitsubishi Electric		Mumbai Sales Office
India	Tamil Nadu	Chennai	Mitsubishi Electric		Chennai Sales Office
India	Andhra Pradesh	Secunderabad	Mitsubishi Electric		Hyderabad Sales Office
India	Punjab	Chandigarh	Mitsubishi Electric		Chandigarh Sales Office
India	Rajasthan	Jaipur	Mitsubishi Electric		Jaipur Sales Office
India	Gujarat	Ahmedabad	Mitsubishi Electric		Ahmedabad Sales Office
India	Tamil Nadu	Coimbatore	Mitsubishi Electric		Coimbatore Sales Office
India	Gujarat	Vadodra	Mitsubishi Electric		Vadodra Sales Office
India	Kerala	Kochi	Mitsubishi Electric		Kochi Sales Office
India	Tamil Nadu	Chennai	Mitsubishi Electric		Mitsubishi Elevator ETA India Pvt. Ltd.
India	Haryana	Gurgaon	Mitsubishi Electric		Mitsubishi Electric Automotive India Pvt. Ltd.
India	Karnataka	Bangalore	Acer Inc		Acer India (Pvt) Ltd.
India		Bangalore	Acer Inc		Head Office
India		Kochi	Acer Inc		Branch Office
India		Ahmedabad	Acer Inc		Branch Office
India		Bangalore	Acer Inc		Branch Office
India		New Delhi	Acer Inc		Branch Office
India		Mumbai	Acer Inc		Branch Office
India		Chennai	Acer Inc		Branch Office
India		Hyderabad	Acer Inc		Branch Office
India		Kolkata	Acer Inc		Branch Office
India		Guwahati	Acer Inc		Branch Office
India		Nagpur	Acer Inc		Branch Office
India		Chandigarh	Acer Inc		Branch Office
India		Pune	Acer Inc		Branch Office
India		Lucknow	Acer Inc		Branch Office
India	Maharashtra	Mumbai	ASUSTeK COMPUTER INC		Asus Technology Pvt Ltd.
India	Uttar Pradesh	Noida	NEC		NEC Technologies India Limited
India		New Delhi	NEC		NEC India Private Limited
India	Haryana	Gurgaon	Delta Electronics		Delta India Electronics Pvt. Ltd
India		Pondicherry	Delta Electronics		Delta Power Solutions (India) Pvt. Ltd
India	Uttarakhand		Delta Electronics		Delta Power Solutions India Pvt. Ltd
India					R&D - Mass Production Facilities -
India	Uttar Pradesh	Noida	Foxconn International Holdings		Client/technology co location facilities
India	Karnataka	Bangalore	MediaTek		MediaTek India Technology Pvt. Ltd (India)
India	Pondicherry		Wistron Corporation		Service Center
India			Lenovo Group		Manufacturing Centers
India	Karnataka	Bangalore	Lenovo Group		Lenovo (India) Private Limited (Registered Office)
India	Haryana	Gurgaon	Lenovo Group		Lenovo India Pvt.Ltd
India	West Bengal	Kolkata	Lenovo Group		Lenovo India Pvt.Ltd
India	Maharashtra	Mumbai	Lenovo Group		Lenovo India Pvt.Ltd
India	Tamil Nadu	Chennai	Lenovo Group		Lenovo India Pvt.Ltd
India	Maharashtra	Pune	Advanced Energy Industries, Inc		REFUSOL Solar Electronics Pvt., Ltd., India Office
India	Haryana	New Delhi	First Solar Inc		First Solar India Pvt. Ltd
India	Tamil Nadu	Chennai	Sun Edison		Sun Edison
India	Karnataka	Bangalore	TSMC		Offices
India	Karnataka	Bangalore	WPG Holding		WPG Holding
India	Haryana	New Delhi	WPG Holding		WPG Holding
India		New Delhi	SunPower Corporation		Office
India	Haryana	Gurgaon	Alps Electric		Head Office
India	Karnataka	Bangalore	Hirose Electric		Bangalore Liaison Office
India	Uttar Pradesh	Noida	Hirose Electric		Delhi Liaison Office
India	Karnataka	Bangalore	Ibiden		Branch: India
India	Haryana	Gurgaon	Kyocera		KYOCERA Asia Pacific (India) Pvt. Ltd.
India	Haryana	Gurgaon	Kyocera		KYOCERA Document Solutions India Private Limited
India	Tamil Nadu	Chennai	Murata		Sales Office
India	Tamil Nadu	Chennai	Rohm		Sales Office - ROHM Semiconductor India Pvt Ltd.
India	Karnataka	Bangalore	Rohm		Sales Office - ROHM Semiconductor India Pvt Ltd.
India		New Delhi	Rohm		Sales Office - ROHM Semiconductor India Pvt Ltd.
India	Maharashtra	Pune	Rohm		Sales Office - ROHM Semiconductor India Pvt Ltd.
India	Haryana	Gurgaon	Nidec		Sales
India	Karnataka	Bangalore	Nidec		Sales
India	Haryana	Gurgaon	Canon		All product segments
India	Maharashtra	Navi Mumbai	Hoya Corporation		HOYA LENS INDIA PVT LTD
India					Marketing, sale, and service of medical equipment in India
India	Haryana	New Delhi	Olympus		Marketing and service of digital cameras and digital voice recorders in India
India		Mumbai	Olympus		
India	Haryana	Gurgaon	Nikon		
India		New Delhi	Nikon		
India	Karnataka	Bangalore	Nikon		
India	West Bengal	Kolkata	Nikon		
India	Maharashtra	Mumbai	Nikon		
India			Nikon		
India			Nikon		
India		New Delhi	Ricoh Co		Sales & Services - Ricoh India Limited
India	Karnataka	Bangalore	Ricoh Co		R&D - Ricoh Innovations Private Limited

Source: Citi Research

Figure 998. Asia – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
India	Maharashtra	Mumbai	Ricoh Co		Manufacturing - Ricoh Thermal Media Asia Pacific
India	Karnataka	Bangalore	Seiko Epson		Private Limited
India	Haryana	Gurgaon	Tamron Co Ltd		Epson India Pvt. Ltd.
					TAMRON INDIA PRIVATE LIMITED
India	Haryana	Gurgaon	Asahi Glass		Manufacturing and sales for architectural and automotive glass
India	Maharashtra	Pune	Sharp Corp		SHARP INDIA LIMITED [India]
India		New Delhi	Sharp Corp		SHARP BUSINESS SYSTEMS (INDIA) LIMITED [India]
			Sony Corp		Sony India Pvt. Ltd.
India	Haryana	Gurgaon	Fujifilm		
India	Maharashtra	Pune	Fujitsu		Fujitsu Consulting
India	Haryana	Gurgaon	Fujitsu		Fujitsu India Pvt. Ltd.
India	Karnataka	Bangalore	Fujitsu		Sales Office
India		Bangalore	3D Systems Corp		
India		Noida	ARM Holdings PLC		ARM Holdings PLC
India	Haryana	Gurgaon	Brocade Communications		Sales office
India	Maharashtra	Mumbai	Brocade Communications		Sales office
					Sales office - Brocade Communications Systems
India	Karnataka	Bangalore	Brocade Communications		India Pvt. Ltd.
India	Karnataka	Bangalore	Brocade Communications		R&D Center
India	Karnataka	Bangalore	Brocade Communications		Brocade Communications Systems Pvt. Ltd.
			CSR Plc	66127	R&D, Sales and Administration
India		Noida	CSR Plc	9200	R&D, Sales and Administration
India		Bangalore	Infineon Technologies AG		Regional Subsidiaries - Infineon India
					Manufacturing & Design Center, Sales Office & Representative
India	Uttar Pradesh	Greater Noida	STMicroelectronics		Sales Office & Representative
India	Karnataka	Bangalore	STMicroelectronics		Sales Office & Representative
India	Maharashtra	Pune	STMicroelectronics		Sales Office & Representative
India	Maharashtra	Mumbai	STMicroelectronics		Sales Office & Representative
India		Bangalore	Strataysys Ltd	1800	Strataysys, Inc. sales office
			TE Connectivity Ltd.		7 Manufacturing Plants
India	Haryana	Gurgaon	ZTE Corp		Sales Office
India	Maharashtra	Nav Mumbai	ZTE Corp		Sales Office
India	Maharashtra	Mumbai	Belden		Sales Offices
India	Karnataka	Bangalore	Emulex Corp		Office
India	Andhra Pradesh	Hyderabad	Emulex Corp		
India	West Bengal	Kolkata	Huawei		Region Headquarter
India	Haryana	Gurgaon	Huawei		
India	Kerala	Cochin	Huawei		
India	Maharashtra	Nav Mumbai	Huawei		Mumbai Representative Office
India	Karnataka	Bangalore	Huawei		R&D
					LifeSize Business Division research and development
India		Bangalore	Logitech International S A	22400	Digital Home Group engineering and quality assurance
				10100	
India		Chennai	Logitech International S A		
India		Bangalore	OmniVision		
India		New Delhi	OmniVision		
India	Maharashtra	Pune	QLogic Corp		
India		Bangalore	QLogic Corp		
India		Bangalore	RF Microdevices		Sales & Customer Support Center
India	Gujarat	Ahmedabad	Molex		Molex (India) Pvt. Ltd.
India	Karnataka	Bangalore	Molex		Bangalore Sales Office
India		New Delhi	Molex		New Delhi Sales Office
India	Gujarat	Gandhinagar	Molex		Gandhinagar Plant
India	Maharashtra	Pune	Molex		Pune Plant - Factory
India	Uttar Pradesh	Noida	Molex		Noida Plant
India	Maharashtra	Pune	Molex		Pune Sales Office
India	Maharashtra	Mumbai	Molex		Mumbai Sales Office
India	Andhra Pradesh	Hyderabad	Molex		Hyderabad Sales Office
India	Tamil Nadu	Chennai	Molex		Chennai Sales Office
India	West Bengal	Kolkata	Molex		Kolkata Sales Office
India	Karnataka	Bangalore	Panasonic		Semiconductor Sales office
India	Haryana	Gurgaon	Panasonic		Gurgaon Head Office
India	Maharashtra	Pune	Panasonic		Pune Office
India	Tamil Nadu	Chennai	Panasonic		Chennai Office
India	Karnataka	Bangalore	Panasonic		Bangalore Office
India	Maharashtra	Mumbai	Panasonic		Mumbai Office
India		New Delhi	Hitachi		Hitachi India Pvt. Ltd.
India	Karnataka	Bangalore	Hitachi		Bangalore Branch Office
India	Maharashtra	Mumbai	Hitachi		Mumbai Branch Office
India	Tamil Nadu	Chennai	Hitachi		Chennai Branch Office
India	Haryana	Gurgaon	Hitachi		Hitachi Chemical India Private Limited
					Hitachi Consulting Software Services India Private Limited
India	Andhra Pradesh	Hyderabad	Hitachi		Hitachi Consulting India Private Limited
India	Maharashtra	Pune	Hitachi		Hitachi Home and Life Solutions (India) Ltd.
India	Ahmedabad	Gujarat	Everlight		Sales Office
India	Tamilnadu	Chennai	Zhen Ding Tech		Service center
India		Mumbai	FUNAI ELECTRIC CO LTD		Funai India Private Limited
India	Haryana	Gurgaon	Pioneer Corporation		Pioneer India Electronics Pvt. Ltd
India	Maharashtra	Mumbai	Brother Industries Ltd		Sales Facilities
					Administrative offices, research and development and service functions
India	Karnataka	Bangalore	Rambus Inc		Solar Sales Office
India		New Delhi	REC Solar ASA		
India		New Delhi	Casio		Corporate Office
India	Maharashtra	Mumbai	Casio		Regional Office
India	Karnataka	Bangalore	Casio		Regional Office
India	Tamil Nadu	Chennai	Casio		Regional Office
India	Andhra Pradesh	Hyderabad	Casio		Regional Office
India	West Bengal	Kolkata	Casio		Regional Office
India	Punjab	Chandigarh	Casio		Regional Office
India	Gujrat	Ahmedabad	Casio		
India	Haryana	Gurgaon	Toshiba		Toshiba India Private Ltd.
India	Andhra Pradesh	Hyderabad	Toshiba		TPSC (India) Pte., Ltd.
India	Karnataka	Bangalore	Toshiba		Toshiba Software (India) Pvt. Ltd.
India	Maharashtra	Mumbai	Toshiba		Toshiba Johnson Elevators (India) Pte., Ltd.
India	Tamil Nadu	Chennai	Toshiba		Toshiba JSW Turbine & Generator Pvt., Ltd.
Indonesia		Batam	Toshiba	258,000	Electronics facilities, Manufacturing
				99,210	New Product Introduction & PCBA & System Assembly
Indonesia		Batam	Sanmina		

Source: Citi Research

Figure 999. Asia – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Indonesia		Jakarta	Arrow Electronics		Office
Indonesia		Jakarta	Ingram Micro		Head Office
Indonesia		Jakarta	Ingram Micro		Warehouse
Indonesia		Jakarta	IBM (International Business Machines Corp)		IBM Indonesia Head Office
Indonesia		Jakarta	Hewlett Packard		Office
Indonesia		Surabaya	Hewlett Packard		Office
Indonesia		Jakarta	EMC Corp		
Indonesia		Jakarta Pusat	NetApp Inc		
Indonesia		Jakarta	NetApp Inc		
Indonesia		Jakarta	Xerox		Office
Indonesia		Jakarta	Lexmark		Lexmark International (S) Pte Ltd
Indonesia		Balikpapan	Nokia		Regional Office
Indonesia		Bandung	Nokia		Regional Office
Indonesia		Jakarta	Nokia		Regional Office
Indonesia		Makassar	Nokia		Regional Office
Indonesia		Medan	Nokia		Regional Office
Indonesia		Palembang	Nokia		Regional Office
Indonesia		Sanur	Nokia		Regional Office
Indonesia		Semarang	Nokia		Regional Office
Indonesia		Surabaya	Nokia		Regional Office
Indonesia		Jakarta	Cisco Systems Inc		
Indonesia		Jakarta	Blackberry		
Indonesia		Bali	Blackberry		
Indonesia		Jakarta	Motorola Solutions		Corporate & Regional Office
Indonesia		Jakarta	Applied Materials Inc		Sales and Services
Indonesia		Jakarta	Microchip Technology		
Indonesia		Jakarta	Alcatel Lucent SA		
Indonesia		Jakarta	Ericsson LM		Office
Indonesia		Jakarta	F5 Networks		Office
Indonesia		Jakarta	Juniper Networks Inc		
Indonesia		Jakarta	Polycorn Inc.		Office
Indonesia		Jakarta	Riverbed Technology		
Indonesia		Jakarta	Advanced Micro Devices, Inc		
Indonesia		Surabaya	Intel		
Indonesia		Jakarta	Intel		
Indonesia		Jakarta	QUALCOMM Incorporated		
Indonesia		Manila	Xilinx Inc		
					P.T. LG Electronics Indonesia, Marketing & Production
Indonesia	West Java	Bekasi	LG Electronics		LG Innotek Indonesia PT. (LGITIN)
Indonesia		Bekasi	LG Innotek		P.T. Mitsubishi Electric Indonesia
Indonesia		Jakarta	Mitsubishi Electric		P.T. Mitsubishi Electric Indonesia
Indonesia		Jakarta	Mitsubishi Electric		P.T. Mitsubishi Electric Indonesia
					P.T. Mitsubishi Electric Automotive Indonesia
Indonesia		Bekasi	Mitsubishi Electric		PT Acer Indonesia
Indonesia		Jakarta	Acer Inc		Head Office
Indonesia		Jakarta	ASUSTek COMPUTER INC		PT. ASUS Indonesia
Indonesia		Jakarta	NEC		P.T. NEC Indonesia
Indonesia		Jakarta	Lenovo Group		Lenovo (Indonesia) Pte Ltd. - Kantor Perwakilan
Indonesia		Bekasi	Hirose Electric		Domestic Subsidiaries
Indonesia		Bekasi	Nidec		Manufacturing
Indonesia		Batam	Nidec		Manufacturing
Indonesia		Batam	Nidec		Manufacturing
Indonesia		Batam	Nidec		Manufacturing
Indonesia		Jakarta	Hoya Corporation		PT. HOYA LENS INDONESIA
Indonesia		Jakarta	Nikon		
Indonesia		Jakarta	Nikon		
Indonesia		Jakarta	Seiko Epson		P.T. Epson Indonesia
					Manufacturing Subsidiaries and Affiliates - P.T.Epson Batam
Indonesia		Jakarta	Seiko Epson		Manufacturing Subsidiaries and Affiliates - P.T.Indonesia Epson Industry
					Manufacturing and sales of for construction,automotive various float glasses, figured glass,mirror, heat-reflective glass,and automotive tempered glass
					Caustic Soda, EDC, VCM, PVC
					P.T. SHARP ELECTRONICS INDONESIA [Indonesia]
Indonesia		Jakarta	Sharp Corp		
Indonesia		Jakarta	Fujitsu		
Indonesia		Jakarta	Fujitsu		Office
Indonesia		Jakarta	Fujitsu		PT. Fujitsu Indonesia
Indonesia		Jakarta	Brocade Communications		
Indonesia		Jakarta	ZTE Corp		Sales Office
Indonesia		Jakarta	Belden		Sales Offices
Indonesia		Jakarta	Huawei		
Indonesia		Jakarta	Molex		Indonesia Sales Office
Indonesia		Batam	Panasonic		
Indonesia		Jakarta	Panasonic		Components Division Capacitor Unit
Indonesia		Jakarta	Panasonic		Semiconductor Production Plants
Indonesia		Jakarta	Panasonic		Sales Office
Indonesia		Jakarta	Hitachi		Branches - PT. Hitachi Asia Indonesia
					Hitachi, Ltd. Infrastructure Systems Company
					Representative Office of Indonesia
Indonesia	West Java	Jakarta	Hitachi		PT. Hitachi Construction Machinery Indonesia
Indonesia		Jakarta	Hitachi		Hitachi Data Systems Pte. Ltd.
Indonesia		Jakarta	Hitachi		PT. Hitachi Modern Sales Indonesia
Indonesia		Jakarta	Hitachi		PT. Hitachi High-Technologies Indonesia (HTJ)
Indonesia		Jakarta	Hitachi		PT. Hitachi Plant Technologies Indonesia
Indonesia		Jakarta	Hitachi		PT. Hitachi Powdered Metals Indonesia
Indonesia		Bekasi	Hitachi		PT. Hitachi Power Systems Indonesia
Indonesia		Jakarta	Brother Industries Ltd		Sales Facilities
Indonesia		Jakarta	Toshiba		Jakarta Representative Office
Indonesia		Bekasi	Toshiba		P.T. Toshiba Consumer Products Indonesia
					PT. Toshiba Visual Media Network Indonesia, P.T. Toshiba Indonesia
Indonesia		Jakarta	Toshiba		
Iraq		Kurdistan	Xerox		Office
Iraq		Basra	Xerox		Office
Iraq		Baghdad	Xerox		Office
Iraq		Baghdad	ZTE Corp		Sales Office
Iraq		Sulaimaniyah	Huawei		
Israel		Tel Aviv	Jabil		3,000 Support

Source: Citi Research



Figure 1000. Asia – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Israel		Arad	Apple Inc		Electronics facilities, Manufacturing
Israel		Migdal Haemek	On Semiconductor	441.32	Electronics facilities, Manufacturing
Israel		Ofakim	On Semiconductor		Electronics facilities, Manufacturing
Israel		Yavne	Semtech		Electronics facilities, Manufacturing
Israel		Kfar Saba	Amphenol		Bar-Tec Ltd.
Israel		Kfar Saba	Amphenol		Tel-Ad Electronics Ltd.
Israel					Design & IDW, Logistics/Post-Manufacturing
Israel					Repair/Warranty, New Product Introduction &
Israel		Multiple locations	Sanmina	295,893	PCBA & System Assembly
Israel		Dimona	Vishey	404000	Resistors & Inductors and Capacitors
Israel		Migdal Haemek	Vishey	288000	Resistors & Inductors and Capacitors
Israel		BeerSheva	Vishey	276000	Resistors & Inductors and Capacitors
Israel		Jerusalem	AVX Corporation	88,000	Manufacturing/Research — PC
Israel		Kfar Saba	Arrow Electronics		Office
Israel		Petach Tikva	Arrow Electronics		Office
Israel		Petach Tikva	IBM (International Business Machines Corp)		IBM Israel Ltd
Israel		Raanana	Hewlett Packard		Office
Israel		Kiryat Gat	Hewlett Packard		Product Development and Manufacturing
Israel		Ness Ziona	Hewlett Packard		Product Development and Manufacturing
Israel		Netanya	Hewlett Packard		Product Development and Manufacturing
Israel					Laboratories
Israel	Haifa		Hewlett Packard		
Israel	BeerSheva		EMC Corp		
Israel	BeerSheva		EMC Corp		
Israel	Haifa		EMC Corp		
Israel		Tel Aviv	EMC Corp		
Israel		Jerusalem	EMC Corp		
Israel		Kfar Saba	EMC Corp		
Israel		Netanya	EMC Corp		
Israel		Tel Aviv	EMC Corp		
Israel		Ramallah	NetApp Inc		Integrated Solutions
Israel		Petach Tikva	NetApp Inc		Office
Israel		Petach Tikva	Xerox		Getter Tech Head Office
Israel		Petach Tikva	Lexmark		Office
Israel		Corning	Corning		Office
Israel		Sapir	Cisco Systems Inc		Corporate & Regional Office
Israel			Motorola Solutions		Manufacturing; Research, Development,
Israel				422,000	Engineering; Customer Support
Israel		Rehovot	Applied Materials Inc		
Israel		Rehovot	Applied Materials Inc		
Israel		Kiryat Gat	Applied Materials Inc		
Israel		Kiryat Gat	Brooks Automation Inc		Office
Israel		Kiryat Gat	Entegris Inc		
Israel		Migdal Haemek	KLA Tencor Corp	191,982	Office and plant
Israel		Migdal Haemek	KLA Tencor Corp		
Israel		Kiryat Gat	KLA Tencor Corp		
Israel		Yokneam	KLA Tencor Corp		
Israel		Ramat-Gan	Lam Research Corp		Office
Israel		Qiryat Gat	Lam Research Corp		Office
Israel		Tel Aviv	On Semiconductor		Sales Office
Israel		Raanana	On Semiconductor		Sales Office
Israel		Rosh HaAyn	On Semiconductor		Sales Office
Israel		Tel Aviv	Arri Enterprises, Inc.	55,391	Office/Warehouse space
Israel		Kfar Saba	Alcatel Lucent SA		
Israel		Tel Aviv	Ciena Corp		
Israel		Rosh HaAyn	Ericsson LM		Office
Israel			F5 Networks		Office
Israel		Tel Aviv	Finisar Corp.	22400	Office
Israel		Ness Ziona	Finisar Corp.	13000	Office
Israel		Herzliya	Juniper Networks Inc		
Israel		Herzliya	Juniper Networks Inc		
Israel					Administrative, manufacturing and research and
Israel					ERP development facilities
Israel					
Israel		Airport City	Broadcom		Office
Israel		Herzliya	Broadcom		Office
Israel		Herzliya	Broadcom		Office
Israel		Raanana	Broadcom		Office
Israel		Ramat Gan	Broadcom		Office
Israel		Tel Aviv	Broadcom		Office
Israel		Tel Aviv	Broadcom		Office
Israel		Yakum	Broadcom		Office
Israel		Herzliya	Freescale Semiconductor Ltd.		Office
Israel		Kiryat Gat	Micron		Wafer fabrication
Israel		Yokneam	Marvell	361,000	
Israel		HaDarom	Intel		
Israel		Haifa	Intel		
Israel		Haifa	Intel		
Israel		Hamerkaz	Petach Tikva		
Israel		Hamerkaz	Intel		
Israel		HaZafon	Intel		
Israel		Yokneam	Intel		
Israel		Tel Aviv	Intel		
Israel		Yerushalayim	Intel		
Israel		Haifa	QUALCOMM Incorporated		
Israel		Beit Shemesh	QUALCOMM Incorporated		
Israel		Hod Hasharon	QUALCOMM Incorporated		
Israel		Tel Aviv	QUALCOMM Incorporated		
Israel					Design Centers and Specialized Centers of
Israel					Excellence
Israel		Netanya	Spansion		
Israel		Tel Aviv	Xilinx Inc		
Israel		Petach Tikva	Lenovo Group		Lenovo (Israel) Ltd
Israel			SunPower Corporation		Dainippon Screen Israel Ltd.
Israel		Ramat-Gan	Dainippon Screen		
Israel			Nikon		
Israel			Seiko Epson		Epson Europe B.V. Israel Office
Israel		Kiryat Gat	Tokyo Electron		Service and sales support in Israel
Israel		Kfar Saba	ARM Holdings PLC		
Israel		Qiryat Gat	ASML Holding NV		
Israel		Tel Aviv	Brocade Communications		
Israel		Tel Aviv	CSR PLC	110653	Operations, R&D, Sales and Administration
Israel		Tel Aviv	STMicroelectronics		Manufacturing & Design Center
Israel		South Netanya	STMicroelectronics		Sales Office & Representative
Israel		Rehovot	Stratysys Ltd	91025	Israeli headquarters
Israel		Kiryat Gat	Stratysys Ltd	72118	Resin factory and laboratories
Israel		Ramat- Gan	Molex		Molex B.V Israel
Israel		Amman	EMC Corp		

Source: Citi Research

Figure 1001. Asia – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Jordan		Amman	Xerox		Office
Jordan		Amman	Ericsson LM		Office
Jordan		Amman	LG Electronics		LG Electronics (Levant) Jordan
Jordan		Amman	ZTE Corp		Sales Office
Jordan		Amman	Huawei		
Kazakhstan	Panfilov	Almaty	IBM (International Business Machines Corp)		IBM East Europe/Asia Limited
Kazakhstan		Almaty	Hewlett Packard		The main office in Almaty
Kazakhstan		Almaty	NetApp Inc		
Kazakhstan		Almaty	Xerox		Office
Kazakhstan		Almaty	Nokia		Regional Office
Kazakhstan		Almaty	Motorola Solutions		Sales Office
Kazakhstan		Almaty	Alcatel Lucent SA		
Kazakhstan		Almaty	Ericsson LM		Office
Kazakhstan		Almaty	Intel		
Kazakhstan		Almaty	LG Electronics		LG Electronics Almaty Kazakhstan, Marketing &
Kazakhstan		Almaty	NEC		Production
Kazakhstan		Almaty	Olympus		Olympus Moscow Limited Liability Company
Kazakhstan		Almaty	Seiko Epson		
Kazakhstan		Almaty	Fujitsu		Fujitsu Technology Solutions GmbH
Kazakhstan		Almaty	ZTE Corp		Sales Office
Kazakhstan		Almaty	Huawei		
Kuwait		Kuwait	EMC Corp		
Kuwait		Kuwait City	EMC Corp		
Kuwait		Safat	Xerox		Office
Kuwait		KuwaitCity	Mitsubishi Electric		Mitsubishi Electric Corporation - Kuwaitoffice
Kuwait		Kaifan	ZTE Corp		Sales Office
Kuwait		Shuwaik	Huawei		
Lebanon		Beirut	Xerox		Office
Lebanon		Hejmeih Beirut	Cisco Systems Inc		
Lebanon		Beirut	Ericsson LM		Office
Lebanon		Metn	Mitsubishi Electric		
Malaysia		Penang	Jabil	969,000	Manufacturing, Aftermarket
Malaysia		Penang	Jabil	286,000	Manufacturing, Support
Malaysia		Selangor	Jabil	50,000	Aftermarket, Storage, Support
Malaysia		Penang	Flextronics		Flextronics facilities, Design Centers,
Malaysia		Kuala Lumpur	Polycorn Inc.		Manufacturing, Industrial Parks
Malaysia		Johor	Polycorn Inc.		Electronics facilities, Manufacturing
Malaysia		Penang	Amphenol		Electronics facilities, Manufacturing
Malaysia		Penang	Amphenol	70,535	Amphenol Malaysia Sdn Bhd
Malaysia		Penang	Amphenol		Amphenol TCS (A-Anseiko)
Malaysia		Pulau Pinang	Amphenol		Amphenol TCS P3 (Malaysia)
Malaysia		Penang	Amphenol	73,080	Amphenol TCS Sdn Bhd (Malaysia)
Malaysia		Subang Jaya	Sensata	108000	Manufacturing
Malaysia		Penang	Sanmina		Logistics/Post-Manufacturing Repair/Warranty &
Malaysia		Penang	Sanmina	516,556	PCBA & System Assembly
Malaysia		Penang	Benchmark Electronics		Benchmark Electronics Malaysia operations are
Malaysia		Penang	Benchmark Electronics	103,000	located in the Free Industrial Zone of Bayan Lepas,
Malaysia		Penang	Plexus	190,000	the main industrial hub of Penang, Malaysia.
Malaysia		Penang		1,048,000	Penang Design Center
Malaysia		Multiple Locations	Celestica		Electronics Manufacturing Operations &
Malaysia		Melaka	Vishey	1,549,000	Automated Manufacturing Operations
Malaysia		Penang	AVX Corporation		480000 Optoelectronic Components
Malaysia		Kuala Lumpur	Arrow Electronics	190,000	Manufacturing — PC
Malaysia		Penang	Arrow Electronics		Office
Malaysia		Selangor	Ingram Micro		Office
Malaysia		Penang	Ingram Micro		
Malaysia		Pahang	Ingram Micro		
Malaysia		Sabah	Ingram Micro		
Malaysia		Johor Bahru	Ingram Micro		
Malaysia		Sarawak	Ingram Micro		
Malaysia		Kuching	Ingram Micro		
Malaysia		Selangor	Petaling Jaya		IBM (International Business Machines Corp)
Malaysia		Kuala Lumpur	Hewlett Packard		Malaysia Head Office IBM Malaysia Sdn Bhd
Malaysia		Kuala Lumpur	EMC Corp		Office
Malaysia		Malacca	EMC Corp		
Malaysia		Penang	NetApp Inc		
Malaysia		Penang	NetApp Inc		
Malaysia		Kuala Lumpur	NetApp Inc		
Malaysia		Petaling Jaya	Xerox		Office
Malaysia		Penang	Xerox		Manufacturing plant
Malaysia		Selangor	Lexmark		Lexmark International (Malaysia) Sdn Bhd
Malaysia		Malaysia	Corning		Office
Malaysia		Kuala Lumpur	Nokia		Regional Office
Malaysia		Penang	Cisco Systems Inc		
Malaysia		Bayan Lepas	BlackBerry		
Malaysia		Selangor	Motorola Solutions		Sales Office
Malaysia		Kuala Langat	Amkor Technology Inc		Sales Office
Malaysia		Kuching	Applied Materials Inc		Sales and Services
Malaysia		Kedah Darul Aman	Applied Materials Inc		Sales and Services
Malaysia		Kuala Lumpur	ATMI Inc		Office
Malaysia					Manufacturing, Research and
Malaysia		Kedah	Kulim		
Malaysia		Penang	Bayan Lepas		
Malaysia		Penang	Entegris Inc	195,000	Manufacturing
Malaysia		Penang	Entegris Inc		
Malaysia		Penang	Fairchild Semiconductor International		Manufacturing Sites
Malaysia		Kuala Lumpur	Intersil Corp.		Office
Malaysia		Kulim	KLA Tencor Corp		
Malaysia		Selangor	KLA Tencor Corp		
Malaysia		Kedah	Lam Research Corp		Office
Malaysia					
Malaysia				338,000	Assembly operations, research and development
Malaysia		Penang	Linear Technology		
Malaysia		Penang	Microchip Technology		
Malaysia		Seremban	On Semiconductor	404,700	Front end/Back End Facilities
Malaysia		Perak	On Semiconductor		Sales Office
Malaysia		Ipoh	Semtech		
Malaysia		Penang	Semtech		
Malaysia		Kuala Lumpur	Alcatel Lucent SA		
Malaysia		Cyberjaya	Ericsson LM		Office

Source: Citi Research



Figure 1002. Asia – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Malaysia		Kuala Lumpur	F5 Networks		Office
Malaysia		Ipo	Finisar Corp.	640,000	Office
Malaysia		Selangor	JDSU Corp.		Sales Office
Malaysia		Kuala Lumpur	Juniper Networks Inc		Office
Malaysia		Kuala Lumpur	Polycorn Inc.		Office
Malaysia	Selangor	Kuala Lumpur	Riverbed Technology		Sales Office
Malaysia		Kuala Lumpur	Tellabs, Inc.		
Malaysia	Penang	Bayan Lepas	Advanced Micro Devices, Inc		
Malaysia	Selangor	Cyberjaya	Advanced Micro Devices, Inc		
Malaysia	Penang	Altera Corp		470,000	
Malaysia		Petaling Jaya	Freescale Semiconductor Ltd.		Office
Malaysia		Muar	Integrated Device Technology	145,000	
Malaysia		Muar	Micron		Assembly and test
Malaysia		Kulim	Marvell		
Malaysia		Pulau Pinang	Intel		
Malaysia		Kuala Lumpur	Intel		
Malaysia					Manufacturing Facilities, Design Centers and Specialized Centers of Excellence
Malaysia	Penang	Bayan Lepas	Spanion		
Malaysia		Kuala Lumpur	Texas Instruments		
Malaysia		Melaka	Texas Instruments		
Malaysia	Penang	Bayan Lepas	SK Hynix		Penang Office
Malaysia		George Town	LG Display		
Malaysia	Selangor	Petaling Jaya	LG Electronics		LG Electronics (M) Sdn. Bhd., Marketing
Malaysia	Penang	Gelugor	Samsung Electro-Mechanics		Overseas Sales Offices
Malaysia	Negeri Sembilan	Sungai Gadut	Samsung SDI		Malaysian Plant (SDI(M) )
Malaysia		Kuala Lumpur	Cheil Industries		Chemicals/Electronic Materials Division
Malaysia	Selangor	Petaling Jaya	Mitsubishi Electric		Mitsubishi Electric Sales Malaysia Sdn Bhd
Malaysia	Selangor	Petaling Jaya	Mitsubishi Electric		Mitsubishi Elevator Malaysia Sdn. Bhd.
Malaysia	Selangor	Petaling Jaya	Mitsubishi Electric		Mitsubishi Electric (Malaysia) Sdn. Bhd.
Malaysia		Kuala Lumpur	Acer Inc		Acer Sales & Services Sdn Bhd.
Malaysia		Kuala Lumpur	Acer Inc		Acer KL Headquarters
Malaysia	Perak	Ipo	Acer Inc		Tech Support - Acer Ipo
Malaysia		Johor Bahru	Acer Inc		Tech Support - Acer Johor Bahru
Malaysia	Johor	Kluang	Acer Inc		Tech Support - Acer Kluang
Malaysia	Kelantan	Kota Bharu	Acer Inc		Tech Support - Acer Kota Bharu
Malaysia	Sabah	Kota Kinabalu	Acer Inc		Tech Support - Acer Kota Kinabalu
Malaysia	Pahang	Kuantan	Acer Inc		Tech Support - Acer Kuantan
Malaysia		Kuching	Acer Inc		Tech Support - Acer Kuching
Malaysia	Melaka		Acer Inc		Tech Support - Acer Melaka
Malaysia	Sarawak	Miri	Acer Inc		Tech Support - Acer Miri
Malaysia	Penang	George Town	Acer Inc		Tech Support - Acer Penang
Malaysia		Sandakan	Acer Inc		Tech Support - Acer Sandakan
Malaysia	Negeri Sembilan	Seremban	Acer Inc		Tech Support - Acer Seremban
Malaysia	Sarawak	Sibu	Acer Inc		Tech Support - Acer Sibu
Malaysia	Sabah	Tawau	Acer Inc		Tech Support - Acer Tawau
Malaysia		Kuala Lumpur	ASUSTek COMPUTER INC		ASUSTek Computer Sdn Bhd
Malaysia		Kuala Lumpur	NEC		NEC Corporation of Malaysia Sdn. Bhd.
Malaysia		Kuala Lumpur	NEC		PERNEC Corporation Berhad
Malaysia		Port Klang	Wistron Corporation		Manufacturing center
Malaysia	Selangor	Petaling Jaya	Lenovo Group		Lenovo Technology Sdn Bhd
Malaysia	Penang		ASE	828,000	Packaging and Testing
Malaysia	Kedah	Kulim	First Solar Inc		Manufacturing
Malaysia		Penang	WPG Holding		
Malaysia		Kuala Lumpur	WPG Holding		
Malaysia		Negeri Sembilan	Alps Electric		Head Office
Malaysia		Penang	Alps Electric		Penang Office
Malaysia	Penang	Bayan Baru	Hirose Electric		Penang Liaison Office
Malaysia	Selangor		Hosiden Corporation(M)Sdn.Bhd.		
Malaysia		Penang	IBIDEN (Malaysia) Sdn. Bhd.		
Malaysia		Penang	IBIDEN		
Malaysia		Penang	IBIDEN Electronics Malaysia Sdn. Bhd		
Malaysia	Johor		KYOCERA Telecom Equipment (Malaysia) Sdn. Bhd.		
Malaysia	Perak	Batu Gajah	Murata		Production and Sales
Malaysia		Kuala Lumpur	Murata		Sales Office
Malaysia		Penang	Murata		Sales Office
Malaysia		Petaling Jaya	Rohm		Sales Office - ROHM Semiconductor Malaysia Sdn.Bhd.
Malaysia		Penang	Rohm		Sales Office - ROHM Semiconductor Malaysia Sdn.Bhd.
Malaysia	Kelantan	Kota Bharu	Rohm		Overseas Manufacturing Centers - ROHM-Wako Electronics (Malaysia) Sdn. Bhd.
Malaysia		Kuala Lumpur	Shinko Electric Industries		Plant & Facilities & Sales Office - SHINKO ELECTRONICS (MALAYSIA) SDN. BHD.
Malaysia		Penang	Shinko Electric Industries		Sales Office - SHINKO ELECTRONICS (MALAYSIA) SDN. BHD.
Malaysia		Melaka	Shinko Electric Industries		Sales Office - SHINKO ELECTRONICS (MALAYSIA) SDN. BHD.
Malaysia	Selangor	Taiyo Yuden			Kuala Lumpur Office/Manufacturing
Malaysia		Penang	Taiyo Yuden		Penang Office/Manufacturing
Malaysia	Sarawak	Kuching	Taiyo Yuden		Manufacturing Base
Malaysia		Penang	TDK Corporation		TDK (MALAYSIA) SDN. BHD.
Malaysia		Penang	TDK Corporation		PENANG Sales Office
Malaysia	Selangor	Petaling Jaya	Nidec		Sales
Malaysia	Selangor	Kajang	Nidec		Manufacturing
Malaysia	Negeri Sembilan	Nilai	Nidec		Manufacturing
Malaysia		Penang	Mitsumi Electric		Sales Office
Malaysia		Kuala Lumpur	Mitsumi Electric		Sales Office
Malaysia	Johor	Batu Pahat	Mitsumi Electric		SALES OFFICE
Malaysia		Penang	Canon		MITSUMI TECHNOLOGY (M.) SDN. BHD.
Malaysia	Selangor	Shah Alam	Canon		Magnetic components
Malaysia	Selangor	Kuala Lumpur	Canon		Die bonder
Malaysia		Kuala Lumpur	Hoya Corporation		All product segments
Malaysia		Kuala Lumpur	Hoya Corporation		Malaysian HOYA LENS SDN. BHD.
Malaysia		Kulim	Hoya Corporation		HOYA LENS MANUFACTURING MALAYSIA SDN. BHD.
Malaysia		Kuala Lumpur	Olympus		HOYA ELECTRONICS MALAYSIA SDN. BHD.
Malaysia		Kuala Lumpur	Nikon		Sale of imaging products in Malaysia
Malaysia		Kuala Lumpur	Nikon		
Malaysia		Kuala Lumpur	Nikon		
Malaysia		Shah Alam	Ricoh Co		Sales & Services - Ricoh (Malaysia) Sdn.Bhd.
Malaysia		Subang Jaya	Seiko Epson		Epson Malaysia Sdn. Bhd.

Source: Citi Research

Figure 1003. Asia – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Malaysia			Seiko Epson		Manufacturing Subsidiaries and Affiliates - Epson Precision (Johor) Sdn. Bhd.
Malaysia			Seiko Epson		Manufacturing Subsidiaries and Affiliates - Epson Precision Malaysia Sdn. Bhd.
Malaysia	Selangor	Shah Alam	Nippon Electric Glass		Manufacturing Plant : Glass fiber, Glass for CRTs, Glass for lighting applications, Heat-resistant glass SHARP-PROXY SALES & SERVICE COMPANY (M) SDN. BHD. [Malaysia]
Malaysia	Selangor	Shah Alam	Sharp Corp		
Malaysia	Selangor	Shah Alam	Fujifilm		
Malaysia		Penang	Fujitsu		FUJITSU SEMICONDUCTOR ASIA
Malaysia		Cyberjaya	Fujitsu		Fujitsu (Malaysia) Sdn. Bhd.
Malaysia		Kuala Lumpur	Fujitsu		Fujitsu (Malaysia) Sdn. Bhd.
Malaysia		Parit Raja	Fujitsu		Fujitsu Component (Malaysia) Sdn. Bhd.
Malaysia	Kedah	Kulim	ASML Holding NV		
Malaysia		Kuala Lumpur	Brocade Communications		Brocade Communications Systems Malaysia Sdn Bhd
Malaysia	Kedah	Kulim	Infineon Technologies AG		Manufacturing
Malaysia	Melaka	Batu Berendam	Infineon Technologies AG		Manufacturing
Malaysia		Johor	Seagate Technology	631,000	Manufacture of substrates
Malaysia		Penang	Seagate Technology	390,000	Manufacture of drive subassemblies
Malaysia		Muar	STMicroelectronics		Manufacturing & Design Center
Malaysia		Jakarta	STMicroelectronics		Sales Office & Representative
Malaysia		Kuala Lumpur	STMicroelectronics		Sales Office & Representative
Malaysia		Penang	STMicroelectronics		Sales Office & Representative
Malaysia		Penang	Venture Corp.	425,414.808	Industrial Usage
Malaysia		Johor	Venture Corp.	164,907.092	Industrial Usage
Malaysia			Western Digital Corp		
Malaysia		Kuala Lumpur	Western Digital Corp	107,2700	Manufacturing of hard drives and printed circuit boards and research and development
Malaysia		Kuching	Western Digital Corp	271,300	Manufacturing and development of substrates
Malaysia		Penang	Western Digital Corp	89,1100	Manufacturing of media, research and development and slider fabrication
Malaysia		Kuala Lumpur	ZTE Corp		Sales Office
Malaysia	Selangor	Subang Jaya	Belden		Sales Offices
Malaysia		Kuala Lumpur	Huawei		Southern Pacific Headquarters
Malaysia		Penang	Silitech Technology		
Malaysia		Penang	Veeva Instruments Inc		
Malaysia		Seremban	Xyratec	246,900	Production and R&D
Malaysia		Penang	Xyratec		Office
Malaysia		Penang	Molex		Penang Plant & Sales Office
Malaysia		Penang	Molex		Kuala Lumpur Sales Office
Malaysia	Selangor	Johor	Molex		Johore Bahru Sales Office
Malaysia		Kuala Lumpur	Panasonic		Semiconductor Sales office
Malaysia		Penang	Panasonic		Semiconductor Sales office
Malaysia		Johor	Panasonic		Semiconductor Sales office
Malaysia		Penang	Panasonic		Semiconductor Production Plants
Malaysia		Melaka	Panasonic		Semiconductor Production Plants
Malaysia		Kuala Lumpur	Panasonic		Panasonic Industrial Devices Sales (M) Sdn. Bhd.
Malaysia		Kuala Lumpur	Hitachi		Branch - Hitachi Asia (M) Sdn. Bhd.
Malaysia		Selangor	Hitachi		Hitachi Air Conditioning Products (M) Sdn. Bhd.
Malaysia		Johor Bahru	Hitachi		Hitachi Cable (Johor) Sdn. Bhd.
Malaysia		Penang	Hitachi		Hitachi Chemical (M) Sdn. Bhd.
Malaysia	Selangor		Hitachi		Hitachi Chemical (Selangor) Sdn. Bhd.
Malaysia		Kuala Lumpur	Hitachi		Hitachi Consulting Malaysia Sdn. Bhd.
Malaysia		Kuala Lumpur	Hitachi		Hitachi Data Systems Sdn. Bhd.
Malaysia	Selangor		Hitachi		Hitachi eBworks Sdn. Bhd.
Malaysia		Kuala Lumpur	Hitachi		Hitachi High-Technologies IPC (M) Sdn. Bhd.
Malaysia		Kuala Lumpur	Hitachi		Hitachi International Treasury (M) Sdn. Bhd.
Malaysia		Subang Jaya	Hitachi		Hitachi Power Tools (M) Sdn. Bhd.
Malaysia	Selangor		Everlight		Sales Office
Malaysia		Johor Bahru	FUNAI ELECTRIC CO LTD		Funai Malaysia R and D SDN. BHD
Malaysia		Kuala Lumpur	Pioneer Corporation		Pioneer Technology (Malaysia) Sdn. Bhd.
Malaysia		Johor Bahru	Brother Industries Ltd		Production Facilities
Malaysia	Selangor	Petaling Jaya	Brother Industries Ltd		Sales Facilities
Malaysia		Kuala Lumpur	Toshiba		Kuala Lumpur Representative Office
Malaysia		Shah Alam	Toshiba		Toshiba Sales & Services Sdn. Bhd.
Malaysia			Toshiba		Toshiba Transmission & Distribution Sys Asia Sdn. Bhd.
Malaysia		Selangor	Toshiba		Toshiba Electronics Trading (Malaysia) Sdn. Bhd.
Malaysia		Petaling Jaya	Toshiba		
Maldives		Male	IBM (International Business Machines Corp)		Office
Mongolia		Ulaanbaatar	Intel		
Mongolia		Ulaanbaatar	ZTE Corp		Sales Office
Mongolia		Ulan Bator	Huawei		
Myanmar		Yangon	Fujifilm		
Myanmar		Yangon	Toshiba		Toshiba Asia Pacific Pte, Ltd (Yangon Branch Office)
Nepal		Kathmandu	Xerox		Office
Nepal		Kathmandu	ZTE Corp		Sales Office
Nepal		Lalitpur	Huawei		
Oman		Muscat	Xerox		Office
Oman		Muscat	Huawei		
Pakistan		Karachi	IBM (International Business Machines Corp)		IBM
Pakistan		Islamabad	EMC Corp		
Pakistan		Karachi	EMC Corp		
Pakistan		Karachi	NetApp Inc		
Pakistan		Lahore	Xerox		
Pakistan		Karachi	Nokia		Office
Pakistan		Islamabad	Intel		Regional Office
Pakistan	Sindh	Karachi	Intel		
Pakistan		Islamabad	NEC		
Pakistan		Karachi	Nikon		
Pakistan		Karachi	Fujifilm		

Source: Citi Research

Figure 1004. Asia – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Pakistan	Punjab	Lahore	STMicroelectronics		Sales Office & Representative
Pakistan		Islamabad	ZTE Corp		Sales Office
Pakistan		Islamabad	Huawei		
Papua New Guinea		Port Moresby	Ericsson LM		Office
Philippines		Cebu City	Flextronics		Flextronics facilities, Design Centers
Philippines		Manila	NetApp Inc	144000	Diodes and Optoelectronic Components
Philippines		Muntinlupa City	Arrow Electronics		Office
Philippines	Manila	Pasig	Ingram Micro		
Philippines		Quezon	IBM (International Business Machines Corp)		IBM Building
Philippines		Makati	Hewlett Packard		Office
Philippines		Taguig	Hewlett Packard		Office
Philippines		Manila	EMC Corp		
Philippines		Manila	NetApp Inc		
Philippines		Makati	Xerox		Office
Philippines		Cebu City	Lexmark		Regional Office
Philippines		Makati	Nokia		
Philippines		Makati	Cisco Systems Inc		
Philippines		Taguig	Motorola Solutions		Corporate & Regional Office
Philippines			Motorola Solutions		Sales Office
Philippines		Muntinlupa	Amkor Technology Inc	749,000	Packaging and test services; package and process development
Philippines	Laguna		Amkor Technology Inc	625,000	Packaging and test services
Philippines		Cavite	Analog Devices, Inc	605,000	Wafer probe and testing, warehouse, engineering and administrative offices
Philippines		Clark Freeport Zone	Applied Materials Inc		Sales and Services
Philippines		Cebu City	Fairchild Semiconductor International		Manufacturing Sites
Philippines	Manila	Pasig	International Rectifier Corp		Manufacturing, engineering, administration, office space, customer service,
Philippines	Cavite		Maxim Integrated	479,000	shipping, and other
Philippines	Batangas		Maxim Integrated	78,000	Manufacturing, engineering, office space and other
Philippines	Cavite		Maxim Integrated		Office
Philippines	Batangas	Tanauan City	Maxim Integrated		Office
Philippines		Manila	Maxim Integrated		Office
Philippines		Metro Manila	Microchip Technology		
Philippines		Pasig City	Microchip Technology		
Philippines		Carmona	On Semiconductor	222,500	Back end Facilities
Philippines		Tarlac City	On Semiconductor	861,100	Back end Facilities
Philippines		Manila	On Semiconductor		Sales Office
Philippines		Manila	Semtech		
Philippines	Cebu		TeraDyne	135,000	Semiconductor Test & Corporate
Philippines	Manila	Makati	Alcatel Lucent SA		
Philippines		Manila	Ciena Corp		
Philippines		Taguig	Ericsson LM		Office
Philippines		Manila	FS Networks		Office
Philippines		Manila	Polycorn Inc.		Office
Philippines		Makati	Riverbed Technology		
Philippines		Pasig City	Tellabs, Inc.		Sales Office
Philippines	Cavite		Cypress Semiconductor Corp	221,000	Manufacturing, research and development
Philippines	Manila	Taguig	Intel		
Philippines		Manila	QUALCOMM Incorporated		
Philippines		Baguio	Texas Instruments		
Philippines		Pampanga (Clark)	Texas Instruments		
Philippines		Muntinlupa	Meyer Burger Technology AG		
Philippines		Pasig City	LG Electronics		Aureotech Corporation
Philippines		Calamba	Samsung Production Subsidiaries		LG Electronics Philippines Inc., Marketing
Philippines		Manila	Samsung Electro-Mechanics		Overseas Sales Offices
Philippines	Manila	Taguig	Acer Philippines, Inc.		Overseas Production Subsidiaries
Philippines		Makati	Acer Inc		Overseas Sales Offices
Philippines		Manila	NEC		Acer Philippines, Inc.
Philippines	Cebu		NEC		Tech Support
Philippines	Laguna		NEC		NEC Philippines, Inc.
Philippines		Makati	Wistron Corporation		Technology support center, service center
Philippines		Manila	Lenovo Group		Lenovo (Singapore) Pte Ltd. – Philippines
Philippines		Manila	WPG Holding		
Philippines	Batangas		Ibiden		
Philippines		Cebu City	Kyocera		IBIDEN Philippines, Inc
Philippines	Laguna	Calamba	Kyocera		KYOCERA Document Solutions Development
Philippines		Quezon	Kyocera		Philippines, Inc.
Philippines		Laguna	Kyocera		KYOCERA Circuit Solutions Philippines, Inc.
Philippines		Santa Rosa	Murata		KYOCERA Circuit Design Philippines, Inc.
Philippines	Batangas	Tanauan City	Murata		Sales Office
Philippines		Muntinlupa	Rohm		Productions
Philippines		Cavite	Rohm		Sales Office - ROHM Semiconductor Philippines Corporation
Philippines		Cebu City	Rohm		Overseas Manufacturing Centers - ROHM
Philippines			Taiyo Yuden		Electronics Philippines, Inc.
Philippines	Laguna		TDK Corporation		Manufacturing Base
Philippines					TDK ELECTRONICS PHILIPPINES CORPORATION

Source: Citi Research

Figure 1005. Asia – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Philippines		Subic Bay Freeport 2	Nidec		Manufacturing
Philippines	Laguna	Binan	Nidec		Manufacturing
Philippines		Bataan	Mitsumi Electric		MITSUMI PHILIPPINES, INC.
Philippines		Danao	Mitsumi Electric		CEBU MITSUMI, INC.
Philippines		Quezon	Canon		Embedded and application software development and testing, hardware design and verification
Philippines	Batangas		Canon		Laser printers
Philippines	Manila	Taguig	Canon		All product segments
Philippines		Makati	Hoya Corporation		HOYA LENS PHILIPPINES, INC.
Philippines		Laguna	Hoya Corporation		HOYA GLASS DISK PHILIPPINES, INC.
Philippines		Batangas	Hoya Corporation		HOYA GLASS DISK PHILIPPINES, INC.
Philippines		Cavite	Hoya Corporation		HOYA GLASS DISK PHILIPPINES, INC.
Philippines			Nikon		
Philippines		Makati	Ricoh Co		Sales & Services - Ricoh (Philippines), Inc.
Philippines		Manila	Seiko Epson		Epson Philippines Corporation
Philippines		Cabuyao	Seiko Epson		Manufacturing Subsidiaries and Affiliates - Epson Precision (Philippines) Inc.
Philippines		Pasig City	Asahi Glass		Manufacturing and sales of for construction, automotive various float glasses, figured glass, mirror, and solar battery cover glass
Philippines	Laguna		Asahi Glass		Automotive glass assembly and delivery service
Philippines		Muntinlupa	Sharp Corp		SHARP (PHILS.) CORPORATION [Philippines]
Philippines		Makati	Fujifilm		
Philippines	Laguna	Binan	Fujitsu		Fujitsu Die-Tech Corporation
Philippines		Metro Manila	Makati		Fujitsu Philippines, Inc.
Philippines		Metro Manila	Pasig City		Fujitsu Ten Solutions Philippines, Inc.
Philippines		Laguna	Stanta Rosa		Office
Philippines		Calamba	STMicroelectronics		Manufacturing & Design Center
Philippines		Pasig City	STMicroelectronics		Sales Office & Representative
Philippines		Makati	ZTE Corp		Sales Office
Philippines		Pasig	Belden		Sales Offices
Philippines		Makati	Huawei		Administration, test and
Philippines	Laguna		TriQuint	9000	assembly
Philippines		Binan	Veeco Instruments Inc		
Philippines	Laguna	Calamba	Xyratex		Office
Philippines		Taguig	Molex		Philippines Sales Office
Philippines		Makati	Panasonic		Sales Office
Philippines		Makati City	Hitachi		Hitachi Asia Ltd. - Philippine Branch
Philippines		Makati City	Hitachi		Hitachi, Ltd. Infrastructure Systems Company
Philippines		Makati City	Hitachi		Philippines Branch Office
Philippines		Batangas	Hitachi		Plant
Philippines		Makati City	Hitachi		Hitachi, Ltd., Philippine Branch (HIMAC)
Philippines		Quezon City	Hitachi		Office - Hitachi Air Conditioning Products (Phils.) Inc.
Philippines		Lipa City	Hitachi		Hitachi Cable Asia Ltd. - Philippine Branch
Philippines		Makati City	Hitachi		Office - Hitachi Cable Philippines, Inc.
Philippines		Lipa City	Hitachi		Plant
Philippines		Quezon City	Hitachi		Hitachi Elevator Philippines Corporation
Philippines	Cavite	Dasmariñas	Hitachi		Hitachi Industrial Machinery Phils. Corp.
Philippines		Makati City	Hitachi		Hitachi Plant Technologies, Ltd. (Philippine Branch Office)
Philippines		Muntinlupa City	Hitachi		Hitachi Via Asia Pte. Ltd. - Philippine Branch
Philippines		Cebu	FUNAI ELECTRIC CO LTD		FUNAI ELECTRIC CO LTD
Philippines		Tanauan City	Brother Industries Ltd		Production Facilities
Philippines		Taguig	Brother Industries Ltd		Sales Facilities
Philippines		Makati City	Toshiba		Toshiba (Philippines), Inc.
Philippines					Toshiba Information Equipment (Philippines), Inc., v
Philippines		Billan City	Toshiba		IBM Qatar SSC
Philippines		Doha	IBM (International Business Machines Corp)		
Philippines		Doha	EMC Corp		Office
Philippines		Doha	Xerox		Sales Office
Philippines		Doha	ZTE Corp		
Philippines		Novatek			
Philippines		Novatek			
Philippines		Dubai	IBM (International Business Machines Corp)		IBM Middle East FZ LLC
Philippines		Riyadh	Hewlett Packard		Office
Philippines		Al Khobar	EMC Corp		
Philippines		Jeddah	EMC Corp		
Philippines		Riyadh	EMC Corp		
Philippines			NetApp Inc		
Philippines		Riyadh	Xerox		Office
Philippines		Jeddah	Xerox		Office
Philippines		Khobar	Xerox		Office
Philippines		Jeddah	Nokia		Regional Office
Philippines		Dhahran	Cisco Systems Inc		
Philippines		Riyadh	Cisco Systems Inc		

Source: Citi Research

Figure 1006. Asia – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Saudi Arabia		Riyadh	Blackberry		
Saudi Arabia		Riyadh	Alcatel Lucent SA		
Saudi Arabia		Al-Khobar	Alcatel Lucent SA		
Saudi Arabia		Riyadh	Ciena Corp		
Saudi Arabia		Riyadh	Juniper Networks Inc		
Saudi Arabia		Riyadh	QUALCOMM Incorporated		
Saudi Arabia		Jeddah	LG Electronics		LG Electronics Saudi Arabia Limited
Saudi Arabia		Riyadh	LG Electronics		LG-Shaker Company Ltd
Saudi Arabia		Riyadh	Mitsubishi Electric		Mitsubishi Electric Saudi Ltd.
Saudi Arabia			NEC		NEC Saudi Arabia
Saudi Arabia		Riyadh	Lenovo Group		Saudi Arabia Office: Lenovo Saudi Arabia Ltd.
Saudi Arabia			Nikon		
Saudi Arabia			Seiko Epson		Epson Europe B.V. Saudi Arabia Office
Saudi Arabia		Riyadh	Fujitsu		Fujitsu Arabia
Saudi Arabia		Riyadh	Brocade Communications		
Saudi Arabia		Riyadh	ZTE Corp		Sales Office
Saudi Arabia		Riyadh	Huawei		
Saudi Arabia		Dammam	Hitachi		Hitachi Sahati Engineering Services Co., Ltd.
Singapore		Alexandra	Jabil	13,000	Manufacturing
Singapore		Tampines	Jabil	8,000	Manufacturing
Singapore		Toa Payoh	Jabil	88,000	Manufacturing, Design
Singapore			Flextronics		Flextronics facilities, Design Centers
Singapore		Changi	Wistron Corporation		Flextronics facilities, Manufacturing
Singapore		Kallang	Wistron Corporation		Flextronics facilities, Manufacturing
Singapore		Joo Koon	Wistron Corporation	560,000	Flextronics facilities, Manufacturing
Singapore		Luzerne	Amphenol		Asia Pacific Sales Operations
					Design & JDM, Logistics/Post-Manufacturing
					Repair/Warranty, New Product Introduction, PCB
					Fabrication & PCBA & System Assembly
					Asia IPO serves as the Purchasing Office for our Far East facilities as well as a gateway for materials procurement in support of other Benchmark
Singapore		Multiple locations	Sanmina	463,019	
Singapore			Benchmark Electronics	42,000/78,000	divisions.
Singapore		Multiple Locations	Celestica	260,000	
Singapore			Vishay		Vishay Intertechnology Asia Pte. Ltd
Singapore			Arrow Electronics		Office
Singapore			Ingram Micro		
Singapore		Kallang	Ingram Micro		
Singapore		Downtown Cor Funan	DigitalLife Mailgram Micro		
Singapore		Changi	Ingram Micro		
Singapore		Changi	IBM (International Business Machines Corp)		IBM Singapore Pte. Ltd.
Singapore			Hewlett Packard		Office
Singapore			Hewlett Packard		Product Development and Manufacturing Laboratories
Singapore		Fusionopolis	EMC Corp		
Singapore		Changi	NetApp Inc		
Singapore		Millenia Tower	Xerox		Office
Singapore			Electronics for Imaging, Inc		Office
Singapore			Lexmark		Lexmark International (Singapore) Pte Ltd - Main Office
Singapore			Corning		Office
Singapore			Cisco Systems Inc		
Singapore			Blackberry		
Singapore			Motorola Solutions		Corporate & Regional Office
Singapore			Apple Inc		Office
Singapore		River Valley	Amkor Technology Inc		Sales Office
Singapore			Applied Materials Inc	402,000	Manufacturing and Customer Support
Singapore			Applied Materials Inc		Main Office
Singapore		Upper Changi	Applied Materials Inc		Asia Product Development
Singapore		Science Park II	ATI Inc		Sales & Customer Service
					Administration, Manufacturing, Research and Development and Sales and Marketing
Singapore			Brooks Automation Inc		Office
Singapore			Entegris Inc	25,278	supply chain.
Singapore			Fairchild Semiconductor International	1,338	Sales office, field service, and repair center
Singapore			FormFactor Inc		
Singapore			FormFactor Inc		
Singapore		Serangoon North	AvInternational Rectifier Corp		Sales office
Singapore			Intersil Corp.		
Singapore		Serangoon	KLA Tencor Corp	188,695	Office and plant
Singapore		Serangoon	KLA Tencor Corp		Office
Singapore			Lam Research Corp		Test and packaging operations, warehousing and distribution, research and development, and sales
Singapore			Linear Technology	260,000	and administration
Singapore			Maxim Integrated		Office
Singapore			Microchip Technology		
Singapore			On Semiconductor		Sales Office
Singapore		Serangoon North	AvSilicon Laboratories, Inc		
Singapore			Silicon Laboratories, Inc		
Singapore			Teradyne		Local Sales and Support Office
Singapore			Adtran		
Singapore			Alcatel Lucent SA		
Singapore		Chai Chee	Alcatel Lucent SA		
Singapore			Ciena Corp		
Singapore			Ericsson LM		Office
Singapore			FS Networks		Office
Singapore			Finisar Corp.	13600	Office
Singapore			Infinera Corp.		Office
Singapore			JDSU Corp.		Office
Singapore			JDSU Corp.		Sales Office
Singapore			Juniper Networks Inc		
Singapore			Polycorn Inc		Office
Singapore			Riverbed Technology		
Singapore			Tellabs, Inc.		Sales Office
Singapore			Advanced Micro Devices, Inc		
Singapore			Altera Corp		
Singapore			Broadcom		Office

Source: Citi Research

Figure 1007. Asia – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Singapore			Micron		Three wafer fabrication facilities and a test, assembly and module assembly facility
Singapore			Marvell	340,000	
Singapore			Intel		
Singapore		Singapore	QUALCOMM Incorporated		Spanion Asia Holdings (Singapore) PTE. LTD
Singapore			Spanion		
Singapore		Singapore	Xilinx Inc	222,000	centrotherm photovoltaics Asia Pte. Ltd.
Singapore			Centrotherm Photovoltaics		
Singapore		Singapore	LG Display		Sales
Singapore			LG Electronics		LG Electronics Singapore PTE LTD, Marketing Overseas Sales Offices
Singapore			Samsung Electro-Mechanics		ASUS Technology Pte Ltd
Singapore			ASUSTEK COMPUTER INC		NEC Asia Pacific Pte. Ltd.
Singapore			NEC		Decillion Solutions Pte. Ltd.
Singapore			NEC		NEC Logistics Singapore Pte. Ltd.
Singapore			NEC		NEC STEE Cloud Services Pte. Ltd.
Singapore			NEC		NEC TOKIN Singapore Pte. Ltd.
Singapore			Delta Electronics		Singapore Office
Singapore			Wistron Corporation		Service center
Singapore			AU Optronics		Office
Singapore			ASE	282,000	Packaging and testing
Singapore			Advanced Energy Industries, Inc		Advanced Energy Singapore PTE, Ltd.
					Regional Headquarters - Trina Solar (Singapore) Pte Ltd
Singapore			Trina Solar Limited		
					Yingli Green Energy Company Singapore Pte. Limited
Singapore			Yingli Green Energy		
Singapore			UMC		
Singapore			PowerTech Technology		Investment Business
Singapore			SPII		Design, manufacturing
Singapore			WPG Holding		
Singapore			Hirose Electric		HIROSE ELECTRIC SINGAPORE PTE. LTD
					IBIDEN Asia Holdings Pte., Ltd; IBIDEN Singapore Pte. Ltd.
Singapore			Ibiden		
Singapore			Kyocera		KYOCERA Asia Pacific Pte. Ltd; KYOCERA Communication Systems Singapore Pte. Ltd.
Singapore					
Singapore			Kyocera		KYOCERA Document Solutions Singapore Pte. Ltd.
					KYOCERA Connector Products Singapore Pte. Ltd.
Singapore			Kyocera		KYOCERA Chemical Singapore Pte. Ltd.
Singapore					Sales Office - ROHM Semiconductor Singapore Pte. Ltd.
Singapore			Rohm		Sales Office - SHINKO ELECTRONICS (SINGAPORE) PTE. LTD.
Singapore					Sales Office
Singapore		Singapore	Shinko Electric Industries		Dainippon Screen Singapore Pte. Ltd.
Singapore			Mitsumi Electric		HOYA HOLDINGS ASIA PACIFIC PTE. LTD.
Singapore			Dainippon Screen		Sales of all product lines in ASEAN, India, and Pakistan
Singapore			Hoya Corporation		
Singapore			Olympus		
Singapore			Nikon		
Singapore			Nikon		
Singapore			Nikon		
Singapore			Seiko Epson		Regional Headquarters - Epson Singapore Pte. Ltd.
Singapore					Manufacturing Subsidiaries and Affiliates - Singapore Epson Industrial Pte. Ltd.
Singapore			Seiko Epson		Sales promotion, sales, and physical distribution of Flat glass
Singapore			Asahi Glass		Sony Electronics (Singapore) Pte. Ltd.
Singapore			Sony Corp		
Singapore			Fujifilm		
Singapore			Fujitsu		Fujitsu Asia
Singapore			ASML Holding NV		
Singapore			Brocade Communications		
Singapore			Brocade Communications		Brocade Communications Singapore Pte. Ltd.
Singapore		Woodlands	Seagate Technology	1,404,000	Manufacture of media
Singapore		Ang Mo Kio		258,000	Manufacturing support, product development and administrative
Singapore			Seagate Technology		
Singapore			Seagate Technology	110,000	Product development
Singapore			STMicroelectronics		Manufacturing & Design Center
Singapore			STMicroelectronics		Manufacturing & Design Center
Singapore		Ang Mo Kio	STMicroelectronics		Manufacturing & Design Center
Singapore		Toa Payoh	STMicroelectronics		Sales Office & Representative
Singapore			STMicroelectronics		Warehouses
Singapore			Venture Corp.	113,560.2	Office & Industrial Usage
Singapore			Emulex Corp		Office
Singapore			Huawei		
Singapore			Logitech International S A	60,000	Distribution center
Singapore			OmniVision		
Singapore			QLogic Corp		
Singapore			TriQuint	4,400	Engineering, administration and marketing
Singapore			Veeco Instruments Inc		
Singapore			Xyratex	18,300	Office
Singapore			Panasonic		
Singapore			Panasonic		Semiconductor Production Plants
Singapore			Panasonic		Sales Office
Singapore			Panasonic		Sale / Marketing, Production
Singapore			Everlight		Sales Office
Singapore			Zhen Ding Tech		Service center
Singapore			FUNAI ELECTRIC CO LTD		FUNAI SINGAPORE PTE. LTD
Singapore		Singapore	Brother Industries Ltd		Sales Facilities
Singapore			REC Solar ASA		Operating Headquarters/production plant
Singapore			REC Solar ASA		Systems and Solutions Offices
Singapore			Casio		Casio Singapore Pte., Ltd., Corporate Office
Singapore			SolarWorld AG		SolarWorld Asia Pacific Pte Ltd.
Singapore			SK Hynix		Headquarters, SK hynix Asia Pte. Ltd.
Singapore			Mitsubishi Electric		Mitsubishi Electric Asia Pte Ltd
Singapore			Mitsubishi Electric		Mitsubishi Elevator (Singapore) Pte Ltd
Singapore			Acer Inc		Acer Computer (Singapore) Pte. Ltd.
Singapore			Acer Inc		Acer Computer (Singapore) Pte Ltd
Singapore			MediaTek		MediaTek Singapore Pte. Ltd.
Singapore		Serangoon	Lenovo Group		Principal Operations and Sales Headquarters

Source: Citi Research

**Figure 1008. Asia – Other (Continued)**

Country	State	City	Company Name	Size (sq ft)	Description/Comments (manufacturing, office)
Singapore			Alps Electric		Head Office
Singapore			Hosiden		Hosiden Singapore Pte.Ltd.
Singapore			Murata		Regional Headquarters, Production and Sales
Singapore			Taiyo Yuden		Sales Office/Manufacturing
Singapore			TDK Corporation		TDK SINGAPORE (PTE) LTD.
Singapore	Singapore		Nidec		Manufacturing
Singapore	Singapore		Nidec		Sales
Singapore	Singapore		Nidec		R&D
Singapore	Singapore		Nidec		Sales
Singapore	Singapore		Nidec		Sales
Singapore	Singapore		Nidec		Sales
Singapore	Singapore		Nidec		Sales
Singapore	Singapore		Manabuchi Motor		Sales Office
Singapore	Singapore		Canon		All product segments
Singapore			Hoya Corporation		HOYA SURGICAL OPTICS
					HOYA MEDICAL SINGAPORE PTE. LTD. Global Headquarters
Singapore			Hoya Corporation		HOYA LENS(S) PTE. LTD
Singapore			Hoya Corporation		HOYA ELECTRONICS SINGAPORE PTE.LTD.
Singapore					Sales & Services - Ricoh Asia Pacific Pte Ltd. - Regional HQ
Singapore			Ricoh Co		Sales & Services - Ricoh (Singapore) Pte Ltd.
Singapore			Tokyo Electron		Sales and services support
					SHARP-ROXY SALES (SINGAPORE) PTE. LTD. (Singapore)
Singapore			Sharp Corp		
Singapore			CSR Plc	1605	Sales and Customer Support
Singapore			Infineon Technologies AG		Office
Singapore			Infineon Technologies AG		Manufacturing
Singapore			Western Digital Corp		
Singapore			ZTE Corp		Sales Office
Singapore			Hi-P International		Headquarters
Singapore			Skyworks		
Singapore			Molex		Singapore Plant & Sales Office
Singapore			Panasonic		Semiconductor Sales office
Singapore			Hitachi		Branch - Hitachi Asia Ltd.
					Hitachi, Ltd. Infrastructure Systems Company
Singapore			Hitachi		Singapore Branch Office
Singapore			Hitachi		Hitachi Aqua-Tech Engineering Pte. Ltd.
Singapore			Hitachi		Hitachi Automotive Systems Singapore Pte. Ltd.
Singapore	Jurong		Hitachi		Hitachi Cable Asia Pacific (HCAP) Pte. Ltd.
Singapore			Hitachi		Hitachi Cable (S) Pte. Ltd.
Singapore			Hitachi		Hitachi Capital Singapore Pte. Ltd.
Singapore			Hitachi		Hitachi Chemical Asia-Pacific Pte. Ltd.
Singapore			Hitachi		Hitachi Chemical (S) Pte. Ltd.
					Hitachi Construction Machinery Asia and Pacific Pte. Ltd.
Singapore			Hitachi		Hitachi Consulting Singapore Pte. Ltd.
Singapore			Hitachi		Hitachi Critical Facilities Protection Pte. Ltd.
Singapore			Hitachi		Hitachi Data Systems Pte. Ltd. (S)
Singapore			Hitachi		Hitachi Elevator Asia Pte. Ltd.
Singapore			Hitachi		Hitachi High-Technologies (S) Pte. Ltd.
Singapore			Hitachi		Hitachi Home Electronics Asia (S) Pte. Ltd.
Singapore			Hitachi		Hitachi International Treasury Ltd.
Singapore			Hitachi		Hitachi Koki (S) Pte. Ltd.
Singapore			Hitachi		Hitachi Medical Systems (S) Pte. Ltd.
Singapore			Hitachi		Hitachi Metals Singapore Pte. Ltd.
Singapore			Hitachi		Hitachi Plant Technologies (Asia) Pte. Ltd.
Singapore			Hitachi		Hitachi Powdered Metals (S) Pte. Ltd.
Singapore			Hitachi		Hitachi T&D Systems Asia Pte. Ltd.
Singapore			Hitachi		Hitachi Transport System (Asia) Pte. Ltd.
Singapore			Hitachi		Hitachi Via Asia Pte. Ltd.
			Pioneer Corporation		Pioneer Electronics AsiaCentre Pte Ltd
					Solar Sales Office - APAC Regional Office - REC Solar Pte. Ltd.
Singapore			REC Solar ASA		
Singapore			Toshiba		Headoffice - Toshiba Asia Pacific Pte Ltd
Singapore			Toshiba		Toshiba Medical Systems Asia Pte., Ltd.
Singapore			Toshiba		Toshiba TEC Singapore Pte., Ltd.
Singapore			Toshiba		Toshiba Logistics (Singapore) Pte., Ltd
					Toshiba Global Commerce Solutions (Singapore), Pte. Ltd.
Singapore			Toshiba		Toshiba Data Dynamics Pte., Ltd.
Sri Lanka	Colombo		IBM (International Business Machines Corp)		IBM World Trade Corporation
Sri Lanka	Colombo		EMC Corp		
Sri Lanka			NetApp Inc		
Sri Lanka	Galle		Xerox		Office
Sri Lanka	Colombo		Xerox		Office
Sri Lanka	Colombo		Cisco Systems Inc		Office
Sri Lanka	Colombo		Ericsson LM		Office
Sri Lanka	Colombo		Intel		
Sri Lanka	Colombo		ASUSTEK COMPUTER INC		Asus Centre
Sri Lanka	Katunayake		Fujitsu		Office
Sri Lanka	Colombo		ZTE Corp		Sales Office
Sri Lanka	Colombo		Huawei		SBM Dpt., TSD

Source: Citi Research

**Figure 1009. Asia – Other (Continued)**

Country	State	City	Company Name	Size (sq ft)	Description/Comments (Manufacturing, office)
Thailand		Phatum Thani	Sannina	326,293	PCBA & System Assembly
Thailand					Benchmark Ayudhya is a high technology facility specializing in System Integration, Box Build, Chip on Board, RF and complex products requiring
Thailand					281,000 / 420(challenging technical manufacturing solutions.
Thailand	Korat	Ayutthaya	Benchmark Electronics	190,000	Hub for technology companies
Thailand		Laem Chabang	Celestica	1,085,000	
Thailand		Bangkok	Arrow Electronics		Office
Thailand	Watthana	Bangkok	Ingram Micro		
Thailand		Bangkok	IBM (International Business Machines Corp)		IBM Thailand Co., Ltd.
Thailand		Bangkok	Hewlett Packard		Office
Thailand		Bangkok	EMC Corp		
Thailand	Lumpini	Bangkok	EMC Corp		
Thailand		Bangkok	NetApp Inc		
Thailand		Bangkok	Xerox		Office
Thailand		Bangkok	Lexmark		Lexmark International (Singapore) Pte Ltd, Bangkok
Thailand		Bangkok	Cisco Systems Inc		Office
Thailand		Pathum Wan	Blackberry		
Thailand		Bangkok	Motorola Solutions		Sales Office
Thailand					Manufacturing, engineering, administration, office space, customer service,
Thailand			Maxim Integrated	144000	shipping, and other
Thailand		Chonburi	Maxim Integrated		Office
Thailand					Test and Assembly; Wafer Probe; Sample Center;
Thailand	Chachoengsao		Microchip Technology	489000	Warehousing and Administrative
Thailand	Chachoengsao		Microchip Technology	215000	Assembly and Test
Thailand		Bangkok	Microchip Technology		
Thailand		Bang Pa In	On Semiconductor	9,000	Back end Facilities
Thailand		Bangkok	On Semiconductor		Sales Office
Thailand		Bangkok	Alcatel Lucent SA		
Thailand	Chatuchak	Bangkok	Ericsson LM		Office
Thailand		Bangkok	F5 Networks		Office
Thailand		Bangkok	Juniper Networks Inc		
Thailand		Bangkok	Polycorn Inc.		Office
Thailand		Bangkok	Telabs, Inc.		Sales Office
Thailand		Bangkok	Advanced Micro Devices, Inc		
Thailand		Bangkok	Intel		
Thailand		Nonthaburi	Spanson		Manufacturing Facilities
Thailand		Bangkok	SMA Solar Technology		SMA Solar (Thailand) Co., Ltd.
Thailand		Bangkok	LG Electronics		LG Electronics Thailand Co., Ltd., Marketing & Production
Thailand	Chachoengsao		Samsung Electro-Mechanics		Overseas Production Subsidiaries
Thailand	Ratchasima	Khon	Samsung Electro-Mechanics		Overseas Production Subsidiaries
Thailand		Bangkok	Samsung Electro-Mechanics		Overseas Sales Offices
Thailand		Bangkok	Cheil Industries		Chemical/Electronic Materials Division
Thailand		Bangkok	Mitsubishi Electric		Mitsubishi Electric Asia (Thailand) Co., Ltd.
Thailand	Chonburi		Mitsubishi Electric		Mitsubishi Elevator Asia Co., Ltd.
Thailand	Samutprakarn		Mitsubishi Electric		Mitsubishi Elevator (Thailand) Co., Ltd.
Thailand					Mitsubishi Electric Consumer Products (Thailand) Co., Ltd.
Thailand	Chonburi		Mitsubishi Electric		
Thailand		Bangkok	Mitsubishi Electric		Mitsubishi Electric Kang Yong Watana Co., Ltd.
Thailand		Bangkok	Mitsubishi Electric		Mitsubishi Electric Automation (Thailand) Co., Ltd.
Thailand		Bangkok	Mitsubishi Electric		Mitsubishi Electric Factory Automation (Thailand) Co., Ltd
Thailand		Rayong	Mitsubishi Electric		Mitsubishi Electric Thai Auto-Parts Co., Ltd.
Thailand		Bangkok	Mitsubishi Electric		Mitsubishi Electric Thai Foundation
Thailand		Bangkok	Acer Inc		Acer Computer Co., Ltd.
Thailand		Bangkok	ASUSTek COMPUTER INC		ASUSTek Computer (Thailand) Co., Ltd.
Thailand		Bangkok	NEC		NEC Corporation (Thailand) Ltd.
Thailand		Bangkok	NEC		NEC Logistics(Thailand) Co., Ltd.
Thailand	Pathumthani		NEC		NEC TOKIN Electronics (Thailand) Co.,Ltd.
Thailand	Samutprakarn	Amphur Muang	Delta Electronics		Bangpoo (Automotive Plant)
Thailand	Samutprakarn	Amphur Muang	Delta Electronics		Bangpoo (Power Supply Plant)
Thailand	Chachoengsao	Amphur Muang	Delta Electronics		Wellgrow Plant
Thailand		Bangkok	Lenovo Group		Lenovo (Thailand) Limited
Thailand		Bangkok	Sun Edison		
Thailand		Bangkok	WPG Holding		
Thailand		Bangkok	Alps Electric		Head Office
Thailand		Bangkok	Hosiden		Hosiden(Thailand) Co.,Ltd.
Thailand		Bangkok	Kyocera		KYOCERA Asia Pacific (Thailand) Co., Ltd.
Thailand		Bangkok	Kyocera		KYOCERA Document Solutions (Thailand) Corp., Ltd.
Thailand		Bangkok	Kyocera		KYOCERA Display (Thailand) Co., Ltd.
Thailand	Lamphun		Kyocera		Production and Sales
Thailand	Lamphun		Murata		Sales Office
Thailand		Bangkok	Murata		Sales Office - ROHM Semiconductor (Thailand) Co.,Ltd.
Thailand		Benkeok	Rohm		

Source: Citi Research

Figure 1010. Asia – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Thailand	Pathumthani		Rohm		Overseas Manufacturing Centers - ROHM Integrated Systems (Thailand) Co., Ltd.
Thailand	Saraburi		Rohm		Overseas Manufacturing Centers - ROHM Mechatec (Thailand) Co., Ltd.
Thailand		Bangkok	Shinko Electric Industries		Sales Office - SHINKO MICROELECTRONICS (THAILAND) CO., LTD.
Thailand		Bangkok	Taiyo Yuden		Sales Office/Manufacturing
Thailand		Bangkok	TDK Corporation		TDK (THAILAND) CO., LTD.
Thailand	Chonburi		Nidec		Manufacturing
Thailand	Chonburi		Nidec		Manufacturing
Thailand	Chachoengsao		Nidec		Sales
Thailand		Bangkok	Nidec		Sales
Thailand		Pathumthani	Nidec		Manufacturing
Thailand		Pathumthani	Nidec		Manufacturing
Thailand		Pathumthani	Nidec		Sales
Thailand		Pathumthani	Nidec		Manufacturing
Thailand		Ayutthaya	Nidec		Manufacturing
Thailand		Ayutthaya	Nidec		Manufacturing
Thailand		Ayutthaya	Nidec		Manufacturing
Thailand	Saraburi		Nidec		Manufacturing
Thailand		Bangkok	Mitsumi Electric		Sales Office
Thailand	Chonburi	Amphoe Ban Bung	Mitsumi Electric		SALES OFFICE
Thailand	Bang Pa-in		Mitsumi Electric		SALES OFFICE
Thailand	Prachinburi		Canon		Injection printers
Thailand		Bangkok	Canon		Digital MFPS, service parts
Thailand			Canon		All product segments
Thailand			HOYA CORPORATION		HOYA LENS THAILAND LTD.
Thailand		Ayutthaya	Hoya Corporation		HOYA LENS THAILAND LTD., -AYUTTHAYA Plant
Thailand		Bangkok	Hoya Corporation		HOYA LENS THAILAND LTD., -BANGKOK IT Office
Thailand		Bangkok	Hoya Corporation		THAI HOYA LENS LTD.
Thailand		Lamphun	Hoya Corporation		HOYA GLASS DISK (THAILAND) LTD.
Thailand		Lamphun	Hoya Corporation		HOYA OPTICS(THAILAND) LTD.
Thailand		Bangkok	Olympus		Import, sale, and service of endoscopes in Thailand
Thailand			Nikon		
Thailand			Nikon		
Thailand		Rayong	Ricoh Co		Manufacturing - Ricoh Manufacturing (Thailand) Ltd.
Thailand		Bangkok	Seiko Epson		Epson (Thailand) Co., Ltd.
Thailand			Seiko Epson		Manufacturing Subsidiaries and Affiliates - Epson Precision (Thailand) Ltd.
Thailand	Lamphun		Asahi Glass		Manufacturing of molded aspherical glass lenses
Thailand	Samutprakarn		Asahi Glass		
Thailand	Chonburi		Asahi Glass		Manufacturing of heat-resistant glass tableware, reflector for projector lamps or halogen lamps. Glass products for science and medical use.
Thailand	Samutprakarn		Asahi Glass		Manufacturing and sales of for construction, automotive, industrial various float glasses, figured glass, mirror, and architectural fabricated glass
Thailand	Chonburi		Asahi Glass		Automotive glass fabrication and sales
Thailand		Bangkok	Asahi Glass		Caustic Soda, HCl, Liquid Chlorine, Caustic Potash, Potassium Carbonate, Sales & Marketing of AGC Chemicals Products
Thailand		Bangkok	Sharp Corp		SHARP THAI CO., LTD. [Thailand]
Thailand		Bangkok	Sony Corp		Sony Thai Co., Ltd.
Thailand		Bangkok	Fujifilm		Fujitsu Systems Business (Thailand) Ltd.
Thailand		Bangkok	Fujitsu		Office
Thailand	Chonburi		Fujitsu		
Thailand		Bangkok	Brocade Communications		
Thailand		Korat	Seagate Technology	1,716,000	Manufacture of drives and drive subassemblies
Thailand		Teparuk	Seagate Technology	362,000	Manufacture of drive subassemblies
Thailand		Bangkok	STMicroelectronics		Sales Office & Representative
Thailand		Bangkok	Western Digital Corp		
Thailand		Navanakorn	Western Digital Corp	290200	Manufacturing of HGAs
Thailand		Prachinburi	Western Digital Corp	729000	Manufacturing of hard drives
Thailand		Bangkok	ZTE Corp		Sales Office
Thailand		Bangkok	Belden		Sales Office
Thailand		Rayong	Hi-P International		Manufacturing sites
Thailand		Bangkok	Huawei		
Thailand		Bangkok	Veeco Instruments Inc		
Thailand	Pathumthani	Klongluang	Xyratec		Office
Thailand	Chachoengsao	Bangpaokong	Molex		Thailand Plant & Sales Office
Thailand	Samutprakarn		Panasonic		
Thailand		Bangkok	Panasonic		Semiconductor Sales office
Thailand		Khon Kaen	Panasonic		Manufacturing locations
Thailand		Bangkok	Panasonic		Panasonic Eco Solutions Sales (Thailand) Co., Ltd.
Thailand		Uthai	Panasonic		Sale / Marketing, Production
Thailand		Bangkok	Hitachi		Hitachi Asia (Thailand) Co., Ltd.
Thailand	Chachoengsao		Hitachi		Hitachi Automotive Systems Asia, Ltd.
Thailand	Chonburi		Hitachi		Hitachi Automotive Systems Chonburi Ltd.
Thailand			Hitachi		Head office - Hitachi Automotive System Korat, Ltd.
Thailand		Korat	Hitachi		
Thailand	Bangna	Bangkok	Hitachi		Bangkok Office - Hitachi Automotive System Korat, Ltd.
Thailand		Bangkok	Hitachi		
Thailand		Bangkok	Hitachi		Hitachi Chemical (Thailand) Co., Ltd.
Thailand			Hitachi		Hitachi Capital (Thailand) Co., Ltd.
Thailand			Hitachi		Hitachi Chemical Automotive Products (Thailand) Co., Ltd.
Thailand	Rayong		Hitachi		Hitachi Compressor (Thailand), Ltd.
Thailand		Ayutthaya	Hitachi		Head Office - Hitachi Consumer Products (Thailand), Ltd
Thailand	Prachinburi		Hitachi		Bangkok Office - Hitachi Consumer Products (Thailand), Ltd.
Thailand		Bangkok	Hitachi		Hitachi High-Technologies (Thailand) Ltd.
Thailand		Bangkok	Hitachi		Hitachi Industrial Technology (Thailand), Ltd.
Thailand		Ayutthaya	Hitachi		Head Office - Hitachi Metals (Thailand) Ltd.

Source: Citi Research

Figure 1011. Asia – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Thailand		Phra Nakhon Si Ayutthaya	Hitachi		Hitachi Metals (Thailand) Ltd.
Thailand	Wattana	Bangkok	Hitachi		Hitachi Plant Technologies (Thailand) Co., Ltd.
Thailand	Chachoengsao		Hitachi		Hitachi Powdered Metals (Thailand) Co., Ltd.
Thailand	Bangapi	Bangkok	Hitachi		Hitachi Power Tools (Thailand) Co., Ltd.
Thailand	Chachoengsao		Hitachi		Hitachi Storage Battery (Thailand) Co., Ltd.
Thailand		Rayong	Hitachi		Hitachi Tochigi Electronics (Thailand) Co., Ltd.
Thailand	Samut Prakan		Hitachi		Hitachi Transport System (Thailand), Ltd.
Thailand		Bangkok	Hitachi		Hitachi Via Asia (Thailand) Co., Ltd.
Thailand			Hitachi		Head Office - Siam-Hitachi Elevator Co., Ltd.
Thailand		Bangkok	Hitachi		
Thailand	Chonburi		Hitachi		Factory
Thailand	Chachoengsao		Hitachi		Thai Hitachi Enamel Wire Co., Ltd.
Thailand		Nakhon Ratchasima	FUNAI ELECTRIC CO LTD		FUNAI (THAILAND) CO., LTD
Thailand		Bangkok	Pioneer Corporation		Pioneer Electronics (Thailand) Co., Ltd.
Thailand			Pioneer Corporation		Pioneer Manufacturing (Thailand) Co., Ltd.
Thailand		Ayutthaya	Pioneer Corporation		Tohoku Pioneer (Thailand) Co., Ltd
Thailand			Brother Industries Ltd		Sales Facilities
Thailand		Bangkok	REC Solar ASA		Systems and Solutions Offices
Thailand		Bangkok	Toshiba		Toshiba Asia Pacific (Thailand) Co., Ltd.
Thailand	Pathum Thani		Toshiba		Toshiba Semiconductor (Thailand) Co., Ltd.
Thailand		Bangkok	Toshiba		Toshiba Asia Pacific (Thailand) Co., Ltd.
Thailand	Nonthaburi		Toshiba		Thai Toshiba Electric Industries Co., Ltd.
Thailand		Bangkok	Toshiba		Toshiba Thailand Co., Ltd.
Turkey	Ankara		Jabil	1,000	Aftermarket
Turkey	Istanbul		Amphenol		Flextronics facilities, Service & Software
Turkey	Istanbul		Amphenol		Amphenol Middle East
Turkey	Istanbul		Arrow Electronics		Amphenol Turkey
Turkey	Istanbul		IBM (International Business Machines Corp)		IBM Türk Limited Sirketi
Turkey	Istanbul		Hewlett Packard		HP Turkey Main office
Turkey	Ankara		Hewlett Packard		HP Ankara Office
Turkey	Istanbul		EMC Corp		
Turkey	Ankara		EMC Corp		
Turkey	Istanbul		EMC Corp		
Turkey	Ankara		NetApp Inc		
Turkey	Istanbul		NetApp Inc		
Turkey	Istanbul		Xerox		Office
Turkey	Ankara		Xerox		Office
Turkey	Istanbul		Lexmark		Lexmark Office
Turkey	Izmir		Lexmark		Lexmark Izmir Branch
Turkey	Ankara		Lexmark		Lexmark Ankara Branch
Turkey			Corning		Office
Turkey	Istanbul		Blackberry		
Turkey	Istanbul		Motorola Solutions		Sales Office
Turkey	Istanbul		Maxim Integrated		Office
Turkey	Istanbul		Alcatel Lucent SA		
Turkey	Ankara		Alcatel Lucent SA		
Turkey	Baku		Alcatel Lucent SA		
Turkey	Istanbul		Ericsson LM		Office
Turkey	Istanbul		JDSU Corp.		Sales Office
Turkey	Istanbul		Juniper Networks Inc		
Turkey	Istanbul		Polycom Inc.		Office
Turkey	Istanbul		Advanced Micro Devices, Inc		
Turkey	Istanbul		QUALCOMM Incorporated		
Turkey	Istanbul/Maslak		LG Display		Sales
Turkey	Kocaeli	Gezbe	LG Electronics		Arçelik-LG Klima Sanayi ve Ticaret A.Ş., Production
Turkey	Istanbul		LG Electronics		LG Electronics Ticaret A.Ş.
Turkey	Istanbul		Samsung Electro-Mechanics		Overseas Sales Offices
Turkey	Istanbul		Chell Industries		Chemicals/Electronic Materials Division
Turkey	Istanbul		Mitsubishi Electric		Mitsubishi Electric Turkey A.Ş. - Head Office
Turkey	Istanbul		Mitsubishi Electric		Umraniye Office (Factory Automation)
Turkey	Istanbul		Acer Inc		Acer Bilgişim Teknolojileri Limited Şirketi
Turkey	Istanbul		ASUSTek COMPUTER INC		Asus Bilgisayar Sistemleri
Turkey	Istanbul		NEC		NEC Telecommunications and Information Technology Ltd.
Turkey	Istanbul		Wistron Corporation		Service center
Turkey	Istanbul		Lenovo Group		
Turkey	Istanbul		Sun Edison		
Turkey	Ataşehir		Yingli Green Energy		Office
Turkey	Kadıköy	Istanbul	Canon		All product segments (with some exceptions)
Turkey	Istanbul		Konica Minolta Holdings		Konica Minolta Turkey İşletmeleri A.Ş.
Turkey	Istanbul		Olympus		Olympus İstanbul Optik Ürünler
Turkey	Istanbul		Nikon		
Turkey	Istanbul		Seiko Epson		Epson Italia S.p.A.
Turkey	Istanbul		Fujifilm		
Turkey	Istanbul		Fujitsu		Fujitsu Technology Solutions Bilgişim Ltd. Şti
Turkey	Istanbul		Brocade Communications		
Turkey	Istanbul		STMicroelectronics		Manufacturing & Design Center
Turkey	Pasaport-Konak İsmi		STMicroelectronics		Sales Office & Representative
Turkey	Yesilköy İstanbul		STMicroelectronics		Sales Office & Representative
Turkey	Istanbul		ZTE Corp		Sales Office
Turkey	Ankara		ZTE Corp		Sales Office
Turkey	Istanbul		Huawei		
Turkey	Istanbul		Molex		Molex Turkey
Turkey	Istanbul		Panasonic		Sales Office
Turkey	Istanbul		Brother Industries Ltd		Sales Facilities
United Arab Emirates	Dubai		Jabil	1,000	Support
United Arab Emirates	Dubai		Jabil		Flextronics facilities, Service & Software
United Arab Emirates	Ajman		Amphenol		Amphenol Middle East Enterprises FZE
United Arab Emirates	Dubai		IBM (International Business Machines Corp)		IBM Middle East FZ LLC
United Arab Emirates	Dubai		EMC Corp		
United Arab Emirates	Abu Dhabi		EMC Corp		
United Arab Emirates	Dubai		NetApp Inc		
United Arab Emirates	Dubai		Xerox		Office
United Arab Emirates	Abu Dhabi		Xerox		Office
United Arab Emirates	Dubai		Lexmark		Lexmark International Middle East FZ LLC
United Arab Emirates	Dubai		Corning		Office

Source: Citi Research

Figure 1012. Asia – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
United Arab Emirates		Dubai	Nokia		Regional Office
United Arab Emirates		Dubai	Cisco Systems Inc		
United Arab Emirates		Dubai	Blackberry		
United Arab Emirates		Dubai	Motorola Solutions		Corporate & Regional Office
United Arab Emirates		Abu Dhabi	Apple Inc		Office
United Arab Emirates		Abu Dhabi	Alcatel Lucent SA		
United Arab Emirates		Dubai	Alcatel Lucent SA		
United Arab Emirates		Abu Dhabi	Ciena Corp		
United Arab Emirates		Dubai	F5 Networks		Office
United Arab Emirates		Dubai	JSU Corp.		Sales Office
United Arab Emirates		Dubai	Juniper Networks Inc		
United Arab Emirates		Dubai	Polycm Inc.		Office
United Arab Emirates		Dubai	Tellabs, Inc.		Sales Office
United Arab Emirates		Dubai	Advanced Micro Devices, Inc		
United Arab Emirates		Dubai	NVIDIA		Office
United Arab Emirates		Dubai	QUALCOMM Incorporated		
United Arab Emirates		Abu Dhabi	SMA Solar Technology		SMA Middle East Limited
United Arab Emirates		Qatar	SolarWorld AG		
United Arab Emirates		Dubai	LG Electronics		LG Electronics Dubai FZE
United Arab Emirates		Dubai	LG Electronics		LG Electronics Gulf FZE
United Arab Emirates		Dubai	LG Electronics		LG Electronics Middle East Co., Ltd.
United Arab Emirates		Dubai	LG Electronics		LG Electronics Africa Logistic FZE
United Arab Emirates		Dubai	LG Electronics		LG Electronics Russia and Ukraine
United Arab Emirates		Dubai	Samsung Technw		Dubai Office
United Arab Emirates		Dubai	Cheil Industries		Chemicals/Electronic Materials Division
United Arab Emirates		Dubai	Mitsubishi Electric		Mitsubishi Electric Corporation - Dubai Branch
United Arab Emirates		Dubai	Acer Inc		Acer Computer (M.E.) Ltd
United Arab Emirates		Dubai	Acer Inc		Tech Support
United Arab Emirates		Dubai	ASUSTEK COMPUTER INC		ASUS COMPUTER ME
United Arab Emirates		Dubai	MediaTek		MediaTek Wireless LLC (Dubai)
					MEA Head Office: Lenovo Middle East & Africa and Gulf Office: Lenovo Bahrain, Kuwait, Oman, Qatar & United Arab Emirates
United Arab Emirates		Dubai	Lenovo Group		
United Arab Emirates		Dubai	First Solar Inc		
United Arab Emirates		Dubai	Sun Edison		
United Arab Emirates		Dubai	Suntech Power Holdings		
United Arab Emirates		Abu Dhabi	Trina Solar Limited		Trina Solar Middle East Ltd
United Arab Emirates		Dubai	Kyocera		KYOCERA Document Solutions Middle East
United Arab Emirates		Abu Dhabi	Nidec		Sales
United Arab Emirates		Dubai	Canon		All product segments (with some exceptions)
United Arab Emirates		Dubai	Nikon		
United Arab Emirates		Dubai	Seiko Epson		Epson Europe B.V. Middle East Office
					SHARP MIDDLE EAST FREE ZONE ESTABLISHMENT [U.A.E.]
United Arab Emirates		Dubai	Sharp Corp		
United Arab Emirates		Dubai	Fujifilm		
United Arab Emirates		Dubai	Fujitsu		Fujitsu Technology Solutions FZ LLC
United Arab Emirates		Abu Dhabi	Fujitsu		
United Arab Emirates		Dubai	Brocade Communications		
United Arab Emirates		Dubai	Western Digital Corp		
United Arab Emirates		Abu Dhabi	ZTE Corp		Sales Office
United Arab Emirates		Dubai	Belden		Sales Offices
United Arab Emirates		Dubai	Huawei		
United Arab Emirates		Dubai	Logitech International S A	54000	Distribution center
United Arab Emirates		Dubai	Molex		Molex Premise Networks
United Arab Emirates		Dubai	Hitachi		Hitachi Ltd. (Gulf Office)
United Arab Emirates		Riyadh	Hitachi		Hitachi Ltd., Riyadh Branch
United Arab Emirates		Dubai	Hitachi		
United Arab Emirates		Abu Dhabi	Hitachi		Hitachi Transport System, Ltd, Middle East Office (Abu Dhabi)
United Arab Emirates		Doha	Hitachi		Hitachi Plant Qatar L.L.C
United Arab Emirates		Dubai	Pioneer Corporation		Pioneer Gulf Free Zone
United Arab Emirates		Dubai	Brother Industries Ltd		Sales Facilities
United Arab Emirates		Dubai	REC Solar ASA		Solar Sales Office/Systems and Solutions Offices
United Arab Emirates		Dubai	Toshiba		Office
United Arab Emirates		Dubai	IBM (International Business Machines Corp)		IBM East Europe/Asia Limited
Uzbekistan		Tashkent	Ericsson LM		Office
Uzbekistan		Tashkent	NEC		
Uzbekistan		Tashkent	Fujitsu		Office
Uzbekistan		Tashkent	ZTE Corp		Sales Office
Uzbekistan		Tashkent	Huawei		
Vnamu		Tashkent	Fujifilm		
Vietnam		Ho Chi Minh City	Jabil	273,000	
Vietnam		Ho Chi Minh City	Jabil	105,000	Manufacturing
Vietnam		Ho Chi Minh City	Amphenol		Amphenol Air LB Vietnam
Vietnam		Ho Chi Minh City	Arrow Electronics		Office
Vietnam		Cochinchina	Ingram Micro		
Vietnam		Ho Chi Minh City	IBM (International Business Machines Corp)		IBM Vietnam Co., Ltd.
Vietnam		Hanoi	IBM (International Business Machines Corp)		IBM Vietnam Co., Ltd.
Vietnam		Ho Chi Minh City	Hewlett Packard		Office
Vietnam		Hanoi	Hewlett Packard		Office
Vietnam		Hanoi	EMC Corp		
Vietnam		Ho Chi Minh City	NetApp Inc		
Vietnam		Hanoi	NetApp Inc		Uncategorized
Vietnam		Ho Chi Minh City	Xerox		Office
Vietnam		Hanoi	Cisco Systems Inc		
Vietnam		Ho Chi Minh City	Cisco Systems Inc		
Vietnam		Ho Chi Minh City	Motorola Solutions		Corporate & Regional Office
Vietnam		Ho Chi Minh City	Microchip Technology		
Vietnam		Binh Thanh Dist	HCM City		

Source: Citi Research

Figure 1013. Asia – Other (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Vietnam		Ho Chi Minh City	On Semiconductor		59,200 Back end Facilities
Vietnam		Bien Hoa	On Semiconductor	247,572	Back end Facilities
Vietnam		Hanoi	Alcatel Lucent SA		
Vietnam		Hanoi	Ciena Corp		
Vietnam		Hanoi	Ericsson LM		Office
Vietnam		Hanoi	F5 Networks		Office
Vietnam		Hanoi	Juniper Networks Inc		
Vietnam		Ho Chi Minh City	Juniper Networks Inc		
Vietnam		Hanoi	Polycm Inc.		Office
Vietnam		Thanh Pho	Intel		
Vietnam		Ho Chi Minh City	Intel		
Vietnam		Hanoi	QUALCOMM Incorporated		
Vietnam		Ho Chi Minh City	QUALCOMM Incorporated		
Vietnam		Hung Yen	LG Electronics		LG Electronics Vietnam co. Ltd., Marketing & Production
Vietnam		Hanoi	Samsung Electro-Mechanics		Overseas Sales Offices
Vietnam		Yen Trung	Samsung SDI		Vietnam Plant
Vietnam		Ho Chi Minh City	Mitsubishi Electric		Mitsubishi Electric Vietnam Company Limited
Vietnam		Ho Chi Minh City	Acer Inc		Acer Vietnam Co., Ltd.
Vietnam		Ho Chi Minh City	ASUSTEK COMPUTER INC		ASUS Technology (Vietnam) Co., Ltd.
Vietnam		Hanoi	NEC		NEC Vietnam Co., Ltd.
Vietnam		Hanoi	NEC		VNPT-NEC Telecommunication Systems Company Limited
Vietnam		Hanoi	Compal Electronics		Compal (Vietnam) Co., Ltd.
Vietnam		Hanoi	Wintek		Production
Vietnam		Hanoi	Lenovo Group		
Vietnam		Ho Chi Minh City	Lenovo Group		
Vietnam		Hanoi	WPG Holding		
Vietnam		Ho Chi Minh City	WPG Holding		
Vietnam		Bac Giang	Viet Yen		Manufacturing Division
Vietnam		Haiphong	Kyocera		KYOCERA Document Technology Vietnam Co., Ltd.
Vietnam		Hanoi	Murata		Sales Office
Vietnam		Ben Tre Province	Nidec		Manufacturing
Vietnam		Ho Chi Minh City	Nidec		Manufacturing
Vietnam		Ho Chi Minh City	Nidec		Global Transportation
Vietnam		Ho Chi Minh City	Nidec		Manufacturing
Vietnam		Hanoi	Nidec		Manufacturing
Vietnam		Bien Hoa	Mabuchi Motor	130000	Factory for Motors
Vietnam		Da Nang City	Mabuchi Motor	164000	Factory for Motors
Vietnam		Dong Anh District	Canon		Inkjet printers, laser printers, scanners, toner cartridges
Vietnam		Hung Yen	Canon		Electronics devices and others
Vietnam		Ho Chi Minh City	Canon		All product segments (with some exceptions)
Vietnam		Thu Dau Mot	Hoya Corporation		HOYA LENS VIETNAM LTD.
Vietnam		Hanoi	Hoya Corporation		HOYA GLASS DISK VIETNAM LTD.
Vietnam		Hung Yen	Hoya Corporation		HOYA GLASS DISK VIETNAM II LTD.
Vietnam		Hanoi	Olympus		Service of medical endoscope related products in Vietnam
Vietnam		Dong Nai	Olympus		Olympus Vietnam Co., Ltd.
Vietnam		Dong Nai	Nikon		
Vietnam		Ho Chi Minh City	Ricoh Co		Sales & Services - Ricoh Vietnam Company Limited
Vietnam		Hanoi	Tamron Co Ltd		TAMRON OPTICAL (VIETNAM) CO., LTD.
Vietnam		Ho Chi Minh City	Sharp Corp		SHARP ELECTRONICS (VIETNAM) CO. LTD. [Vietnam]
Vietnam		Ho Chi Minh City	Fujifilm		
Vietnam		Dong Nai	Fujitsu		Fujitsu Computer Products of Vietnam
Vietnam		Hanoi	Fujitsu		Fujitsu Vietnam Limited
Vietnam		Hanoi	STMicroelectronics		Sales Office & Representative
Vietnam		Hanoi	ZTE Corp		Sales Office
Vietnam		Ho Chi Minh City	Belden		Sales Offices
Vietnam		Hanoi	Huawei		
Vietnam		Ho Chi Minh City	Molex		Molex Sales Office
Vietnam		Hanoi	Panasonic		Sales Office
Vietnam		Ho Chi Minh City	Panasonic		Hitachi Asia (Vietnam) Co., Ltd.
Vietnam		Hanoi	Hitachi		Hanoi Office
Vietnam		Tan Binh Dist	Hitachi		Office
Vietnam		Hai Duong Province	Hitachi		Hitachi Cable Vietnam Co., Ltd.
Vietnam		Hanoi	Hitachi		Hitachi Construction Machinery - Hanoi Representative Office
Vietnam		Hanoi	Hitachi		Hitachi Data Systems
Vietnam		Hanoi	Hitachi		Hitachi Plant Technologies (Vietnam) Pte. Ltd.
Vietnam		Ho Chi Minh	Hitachi		Hitachi Transport System (Asia) Pte Ltd. - Ho Chi Minh Representative Office
Vietnam		Duong Province	Brother Industries Ltd		Production Facilities
Vietnam		Dong Nai Province	Brother Industries Ltd		Production Facilities
Vietnam		Ho Chi Minh City	Brother Industries Ltd		Sales Facilities
Vietnam		Hanoi	Toshiba		Hanoi Representative Office
Vietnam		Ho Chi Minh City	Toshiba		Hitachi Asia (Vietnam) Co., Ltd.
Vietnam		Bien Hoa	Toshiba		Toshiba Industrial Products Asia Co., Ltd.
Vietnam		Dong Nai	Toshiba		Toshiba Clean Development Service (Vietnam) Co., Ltd.
Vietnam		Tay Ninh	Toshiba		

Source: Citi Research

Figure 1014. Europe

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Albania		Tirana	Ericsson LM		Office
Andorra		Saint-Jean-de-Braye	IBM (International Business Machines Corp)		IBM France
Armenia		Yerevan	EMC Corp		
Armenia		Yerevan	Alcatel Lucent SA		Sales Office
Armenia		Yerevan	ZTE Corp		
Austria		Vienna	Jabil	88,000	Manufacturing, Design
Austria		Althofen	Jabil	182,986	Manufacturing
Austria		Salzburg	Celestica	54,000	
Austria		Vocklabruck	Vishay	153000	Diodes
Austria		Klagenfurt	Vishay	130000	Capacitors
Austria		Linz	Arrow Electronics		Office
Austria		Vienna	Arrow Electronics		Office
Austria		Vienna	Arrow Electronics		Office
Austria		Vienna	Tech Data		Office
Austria		Vienna	IBM (International Business Machines Corp)		IBM Österreich Internationale Büromaschinen
Austria		Vienna	Hewlett Packard		Gesellschaft m.b.H.
Austria		Unterpremstätter	Hewlett Packard		Headquarters - Austria
Austria		Graz	Hewlett Packard		Office
Austria		Gotzis	Hewlett Packard		Office
Austria		Saint Florian	Hewlett Packard		Location Technology and Innovation Centre
Austria		Innsbruck	EMC Corp		
Austria		Linz	EMC Corp		
Austria		Vienna	EMC Corp		
Austria		Vienna	NetApp Inc		
Austria		Vienna	Xerox		Office
Austria		Vienna	Lexmark		Lexmark Handelsgesellschaft m.b.H
Austria		Salzburg	Cisco Systems Inc		
Austria		Vienna	Cisco Systems Inc		
Austria		Vienna	Blackberry		
Austria		Vienna	Motorola Solutions		Sales Office
Austria		Vienna	Lam Research Corp		Office
Austria		Graz	Maxim Integrated		Office
Austria		Wels	Microchip Technology		
Austria		Vienna	Alcatel Lucent SA		
Austria		Vienna	Ericsson LM		Office
Austria		Vienna	JOSU Corp		Sales Office
Austria		Vienna	Juniper Networks Inc		
Austria		Vienna	Riverbed Technology		
Austria		Vienna	Tellabs, Inc.		Sales Office
Austria		Villach	Intel		
Austria		Linz	Intel		
Austria		Vienna	QUALCOMM Incorporated		
Austria		Vienna	LG Electronics		LG Electronics Austria GmbH, Marketing
Austria		Brunn am Gebirge	Acer Inc		Acer Austria GmbH
Austria		Vienna	Lenovo Group		Lenovo Technology B.V.
Austria		Vienna	Kyocera		KYOCERA Document Solutions Austria GmbH
Austria		Vienna	Canon		All product segments (with some exceptions)
Austria		Vienna	Konica Minolta Holdings		Head Office
Austria		Linz	Konica Minolta Holdings		Linz Branch
Austria		Salzburg	Konica Minolta Holdings		Salzburg Branch
Austria		Innsbruck	Konica Minolta Holdings		Innsbruck Branch
Austria		Dornbirn	Konica Minolta Holdings		Dornbirn Branch
Austria		Graz	Konica Minolta Holdings		Store Graz
Austria		Klagenfurt	Konica Minolta Holdings		Klagenfurt Branch
Austria		Brunn am Gebirge	Hoya Corporation		HOYA LENS OSTERREICH
Austria		Vienna	Olympus		Olympus Austria Ges.m.b.H.
Austria		Nikon			
Austria		Seiko Epson			
Austria		Vienna	Epson Deutschland GmbH		HEADQUARTERS SHARP ELECTRONICS (EUROPE)
Austria		Vienna	Sharp Corp		GMH
Austria		Fujifilm			
Austria		Vienna	Fujitsu		Fujitsu Technology Solutions GesmbH
Austria		Villach	Infineon Technologies AG		
Austria		Vienna	TE Connectivity Ltd.		1 Manufacturing Plant
Austria		Klagenfurt	ZTE Corp		Sales Office
Austria		Vienna	American Superconductor Corp.	38880	Wind Segment
Austria		Vienna	Huawei		
Austria		Wienerwald	Molex		German Sales Branch
Austria		Sittendorf	Molex		German Sales Branch
Austria		Biedermannsdorf	Panasonic		Panasonic Electric Works Austria GmbH
Austria		Enns	Panasonic		Sale / Marketing, Production
Austria		Vienna	Hitachi		Hitachi Data Systems GmbH
Austria		Linz	Hitachi		Hitachi Data Systems GmbH
Austria		Wiener Neudorf	Hitachi		Hitachi Medical Systems GesmbH
Austria		Vienna	Brother Industries Ltd		Sales Facilities
Austria		Vienna	Brother Industries Ltd		Sales Facilities
Austria		Vienna	Toshiba		Toshiba Europe GmbH
Austria		Minsk	Hewlett Packard		Office
Belarus		Minsk	Xerox		Office
Belarus		Minsk	Motorola Solutions		Sales Office
Belarus		Minsk	Ericsson LM		Office
Belarus		Minsk	NEC		NEC Nava Communications Systems
Belarus		Minsk	Nikon		Sales Office
Belarus		Minsk	ZTE Corp		Office
Belarus		Minsk	Huawei		Office
Belgium		Hasselt	Jabil	85,000	Prototype Manufacturing, Design
Belgium		Olen	Sensata		Business Centre
Belgium		Tongeren	Avnet	388,000	operations
Belgium		Sint-Stevens-Woluwe	Arrow Electronics		
Belgium		Aalst	Tech Data	209358	
Belgium		Brussels	IBM (International Business Machines Corp)		IBM Belgium SA/NV
Belgium		Diegem	Hewlett Packard		Hewlett-Packard Belgium
Belgium		Brussels	EMC Corp		
Belgium		Diegem	NetApp Inc		
Belgium		Brussels	Xerox		Office
Belgium		Brussels	Electronics For Imaging, Inc	57	Office
Belgium		Diegem	Lexmark		Lexmark International nv/sa
Belgium		Diegem	Corning		Office
Belgium		Diegem	Nokia		Regional Office
Belgium		Machelen	Cisco Systems Inc		
Belgium		Diegem	Blackberry		
Belgium		Brussels	Motorola Solutions		Sales Office
Belgium		Brussels	Apple Inc		Office
Belgium		Hooftgaten	ATMI Inc		Manufacturing
Belgium		Brussels	ATMI Inc		Cell Culture Technologies

Source: Citi Research

Figure 1015. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Belgium	Flemish Brabant	Leuven	KLA Tencor Corp		Office, plant and
Belgium	Flemish Brabant	Leuven	KLA Tencor Corp	99,315	warehouse
Belgium		Buggenhout	Microchip Technology		
Belgium	Flemish Brabant	Oudenaarde	On Semiconductor	167,900	Front end Facilities
Belgium		Oudenaarde	On Semiconductor		Sales Office
Belgium		Anvers	Alcatel Lucent SA		
Belgium	Wallonia	Namur	Alcatel Lucent SA		
Belgium		Antwerp	Alcatel Lucent SA		
Belgium		Zaventem	Ericsson LM		Office
Belgium			FS Networks		Office
Belgium		Zaventem	Juniper Networks Inc		
Belgium			Polycom Inc.		Office
Belgium			Riverbed Technology		
Belgium		Diegem	Riverbed Technology		
Belgium		Mechelen	Broadcom		Office
Belgium	Brussels-Capitale	Brussels	Intel		
Belgium		Antwerp	Intel		
Belgium		Brussels	QUALCOMM Incorporated		
Belgium		Brussels	Xilinx Inc		
Belgium		Brussels	Xilinx Inc		
Belgium		Mechelen	SMA Solar Technology		SMA Benelux bvba / sprl
Belgium		Bruges	Mitsubishi Electric		Mitsubishi Electric Europe B.V.
Belgium	Flemish Brabant	Diegem	Lenovo Group		Lenovo Belgium bvba
Belgium		Waterloo	ASE		
Belgium		Brussels	First Solar Inc		Office
Belgium		Zaventem	Kyocera		KYOCERA Document Solutions Belgium N.V.
Belgium		Diegem	Canon		All product segments (with some exceptions)
Belgium		Zaventem	Konica Minolta Holdings		Konica Minolta Business Solutions (Belgium)
Belgium		Kapellen	Hoya Corporation		N.V./S.A.
Belgium		Aartselaar	Olympus		HOYA LENS BELGIUM N.V.
Belgium			Nikon		Olympus Belgium N.V.
Belgium		Vilvoorde	Ricoh Co		Sales & Services - Ricoh Belgium N.V.
Belgium			Seiko Epson		Epson Europe B.V.
Belgium		Brussels	Asahi Glass		Float glass, figured glass, double-glazing units,
Belgium		Louvain-la-Neuve	Asahi Glass		mirror and other processed glass
Belgium					Automotive glass
Belgium		Brussels	Sharp Corp		SHARP ELECTRONICS BENELUX B.V. BELGIUM
Belgium		Brussels	Fujifilm		BRANCH [Belgium]
Belgium		Sint-Niklaas	Fujifilm		
Belgium		Zwijndrecht	Fujifilm		
Belgium		Overpelt	Fujifilm		
Belgium		Brussels	Fujitsu		Fujitsu Technology Solutions NV
Belgium		Brussels	Brocade Communications		
Belgium		Antwerp	Infoblox Inc.		sales support offices
Belgium		Zaventem	STMicroelectronics		Manufacturing & Design Center, Sales Office &
Belgium			TE Connectivity Ltd.		Representative
Belgium		Louvain-la-Neuve	Huawei		2 Manufacturing Plants
Belgium		Leuven	Huawei		
Belgium		Brussels	Huawei		
Belgium		Mechelen	Hitachi		Hitachi Medical Systems N.V./S.A.
Belgium		Beveren	Pioneer Corporation		Pioneer Belgium, Division of Pioneer Europe N.V.
Belgium		Beveren	Pioneer Corporation		Pioneer Europe NV, European headquarters
Belgium		Brussels	Brother Industries Ltd		Sales Facilities
Belgium		Brussels	Toshiba		Toshiba TEC Europe Retail Information Systems
Belgium		Wijnegem	Toshiba		Toshiba Medical Systems NV / SA
Belgium		Brussels	Toshiba		Toshiba TEC Europe Retail Information Systems NV
Belgium		Sint-Stevens-Woluwe	Toshiba		/ SA
Belgium		Sarajevo	Ericsson LM		Toshiba Medical Systems NV / SA BELGIUM
Bosnia and Herzegovina		Sarajevo	Ericsson LM		Office
Bosnia and Herzegovina		Sarajevo	Huawei		Office
Bulgaria		Botetgrad	Sensata		Manufacturing
Bulgaria		Sofia	Arrow Electronics		Office
Bulgaria		Sofia	IBM (International Business Machines Corp)		IBM Bulgaria Ltd
Bulgaria		Sofia	Hewlett Packard		HP Bulgaria - Sales Office
Bulgaria		Sofia	EMC Corp		
Bulgaria		Sofia	Xerox		Office
Bulgaria		Sofia	Lexmark		Lexmark International Bulgaria Ltd
Bulgaria		Sofia	Cisco Systems Inc		
Bulgaria		Sofia	Alcatel Lucent SA		
Bulgaria		Sofia	Ericsson LM		Office
Bulgaria		Sofia	Lenovo Group		
Bulgaria		Sofia	Canon		All product segments (with some exceptions)
Bulgaria		Sofia	Konica Minolta Holdings		Konica Minolta Business Solutions Bulgaria EOOD
Bulgaria		Sofia	Fujitsu		Fujitsu Technology Solutions GesmbH
Bulgaria		Sofia	ZTE Corp		Sales Office
Bulgaria		Sofia	Huawei		
Croatia		Zagreb	Arrow Electronics		Office
Croatia		Zagreb	IBM (International Business Machines Corp)		IBM Croatia
Croatia		Zagreb	Hewlett Packard		Office
Croatia		Zagreb	EMC Corp		
Croatia		Zagreb	Xerox		Office
Croatia		Zagreb	Lexmark		Lexmark International CRT
Croatia		Zagreb	Cisco Systems Inc		
Croatia		Zagreb	Lenovo Group		
Croatia		Zagreb	Konica Minolta Holdings		Konica Minolta Croatia Business Solutions Ltd.
Croatia		Zagreb	Olympus		Olympus d.o.o. za trgovinu
Croatia		Zagreb	Fujitsu		Fujitsu Technology Solutions Ges.m.b.H.
Croatia		Zagreb	Huawei		
Cyprus		Nicosia	IBM (International Business Machines Corp)		IBM SEMEA S.p.A. Cyprus Branch
Cyprus		Halandri	Hewlett Packard		Headquarters - Hewlett-Packard Hellas Ltd.
Cyprus		Nicosia	Xerox		Office
Cyprus		Nicosia	Cisco Systems Inc		
Cyprus		Nicosia	Ericsson LM		Office
Czech Republic		Brno	Ericsson LM		Flextronics facilities, Design Centers
Czech Republic		Brno	Ericsson LM		Flextronics facilities, Service & Software
Czech Republic		Pardubice	Ericsson LM		Amphenol Tuchel Electronics GmbH - Czechia
Czech Republic		Ostrov	Amphenol		Files Europe Centrale
Czech Republic		Smirice	Amphenol		KE Ostrov-Elektrik s.r.o.
Czech Republic		Ostrov	Amphenol		KE Ostrov-Elektrik s.r.o.

Source: Citi Research



Figure 1016. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Czech Republic			Amphenol		Konfektion E2 s.r.o.
Czech Republic		Brno	Sanmina	70,870	Logistics/Post-Manufacturing Repair/Warranty
Czech Republic		Blatna	Vishay	191,000	Capacitors
Czech Republic		Plychnov	Vishay	182,000	Resistors & Inductors and Capacitors
Czech Republic		Prachovice	Vishay	91,000	Resistors & Inductors
Czech Republic		Volary	Vishay	35,000	Resistors & Inductors
Czech Republic		Prestice	Vishay	13,000	Resistors & Inductors
Czech Republic		Lanskroun	AVX Corporation	500,000	Manufacturing/Warehouse/Research — PC
Czech Republic		Lanskroun	AVX Corporation	70,000	Manufacturing/Warehouse — PC
Czech Republic		Uherske Hradiste	AVX Corporation	470,000	Manufacturing — PC — CP
Czech Republic		Uherske Hradiste	AVX Corporation	139,000	Manufacturing/Warehouse — CP — PC
Czech Republic		Bzenec	AVX Corporation	194,000	Manufacturing — CP
Czech Republic		Prague	Arrow Electronics		Office
Czech Republic		Ostrava	Arrow Electronics		Office
Czech Republic		Prague	Tech Data		
Czech Republic		Bor	Tech Data		
Czech Republic		Ostrava	Tech Data		
Czech Republic	Prague	Chodov	IBM (International Business Machines Corp)		IBM Czech Republic
Czech Republic		Praha	Hewlett Packard		Headquarters - Hewlett-Packard sro
Czech Republic		Rudna	Hewlett Packard		Rudna Logistics Park
Czech Republic		Prague	EMC Corp		
Czech Republic		Prague	NetApp Inc		
Czech Republic		Prague	Xerox		Office
Czech Republic			Nokia		Regional Office
Czech Republic		Prague	Blackberry		
Czech Republic			Motorola Solutions		Corporate & Regional Office
Czech Republic		Brno	Microchip Technology		
Czech Republic	Zlin Region	Roznov	On Semiconductor	237,000	Front end Facilities
Czech Republic		Roznov	On Semiconductor	405,300	Other Facilities
Czech Republic	Prague	Hlouboetin	Alcatel Lucent SA		
Czech Republic		Praha	Ericsson LM		Office
Czech Republic			Freescall Semiconductor Ltd.		Office
Czech Republic		Praha	Intel		
Czech Republic		Praha	SMA Solar Technology		SMA Central & Eastern Europe s.r.o
Czech Republic		Praha	LG Electronics		LG ELECTRONICS CZ s.r.o., Marketing
Czech Republic		Slany	Mitsubishi Electric		Mitsubishi Electric Automotive Czech s.r.o.
Czech Republic		Praha	Acer Inc		Acer Czech Republic s.r.o.
Czech Republic			ASUSTek COMPUTER INC		ASUS Computer Czech Republic S.R.O
Czech Republic		Preibitz	Chicony Electronics		CHICONY ELECTRONICS CEZ S.R.O
Czech Republic		Ostrava	Pegatron		Operation Sites
Czech Republic		Brno	Wistron Corporation		Manufacturing center, Service center
Czech Republic	Margraviate of M Brno		AU Optronics		Office
Czech Republic	Margraviate of M Brno		AU Optronics		Office
Czech Republic		Prague	Lenovo Group		Lenovo Technology B.V.
Czech Republic		Kadan	Kyocera		KYOCERA Solar Europe s.r.o.
Czech Republic		Praha	Canon		All product segments (with some exceptions)
Czech Republic		Brno	Konica Minolta Holdings		Konica Minolta Business Solutions Czech spol. s.r.o.
Czech Republic		Turnov	Hoya Corporation		HOYA LENS CZ a.s
Czech Republic		Vokovice	Olympus		Olympus Czech Group
Czech Republic			Nikon		
Czech Republic			Seiko Epson		Epson Europe B.V.
Czech Republic					Float glass, double-glazing units, automotive glass, mirror
Czech Republic		Teplice	Asahi Glass		
Czech Republic			Fujitsu		Fujitsu Technology Solutions s.r.o
Czech Republic		Prague 8	STMicroelectronics		Manufacturing & Design Center
Czech Republic			TE Connectivity Ltd.		3 Manufacturing Plants
Czech Republic			Western Digital Corp		
Czech Republic		Prague	ZTE Corp		Sales Office
Czech Republic			Belden		Manufacturing Facilities
Czech Republic		Prague	Huawei		
Czech Republic		Brno	Molex		Molex Czech and Slovakia
Czech Republic		Brno	Panasonic		Manufacturing locations
Czech Republic		Brno	Panasonic		Panasonic Electric Works Czech s.r.o.
Czech Republic		Praha	Hitachi		Hitachi Europe Ltd
Czech Republic		Brno	Brother Industries Ltd		Sales Facilities
Czech Republic			Hon Hai Precision		PC/PC component
Czech Republic		Aarhus	Arrow Electronics		Office
Czech Republic		Ballerup	Arrow Electronics		Office
Czech Republic		Herlev	Arrow Electronics		Office
Czech Republic		Silkeborg	Arrow Electronics		Office
Czech Republic		Copenhagen	Tech Data		
Czech Republic		Lyngby	IBM (International Business Machines Corp)		IBM Denmark ApS
Czech Republic		Allerod	Hewlett Packard		Headquarters - Hewlett-Packard ApS
Czech Republic		Aarhus	Hewlett Packard		South Head Office
Czech Republic		Aarhus	EMC Corp		
Czech Republic		Copenhagen	EMC Corp		
Czech Republic		Copenhagen	EMC Corp		
Czech Republic		Kokkedal	NetApp Inc		Comm2IG
Czech Republic		Dustin	NetApp Inc		Dustin
Czech Republic		Brøndby	NetApp Inc		NetData Aps
Czech Republic		Copenhagen	NetApp Inc		Netdesign
Czech Republic		Ballerup	Xerox		Office
Czech Republic		Birkeroed	Lexmark		Lexmark Denmark
Czech Republic			Corning		Office
Czech Republic		Aarhus	Cisco Systems Inc		
Czech Republic		Automatikvej	Cisco Systems Inc		
Czech Republic		Glostrup	Motorola Solutions		Corporate & Regional Office
Czech Republic			Motorola Solutions		Sales Office
Czech Republic		Skovlunde	International Rectifier Corp		
Czech Republic		Ballerup	Microchip Technology		
Czech Republic		Copenhagen	Alcatel Lucent SA		
Czech Republic		Copenhagen	Ciena Corp		
Czech Republic		København	Ericsson LM		Office
Czech Republic			FS Networks		Office
Czech Republic			JDSU Corp.		Sales Office
Czech Republic		Copenhagen	Juniper Networks Inc		
Czech Republic			Polycom Inc.		Office
Czech Republic		Ballerup	Riverbed Technology		
Czech Republic			Tellabs, Inc.		Business Units
Czech Republic		Copenhagen	Broadcom		Office
Czech Republic			Cypress Semiconductor Corp		
Czech Republic			Freescall Semiconductor Ltd.		Office
Czech Republic			Marvell		
Czech Republic		Aalborg	Intel		
Czech Republic		Copenhagen	Intel		
Czech Republic		Naerum	Acer Inc		Acer Denmark A/S
Czech Republic		Naerum	Acer Inc		Tech Support
Czech Republic		Copenhagen	Foxconn International Holdings		R&D
Czech Republic		Aalborg	MediaTek		MediaTek Denmark ApS (Denmark)
Czech Republic		Glostrup	Kyocera		KYOCERA Document Solutions Denmark A/S
Czech Republic			Kyocera		KYOCERA UNIMERCO A/S

Source: Citi Research

Figure 1017. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Denmark			Canon		All product segments (with some exceptions)
Denmark		Albertslund	Konica Minolta Holdings		Konica Minolta Business Solutions Denmark a/s
Denmark		Taastrup	Hoya Corporation		HOYA LENS DANMARK A/S
Denmark		Ballerup	Olympus		Olympus Danmark A/S
Denmark			Nikon		
Denmark		Vallensbæk	Ricoh Co		Sales & Services - Ricoh Denmark A/S
Denmark			Seiko Epson		Epson (U.K.) Ltd., Denmark Office
Denmark		Glostrup	Fujifilm		
Denmark		Ballerup	Fujitsu		Fujitsu A/S
Denmark			Brocade Communications		
Denmark		Belden			Manufacturing Facilities
Denmark		Gjern			
Denmark		Copenhagen	Huawei		
Denmark		Aalborg	RF Microdevices		
Denmark		Glostrup	Molex		Design Center
Denmark		Herlev	Pioneer Corporation		Molex Knutsen Danmark AS
Denmark		Isboej	Brother Industries Ltd		Pioneer Europe N.V., Representative Office
Denmark		Tallinn	Amphenol		Sales Facilities
Denmark		Tallinn	Arrow Electronics		Amphenol ConneXus AEOU
Denmark		Tallinn	IBM (International Business Machines Corp)		Office
Denmark		Tallinn	Hewlett Packard		HP office in
Denmark		Tallinn	EMC Corp		
Denmark		Tallinn	Nokia		Regional Office
Denmark		Tallinn	Cisco Systems Inc		
Denmark		Tallinn	Ericsson LM		Office
Denmark		Tallinn	Xilinx Inc		
Denmark		Tallinn	Konica Minolta Holdings		UAB Konica Minolta branch Estonia
Denmark		Tallinn	Olympus		Olympus Estonia OU
Denmark			Nikon		
Denmark		Tallinn	Fujitsu		Fujitsu Services AS
Denmark		Addis Ababa	Xerox		Office
Denmark		Addis Ababa	Ericsson LM		Office
Denmark		Addis Ababa	ZTE Corp		Sales Office
Denmark		Addis Ababa	Huawei		
Denmark					Enclosures, Logistics/Post-Manufacturing
Denmark					Repair/Warranty, New Product Introduction &
Denmark					PCBA & System Assembly
Denmark		Multiple locations	Sanmina	223,060	
Denmark		Espos	Arrow Electronics		Office
Denmark		Oulu	Arrow Electronics		Office
Denmark		Turku	Arrow Electronics		Office
Denmark			Tech Data		
Denmark		Helsinki	IBM (International Business Machines Corp)		Oy International Business Machines Ab
Denmark		Espos	Hewlett Packard		Hewlett-Packard Oy
Denmark		Helsinki	EMC Corp		
Denmark		Espos	NetApp Inc		
Denmark		ESPOO	Xerox		Office
Denmark		Espos	Lexmark		Lexmark Finland
Denmark			Nokia		Regional Office
Denmark		Espos	Cisco Systems Inc		
Denmark			Motorola Solutions		Sales Office
Denmark		Helsinki	Apple Inc		Office
Denmark		Oulu	Fairchild Semiconductor International		Design Centers
Denmark		Vantaa	Linear Technology		Office
Denmark		Vantaa	Alcatel Lucent SA		
Denmark		Jorvas	Ericsson LM		Office
Denmark		Espos	FS Networks		Office
Denmark			Juniper Networks Inc		
Denmark		Polycom Inc.			Office
Denmark		Espos	Riverbed Technology		
Denmark		Espos	Tellabs, Inc.		Business Units
Denmark		Espos	Altera Corp		
Denmark		Lohja	Micron		Sales
Denmark		Espos	Intel		
Denmark		Tampere	Intel		
Denmark		Helsinki	NVIDIA		Office
Denmark		Espos	QUALCOMM Incorporated		
Denmark		Tampere	QUALCOMM Incorporated		
Denmark		Helsinki	Xilinx Inc		
Denmark		Espos	Xilinx Inc		
Denmark		Espos	SK Hynix		Helsinki Office
Denmark		Helsinki	LG Display		Sales
Denmark		Espos	Samsung Electro-Mechanics		Overseas Sales Offices
Denmark		Turku	AAC Technologies Holdings		Office
Denmark		Helsinki	Acer Inc		Acer Finland Oy
Denmark		Espos	NEC		
Denmark		Espos	Delta Electronics		Delta Energy Systems (Finland) Oy
Denmark			Foxconn International Holdings		Client/technology co location facilities
Denmark		Espos	Lenovo Group		
Denmark		Pirkanmaa	Hiore Electric		Finland Branch
Denmark		Helsinki	Ibiden		Branch: Finnish
Denmark		Helsinki	Kyocera		KYOCERA Document Solutions Finland Oy
Denmark		Vantaa	Murata		Development & Productions
Denmark		Oulu	Rohm		Sales Office - ROHM Semiconductor GmbH
Denmark		Salo	Taiyo Yuden		Finland Office
Denmark		Turku	TDK Corporation		FINLAND Branch Office
Denmark		Helsinki	Mitsumi Electric		Sales Office
Denmark					All product segments (with some exceptions)
Denmark		Espos	Konica Minolta Holdings		Konica Minolta Business Solutions Finland Oy
Denmark		Helsinki	Hoya Corporation		HOYA LENS FINLAND Oy
Denmark		Vantaa	Olympus		Olympus Finland Oy
Denmark			Nikon		
Denmark		Espos	Ricoh Co		Sales & Services - Ricoh Finland Oy
Denmark			Seiko Epson		Epson Europe Electronics GmbH
Denmark			Seiko Epson		Epson (U.K.) Ltd., Finland Office
Denmark		Riihimäki	Fujifilm		
Denmark		Helsinki	Fujitsu		Fujitsu Finland Oy
Denmark		Oulu	ARM Holdings PLC		
Denmark		Espos	Brocade Communications		Brocade Communications
Denmark		Salo	CSR PLC		213 Sales
Denmark		Nummela	STMicroelectronics		Sales Office & Representative
Denmark		Espos	ZTE Corp		Sales Office
Denmark		Helsinki			
Denmark		Oulu	RF Microdevices		Sales & Customer Support Center
Denmark		Espos	Skyworks		
Denmark		ESPOO	Hitachi		Hitachi Digital Media Group
Denmark		Espos	Zhen Ding Tech		Service center
Denmark		Espos	Pioneer Corporation		Pioneer Europe N.V., Representative Office
Denmark		Vantaa	Brother Industries Ltd		Sales Facilities

Source: Citi Research



Figure 1018. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
France		Brest	Jabil	463,000	Manufacturing
France		Gallargues	Jabil	25,000	Manufacturing
France		Blagny	Amphenol		Amphenol Air LB SAS
France		Amboise	Amphenol		Amphenol Antenna Solutions Europe
France		Dole Cedex	Amphenol		Amphenol European Design Center
France		Espoo	Amphenol		Amphenol Filtec, S.A.S.
France		Courbevoie	Amphenol		Amphenol International Military Aerospace & Industrial Operations
France		Thyvez	Amphenol		Amphenol Provens S.A.S.
France		Thyvez	Amphenol		Amphenol Socapex S.A.S.
France		Amboise	Amphenol		Jaybeam Wireless - France
France		Cedex	Amphenol		Sefee
France		Nice	Vishay	215,000	Resistors & Inductors
France		Heyres	Vishay	65,000	Resistors & Inductors
France		Saint-Apollinaire	AVX Corporation	322,000	Manufacturing/Research — PC
France		Courbevoie	Arrow Electronics		Office
France		Bordeaux	Arrow Electronics		Office
France	Haute-Garonne	Toulouse	Arrow Electronics		Office
France		Paris	Arrow Electronics		Office
France		Strasbourg	Arrow Electronics		Office
France		Rennes	Arrow Electronics		Office
France		Bussy St. George	Tech Data	430,556	
France	Martinique	Fort-de-France	IBM (International Business Machines Corp)		IBM France
France		Boigny-sur-Bionne	IBM (International Business Machines Corp)		IBM France
France		Saint Jean de Braye	IBM (International Business Machines Corp)		IBM France
France		Les Ulis	Hewlett Packard		Headquarters - Paris region
France		Boulogne	Hewlett Packard		Office - Paris region
France		Nanterre	Hewlett Packard		Office - Paris region
France		Lille	Hewlett Packard		Office - Northern Region
France		Nantes	Hewlett Packard		Office - Northern Region
France		Strasbourg	Hewlett Packard		Office - Northern Region
France		Grenoble	Hewlett Packard		Office - Southern Region
France		L'Isle d'Abeau	Hewlett Packard		Office - Southern Region
France	Haute-Garonne	Toulouse	Hewlett Packard		Office - Southern Region
France		Valbonne	Hewlett Packard		Office - Southern Region
France		Antony	EMC Corp		
France		Beacons Cedex	EMC Corp		
France	Garonne	Bordeaux	EMC Corp		
France		Grenoble	EMC Corp		
France		La Celle St. Cloud	EMC Corp		
France		Lille Métropole	EMC Corp		
France		Lognes	EMC Corp		
France		Lyon	EMC Corp		
France	Rhone-Alpes	Grenoble	EMC Corp		
France		Nanterre	EMC Corp		
France		Nantes	EMC Corp		
France		Orly	EMC Corp		
France		Paris	EMC Corp		
France	Pyrenees	Pau	EMC Corp		
France	Haute-Garonne	Toulouse	EMC Corp		
France		Paris	NetApp Inc		
France	Saint Martin	Phillipsburg	Xerox		Office
France		Saint-Denis	Xerox		Office
France		Bobigny	Xerox		Office
France	Haute-Garonne	Toulouse	Xerox		Office
France		Guillermund-Granges	Xerox		Office
France		Aulnieres-sur-Seine	Xerox		Office
France		Neuville-en-Ferrain	Xerox		Manufacturing plant
France		Lille	Xerox		Manufacturing plant
France		Paris	Electronics For Imaging, Inc		office
France		Lexmark	Lexmark		Lexmark International SASU
France		Corning	Corning		Office
France		Paris	Nokia		Regional Office
France	Rhone-Alpes	Paris	Cisco Systems Inc		
France		Lyon	Cisco Systems Inc		
France	Haute-Garonne	Toulouse	Cisco Systems Inc		
France	Alsace	Strasbourg	Cisco Systems Inc		
France	Brittany	Rennes	Cisco Systems Inc		
France		Courbevoie	Blackberry		
France		Bordeaux	Motorola Solutions		Sales Office
France		Dijon	Apple Inc		Retail Store
France		Le Chesnay	Apple Inc		Retail Store
France		Lieusaint	Apple Inc		Retail Store
France		Lyon	Apple Inc		Retail Store
France		Mame La Vallee	Apple Inc		Retail Store
France		Montpellier	Apple Inc		Retail Store
France		Nice	Apple Inc		Retail Store
France		Paris	Apple Inc		Retail Store
France		Puteaux - la Defense	Apple Inc		Retail Store
France		Rosny-Sous-Bois	Apple Inc		Retail Store
France		Saint Herblain	Apple Inc		Retail Store
France		Strasbourg	Apple Inc		Retail Store
France		Velizy-Villacoublay	Apple Inc		Retail Store
France		Paris	Apple Inc		Office
France	Rhone-Alpes	Archamps	Amkor Technology Inc		Sales Office
France		Meylan	Applied Materials Inc		Business Center
France		Corbeil - Essonnes	Applied Materials Inc		Sales and Services
France		Roussel	Applied Materials Inc		Sales and Services
France		Meylan	Brooks Automation Inc		Office
France		Montpellier	Entegris Inc	53,000	Cleaning Services
France		Moirans	Entegris Inc		Customer Service Center
France		Limonest	Entegris Inc		Customer Service Center
France	Provence	International Rectifier Corp			
France		Velizy Villacoublay	Intersil Corp.		Sales Office

Source: Citi Research

Figure 1019. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
France		Meylan	KLA Tencor Corp		
France		Menecy	KLA Tencor Corp		
France	Bouches-du-Rhône	Rousset	KLA Tencor Corp		
France		Meylan	Lam Research Corp		Office
France		Corbeil Essonnes Cedex	Lam Research Corp		Office
France		Rousset Cedex	Lam Research Corp		Office
France		Rungis	Linear Technology		Office
France		Grenoble	Maxim Integrated		Office
France		La Ciotat	Maxim Integrated		Office
France		Paris	Maxim Integrated		Office
France		Courtaboeuf Cedex	Microchip Technology		
France		Velizy-Villacoublay	On Semiconductor		Sales Office
France		Courtaboeuf	Semtech		
France	Essonne	Les Ulis	Silicon Laboratories, Inc		
France	Cedex	Calais	Teradyne		Local Sales and Support Office
France		Calais	Alcatel Lucent SA	79,000	Manufacturing
France		Calais	Alcatel Lucent SA	31,000	Manufacturing
France		Villarsaux	Alcatel Lucent SA		
France		Velizy-Villacoublay	Alcatel Lucent SA		
France		Paris	Alcatel Lucent SA		
France		Lannion	Alcatel Lucent SA		
France	Brittany	Paris	Alcatel Lucent SA		Headquarters
France		Orvault	Alcatel Lucent SA		
France	Nantes	Ilkirch-Graffenstaden	Alcatel Lucent SA		
France		Brest	Alcatel Lucent SA		
France		Rennes	Alcatel Lucent SA		
France	ile-de-France	Velizy-Villacoublay	Alcatel Lucent SA		
France	Toulouse	Colomiers	Alcatel Lucent SA		
France		Sophia-Antipolis	Alcatel Lucent SA		
France	Loire-Atlantique	Trignac	Alcatel Lucent SA		
France		Ormes	Alcatel Lucent SA		
France		Paris	Ciena Corp		
France		Massy Cedex	Ericsson LM		Office
France		Massy Cedex	F5 Networks		Office
France		Massy Cedex	JDSU Corp.		Manufacturing, Research and Development
France		Massy Cedex	JDSU Corp.		Sales Office
France		Neuilly sur Seine	Juniper Networks Inc		
France		Paris	Polycom Inc.		Office
France		Paris	Riverbed Technology		
France		Paris	Riverbed Technology		
France		Boulogne Billancourt	Tellabs, Inc.		Sales Office
France		Issy les Moulineaux	Advanced Micro Devices, Inc		
France		Velizy-Villacoublay	Altera Corp		
France		Sophia Antipolis	Broadcom		Office
France		Paris	Cypress Semiconductor Corp		
France		Paris	Freescall Semiconductor Ltd.		Office
France		Les Ulis	Micron		Sales
France	Alpes-Maritimes	Sophia Antipolis	Intel		
France	Haute-Garonne	Toulouse	Intel		
France	Herault	Montpellier	Intel		
France	Loire-Atlantique	Nantes	Intel		
France		Meudon	Intel		
France		Issy les Moulineaux	Intel		Office
France		Paris	QUALCOMM Incorporated		
France		Paris	QUALCOMM Incorporated		
France		Paris	Spansion		Spancion EMEA, Design Centers and Specialized Centers of Excellence
France		Nice	Texas Instruments		
France		Paris	Xilinx Inc		
France	ile-de-France	VOISINS LE BRETONNEUX	Xilinx Inc		
France		Saint Priest	SMA Solar Technology		SMA France S.A.S
France		Grenoble	SolarWorld AG		SOLARWORLD FRANCE
France	Cedex	Paris	SK Hynix		Paris Office
France	ile-de-France	Paris	LG Electronics		LG Electronics France S.A.S, Marketing
France		Paris	Samsung Electronics		France - Samsung Electronics France
France		Cedex	Mitsubishi Electric		Mitsubishi Electric Europe B.V. - French Branch
France			Mitsubishi Electric		Mitsubishi Electric Automotive Europe B.V. - technical Center
France		Rennes	Mitsubishi Electric		Mitsubishi Electric R&D Centre Europe B.V. (MERCE) - French Branch
France		Nanterre	Mitsubishi Electric		Ascenseurs Mitsubishi France S.A.S
France		Roissy-en-France	Acer Inc		Acer Computer France SAS
France		Nanterre	ASUSTek COMPUTER INC		ASUS France S.A.R.L.
France		Nanterre	NEC		NEC France S.A.S.
France	ile-de-France	Courbevoie	Lenovo Group		Sales Headquarters
France		Lyon	Trina Solar Limited		Trina Solar (France) SAS
France		Lyon	Yingli Green Energy		Yingli Green Energy France S.A.S.
France		Lyon	SuperPower Corporation		Office
France		Charles de Gaulle	Alps Electric		Paris Office
France		Paris	Ibiden		IBIDEN DPF France S.A.S.
France		Paris	Ibiden		IBIDEN France S.A.S
France		Gif-sur-Yvette	Kyocera		KYOCERA Document Solutions France S.A.S.
France		La Plessis - Robinson	Murata		Sales Office
France		Paris	Rohm		Sales Office - ROHM Semiconductor GmbH
France	La Chapelle-Saint-Mesmin	Taiyo Yuden			France Office
France		Pantin	TDK Corporation		PARIS Branch Office
France		CHÉTEL Cedex	Nidec		R&D, Manufacturing and Sales of Automotive Motors
France		Roche La molliere	Nidec		Sales & Factory
France		Cergy-Pontoise	Mitsumi Electric		Sales Office

Source: Citi Research

Figure 1020. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
France		Cesson - Sevigne	Canon		Audio-video networking, image connectivity, acoustic and web-related technologies
France		Liffre Cedex	Canon		Chemical products for copying machines and printers, recycling of toner cartridges, after-sales service and others
France		Courbevoie	Canon		All product segments (with some exceptions)
France		Rousset	Dainippon Screen		Rousset Office
France		Croles	Dainippon Screen		Croles Office
France		Carrières-sur-Seine	Konica Minolta Holdings		Konica Minolta Business Solutions France S.A.S.
France		Emerainville	Hoya Corporation		HOYA LENS FRANCE S.A.S.
France		Rungis	Olympus		Sales of all product lines and service of digital cameras and medical endoscopes in Russia and CIS
France			Nikon		
France			Ricoh Co		Sales & Services - Ricoh France S.A.S.
France		Cedex	Ricoh Co		Manufacturing - Ricoh Industrie France S.A.S.
France		Wettolsheim	Seiko Epson		Epson France S.A.
France		Paris	TAMRON France S.A.		TAMRON France S.A.
France			Tamron Co Ltd		Tamron Co Ltd
France		Meylan	Grenoble		Tokyo Electron
France			Asahi Glass		Float glass, automotive glass
France		Cedex	Sharp Corp		SHARP ELECTRONICS FRANCE S.A. [France]
France		Bois-d'Arcy	Fujifilm		
France		Marne La Vallee	Fujifilm		
France		Asnières-sur-Seine	Fujifilm		
France		Cedex	Fujifilm		
France		Paris	Fujitsu		Fujitsu Components Europe B.V.
France		Massy	Fujitsu		Fujitsu Semiconductor Europe GmbH
France		Asnières-sur-Seine	Fujitsu		Fujitsu Technology Solutions SA
France		Le Mans	3D Systems Corp	21000	office and printed parts service facilities
France		Grenoble	ARM Holdings PLC		ARM Holdings PLC
France		Paris	ARM Holdings PLC		ARM Holdings PLC
France		Sophia Antipolis	ARM Holdings PLC		ARM Holdings PLC
France			ASML Holding NV		ASML Holding NV
France		Paris	Brocade Communications		Brocade Communications France SAS
France		Paris	Infoblox Inc		Facilities for development activities
France		Sofia Antipolis	STMicroelectronics		Manufacturing & Design Center
France		Rennes	STMicroelectronics		Manufacturing & Design Center
France		Grenoble	STMicroelectronics		Manufacturing & Design Center
France		Rousset	STMicroelectronics		Manufacturing & Design Center
France		Paris	STMicroelectronics		Manufacturing & Design Center
France		Croles	STMicroelectronics		Manufacturing & Design Center
France		Le Mans	STMicroelectronics		Manufacturing & Design Center
France			STMicroelectronics		Manufacturing & Design Center
France		Saint-Genis-Pouilly	STMicroelectronics		Warehouses
France			TE Connectivity Ltd.		4 Manufacturing Plants
France			Vtech Holdings		Regional Office - Electronic Learning Products
France			Western Digital Corp		
France		Paris	ZTE Corp		Sales Office
France			Belden		Manufacturing Facilities
France			Belden		Manufacturing Facilities
France		Lyon	Belden		Sales Offices
France		Paris	Emulex Corp		Office
France		Mouais	Huawei		
France		Boulogne Billancourt	Huawei		
France		Lannion	Huawei		
France			QLogic Corp		
France		Paris	RF Microdevices		Design Center
France		Paris	Skyworks		
France		Bievres	Molex		France Sales Branch
France		Windows-le-Buisson	Panasonic		French Branch Office
France		Bron	Hitachi		Hitachi Europe S.A.S. Digital Media Group
France		Velizy - Villacoublay	Hitachi		
France		Argenteuil	Pioneer Corporation		Pioneer France S.A.S
France			Brother Industries Ltd		Sales Facilities
France		Paris	Rambus Inc		Regional Office
Germany		Böblingen	Jabil	16,000	Manufacturing, Prototype Manufacturing
Germany		Jena	Jabil	24,000	Design
Germany		Frickenhäuser	Alps Electric		Electronics facilities, Design Centers
Germany		Ostbevern	Canon		Electronics facilities, Design Centers
Germany		Tuebingen	Canon		Electronics facilities, Design Centers
Germany		Boeblingen	Canon		Electronics facilities, Manufacturing
Germany		Paderborn	Canon	269,098	Electronics facilities, Manufacturing
Germany		Saarbrücken	Amphenol		Amphenol Air LB GmbH
Germany		Heilbronn	Amphenol		Amphenol Tuchel Electronics GmbH
Germany		Herrnsburg	Amphenol		Deutgen Kunststofftechnik GmbH
Germany		Pins	Amphenol		FEP Fahrzeugtechnik Pins GmbH
Germany		Kressberg-Marktstedenau	Amphenol		Konfektion E Elektronik GmbH
					New Product Introduction, PCBA & System Assembly & Logistics/Post-Manufacturing
Germany			Sannina	363,778	Repair/Warranty
Germany		Darmstadt	Plexus	16,000	Engineering Solutions
Germany			Vishay Electronic GmbH		
Germany		Bavaria	Vishay	306000	Resistors & Inductors and Capacitors
Germany		Heide	Vishay	161000	Resistors & Inductors
Germany		Landshut	Vishay	72000	Capacitors
Germany		Fichtelberg	Vishay	24000	Resistors & Inductors
Germany		Itzehoe	Vishay	207000	MOSFETs
Germany		Heilbronn	Vishay	48000	Diodes and Optoelectronic Components
Germany		Betzdorf	AVX Corporation	111,000	Manufacturing — CP
Germany		Bavaria	Avnet	423,000	offices
					EM warehousing, value-added operations and
Germany		Bavaria	Avnet	296,000	offices
					EM warehousing, value-added operations and
Germany		North Rhine-Westphalia	Avnet	137,000	offices
					TS warehousing, value-added operations and
Germany		North Rhine-Westphalia	Avnet	126,000	offices
Germany		Fürstfeldbruck	Arrow Electronics		Office
Germany		Ettingen	Arrow Electronics		Office
Germany		Oberhausen	Arrow Electronics		Office
Germany		Aachen	Arrow Electronics		Office
Germany		Berlin	Arrow Electronics		Office
Germany		Dortmund	Arrow Electronics		Office
Germany		Frankfurt	Arrow Electronics		Office
Germany		Erfurt	Arrow Electronics		Office
Germany		Freiburg	Arrow Electronics		Office
Germany		Göttingen	Arrow Electronics		Office
Germany		Karlsruhe	Arrow Electronics		Office
Germany		Hamburg	Arrow Electronics		Office
Germany		Leipzig	Arrow Electronics		Office

Source: Citi Research

Figure 1021. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Germany		München	Arrow Electronics		Office
Germany		Ravensburg	Arrow Electronics		Office
Germany		Nuremberg	Arrow Electronics		Office
Germany		Stuttgart	Arrow Electronics		Office
Germany	North Rhine-Westphalia	Düsseldorf	Tech Data		
Germany	Bavaria	Munich	EMC Corp		Tech Data
Germany		Bad Homburg	Hewlett Packard		Office
Germany		Berlin	Hewlett Packard		Office
Germany		Böblingen	Hewlett Packard		Office
Germany		Dortmund	Hewlett Packard		Office
Germany		Düsseldorf	Hewlett Packard		Office
Germany		Hamburg	Hewlett Packard		Office
Germany		Hannover	Hewlett Packard		Office
Germany		Jena	Hewlett Packard		Office
Germany		Krefeld	Hewlett Packard		Office
Germany		Leipzig	Hewlett Packard		Office
Germany		Darmstadt	Hewlett Packard		Office
Germany		Nuremberg	Hewlett Packard		Office
Germany		Ratingen	Hewlett Packard		Office
Germany		Russelsheim	Hewlett Packard		Office
Germany		Waldorf	Hewlett Packard		Office
Germany		Bochum	EMC Corp		EMC Corp
Germany	North Rhine-Westphalia	Bochum	EMC Corp		EMC Corp
Germany	Saxony	Dresden	EMC Corp		EMC Corp
Germany	North Rhine-Westphalia	Düsseldorf	EMC Corp		EMC Corp
Germany	Hesse	Frankfurt	EMC Corp		EMC Corp
Germany		Hamburg	EMC Corp		EMC Corp
Germany	Saxony	Hannover	EMC Corp		EMC Corp
Germany	Baden-Württemberg	Karlsruhe	EMC Corp		EMC Corp
Germany	Bavaria	Munich	EMC Corp		EMC Corp
Germany	North Rhine-Westphalia	Neuss	EMC Corp		EMC Corp
Germany	Bavaria	Numberg	EMC Corp		EMC Corp
Germany		Main-Taunus-Kreis	EMC Corp		EMC Corp
Germany	Baden-Württemberg	Stuttgart	EMC Corp		EMC Corp
Germany	Rhein-Neckar-Kreis	Waldorf	EMC Corp		EMC Corp
Germany		Berlin	NetApp Inc		NetApp Inc
Germany	North Rhine-Westphalia	Düsseldorf	NetApp Inc		NetApp Inc
Germany	Hesse	Frankfurt	NetApp Inc		NetApp Inc
Germany		Hamburg	NetApp Inc		NetApp Inc
Germany		Kirchheim unter Teck	NetApp Inc		NetApp Inc
Germany	Bavaria	Nuremberg	NetApp Inc		NetApp Inc
Germany	Baden-Württemberg	Stuttgart	NetApp Inc		NetApp Inc
Germany	Rhein-Neckar-Kreis	Waldorf	NetApp Inc		NetApp Inc
Germany		Mülheim	Xerox		Office
Germany		Ratingen	Electronics For Imaging, Inc	27	office
Germany		Essen	Electronics For Imaging, Inc	9	office
Germany	Hesse	Dietzenbach	Lexmark		Lexmark Deutschland GmbH
Germany			Corning		Office
Germany		Berlin	Cisco Systems Inc		
Germany		Hamburg	Cisco Systems Inc		
Germany	North Rhine-Westphalia	Düsseldorf	Cisco Systems Inc		
Germany		Eschborn	Cisco Systems Inc		
Germany	Friesland	Hallbergmoos	Cisco Systems Inc		
Germany	North Rhine-Westphalia	Bonn	Cisco Systems Inc		
Germany	Baden-Württemberg	Mannheim	Cisco Systems Inc		
Germany		Bochum	Blackberry		
Germany		Frankfurt	Blackberry		
Germany		Düsseldorf	Blackberry		
Germany		Munich	Blackberry		
Germany		Berlin	Motorola Solutions		Corporate & Regional Office
Germany		Taunusstein	Motorola Solutions		Sales Office
Germany		Düsseldorf	Motorola Solutions		Sales Office
Germany		Augsburg	Apple Inc		Retail Store
Germany		Berlin	Apple Inc		Retail Store
Germany		Cologne	Apple Inc		Retail Store
Germany		Dresden	Apple Inc		Retail Store
Germany		Düsseldorf	Apple Inc		Retail Store
Germany		Frankfurt	Apple Inc		Retail Store
Germany		Hamburg	Apple Inc		Retail Store
Germany		Munich	Apple Inc		Retail Store
Germany		Oberhausen	Apple Inc		Retail Store
Germany		Sindelfingen	Apple Inc		Retail Store
Germany		Sulzbach	Apple Inc		Retail Store
Germany		Munich	Applied Materials Inc		Office
Germany		Dresden	Applied Materials Inc		Business Center
Germany		Alzenau	Applied Materials Inc		Research, Development and Manufacturing
Germany		Ammerthal	Applied Materials Inc		Research, Development and Manufacturing
Germany		Feldkirchen	Applied Materials Inc		Sales and Services
Germany		Heimstetten	Applied Materials Inc		Sales and Services
Germany		Unterhaching	ATMI Inc		Sales & Customer Service
					Administration, Research and Development and Sales
Germany					
Germany		Jena	Brooks Automation Inc	30100	Manufacturing, R&D and sales & support
Germany		Dresden	Brooks Automation Inc		Office
Germany		Mittelgau	Brooks Automation Inc		Office
Germany		Dresden	Entegris Inc		
Germany		Hannover	Fairchild Semiconductor International		Regional Sales and Customer Service Centers
Germany		Munich	Fairchild Semiconductor International		Design Centers
Germany		Dresden	FormFactor Inc	2,282	Sales office
Germany		Neu Isenburg	International Rectifier Corp		
Germany		Ismaning	Intersil Corp.		Office
Germany		Ismaning	Intersil Corp.		Sales office
Germany	Hesse	Weilburg	KLA Tencor Corp	138,119	Office and plant
Germany	Saxony	Dresden	KLA Tencor Corp		
Germany	Hesse	Weilburg	KLA Tencor Corp		
Germany	Thuringia	Jena	KLA Tencor Corp		
Germany		Dresden	Lam Research Corp		Office
Germany		Ismaning	Lam Research Corp		Office
Germany		Rendsburg	Lam Research Corp		Office
Germany		Ismaning	Linear Technology		Office
Germany		Ascheberg	Linear Technology		Office
Germany	Baden-Württemberg	Kirchheim unter Teck	Linear Technology		Office
Germany		Garching	MagnaChip Semiconductor Corp		Sales Office
Germany		Munich	Maxim Integrated		Office
Germany		Itzehoe	Maxim Integrated		Office
Germany		Pforzheim	Microchip Technology		

Source: Citi Research

Figure 1022. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Germany		Ismaning	Microchip Technology		
Germany		Haan	Microchip Technology		
Germany		Munich	On Semiconductor		Sales Office
Germany	Hallbergmoos		Semtech		
Germany	Bavaria	Hallbergmoos	Silicon Laboratories, Inc		
Germany		Munich	Teradyne		Local Sales and Support Office
Germany		Munich	Adtran		
Germany		Stuttgart	Alcatel Lucent SA		
Germany		Nuremberg	Alcatel Lucent SA		
Germany		Frankfurt	Ciena Corp		
Germany		Duesseldorf	Ericsson LM		Office
Germany		Munich	FS Networks		Office
Germany			JDSU Corp.		Sales Office
Germany			JDSU Corp.		Manufacturing, Research and Development
Germany		Frankfurt	Juniper Networks Inc		
Germany		Munich	Juniper Networks Inc		
Germany					Administrative, manufacturing and research and
Germany		Munich	Oclaro Inc.	3000	development facilities
Germany		Hallbergmoos	Polycom Inc.		Office
Germany		Aschheim	Riverbed Technology		
Germany		Regensburg	Riverbed Technology		
Germany		Stuttgart	Riverbed Technology		
Germany		Rattingen	Riverbed Technology		
Germany		Hamburg	Riverbed Technology		
Germany		Frankfurt	Riverbed Technology		
Germany		Munich	Tellabs, Inc.		Sales Office
Germany	Bavaria	Munich	Advanced Micro Devices, Inc		
Germany		Unterschleissheim	Altera Corp		
Germany		Munich	Cypress Semiconductor Corp		Office
Germany		Muenchen	Freemove Semiconductor Ltd.		Office
Germany		Wiesbaden	Freemove Semiconductor Ltd.		Office
Germany		Ismaning	Micron		Sales
Germany			Marvell		
Germany	Baden-Württemberg	Karlsruhe	Intel		
Germany	Baden-Württemberg	Ulm	Intel		
Germany	Baden-Württemberg	Ulm	Intel		
Germany	Bavaria	Munich	Intel		
Germany	Bavaria	Neuberg	Intel		
Germany	Bavaria	Nuremberg	Intel		
Germany	Bavaria	Regensburg	Intel		
Germany	Bavaria	Unterhaching	Intel		
Germany	Niedersachsen (Low Braunschweig		Intel		
Germany	Nordrhein-Westfale	Duisburg	Intel		
Germany	Sachsen	Dresden	Intel		
Germany			NVIDIA		Office
Germany		Munich	NVIDIA		Office
Germany		Würselen	NVIDIA		Office
Germany	Bavaria	Munich	QUALCOMM Incorporated		
Germany	Bavaria	Nuremberg	QUALCOMM Incorporated		
Germany	Hesse	Sulzbach	QUALCOMM Incorporated		
Germany	North Rhine-Westpl	Munster	QUALCOMM Incorporated		
Germany					Spanion International Inc., Design Centers and
Germany		Munich	Spanion		Specialized Centers of Excellence
Germany		Freising	Texas Instruments		
Germany		Munich	Xilinx Inc		
Germany	Baden-Württemberg	Reutlingen	Manz AG	3,44,445	Headquarters, Worldwide Production, Sales &
Germany		Stuttgart	Manz AG	Service	
Germany	Bavaria	Karlsruhe	Manz AG	48,438	Production, Sales & Service
Germany	Baden-Württemberg	Schwabisch Hall	Manz AG	20451.4	Production
Germany	Saxony	Leipzig	Manz AG	1,39,930.4	Production
Germany			Manz AG	Service	
Germany	North Rhine-Westpl	Zülpich	Meyer Burger Technology AG		Hennecke - Metrology Systems, Service Contacts
Germany	Hesse	Reichelsheim	Meyer Burger Technology AG		MUEGGE GmbH, Service Contacts
Germany	Baden-Württemberg	Ulm	Meyer Burger Technology AG		Somont GmbH, Service Contacts
Germany	Hesse	Niestetal	SMA Solar Technology		
Germany		Kassel	SMA Solar Technology		SMA Solar Technology GmbH
Germany		Niestetal	SMA Solar Technology		SMA Railway Technology GmbH
Germany	Bonn		SolarWorld AG		Sales center
Germany		Rheinfelden	SolarWorld AG		
Germany		Freiburg	SolarWorld AG		
Germany	Alb-Donau	Blaubeuren	Centrotherm Photovoltaics		Headquarters Blaubeuren centrotherm
Germany		Raunheim	SK Hynix		photovoltaics AG
Germany	North Rhine-Westphalia		LG Display		Headquarters, SK hynix Deutschland GmbH
Germany	North Rhine-Westpl	Rattingen	LG Electronics		Sales
Germany	Hesse	Frankfurt	LG Innovec		LG Electronics Deutschland GmbH, Marketing
Germany	Hesse	Schwalbach am Taunus	Overseas Sales Offices		LG Innovec Co., Ltd. Frankfurt office (LGITEU)
Germany		Schwalbach am Taunus	Samsung Electronics		Overseas Sales Offices
Germany		Ismaning	Samsung SDI		Germany - Samsung Electronics GmbH
Germany			Chemil Industries		Germany/Europe Subsidiary
Germany		Dresden	Chemil Industries		Chemicals/Electronic Materials Division
Germany		Rattingen	Mitsubishi Electric		Mitsubishi Electric Europe B.V.
Germany					Mitsubishi Electric Automotive Europe B.V. -
Germany		Sindelfingen	Mitsubishi Electric		Technical Center
Germany		Unterhaching	Vincotech GmbH		
Germany		Ahrensburg	Acer Inc		Vincotech GmbH
Germany		Hamburg	Acer Inc		Acer Eastern Europe
Germany		Ahrensburg	Acer Inc		Acer Computer GmbH
Germany			Acer Inc		Tech Support
Germany	North Rhine-Westpl	Duesseldorf	ASUSTek COMPUTER INC		ASUS COMPUTER GmbH (Germany)
Germany	Bavaria	Munich	NEC		NEC Deutschland
Germany	Baden-Württemberg	Heidelberg	NEC		NEC Display Solutions Europe
Germany	North Rhine-Westpl	Neuss	NEC		NEC Laboratories Europe
Germany		Soest	NEC		NEC Tokin Europe
Germany			Delta Electronics		Germany Office
Germany		Teningen	Delta Electronics		Delta Energy Systems Germany GmbH
Germany	North Rhine-Westpl	Aachen	Quanta Computer		QCC Computer GmbH
Germany		Oberhausen	AU Optonics		Office
Germany	Bavaria	Munich	Wintek		Wintek Central Europe GmbH

Source: Citi Research

Figure 1023. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Germany	North Rhine-Westphalia		Innolux		Office
Germany	Baden-Württemberg	Stuttgart	Lenovo Group		Lenovo (Deutschland) GmbH
Germany		Munich	ASE		
Germany	Baden-Württemberg	Metzingen	Advanced Energy Industries, Inc		Advanced Energy Industries GmbH
Germany		Frankfurt	First Solar Inc		First Solar Inc
Germany		Munich	Suntech Power Holdings		Office
Germany		Duesseldorf	Trina Solar Limited		Trina Solar (Germany) GmbH
Germany		Munich	Yingli Green Energy		Yingli Green Energy Europe GmbH
Germany		Frankfurt	Yingli Green Energy		Munich Office
Germany	Bavaria	Unterschleissheim	SunPower Corporation		Office
Germany		Duesseldorf	Alps Electric		Head Office
Germany		Ostfildern	Hirose Electric		Duesseldorf Office
Germany		Duesseldorf	Hosiden		German Branch
Germany		Stuttgart	Hosiden		Hosiden Europe GmbH
Germany		Esslingen	Ibiden		IBIDEN Deutschland GmbH
Germany			Kyocera		KYOCERA Fineceramics GmbH
Germany		Meerbusch	Kyocera		KYOCERA Document Solutions Deutschland GmbH
Germany		Dietzenbach	Kyocera		KYOCERA Display Europe GmbH
Germany		Nuremberg	Murata		Sales Office
Germany		Duesseldorf	Rohm		Sales & QA Office - ROHM Semiconductor GmbH
Germany		Stuttgart	Rohm		Sales Office - ROHM Semiconductor GmbH
Germany		Fürth	Taiyo Yuden		Sales Headquarters
Germany	North Rhine-Westpl	Duesseldorf	TDK Corporation		TDK ELECTRONICS EUROPE GmbH - Headquarters
Germany	Baden-Württemberg	Leonberg	TDK Corporation		STUTTGART Regional Office
Germany		Duesseldorf	Nidec		Sales
Germany		Nidec	Nidec		Sales & Factory
Germany		Eschborn	Nidec		Sales
Germany		Bietigheim-Bissingen	Nidec		Sales
Germany		Bietigheim-Bissingen	Nidec		Sales Office, Factory and R&D
Germany		Halblech	Nidec		Sales
Germany		Eschborn	Mitsumi Electric		Sales Office & Head Office of Europe
Germany		Pleidelshelm	Mitsumi Electric		Sales Office
Germany		Frankfurt	Mabuchi Motor		Sales Office
Germany					Remanufacturing of copying machines; repair of
Germany					cameras; service and support for Canon sales
Germany		Giessen	Canon		companies
Germany		Krefeld	Canon		All product segments (with some exceptions)
Germany					Head Office - Dainippon Screen (Deutschland)
Germany		Duesseldorf	Dainippon Screen		GmbH
Germany		Kirchheim unter Teck	Dainippon Screen		Sales Office
Germany		Feldkirchen	Dainippon Screen		Refurbish Center
Germany		Dresden	Dainippon Screen		Dresden Office
Germany		Langenhagen	Konica Minolta Holdings		Konica Minolta Business Solutions Europe GmbH
Germany		Frankfurt	Hoya Corporation		HOYA SURGICAL OPTICS GmbH
Germany		Monchengladbach	Hoya Corporation		HOYA LENS DEUTSCHLAND GmbH
Germany		Hamburg	Olympus		Principal Business Bases
Germany					Development, manufacture, and sale of complete
Germany		Munster	Olympus		microscope system solutions
Germany			Nikon		
Germany		Hannover	Nikon		
Germany			Ricoh Co		Sales & Services - Ricoh Deutschland GmbH
Germany		Hamburg	Ricoh Co		Sales & Services - RICOH IMAGING DEUTSCHLAND
Germany					GmbH
Germany		Duesseldorf	Ricoh Co		Sales & Services - European Technology Centre,
Germany		Meerbusch	Ricoh Co		Ricoh Europe PLC
Germany		Munich	Seiko Epson		Epson Deutschland GmbH
Germany			Seiko Epson		Epson Europe Electronics GmbH
Germany			Tamron Co Ltd		TAMRON Europe GmbH
Germany		Dresden	Tokyo Electron		German Branch
Germany		Duesseldorf	Nippon Electric Glass		Manufacturing Plant : Glass fiber
Germany		Hamburg	Sharp Corp		SHARP ELECTRONICS GMBH [Germany/Austria]
Germany		Duesseldorf	Sony Corp		Sony Deutschland G.m.b.H.
Germany		Kleve	Fujifilm		
Germany		Duesseldorf	Fujitsu		
Germany		Munich	Fujitsu		FDK Electronics GMBH
Germany		Langen	Fujitsu		Fujitsu Enabling Software Technology GmbH
Germany		Frankfurt	Fujitsu		Fujitsu Semiconductor Europe GmbH
Germany		Munich	Fujitsu		Fujitsu Services GmbH
Germany			Fujitsu		Fujitsu Technology Solutions GmbH
Germany		Grasbrunn	3D Systems Corp		
Germany		Dresden	ARM Holdings PLC		
Germany			ASML Holding NV		
Germany			Brocade Communications		Brocade Communications GmbH
Germany		Neu-Isenburg	Brocade Communications		Brocade Communications GmbH
Germany		Ingolstadt	CSR Plc	65116	R&D and Operations
Germany		Freiburg	CSR Plc	5317	R&D
Germany		Würzburg	Garmin Ltd.	40,000	office and research and development activities -
Germany					Garmin Würzburg GmbH
Germany	Bavaria		Infineon Technologies AG		Headquarter / Research & Development / Sales
Germany		Regensburg	Infineon Technologies AG		Offices
Germany		Warstein	Infineon Technologies AG		Manufacturing
Germany		Herzogenrath	Aixtron	134,086	Headquarters
Germany		Herzogenrath	Aixtron	172,223	R&D, Manufacturing
Germany		Herzogenrath	Aixtron	26,038	Administration, sales
Germany		Aachen	Aixtron	2,153	R&D
Germany		Stuttgart	STMicroelectronics		Sales Office & Representative
Germany		Aschheim	STMicroelectronics		Sales Office & Representative
Germany		Rheinmunster	Stratays Ltd	8571	Objet GMBH office space
Germany		Frankfurt	Stratays Ltd	16081	Stratays GMBH sales and service office

Source: Citi Research

Figure 1024. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Germany			TE Connectivity Ltd.		6 Manufacturing Plants
Germany		Filderstadt	Vtech Holdings		Regional Office - Electronic Learning Products
Germany			Western Digital Corp		
Germany		Bonn	ZTE Corp		Sales Office
Germany		Darmstadt	ZTE Corp		Sales Office
Germany		Duesseldorf	ZTE Corp		Sales Office
Germany		Neckartenzlingen	Belden		Sales Offices
Germany		Munich	Emulex Corp		Office
Germany		Munich	Huawei		
Germany		Bonn	Huawei		
Germany		Duesseldorf	Huawei		
Germany		Frankfurt	Huawei		
Germany		Nuremberg	Huawei		
Germany			LifeSize operating segment, finance,		
Germany		Munich	Logitech International S A	17800	administration, sales and marketing
Germany		Munich	Omnivision		
Germany		Munich	QLogic Corp		
Germany		Nuremberg	RF Microdevices		Manufacturing Unit
Germany		Munich	RF Microdevices		Sales & Customer Support Center
Germany		Munich	TriQuint	21050	Engineering and marketing
Germany		Manheim	Veeco Instruments Inc		
Germany		Walldorf	Molex		German Sales Branch
Germany		Ettingen	Molex		Design Center and European Logistic Center
Germany		Bretten	Molex		Design Center
Germany		Haar	Panasonic		Semiconductor Sales office
Germany		Pfaffenhofen	Panasonic		Manufacturing locations
Germany	Bavaria	Hofkirchen	Panasonic		European Headquarters
Germany			Corporate headquarters - Hitachi Power Europe		
Germany		Duisburg	Hitachi		GmbH
Germany		Berlin	Hitachi		Berlin Office
Germany	Hesse	Dreieich - Buchschlag	Hitachi		Hitachi Data Systems
Germany		Krefeld	Hitachi		Hitachi High-Technologies Europe GmbH
Germany		Erkrath	Hitachi		Hitachi Kokusai Electric Europe GmbH
Germany		Wiesbaden	Hitachi		Hitachi Medical Systems GmbH
Germany		Hilden	Hitachi		Hitachi Tool Engineering Europe GmbH
Germany		Duesseldorf	Hitachi		Hitachi Europe GmbH
Germany		Karlsruhe	Everlight		Sales Office
Germany		Ismaning	Everlight		Sales Office
Germany			FUNAI DEUTSCHLAND A DIVISION OF FUNAI		
Germany		Hamburg	Pioneer Corporation		ELECTRIC EUROPE Sp.2 o.o.
Germany		Willich	Pioneer Electronics Deutschland GmbH		
Germany		Bad Vilbel	Brother Industries Ltd		Sales Facilities
Germany		am Rhein, Basel	Brother Industries Ltd		Sales Facilities
Germany		Bad Vilbel	Brother Industries Ltd		Sales Facilities
Germany		Munich	Solar Sales Office		
Germany		Munich	REC Solar ASA		Systems and Solutions Offices
Germany		Neuss	Toshiba		Toshiba Europe GmbH (no Service- /Reparaturannahme)
Germany		Duesseldorf	Toshiba		Products Division
Germany		Regensburg	Toshiba		Toshiba Europe GmbH - Technology and Service Center
Germany			Toshiba TEC Europe Retail Information Systems, SA (subsidiary Germany)		
Germany		Krefeld	Toshiba		Toshiba Machine (Europe) GmbH
Germany		Ismaning	Toshiba		Office
Greece		Athens	Arrow Electronics		IBM (International Business Machines Corp)
Greece		Halandri	Hewlett Packard		Office
Greece	Athens	Marousi	EMC Corp		
Greece		Marousi	NetApp Inc		
Greece		Athens	Xerox		Office
Greece		Athens	Lexmark		Infotech S.A.
Greece		Athens	Nokia		Regional Office
Greece		Marousi	Cisco Systems Inc		
Greece		Athens	Motorola Solutions		Sales Office
Greece		Athens	Alcatel Lucent SA		
Greece		Peania	Ericsson LM		Office
Greece		Athens	Juniper Networks Inc		
Greece		Alimos	Broadcom		Office
Greece	Attiki	Athens	Intel		
Greece		Athens	QUALCOMM Incorporated		
Greece		Athens	SMA Solar Technology		SMA Hellas AE
Greece		Athens	LG Electronics		LG Electronics SA, Marketing
Greece		Athens	Acer Inc		Acer Hellas LTD
Greece		Athens	NEC		NEC Unified Solutions Hellas S.A.
Greece	Attica	Athens	Lenovo Group		Lenovo Technology B.V. - Greece Branch
Greece		Athens	Sun Edison		
Greece		Athens	Suntech Power Holdings		
Greece		Athens	Yingli Green Energy		Athens Office
Greece		Athens	SunPower Corporation		Office
Greece		Metamorfofi	Konica Minolta Holdings		Konica Minolta Business Solutions Greece SA
Greece			Seiko Epson		Epson Italia S.p.A.
Greece		Athens	Fujitsu		Fujitsu Technology Solutions A.E.
Greece			Brocade Communications		
Greece		Athens	ZTE Corp		Sales Office
Greece		Athens	Huawei		
Greece		Athens	Hitachi		Hitachi Digital Media Group
Greece		Chalandri	Hitachi		
Hungary		Pecs	Jabil	36,000	Aftermarket
Hungary		Szombathely	Jabil	198,000	Aftermarket
Hungary		Szombathely	Jabil	68,000	Aftermarket
Hungary		Tiszaújváros	Jabil	423,000	Manufacturing
Hungary		Tiszaújváros	Jabil	160,000	Manufacturing

Source: Citi Research

Figure 1025. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Hungary		Sarvar	Jabil		Electronics facilities, Manufacturing, Industrial Parks
Hungary		Tab	Jabil	172,222	Electronics facilities, Manufacturing, Industrial Parks
Hungary		Zalaegerszeg	Entegris Inc		Electronics facilities, Service & Software
Hungary		Budapest	KLA Tencor Corp		Electronics facilities, Service & Software
Hungary		Pecs	Alcatel Lucent SA		Enclosures, Logistics/Post-Manufacturing Repair/Warranty, New Product Introduction & Assembly
Hungary		Multiple locations	Sanmina	592,388	PCBA & System Assembly
Hungary		Budapest	Vishay	116000	Diods
Hungary		Budapest	Arrow Electronics		Office
Hungary		Budapest	IBM (International Business Machines Corp)		IBM Hungary Ltd.
Hungary		Budapest	Hewlett Packard		Hewlett-Packard Hungary
Hungary		Budapest	EMC Corp		
Hungary		Budapest	EMC Corp		
Hungary		Budapest	NetApp Inc		
Hungary		Budapest	Xerox		Office
Hungary		Budapest	Lexmark		Lexmark Magyarorszag Kft.
Hungary		Budapest	Nokia		Regional Office
Hungary		Budapest	Cisco Systems Inc		
Hungary		Kandorf	Alcatel Lucent SA		
Hungary		Budapest	Ericsson LM		Office
Hungary		Budapest	Juniper Networks Inc		
Hungary		Budapest	Tellabs, Inc.		Sales Office
Hungary		Budapest	Intel		
Hungary		Debrecen	Manz AG	53,820	Production
Hungary			LG Electronics		LG electronics Magyar KFT, Marketing
Hungary		Szigetszentmiklós	Samsung Electro-Mechanics		Overseas Branch Production Plants
Hungary		Ipartelp	Samsung SDI		Hungarian Plant ( SDIHU )
Hungary		Budapest	Chell Industries		Chemicals/Electronic Materials Division
Hungary		Budapest	Acer Inc		Acer Magyarorszag
Hungary		Budapest	Foxconn International Holdings		R&D - Mass Production Facilities
Hungary		Budapest	Lenovo		Lenovo Magyarorszag
Hungary		Budapest	IBIDEN Hungary Kft		IBIDEN Hungary Kft
Hungary		Budapest	Murata		Sales Office
Hungary		Budapest	Rohm		Sales Office - ROHM Semiconductor GmbH
Hungary		Budapest	TDK Corporation		HUNGARY Sales Office
Hungary		Bercel	Nidec		Manufacturing of Motors for Home Appliances
Hungary		Zahony	Canon		All product segments (with some exceptions)
Hungary		Budapest	Konica Minolta Holdings		Konica Minolta Hungary Business Solutions Ltd.
Hungary		Budapest	Hoya Corporation		HOYA LENS HUNGARY Zrt.
Hungary		Budapest	Hoya Corporation		HOYA LENS MANUFACTURING HUNGARY PRIVATE CO.
Hungary		Budapest	Olympus		Olympus Hungary Kft.
Hungary		Budaors	Nikon		Sales & Services - Ricoh HungaryKft.
Hungary		Budaors	Ricoh Co		Epson Europe B.V.
Hungary		Budapest	Selko Epson		
Hungary		Budapest	Fujifilm		
Hungary		Budapest	Fujitsu		Fujitsu Technology Solutions KFT
Hungary		Cegléd	Infineon Technologies AG		Regional Subsidiaries - Infineon Technologies Austria AG
Hungary			TE Connectivity Ltd.		1 Manufacturing Plant
Hungary		Budapest	Venture Corp.		
Hungary		Budapest	ZTE Corp		Sales Office
Hungary		Budapest	Belden		Manufacturing Facilities
Hungary		Budapest	Huawei		
Hungary		Budapest	Molex		Molex Deutschland GmbH
Hungary		Budapest	Panasonic		Hungarian Representative Office
Hungary		Budapest	Brother Industries Ltd		Sales Facilities
Hungary		Reykjavik	Arrow Electronics		Office
Hungary		Reykjavik	IBM (International Business Machines Corp)		Nyerhjel hf.
Hungary		Reykjavik	NetApp Inc		Sensa ehf
Hungary		Reykjavik	Xerox		Office
Hungary		Reykjavik	Nikon		
Hungary		Reykjavik	Huawei		
Ireland		Dublin	Jabil	4,000	Support
Ireland		Cork	Ericsson LM		Flextronics facilities, Manufacturing, Service & Software
Ireland		Limerick	Ericsson LM	235,704	Software
Ireland					Flextronics facilities, Service & Software
Ireland	Co Louth	Drogheda	Amphenol		Amphenol Backplane Assembly & Integration
Ireland	Co Louth	Drogheda	Amphenol		Amphenol TCS Ireland Ltd.
Ireland					New Product Introduction & PCBA & System Assembly
Ireland		Fermoy	Sanmina	110,000	Assembly
Ireland		Galway	Celestica	241,000	
Ireland		Dublin	IBM (International Business Machines Corp)		IBM Ireland Limited
Ireland	Leixlip	Dublin	Hewlett Packard		Product Development and Manufacturing
Ireland					Sales & Services Division, HP Global Service Desk, HP Financial Services EMEA, HP International Bank, Dublin Injekt Manufacturing Operations (DIMO), HP Galway Limited
Ireland	County Kildare	Leixlip	Hewlett Packard		HP Belfast
Ireland	County Antrim	Newtownabbey	Hewlett Packard		
Ireland		Dublin	Hewlett Packard		HP-CDS facility at Swords Business Campus, Swords
Ireland		Belfast	EMC Corp		
Ireland		Cork COE Owens	EMC Corp		
Ireland		Ballincollig	EMC Corp		
Ireland		Dublin	EMC Corp		
Ireland		Shannon	EMC Corp		

Source: Citi Research

Figure 1026. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Ireland		Dublin	Xerox		Office
Ireland		Dundalk	Xerox		Manufacturing plant
Ireland		Dublin	Nokia		Regional Office
Ireland		Dublin	Cisco Systems Inc		
Ireland		Limerick	Analog Devices, Inc	66000	Wafer fabrication, wafer probe and testing, engineering and administrative offices
Ireland		Limerick	Analog Devices, Inc	351500	Wafer fabrication, wafer probe and testing, engineering and administrative offices
Ireland		County Kildare	Applied Materials Inc		Sales and Services
Ireland		Dublin	KLA Tencor Corp		
Ireland		Dublin	Lam Research Corp		
Ireland		Dublin	Maxim Integrated		Office
Ireland		Munster	Arris Enterprises, Inc.	11,135	Office space
Ireland		Dublin	Alcatel Lucent SA		
Ireland		Dublin	Ericsson LM		Office
Ireland		Dublin	Juniper Networks Inc		
Ireland		Shannon	Intel		
Ireland		Kildare	Leivip		
Ireland		Dublin	QUALCOMM Incorporated		
Ireland		Dublin	Xilinx Inc	228,000	
Ireland		Dublin	SK Hynix		Dublin Office
Ireland		Dublin	Mitsubishi Electric		Mitsubishi Electric Europe B.V. - Irish Branch
Ireland		Dublin	Lenovo Group		
Ireland		Dublin	Canon		All product segments (with some exceptions)
Ireland		Dainippin	Screen		
Ireland		Dublin	Olympus		Olympus Ireland
Ireland		Limerick	Olympus		Olympus Biotech International Ltd.
Ireland			Nikon		
Ireland		Dublin	Ricoh Co		Sales & Services - Ricoh Ireland Ltd.
Ireland		Dublin	Seiko Epson		
Ireland		Dublin	Tokyo Electron		Irish Branch
Ireland		Dublin	Fujitsu		Fujitsu (Ireland) Limited
Ireland		Kildare	ASML Holding NV		
Ireland		Springtown	Seagate Technology		
Ireland		Dublin	ZTE Corp		Sales Office
Ireland		Dublin	Emulex Corp		Office
Ireland		Dublin	Huawei		
Ireland		Cork	Logitech International S A	18900	Finance, administration, research and development
Ireland		Shannon	QLogic Corp		
Ireland		Shannon	Molex		Molex Sales (Ireland)
Ireland		Dublin	Molex		Molex Ireland Ltd. (Factory)
Ireland		Dublin	Panasonic		Irish Branch Office
Ireland		Dublin	Brother Industries Ltd		Sales Facilities
Ireland		Cassina de Pecchi	Jabil	161,000	
Ireland		Marcanise	Jabil	230,000	Manufacturing
Ireland		Milan	Juniper Networks Inc	240,000	Software
Ireland		Triviso	Juniper Networks Inc		Electronics facilities, Design Centers,
Ireland		Monza	Juniper Networks Inc		Manufacturing
Ireland		Lombardy	Amphenol		Electronics facilities, Manufacturing
Ireland		Lombardy	Amphenol		European Sales Operations
Ireland		Turin	Visay	127000	
Ireland		Milan	Arrow Electronics		Office
Ireland		Torino	Arrow Electronics		Office
Ireland		Firenze	Arrow Electronics		Office
Ireland		Bologna	Arrow Electronics		Office
Ireland		Rome	Arrow Electronics		Office
Ireland		Padova	Arrow Electronics		Office
Ireland		Senigallia	Arrow Electronics		Office
Ireland		Milan	Tech Data	121632	
Ireland		Segrate	IBM (International Business Machines Corp)		IBM Italia
Ireland		Milan	Hewlett Packard		HP Headquarters - Italy
Ireland		Bologna	Hewlett Packard		Commercial office in Bologna
Ireland		Naples	Hewlett Packard		Commercial Office in Naples
Ireland		Padua	Hewlett Packard		Commercial office of Padua
Ireland		Rome	Hewlett Packard		Commercial Office in Rome
Ireland		Turin	Hewlett Packard		Commercial office in Turin
Ireland		Emilia-Romagna	EMC Corp		
Ireland		Lombardy	EMC Corp		
Ireland		Monza	EMC Corp		
Ireland		Veneto	EMC Corp		
Ireland		Lazio	EMC Corp		
Ireland		Piedmont	EMC Corp		
Ireland		Milan	NetApp Inc		
Ireland		Rome	NetApp Inc		
Ireland		Lombardy	NetApp Inc		
Ireland		Milan	Xerox		Office
Ireland		Assago	Electronics For Imaging, Inc		Office
Ireland		Milan	Lexmark		Lexmark International Srl
Ireland		Milan	Corning		Office
Ireland		Milan	Nokia		Regional Office
Ireland		Monza Brianza	Cisco Systems Inc		
Ireland		Rome	Cisco Systems Inc		
Ireland		Turin	Cisco Systems Inc		
Ireland		Padua	Cisco Systems Inc		
Ireland		Monza	Cisco Systems Inc		
Ireland		Milan	Blackberry		
Ireland		Rome	Motorola Solutions		Sales Office
Ireland		Lombardy	Apple Inc		Retail Store
Ireland		Contrada Cubba	Apple Inc		Retail Store
Ireland		Porta di Roma	Apple Inc		Retail Store
Ireland		Grugliasco	Apple Inc		Retail Store
Ireland		Lonato	Apple Inc		Retail Store
Ireland		Marcanise	Apple Inc		Retail Store
Ireland		Misterbianco	Apple Inc		Retail Store
Ireland		Orto al Serio	Apple Inc		Retail Store

Source: Citi Research

Figure 1027. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Italy		Rimini	Apple Inc		Retail Store
Italy		Rome	Apple Inc		Retail Store
Italy		Rome	Apple Inc		Retail Store
Italy		Rome	Apple Inc		Retail Store
Italy		Rozzano	Apple Inc		Retail Store
Italy		Torino	Apple Inc		Retail Store
Italy		Campi Bisenzio	Apple Inc		Retail Store
Italy		Carugate	Apple Inc		Retail Store
Italy		Treviso	Applied Materials Inc		Research, Development and Manufacturing
Italy		Milan	Applied Materials Inc		Sales and Services
Italy		Avezzano	Applied Materials Inc		Sales and Services
Italy		Catania	Applied Materials Inc		Sales and Services
Italy		0022000			
Italy		Milan	International Rectifier Corp		
Italy		Monza Brianza	KLA Tencor Corp		
Italy		Concorezzo	Lam Research Corp		Office
Italy		Vimercate	Linear Technology		Office
Italy		Catania	Maxim Integrated		Office
Italy		Milan	Maxim Integrated		Office
Italy		Milan	Maxim Integrated		Office
Italy		Pavia	Maxim Integrated		Office
Italy		Pisa	Maxim Integrated		Office
Italy		Ragusa	Maxim Integrated		Office
Italy		Milan	Microchip Technology		
Italy		Padova	Microchip Technology		
Italy		Milan	On Semiconductor		Sales Office
Italy		Gallarate	Silicon Laboratories, Inc		
Italy		Vimercate	Alcatel Lucent SA		
Italy		Vimercate	Alcatel Lucent SA		
Italy		Ciena Corp			
Italy		Rome	Ericsson LM		Office
Italy		Lombardy	F5 Networks		Office
Italy		Lombardy	JDSU Corp.		Sales Office
Italy		Milan	Juniper Networks Inc		
Italy		Rome	Juniper Networks Inc		
Italy		San Donato	Oclaro Inc.	66000	Office space, manufacturing, research and development
Italy		Milan	Polycom Inc.		Office
Italy		Lombardy	Milan		
Italy		Riverbed Technology			
Italy		Tellabs, Inc.			Sales Office
Italy		Milan	Advanced Micro Devices, Inc		
Italy		Altera Corp			
Italy		San Mauro Torinese	Cypress Semiconductor Corp		
Italy		Milan	Freemove Semiconductor Ltd.		Office
Italy		Agrate Brianza	Micron		Design & Manufacturing
Italy		Arzano Napoli	Micron		Design
Italy		Avezzano	Micron		Design & Sales
Italy		Catania	Micron		Design
Italy		Padova	Micron		Design
Italy		Vimercate	Micron		Design & Sales
Italy		Milan	Marvell		
Italy		Rome	Intel		
Italy		Lombardy	Intel		
Italy		Milan	NVIDIA		Office
Italy		Lazio	QUALCOMM Incorporated		
Italy		Milan	Xilinx Inc		
Italy		Lombardy	SMA Solar Technology		SMA Italia S.r.l.
Italy		Agrate Brianza	SK Hynix		Headquarters, SK Hynix Italy S.r.l.
Italy		Milan	LG Electronics		LG Electronics Italia SpA, Marketing
Italy		Lombardy	Samsung Electronics		Italy - Samsung Electronics Italia SPA
Italy		Milan	Samsung Technwin		Milan Office
Italy		Agrate Brianza	Mitsubishi Electric		Mitsubishi Electric Europe B.V. - Italian Branch
Italy		Lombardy	Acer Inc		Acer Italy S.r.l.
Italy		Milan	ASUSTek COMPUTER INC		ASUSTek Italy srl
Italy		Milan	NEC		NEC Italia S.p.A.
Italy		Milan	Lenovo Group		LENOVO (Italy) S.r.l.
Italy		Lecce	Sun Edison		
Italy		Agrate Brianza	Suntech Power Holdings		
Italy		Milan	Trina Solar Limited		Trina Solar (Italy) S.r.l.
Italy		Rome	Yingli Green Energy		Yingli Green Energy Italia S.r.l. s.u.
Italy		Lombardy	SunPower Corporation		Office
Italy		Milan	Alps Electric		Milan Office
Italy		Milan	Kyocera		KYOCERA Document Solutions Italia S.p.A.
Italy		Monza Brianza	Murata		Sales Office
Italy		Besana Brianza	Robm		Sales Office - ROHM Semiconductor GmbH
Italy		Milan	TDK Corporation		MILAN Branch Office
Italy		Milan	Nidec		Sales, Factory and R&D
Italy		Milan	Nidec		Headquarters
Italy		Genova	Nidec		Sales Office, Factory and R&D
Italy		Casalmaggiore	Nidec		Sales Office & Factory
Italy		Montebello Vicentino	Nidec		Sales Office, Factory and R&D
Italy		Pordenone	Nidec		Factory, R&D and Techno Motor Division
Italy		Monfalcone	Nidec		Sales Office, Factory and R&D
Italy		Milan	Canon		All product segments (with some exceptions)
Italy		Milan	Dainippin Screen		Milan Office
Italy		Catania	Dainippin Screen		Office
Italy		Lombardy	Konica Minolta Holdings		Konica Minolta Business Solutions Italia S.p.A.
Italy		Milan	Hoya Corporation		HOYA LENS ITALIA S.p.A.
Italy		Milan	Olympus		Olympus Italia S.r.l.
Italy			Nikon		
Italy			Nikon		
Italy		Vimodrone, Milan	Ricoh Co		Sales & Services - Ricoh Italia Srl
Italy		Milan	Seiko Epson		Epson Italia S.p.A.
Italy		Milan	Tokyo Electron		Italian Branch

Source: Citi Research

Figure 1028. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Italy			Asahi Glass		Float glass, automotive glass
Italy		Milan	Sharp Corp		SHARP ELECTRONICS (ITALIA) S.P.A. [Italy]
Italy		Milan	Fujifilm		
Italy	Lombardy	Milan	Fujitsu		Fujitsu Semiconductor Europe GmbH
Italy		Pinerolo	3D Systems Corp	22000	office and printed parts service facilities
Italy		Avezzano	ASML Holding NV		
Italy		Milan	ASML Holding NV		
Italy		Milan	Brocade Communications		Brocade Communications Italy Srl
Italy		Rome	Brocade Communications		Brocade Communications Italy Srl
Italy		Aosta	STMicroelectronics		Manufacturing & Design Center
Italy		Azzano Napoli	STMicroelectronics		Manufacturing & Design Center
Italy		Palermo	STMicroelectronics		Manufacturing & Design Center
Italy		Comaredo (MI)	STMicroelectronics		Manufacturing & Design Center
Italy	Agrate Brianza		STMicroelectronics		Manufacturing & Design Center
Italy		Catania	STMicroelectronics		Manufacturing & Design Center
Italy		Rome	STMicroelectronics		Sales Office & Representative
Italy		Comaredo	STMicroelectronics		Sales Office & Representative
Italy		Genoa	Stratys Ltd	6857	Technimold, S.R.L. sales and service office
Italy			TE Connectivity Ltd.		2 Manufacturing Plants
Italy		Rome	ZTE Corp		
Italy		Milan	Belden		Sales Offices
Italy		Bagnacavallo	Belden		Sales Offices
Italy		Milan	Huawei		
Italy		Rome	Huawei		
Italy		Milan	Molex		Italian Sales Branch
Italy		Padova	Molex		Zetronic SPA (Factory)
Italy		Bussolengo	Panasonic		Panasonic Electric Works Italia s.r.l.
Italy		Milano	Hitachi Digital Media Group		
Italy		Milan	Pioneer Corporation		Pioneer Italia S.P.A.
Italy		Bologna	Brother Industries Ltd		Sales Facilities
Italy		Milano	Brother Industries Ltd		Sales Facilities
Italy	Monza and Brianza	Burago di Molgora	Rambus Inc		Research and development
Italy	Monza Brianza		Toshiba		Toshiba Europe GmbH (Branch Office in Italy)
Latvia		Riga	IBM (International Business Machines Corp)		HP Latvian office
Latvia		Riga	Hewlett Packard		Office
Latvia		Riga	Xerox		Office
Latvia		Riga	Cisco Systems Inc		
Latvia		Riga	Alcatel Lucent SA		
Latvia		Riga	Ericsson LM		
Latvia		Riga	LG Electronics		LG Electronics Latvia, LLC, Marketing
Latvia		Riga	Lenovo Group		Lenovo Technology B.V.
Latvia		Riga	Konica Minolta Holdings		UAB Konica Minolta branch Latvia
Latvia		Riga	Olympus		Olympus Latvia SIA
Latvia			Nikon		
Latvia			Seko Epson		Epson Europe B.V. Baltic Office (Latvia)
Latvia		Riga	Fujitsu		Fujitsu Services SIA
Latvia		Riga	ZTE Corp		Sales Office
Latvia		Riga	Huawei		
Lithuania		Vilnius	IBM (International Business Machines Corp)		IBM Lietuva
Lithuania		Vilnius	Hewlett Packard		HP Office in Lithuania
Lithuania		Vilnius	EMC Corp		
Lithuania		Vilnius	Nokia		Regional Office
Lithuania		Vilnius	Cisco Systems Inc		
Lithuania		Vilnius	Intel		
Lithuania		Vilnius	Lenovo Group		
Lithuania		Vilnius	Konica Minolta Holdings		Konica Minolta Baltia UAB
Lithuania		Vilnius	Olympus		Olympus Lithuania UAB
Lithuania			Nikon		
Lithuania		Vilnius	Fujitsu		Fujitsu Services UAB
Lithuania		Vilnius	ZTE Corp		Sales Office
Lithuania		Vilnius	Huawei		
Luxembourg		Windhof	Arrow Electronics		Office
Luxembourg		Capellen	IBM (International Business Machines Corp)		IBM Luxembourg
Luxembourg		Capellen	Hewlett Packard		Hewlett-Packard Luxembourg SCA
Luxembourg		Capellen	EMC Corp		
Luxembourg			EMC Corp		
Luxembourg			NetApp Inc		Office
Luxembourg			Xerox		
Luxembourg			Cisco Systems Inc		
Luxembourg		Brueilles	Motorola Solutions		Sales Office
Luxembourg		Strassen	Ericsson LM		Office
Luxembourg			Trina Solar Limited		Trina Solar (Luxembourg) S.A.s.r.l.
Luxembourg			Nikon		
Luxembourg		Bertrange	Rich Co		Sales & Services - Rich Luxembourg PSF Sarl
Luxembourg			Fujitsu		Fujitsu Technology Solutions
Luxembourg			ZTE Corp		Sales Office
Malta			IBM (International Business Machines Corp)		
Malta		Valetta	Xerox		Office
Malta		Ricasoli	Cisco Systems Inc		
Malta		Slania	Ericsson LM		Office
Malta			Konica Minolta Holdings		Representative Office Malta
Malta		Birkirkara	STMicroelectronics		Manufacturing & Design Center
Malta		Kirkop			
Malta		Swieqi	Huawei		
Moldova		Chisinau	Ericsson LM		Office
Moldova			Nikon		
Moldova		Chisinau	Huawei		
Monaco		Saint-Jean-de-Braye	IBM (International Business Machines Corp)		IBM France
Netherlands		Amsterdam	Jabil	79,000	Aftermarket
Netherlands		Eindhoven	Jabil	124,000	Aftermarket, Storage, Support
Netherlands		Venray	Jabil	399,000	Manufacturing
Netherlands		Venray	Jabil		Electronics facilities, Service & Software
Netherlands		Houten	Amphenol		Amphenol Infocom Europe
Netherlands		Houten	Amphenol		Amphenol RF - Europe
Netherlands		Almelo	Sensata	188000	Manufacturing
Netherlands					Serving high technology companies in Test and Measurement, Medical, Military, Aerospace, Semiconductor equipment, and Commercial/Industrial markets. Also includes our
Netherlands	Almelo		Benchmark Electronics	132,000	European Design Engineering Groups

Source: Citi Research

Figure 1029. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Netherlands		Zwolle	Vishay	283000	Capacitors
Netherlands		Emmen	Arrow Electronics		Office
Netherlands		Hilversum	Arrow Electronics		Office
Netherlands		Houten	Arrow Electronics		Office
Netherlands		Utrecht	Tech Data		
Netherlands		Amsterdam	IBM (International Business Machines Corp)		IBM Nederland BV
Netherlands		Amstelveen	Hewlett Packard		Head and sales Hewlett-Packard Netherlands BV
Netherlands		Delft	EMC Corp		
Netherlands	Haarlemmermeer	Hoofddorp	EMC Corp		
Netherlands		Nieuwegein	EMC Corp		
Netherlands		Rotterdam	EMC Corp		
Netherlands		Utrecht	EMC Corp		
Netherlands	North Holland	Schiphol-Rijk	NetApp Inc		
Netherlands		Phillipsburg	Xerox		Office
Netherlands		Oranjestad	Xerox		Office
Netherlands		Bonaire	Xerox		Office
Netherlands		Amsterdam	Xerox		Office
Netherlands		Venray	Xerox		Manufacturing plant
Netherlands			Electronics For Imaging, Inc	17	office
Netherlands		Naarden	Lexmark		Lexmark International B.V.
Netherlands		Amsterdam	Corning		Office
Netherlands		Rijswijk	Nokia		Regional Office
Netherlands		Amsterdam	Cisco Systems Inc		
Netherlands		Amsterdam	Cisco Systems Inc		
Netherlands		Amsterdam	BlackBerry		
Netherlands		Amsterdam	Motorola Solutions		Sales Office
Netherlands		Amsterdam	Apple Inc		Retail Store
Netherlands		Haarlem	Apple Inc		Retail Store
Netherlands		Amsterdam	Apple Inc		Office
Netherlands	Haarlemmermeer	Hoofddorp	Applied Materials Inc		Business Center
Netherlands		Nijmegen	Applied Materials Inc		Sales and Services
Netherlands		Oss	KLA Tencor Corp		
Netherlands			Lam Research Corp		Office
Netherlands		Drunen	Microchip Technology		
Netherlands		Amsterdam	Arris Enterprises, Inc		
Netherlands	Haarlemmermeer	Hoofddorp	Alcatel Lucent SA		
Netherlands	North Holland	Hoofddorp	Ciena Corp		
Netherlands		Rijen	Ericsson LM		Office
Netherlands			FS Networks		Office
Netherlands		Amsterdam	Juniper Networks Inc		
Netherlands		Amsterdam	Polycom Inc.		Office
Netherlands		Bunnik	Broadcom		Office
Netherlands			Marvell		
Netherlands	Noord-Brabant	Eindhoven	Intel		Office
Netherlands			NVIDIA		
Netherlands	Utrecht	Bruckelen	QUALCOMM Incorporated		
Netherlands		Waalre	QUALCOMM Incorporated		
Netherlands			LG Electronics		LG Electronics European Shared Service Center B.V., Shared Service Center
Netherlands			LG Electronics		LG Electronics European Holdings BV - Holdings
Netherlands			Mitsubishi Electric		Mitsubishi Electric Europe B.V. - Automotive Equipment Group
Netherlands			Mitsubishi Electric		Mitsubishi Electric Europe B.V. - Benelux Branch
Netherlands		Mijdrecht	Mitsubishi Electric		Mitsubishi Elevator Europe B.V.
Netherlands		Veenendaal	Mitsubishi Electric		Mitsubishi Electric Automotive Europe B.V. - Head Office
Netherlands			Mitsubishi Electric		Re-Manufacturing / Technical Center
Netherlands		s-Hertogenbosch	Acer Inc		Acer Computer BV
Netherlands			ASUSTek COMPUTER INC		ASUS Computer Benelux B.V.
Netherlands	North Holland	Hoofddorp	NEC		NEC Logistics Europe
Netherlands		Hilversum	NEC		NEC Nederland B.V.
Netherlands		Amsterdam	Delta Electronics		Amsterdam Office
Netherlands		Eindhoven	Delta Electronics		Eindhoven Office
Netherlands		Eindhoven	Richtek Technology		Europe Office
Netherlands		Eindhoven	Wistron Corporation		Service center
Netherlands		Eindhoven	Wistron Corporation		R&D center
Netherlands		Amsterdam	AU Optronics		Office
Netherlands		Hoofddorp	Innolux		Office
Netherlands	North Holland	Amsterdam	Lenovo Group		Lenovo (International) BV
Netherlands		Meije	Suntech Power Holdings		Offices
Netherlands		Amsterdam	TSAC		Subsidiary
Netherlands		Amsterdam	UMC		
Netherlands		Amsterdam	Hirose Electric		Hirose Electric Europe B.V.
Netherlands		Hoofddorp	Ibiden		IBIDEN European Holdings B.V.
Netherlands		Hoofddorp	Ibiden		IBIDEN Europe B.V.
Netherlands		Hoofddorp	Kyocera		KYOCERA Document Solutions Europe B.V.
Netherlands			Kyocera		KYOCERA Document Solutions Nederland B.V.
Netherlands		Hoofddorp	Murata		Regional Headquarters - Murata Electronics Europe B.V.
Netherlands		Hoofddorp	Murata		Sales Office - Murata Electronics (Netherlands) B.V.
Netherlands		Hoofddorp	Nidec		Sales
Netherlands	Amstelveen		Canon		All product segments
Netherlands	North Brabant	S-Hertogenbosch	Canon		All product segments (with some exceptions)
Netherlands		Amstelveen	Dainippon Screen		Amstelveen Head Office
Netherlands		Amsterdam	Konica Minolta Holdings		Konica Minolta Business Solutions Nederland bv
Netherlands		Uithoorn	Hoya Corporation		HOYA HOLDINGS N.V. (NETHERLANDS BRANCH),
Netherlands		Uithoorn	Hoya Corporation		HOYA VISION CARE EUROPE (Europe Regional HQ)
Netherlands		Uithoorn	Hoya Corporation		HOYA LENS NEDERLAND B.V.
Netherlands			Nikon		

Source: Citi Research

Figure 1030. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Netherlands		Amstelveen	Ricoh Co		Sales & Services - Ricoh Europe (Netherlands) B.V.
Netherlands			Ricoh Co		Sales & Services - Ricoh Europe SCM B.V.
Netherlands			Ricoh Co		Sales & Services - Ricoh Nederland B.V.
Netherlands	Amsterdam		Seiko Epson		Regional Headquarters - Epson Europe B.V.
Netherlands	Nijmegen		Tokyo Electron		Netherlands Branch
Netherlands			Asahi Glass		Float glass, double-glazing units and other processed glass
Netherlands			Sharp Corp		SHARP ELECTRONICS BENELUX B.V. [Netherlands]
Netherlands	Rotterdam		Fujifilm		
Netherlands	Tilburg		Fujifilm		
Netherlands	Hoofddorp		Fujitsu		Fujitsu Components Europe B.V.
Netherlands	Maarsse		Fujitsu		Fujitsu Technology Solutions B.V.
Netherlands			3D Systems Corp		
Netherlands	Veldhoven		ASML Holding NV	1356253	Headquarters, main manufacturing facilities, applications laboratory and R&D facilities
Netherlands	Oirschot		ASML Holding NV		
Netherlands			Brocade Communications		
Netherlands	Eindhoven		STMicroelectronics		Sales Office & Representative
Netherlands			Venture Corp.		
Netherlands			Veech Holdings		Regional Office - Electronic Learning Products
Netherlands			Western Digital Corp		
Netherlands	The Hague		ZTE Corp		Sales Office
Netherlands	Venlo		Belden		Sales Offices
Netherlands	Hilversum		Belden		Sales Offices
Netherlands	Amstelveen		Huawei		
Netherlands	Amsterdam		Huawei		
Netherlands					Finance, administration and distribution center
Netherlands	Nijmegen		Logitech International S A	14700	support
Netherlands	Oostrum		Logitech International S A	155600	Distribution center
Netherlands	Waalwijk		Logitech International S A	26000	Distribution center
Netherlands	Eindhoven		Molex		Molex B.V. - Benelux Sales Branch
Netherlands	Best		Head Office		
Netherlands	Amsterdam		Hitachi		Hitachi Construction Machinery (Europe) NV
Netherlands			Hitachi		Hitachi Transport System(Europe)B.V
NETHERLANDS	Gelderland	Waalburg	Pioneer Corporation		Pioneer Holding BV
Netherlands			Pioneer Benelux, branch office of Pioneer Europe		
Netherlands	Amstelveen		Brother Industries Ltd		Sales Facilities
Netherlands			Toshiba		Toshiba Europe GmbH
Netherlands	Breda		Toshiba		Toshiba Europe GmbH
Norway	Oslo		Arrow Electronics		Office
Norway	Nedre Vats		Arrow Electronics		Office
Norway	Oslo		Tech Data		
Norway	Kolbotn		IBM (International Business Machines Corp)		IBM AS
Norway	Oslo		Hewlett Packard		Hewlett-Packard Norway AS
Norway	Stavanger		Hewlett Packard		Hewlett-Packard Norway AS
Norway	Trondheim		Hewlett Packard		Hewlett-Packard Norway AS
Norway	Bergen		EMC Corp		
Norway	Oslo		EMC Corp		
Norway	Oslo		NetApp Inc		
Norway	Stavanger		NetApp Inc		
Norway	Lysaker		Xerox		Office
Norway	Oslo		Lexmark		Lexmark Norge
Norway	Oslo		Cisco Systems Inc		
Norway	Oslo		Motorola Solutions		Office
Norway	Oslo		Apple Inc		Office
Norway	Fornebu		Alcatel Lucent SA		
Norway	Fornebu		Ericsson LM		Office
Norway	Oslo		F5 Networks		Office
Norway	Oslo		Juniper Networks Inc		
Norway	Oslo		Polycorn Inc		Office
Norway			Cypress Semiconductor Corp		
Norway	Oslo		LG Electronics		LG Electronics Norway AS, Marketing
Norway	Tranby		Acer Inc		Acer Computer Norway AS
Norway	Oslo		NEC		
Norway	Oslo		Kyocera		KYOCERA Document Solutions Norge Nurf
Norway	Holmlia		Canon		All product segments (with some exceptions)
Norway	Oslo		Konica Minolta Holdings		Konica Minolta Business Solutions Norway AS
Norway	Oslo		Olympus		Olympus Norge A/S
Norway	Oslo		Ricoh Co		Sales & Services - Ricoh Norge A.S.
Norway	Oslo		Seiko Epson		Epson (U.K.) Ltd., Norway Office
Norway					R&D Subsidiaries and Affiliates - Epson Norway
Norway	Oslo		Fujitsu		Research And Development AS
Norway	Trondheim		Fujitsu		Fujitsu Technology Solutions AS
Norway			ARM Holdings PLC		
Norway	Oslo		ZTE Corp		Sales Office
Norway	Oslo		Huawei		
Norway	Oslo		Omnivision		
Norway	Oslo		Molex		Molex Knutsen Norge AS
Norway	Oslo		Pioneer Corporation		Pioneer Europe N.V.
Norway	Oslo		REC Solar ASA		Group Headquarters
Poland	Bydgoszcz		Jabil	228,000	Aftermarket
Poland	Kwidzyn		Jabil	563,000	Manufacturing, Storage
Poland					Flextronics facilities, Manufacturing, Industrial
Poland	Tczew		Jabil		Parks
Poland	Lodz		Chicony Electronics		Electronics facilities, Service & Software
Poland	Krakow		Arrow Electronics		Office
Poland	Warsaw		Arrow Electronics		Office
Poland	Katowice		Arrow Electronics		Office
Poland	Warsaw		Tech Data	125292	
Poland	Krakow		Tech Data		
Poland	Warsaw		IBM (International Business Machines Corp)		IBM Polska
Poland	Warsaw		Hewlett Packard		Hewlett-Packard Poland Sp. z o.o
Poland	Wroclaw		Hewlett Packard		Global e-Business Operations Sp. Ltd.
Poland	Warsaw		EMC Corp		
Poland	Warsaw		NetApp Inc		
Poland	Krakow		Xerox		Office
Poland	Warsaw		Xerox		Office
Poland	Warsaw		Lexmark		Lexmark International Polska Sp. z o.o.
Poland	Strykow		Corning		Office

Source: Citi Research

Figure 1031. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Poland		Warsaw	Corning		Office
Poland		Warsaw	Nokia		Regional Office
Poland		Warsaw	BlackBerry		
Poland		Krakow	Motorola Solutions		Corporate & Regional Office
Poland		Warsaw	Motorola Solutions		Sales Office
Poland		Bydgoszcz	Alcatel Lucent SA		
Poland		Poznan	Alcatel Lucent SA		
Poland		Bydgoszcz	Alcatel Lucent SA		
Poland		Katowice	Alcatel Lucent SA		
Poland		Warsaw	Alcatel Lucent SA		
Poland		Gdansk	Alcatel Lucent SA		
Poland		Wroclaw	Alcatel Lucent SA		
Poland		Warsaw	Ciena Corp		
Poland		Warsaw	Ericsson LM		Office
Poland		Warsaw	Juniper Networks Inc		
Poland		Warsaw	Polycorn Inc		Office
Poland		Warsaw	Riverbed Technology		
Poland		Warsaw	Tellabs, Inc.		Sales Office
Poland		Warsaw	Advanced Micro Devices, Inc		
Poland	Pomorskie	Gdansk	Intel		
Poland	Mazowieckie	Warsaw	Intel		
Poland		Warsaw	QUALCOMM Incorporated		
Poland		Zabierzow	SMA Solar Technology		dtw sp. z o.o
Poland		Wroclaw	LG Display		Production
Poland		Mlaw	LG Electronics		LG Electronics Mlaw Sp.z.o.o., Production
Poland		Warsaw	LG Electronics		LG Electronics Polska Spzoo, Marketing
Poland		Kobierzyce	LG Electronics		LG Electronics Wroclaw Spzoo, Production
Poland			LG Innotek		LG Innotek Poland Sp. z o.o. (LGITPO)
Poland			Mitsubishi Electric Europe B.V. - Polish Branch		
Poland		Warsaw	Acer Inc		Acer Polska
Poland		Warsaw	ASUSTEK COMPUTER INC		ASUS T&E SP. Z.O.O.
Poland			NEC		NEC Display Solutions Poland
Poland		Lodz	Compal Electronics		Compal Europe (Poland) Sp.zo.o.
Poland		Warsaw	Lenovo Group		Lenovo Technology B.V. Sp. z o.o.
Poland		Niepolomice	Nidec		Manufacturing of Automotive Motors
Poland		Warsaw	Canon		All product segments (with some exceptions)
Poland		Warsaw	Konica Minolta Holdings		Konica Minolta Business Solutions SP. Z.O.O.
Poland		Piaseczno	Hoya Corporation		HOYA LENS POLAND SP. Z O.O
Poland		Warsaw	Nikon		
Poland		Warsaw	Ricoh Co		Sales & Services - Ricoh Polska Sp.zo.o.
Poland		Warsaw	Seiko Epson		Epson Europe B.V.
Poland			Sharp Corp		Sharp Electronics (EUROPE) GMBH Spółka z o. o., Oddzial w Polsce [Poland]
Poland		Warsaw	Fujitsu		Fujitsu Technology Solutions Sp. z o.o.
Poland		Krakow	Fujitsu		
Poland		Warsaw	Brocade Communications		Brocade Poland Sp. z o.o.
Poland		Warsaw	STMicroelectronics		Sales Office & Representative
Poland		Warsaw	TE Connectivity Ltd.		1 Manufacturing Plant
Poland		Warsaw	ZTE Corp		Sales Office
Poland		Warsaw	Hi-P International		Manufacturing sites
Poland		Warsaw	Huawei		
Poland		Warsaw	Molex		MOLEX POLSKA Sp. z o.o.
Poland		Warsaw	Molex		Manufacturing & Customer Services
Poland		Warsaw	Panasonic		Panasonic Electric Works Polska sp. z o.o.
Poland		Warsaw	Hitachi		Hitachi Digital Media Group
Poland		Nowa Sol	FUNAI ELECTRIC CO LTD		FUNAI ELECTRIC EUROPE Sp. z o.o.
Poland		Warsaw	FUNAI ELECTRIC CO LTD		FUNAI ELECTRIC EUROPE Sp.z.o.o. ODDZIAL W WARSZAWIE
Poland		Warsaw	Brother Industries Ltd		Sales Facilities
Poland		Warsaw	Toshiba		Toshiba Europe GmbH Distributor Sales, Central & Eastern Europe, Computers Systems, EMEA Sales
Poland		Kobierzyce	Toshiba		Toshiba Television Central Europe Sp. Ltd.
Poland		Warsaw	Toshiba		Toshiba TEC PolandSA
Portugal		Famalicao	Vishay	167000	Capacitors
Portugal		Lisbon	Arrow Electronics		Office
Portugal		Lisbon	IBM (International Business Machines Corp)		Headquarters - Portugal
Portugal		Lisbon	EMC Corp		
Portugal		Lisbon	NetApp Inc		
Portugal		Lisbon	Xerox		Office
Portugal		Bragança	Lexmark		Escritórios da Lexmark em Portugal
Portugal		Porto Salvo	Cisco Systems Inc		
Portugal		Cascais	Motorola Solutions		
Portugal		Paco de Arcos	Alcatel Lucent SA		
Portugal		Paco de Arcos	Ericsson LM		Office
Portugal		Lisboa	Intel		
Portugal		Pinhal Novo	SMA Solar Technology		SMA Solar Technology Portugal; Unipessoal LDA
Portugal		Oeiras	LG Electronics		LG Electronics Portugal SA, Marketing
Portugal		Lisbon	Mitsubishi Electric		Mitsubishi Electric Europe B.V. - Portuguese Branch
Portugal		Lisbon	NEC		NEC Portugal Telecomunicações e Sistemas
Portugal		Lisbon	Kyocera		KYOCERA Document Solutions Portugal Ltd.
Portugal		Amadora	Canon		All product segments (with some exceptions)
Portugal		Lisbon	Konica Minolta Holdings		Konica Minolta Business Solutions Portugal, Unipessoal, Ltd.
Portugal		Lisbon	Hoya Corporation		HOYA LENS IBERIA S.A.(Portugal)
Portugal		Lisbon	Olympus		Olympus Iberia, S.A.U.
Portugal		Vila Nova de Gaia	Ricoh Co		Sales & Services - Ricoh Portugal, Unipessoal, Ltd
Portugal		Lisbon	Seiko Epson		Epson Iberica S.A. Sucursal em Portugal
Portugal		Lisbon	Fujitsu		Fujitsu Technology Solutions
Portugal		Massama	Fujitsu		Fujitsu Telecomunicações Portugal
Portugal		Lisbon	Brocade Communications		
Portugal		Lisbon	ZTE Corp		Sales Office
Portugal		Lisbon	Huawei		
Portugal		Cascais	Panasonic		Portuguese Branch Office
Portugal		Alcochete	Pioneer Corporation		Pioneer Europe NV
Portugal		Lisbon	Brother Industries Ltd		Sales Facilities
Portugal		Porto Salvo	Toshiba		Toshiba Portugal
Portugal		Linda-a-Velha	Toshiba		Toshiba Medical Systems SA

Source: Citi Research



Figure 1032. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Romania		Timisoara	Toshiba	430,000	Electronics facilities, Manufacturing
Romania	Brasov		Benchmark Electronics	224,000	
Romania	Oradea		Plexus	66,000	Engineering & Manufacturing Solutions
Romania		Oradea	Celestica	186,000	
Romania	Cluj-Napoca		Arrow Electronics		Office
Romania	Bucharest		IBM (International Business Machines Corp)		IBM Romania SRL
Romania	Bucharest		Hewlett Packard		Hewlett Packard Romania
Romania	Bucharest		Hewlett Packard		HP Global e-Business Center
Romania	Bucharest		Hewlett Packard		HP Global e-Business Center - Union
Romania	Bucharest		Hewlett Packard		HP Solutions Center
Romania	Cluj-Napoca		Hewlett Packard		HP Software BTO - Cluj-Napoca
Romania	Timisoara		Hewlett Packard		HP Romania - Timisoara
Romania	Bucharest		EMC Corp		
Romania	Bucharest		Xerox		Office
Romania	Bucharest		Lexmark		Lexmark Romania Headquarters
Romania	Bucharest		Nokia		Regional Office
Romania	Timisoara		Alcatel Lucent SA		
Romania	Timisoara		Alcatel Lucent SA		
Romania	Bucharest		Ericsson LM		Office
Romania	Bucharest		Freescall Semiconductor Ltd.		Office
Romania	Bucharest		Intel		
Romania	Bucharest		LG Electronics		LG Electronics Romania S.R.L., Marketing
Romania	Bucharest		Lenovo Group		
Romania	Bucharest		Nidec		Sales & Factory
Romania	Dambovit				
Romania		Bucharest	Konica Minolta Holdings		Konica Minolta Business Solutions Romania S.R.L.
Romania		Bucharest	Seiko Epson		Epson Europe B.V.
Romania		Bucharest	Fujifilm		
Romania		Bucharest	Fujitsu		Fujitsu Technology Solutions GmbH Viena
Romania	Cluj-Napoca		Garmin Ltd.	11,355	research and development activities
Romania	Bucharest		Infineon Technologies AG		R&D
Romania	Bucharest		ZTE Corp		Sales Office
Romania	Bucharest		Huawei		
Russia	Tver		Jabil	44,000	Manufacturing
Russia	Moscow		Amphenol		Amphenol Russia
Russia	Moscow		Arrow Electronics		Office
Russia	Saint - Petersburg		Arrow Electronics		Office
Russia	Ekaterinburg		Arrow Electronics		Office
Russia	Moscow		IBM (International Business Machines Corp)		IBM East Europe/Asia Ltd
Russia	St. Petersburg		Hewlett Packard		Laboratories
Russia	Moscow		Hewlett Packard		The main office
Russia	Moscow		Hewlett Packard		Service center
Russia	Ekaterinburg		EMC Corp		
Russia	Moscow		EMC Corp		
Russia	Novosibirsk		EMC Corp		
Russia	St. Petersburg		EMC Corp		
Russia	Yekaterinburg		EMC Corp		
Russia	Moscow		NetApp Inc		
Russia	Moscow		Xerox		Office
Russia	Saint-Petersburg		Corning		Office
Russia	Moscow		Corning		Office
Russia	Samara		Corning		Office
Russia	Moscow		Nokia		Regional Office
Russia	Saint Petersburg		Cisco Systems Inc		
Russia	Moscow		BlackBerry		
Russia	Moscow		Motorola Solutions		Corporate & Regional Office
Russia	Moscow		Apple Inc		Office
Russia	Moscow		Alcatel Lucent SA		
Russia	St Petersburg		Alcatel Lucent SA		
Russia	Moscow		Ciena Corp		Office
Russia	Moscow		Ericsson LM		Office
Russia	Moscow		FS Networks		Office
Russia	Moscow		FS Networks		Office
Russia	Tomsk		FS Networks		Office
Russia	Moscow		JDSU Corp.		Sales Office
Russia	Moscow		Juniper Networks Inc		Office
Russia	Moscow		Polycorn Inc.		Office
Russia	Moscow		Riverbed Technology		Office
Russia	Moscow		Tellabs, Inc.		Sales Office
Russia	Moscow		Advanced Micro Devices, Inc		
Russia	Moscow		Freescall Semiconductor Ltd.		Office
Russia	Moskovskaja		Intel		
Russia	Nizhny Novgorod		Intel		
Russia	Novosibirsk		Intel		
Russia	Sankt-Peterburg		Intel		
Russia	Moscow		NVIDIA		Office
Russia	Moscow		QUALCOMM Incorporated		
Russia	Moscow		Meyer Burger Technology AG		
Russia	Moscow		SK Hynix		
Russia	Moscow		LG Electronics		
Russia	Moscow		Samsung Technwin		
Russia	Moscow		Mitsubishi Electric		
Russia	Moscow		Acer Inc		
Russia	Moscow		NEC		
Russia	Krasnogorsk		Lenovo Group		
Russia	Moscow		Kyocera		
Russia	Moscow		Rohm		
Russia	Moscow		Canon		All product segments (with some exceptions)
Russia	Moscow		Konica Minolta Holdings		Konica Minolta Business Solutions Russia
Russia	Moscow		Olympus		Olympus Moscow LLC
Russia	Moscow		Nikon		
Russia	Moscow		Ricoh Co		Sales & Services - Ricoh Rus, Ltd.
Russia	Moscow		Seiko Epson		Epson Europe B.V.
Russia	Moscow		Seiko Epson		Epson CIS Ltd.
Russia	Moscow		Tamron Co Ltd		TAMRON (Russia) LLC.
Russia	Moscow		Asahi Glass		Float glass, automotive glass, architectural glass, mirrors
Russia	Moscow		SHARP ELECTRONICS RUSSIA LLC. [Russian Federation]		
Russia	Moscow		Sharp Corp		
Russia	Moscow		Fujifilm		
Russia	Moscow		Fujitsu		Fujitsu Technology Solutions GmbH
Russia	Moscow		Brocade Communications		
Russia	Moscow		STMicroelectronics		Sales Office & Representative
Russia	Moscow		Western Digital Corp	837100	development
Russia	Moscow		ZTE Corp		Sales Office
Russia	Moscow		Belden		Sales Offices
Russia	Moscow		Huawei		
Russia	Moscow		Molex		Molex Russia
Russia	Moscow		Hitachi		Hitachi Home Electronics Russia
Russia	Moscow		Pioneer Corporation		PIONEER RUS LLC
Russia	Moscow		Brother Industries Ltd		Sales Facilities
Russia	Moscow		Hon Hai Precision		PC assembly

Source: Citi Research

Figure 1033. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
San Marino		Vimercate	IBM (International Business Machines Corp)		IBM Italia
Scotland	Ayr	Jabil		13,000	Aftermarket
Scotland	Livingston	Jabil		130,000	Manufacturing
Scotland	Kelso	Plexus		57,000	Manufacturing Solutions
Scotland	Galashiels	Plexus		43,000	
Scotland	Livingston	Plexus		4,000	
Scotland	Gourock	Celestica		58,000	
Scotland	Edinburgh	NetApp Inc			
Scotland	Glasgow	Blackberry			
Scotland	Edinburgh	JDSU Corp.			Research and Development
Scotland	Glasgow	Freescall Semiconductor Ltd.			Office
Scotland	Greenock	Texas Instruments			
Scotland	Edinburgh	Xilinx Inc			
Scotland	Glasgow	Delta Electronics			Glasgow Office
Scotland	Renfrew	Lenovo Group			
Scotland	Livingston	Konica Minolta Holdings			Livingston Office
Scotland	Belgrade	Arrow Electronics			
Serbia	Belgrade	IBM (International Business Machines Corp)			IBM (International Business Machines Corp) d.o.o
Serbia	Novi Beograd	Hewlett Packard			Hewlett-Packard Ltd.
Serbia	Belgrade	EMC Corp			
Serbia	Belgrade	Lexmark			Lexmark International RS
Serbia	Belgrade	Alcatel Lucent SA			
Serbia	Belgrade	Ericsson LM			Office
Serbia	Belgrade	Intel			
Serbia	Belgrade	Lenovo Group			Lenovo Technology B.V.
Serbia	Novi Beograd	Konica Minolta Holdings			Konica Minolta Poslovna Rešenja SE d.o.o.
Serbia	Belgrade	Olympus			Olympus d.o.o.
Serbia	Novi Sad	Fujitsu			Office
Serbia	New Belgrade	ZTE Corp			Fujitsu Technology Solutions
Serbia	New Belgrade	ZTE Corp			Sales Office
Slovakia	Presov	Amphenol			CEMM THOME SK, spol. s r. o.
Slovakia	Presov	Amphenol			Konfektion E-SK s.r.o.
Slovakia	Bratislava	Arrow Electronics			Office
Slovakia	Bratislava	Tech Data			
Slovakia	Bratislava	IBM (International Business Machines Corp)			IBM Slovensko, spol. s r.o.
Slovakia	Bratislava	Hewlett Packard			Office
Slovakia	Bratislava	EMC Corp			
Slovakia	Bratislava	Xerox			Office
Slovakia	Bratislava	Lexmark			Lexmark International Slovakia sro
Slovakia	Bratislava	Nokia			Regional Office
Slovakia	Bratislava	On Semiconductor			Sales Office
Slovakia	Bratislava	Alcatel Lucent SA			
Slovakia	Bratislava	Ericsson LM			Office
Slovakia	Nové Mesto nad Vahom	Manz AG		1,72,222	Production, Sales & Service
Slovakia	Bratislava	Chell Industries			Chemicals/Electronic Materials Division
Slovakia	Bratislava	Acer Inc			Konica Minolta Slovakia spol. s r.o.
Slovakia	Dubnica nad Vahom	Delta Electronics			Delta Electronics (Slovakia) s.r.o.
Slovakia	Trencin	AU Optonics			Office
Slovakia	Bratislava	Lenovo Group			Lenovo (Slovakia) s.r.o.
Slovakia	Bratislava	Canon			All product segments (with some exceptions)
Slovakia	Bratislava	Konica Minolta Holdings			Konica Minolta Slovakia spol. s r.o.
Slovakia	Bratislava	Olympus			Olympus SK, s.r.o.
Slovakia	Bratislava	Nikon			Fujitsu Technology Solutions
Slovakia	Bratislava	Huawei			
Slovakia	Trstena	Panasonic			
Slovakia	Krupina	Brother Industries Ltd			Production Facilities
Slovakia	Hon Hai Precision	Hon Hai Precision			LCD TV assembly
Slovakia	Ljubljana	Arrow Electronics			Office
Slovakia	Ljubljana	IBM (International Business Machines Corp)			IBM Slovenija, d.o.o.
Slovakia	Ljubljana	Hewlett Packard			Hewlett-Packard Ltd. Society for technological solutions
Slovakia	Ljubljana	EMC Corp			
Slovakia	Ljubljana	Xerox			Office
Slovakia	Ljubljana	Lexmark			NA
Slovakia	Ljubljana	Ericsson LM			Office
Slovakia	Ljubljana	Canon			All product segments (with some exceptions)
Slovakia	Ljubljana	Konica Minolta Holdings			Konica Minolta Business Solutions, Poslovne
Slovakia	Ljubljana	Olympus			Relative d.o.o.
Slovakia	Ljubljana	Nikon			Olympus Slovenija d.o.o.
Slovakia	Ljubljana	Fujitsu			Office
Slovakia	Ljubljana	ARM Holdings PLC			
Spain	Madrid	Jabil		1,000	Support
Spain	Las Rozas (Madrid)	Amphenol			Amphenol Espana
Spain	Valencia	Celestica		100,000	
Spain	Madrid	Arrow Electronics			Office
Spain	Barcelona	Arrow Electronics			Office
Spain	Las Arenas	Arrow Electronics			Office
Spain	Lasarte - Guipuzcoa	Arrow Electronics			Office
Spain	Valencia	Arrow Electronics			Office
Spain	Zaragoza	Arrow Electronics			Office
Spain	Barcelona	Tech Data			
Spain	Bilbao	Tech Data			
Spain	Alcobendas	Tech Data			
Spain	Alovera	Tech Data		215278	Warehouse
Spain	Porto	Tech Data			
Spain	Alfragide	Tech Data			
Spain	Madrid	IBM (International Business Machines Corp)			IBM España S. A.
Spain	Sant Cugat del Valles	Hewlett Packard			Product Development and Manufacturing
Spain	Madrid	Hewlett Packard			Headquarters (Madrid)
Spain	Barcelona	Hewlett Packard			Commercial Office (Barcelona)
Spain	Bilbao	Hewlett Packard			Commercial Office (Bilbao)
Spain	Sevilla	Hewlett Packard			Commercial Office (Sevilla)
Spain	Valencia	Hewlett Packard			Commercial Office (Valencia)
Spain	Zaragoza	Hewlett Packard			Commercial Office (Zaragoza)
Spain	Barcelona	EMC Corp			
Spain	Bilbao	EMC Corp			
Spain	Madrid	EMC Corp			
Spain	Barcelona	EMC Corp			
Spain	Madrid	NetApp Inc			
Spain	Madrid	NetApp Inc			Office
Spain	Santa Maria de Barberà	Xerox			Office
Spain	Castellon	Electronics For Imaging, Inc		44	office
Spain	Madrid	Lexmark			LEXMARK SPAIN L.L.C. & CIA
Spain	Madrid	Corning			Office
Spain	Madrid	Nokia			Regional Office
Spain	Madrid	Cisco Systems Inc			
Spain	Madrid	BlackBerry			
Spain	Madrid	Motorola Solutions			Sales Office
Spain	Arroyo de la Encomienda	Apple Inc			Retail Store
Spain	Arroyomolinos	Apple Inc			Retail Store

Source: Citi Research



Figure 1034. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description	Comments (manufacturing, office)
Spain		Barcelona	Apple Inc		Retail Store	
Spain		Churra	Apple Inc		Retail Store	
Spain		Leganes	Apple Inc		Retail Store	
Spain		Majadahonda	Apple Inc		Retail Store	
Spain		Zaragoza	Apple Inc		Retail Store	
Spain		Valencia	Apple Inc		Retail Store	
Spain		Marbella	Apple Inc		Retail Store	
Spain		Madrid	Apple Inc		Office	
Spain		Madrid	Microchip Technology			
Spain		Solna	Microchip Technology			
Spain		Barcelona	Arris Enterprises, Inc.			
Spain		Madrid	Alcatel Lucent SA			
Spain		Barcelona	Alcatel Lucent SA			
Spain		Madrid	Ciena Corp			
Spain		Madrid	Ericsson LM		Office	
Spain		Barcelona	F5 Networks		Office	
Spain		Madrid	F5 Networks		Office	
Spain		Madrid	JDSU Corp.		Sales Office	
Spain		Madrid	Juniper Networks Inc			
Spain		Madrid	Polycm Inc.		Office	
Spain		Madrid	Riverbed Technology			
Spain		Madrid	Tellabs, Inc.		Sales Office	
Spain		Madrid	Marvell			
Spain		Barcelona	Intel			
Spain		Madrid	Intel			
Spain		Barcelona	QUALCOMM Incorporated			
Spain		Madrid	SMA Solar Technology		SMA Iberica Tecnologia Solar, S.L.	
Spain		Madrid	SolarWorld AG		SolarWorld Iberica	
Spain		Madrid	LG Electronics		LG Electronics Espana SA, Marketing	
Spain		Barcelona	Mitsubishi Electric		Mitsubishi Electric Europe B.V. - Spanish Branch	
Spain		Barcelona	Acer Inc		Acer Computer Iberica	
Spain		Barcelona	ASUSTEK COMPUTER INC		ASUS IBERICA S.L.	
Spain		Madrid	NEC		NEC Iberica	
Spain		Madrid	Lenovo Group		Lenovo (Spain) S.L.	
Spain		Madrid	Sun Edison		Headquarters	
Spain		Madrid	Trina Solar Limited		Trina Solar (Spain) S.L.U.	
Spain		Madrid	Yingli Green Energy		Yingli Green Energy Spain, S.L.U	
Spain		Madrid	SunPower Corporation		Office	
Spain		Madrid	KYOCERA Document Solutions Espana S.A.		KYOCERA Document Solutions Espana S.A.	
Spain		Barcelona	Murata		Sales Office	
Spain		Barcelona	Rohm		Sales Office - ROHM Semiconductor GmbH	
Spain		Barcelona	Nidec		Sales Office. Factory and R&D	
Spain		Madrid	Canon		All product segments (with some exceptions)	
Spain		Madrid	Konica Minolta Holdings		Konica Minolta Business Solutions Spain S.A.	
Spain		Madrid	Hoya Corporation		Hoya LENS IBERIA S.A. (Spain) - Iberia Head Office	
Spain		L'Hospitalet de Llobregat	Olympus		Olympus Iberia, S.A.U.	
Spain		Barcelona	Ricoh Co		Sales & Services - Ricoh Espana S.L.U.	
Spain		Barcelona	Seiko Epson		Epson Iberica, S.A.	
Spain		Barcelona	Asahi Glass		Supervision of Float glass sales, management of joint-venture manufacturing company	
Spain		Barcelona	Sharp Corp		SHARP ELECTRONICA ESPAÑA, S.A. (Spain)	
Spain		Madrid	Fujitsu		Fujitsu Technology Solutions	
Spain		Madrid	Fujitsu		Fujitsu Ten Espana	
Spain		Madrid	Brocade Communications		Brocade Communications Spain S.L.	
Spain		Madrid	STMicroelectronics		Manufacturing & Design Center	
Spain		Barcelona	STMicroelectronics		Sales Office & Representative	
Spain		Barcelona	TE Connectivity Ltd.		1 Manufacturing Plant	
Spain		Barcelona	Venture Corp.			
Spain		Madrid	Vitech Holdings		Regional Office - Electronic Learning Products	
Spain		Madrid	ZTE Corp		Sales Office	
Spain		Madrid	Belden		Manufacturing Facilities	
Spain		Madrid	Huawei			
Spain		Barcelona	Molex		Molex BV Espana	
Spain		Madrid	Panasonic		Head Office	
Spain		Barcelona	Hitachi		Hitachi Digital Media Group	
Spain		Sant Cugat del Valles	Pioneer Corporation		Pioneer Electronics Iberica S.A.	
Spain		Madrid	Brother Industries Ltd		Sales Facilities	
Spain		Madrid	Toshiba		Toshiba Europe GmbH Branch in Spain	
Spain		Alcobendas	Toshiba		Toshiba Medical Systems SA	
Spain		Madrid	Toshiba		Toshiba TEC Europe Retail Information Systems SA	
Sweden		Ronneby	Toshiba	161,459	Manufacturing	
Sweden		Stockhold	Amphenol		Amphenol ConneXus AB	
Sweden		Stockholm	Amphenol		Amphenol Finland Oy	
Sweden		Stockholm	Amphenol		Amphenol TCS Sweden	
Sweden		Ornskoldsvik	Sanmina	77,425	PCBA & System Assembly	
Sweden		Kista	Arrow Electronics		Office	
Sweden		Västra Frölunda	Arrow Electronics		Office	
Sweden		Stockholm	Tech Data	25,2952		
Sweden		Stockholm	IBM (International Business Machines Corp)		IBM Svenska AB	
Sweden		Solna	Hewlett Packard		Hewlett-Packard Sweden AB	
Sweden		Gothenburg	Hewlett Packard		Hewlett-Packard Sweden AB	
Sweden		Malmö	Hewlett Packard		Hewlett-Packard Sweden AB	
Sweden		Gothenburg	EMC Corp			
Sweden		Stockholm	EMC Corp			
Sweden		Stockholm	NetApp Inc			
Sweden		Västra Frölunda	NetApp Inc			
Sweden		Upplands Väsby	Xerox		Office	
Sweden		Kista	Electronics For Imaging, Inc		office	
Sweden		Kista	Lexmark		LexmarkSweden	

Source: Citi Research

Figure 1035. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description	Comments (manufacturing, office)
Sweden		Stockholm	Cisco Systems Inc			
Sweden		Gothenburg	Blackberry			
Sweden		Malmö	Blackberry			
Sweden		Stockholm	Blackberry			
Sweden		Gothenburg	Blackberry			
Sweden		Kista	Motorola Solutions			Sales Office
Sweden		Helsingborg	Apple Inc			Retail Store
Sweden		Malmö	Apple Inc			Retail Store
Sweden		Täby	Apple Inc			Retail Store
Sweden		Stockholm	Apple Inc			Office
Sweden		Älvsjö	Intersil Corp.			Sales office
Sweden		Kista	Linear Technology			Office
Sweden		Kista	Maxim Integrated			Office
Sweden		Linköping	Arris Enterprises, Inc.			
Sweden		Stockholm	Alcatel Lucent SA			
Sweden		Stockholm	Ericsson LM			Headquarters
Sweden		Stockholm	Ericsson LM			Office
Sweden		Stockholm	F5 Networks			Office
Sweden		Jarfalla	Finisar Corp.	26,400		Office
Sweden		Jarfalla	JDSU Corp.			Sales Office
Sweden		Stockholm	Juniper Networks Inc			
Sweden		Stockholm	Polycm Inc.			Office
Sweden		Stockholm	Riverbed Technology			
Sweden		Danderyd	Tellabs, Inc.			Sales Office
Sweden		Kista	Altera Corp			
Sweden		Kista	Cypress Semiconductor Corp			
Sweden		Kista	Freescale Semiconductor Ltd.			Office
Sweden		Kista	Marvell			
Sweden		Skane	Intel			
Sweden		Lund	Intel			
Sweden		Stockholm	Intel			
Sweden		Stockholm	Intel			
Sweden		Stockholm	NVIDIA			Office
Sweden		Lund	QUALCOMM Incorporated			
Sweden		Stockholm	QUALCOMM Incorporated			
Sweden		Stockholm	Spansion			Spansion International, Inc. (Sweden Branch/Stockholm)
Sweden		Gothenburg	Xilinx Inc			
Sweden		Kista	Xilinx Inc			
Sweden		Stockholm	SK Hynix			Stockholm Office
Sweden		Stockholm	LG Electronics			LG Electronics Nordic AB, Marketing
Sweden		Stockholm	Mitsubishi Electric			Mitsubishi Electric Europe B.V. - Scandinavian Branch
Sweden		Gothenburg	Mitsubishi Electric			Mitsubishi Electric Automotive Europe B.V. - Technical Center
Sweden		Bromma	Acer Inc			Acer Sweden AB
Sweden		Bromma	Acer Inc			Tech Support
Sweden		Kista	ASUSTEK COMPUTER INC			ASUS Nordic AB
Sweden		Kista	NEC			NEC Scandinavia AB
Sweden		Kista	NEC			NEC Scandinavia AB
Sweden		Linköping	MediaTek			MediaTek Sweden AB (Sweden)
Sweden		Gothenburg	Alp Electric			Gothenburg Office
Sweden		Kista	Kyocera			KYOCERA Document Solutions Nordic AB
Sweden		Skänninge	Taiyo Yuden			Scandinavia Office
Sweden		Stockholm	TDK Corporation			STOCKHOLM Branch Office
Sweden		Stockholm	Canon			All product segments (with some exceptions)
Sweden		Solna	Konica Minolta Holdings			Konica Minolta Business Solutions Sweden AB
Sweden		Malmö	Hoya Corporation			HOYA LENS SWEDEN AB
Sweden		Stockholm	Olympus			Olympus Sverige AB
Sweden		Solna	Nikon			Sales & Services - Ricoh Sverige AB.
Sweden		Solna	Ricoh Co			Epson (U.K.) Ltd., Sweden Office
Sweden		Solna	Seiko Epson			SHARP ELECTRONICS (NORDIC) AB [Sweden]
Sweden		Bromma	Sharp Corp			
Sweden		Stockholm	Fujifilm			
Sweden		Kista	Fujifilm			
Sweden		Kista	Fujitsu			Fujitsu Sweden AB
Sweden		Lund	ARM Holdings PLC			
Sweden		Lund	Brocade Communications			Brocade Communications
Sweden		Lund	Altron	4,833		Engineering, Services
Sweden		Kista	STMicroelectronics			Sales Office & Representative
Sweden		Stockholm	ZTE Corp			Sales Office
Sweden		Malmö	Belden			Sales Offices
Sweden		Gothenburg	Huawei			
Sweden		Stockholm	Huawei			
Sweden		Kista	Huawei			Rep Office
Sweden		Kista	Huawei			R&D
Sweden		Stockholm	RF Microdevices			Sales & Customer Support Center
Sweden		Stockholm	Molex			Molex Sweden
Sweden		Kista	Panasonic			Panasonic Electric Works Europe AG Filial Nordic
Sweden		Solna	Hitachi			Hitachi Europe
Sweden		Tranas	Everlight			Sales Office
Sweden		Farsta	Pioneer Corporation			Pioneer Nordic
Sweden		Gothenburg	Brother Industries Ltd			Sales Facilities
Sweden		Celestica	Celestica			
Sweden		Zürich	Arrow Electronics			Office
Sweden		Wallisellenstrasse	Arrow Electronics			Office
Sweden		Neuchâtel	Arrow Electronics			Office
Sweden		Yverdon	Arrow Electronics			Office
Sweden		Zürich	Arrow Electronics			Office
Sweden		Altshofen	Tech Data			Warehouse
Sweden		Risch-Rotkreuz	Tech Data			
Sweden		Gland	Tech Data			
Sweden		Zürich	IBM (International Business Machines Corp)			IBM (Switzerland)
Sweden		Geneva	Hewlett Packard			Office

Source: Citi Research

Figure 1036. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Switzerland		Dubendorf	Hewlett-Packard		Hewlett-Packard (Switzerland) GmbH
Switzerland		Love Field	Hewlett-Packard		Hewlett-Packard (Switzerland) GmbH
Switzerland		Love Field	Hewlett-Packard		Service Center Bern
Switzerland		Meyrin	Hewlett-Packard		Hewlett-Packard (Suisse) Sarl
Switzerland		Gland	EMC Corp		
Switzerland		Bern	EMC Corp		
Switzerland		Geneva	EMC Corp		
Switzerland		Zurich	EMC Corp		
Switzerland	Bülach	Wallisellen	NetApp Inc		
Switzerland		Bern	NetApp Inc		
Switzerland	Romandy	Lausanne	NetApp Inc		
Switzerland		Kloten	Xerox		Office
Switzerland		Bümplizstrasse	Xerox		Office
Switzerland		Thalwil	Lexmark		Lexmark Schweiz AG
Switzerland		Zurich	Cisco Systems Inc		
Switzerland		Bern	Cisco Systems Inc		
Switzerland	Bundesstadt	Vaud	Cisco Systems Inc		
Switzerland			Motorola Solutions		Sales Office
Switzerland		Geneva	Apple Inc		Retail Store
Switzerland		Glattzentrum bei Wallisell	Apple Inc		Retail Store
Switzerland		Zurich	Apple Inc		Retail Store
Switzerland		Zurich	Apple Inc		Office
Switzerland	Lausanne	Chesaux	Applied Materials Inc		Research, Development and Manufacturing
Switzerland		Oberdiesbach	Brooks Automation Inc		Office
Switzerland			Lam Research Corp		Office
Switzerland			On Semiconductor		Sales Office
Switzerland		Neuchâtel	Semtech		
Switzerland		Wil	Semtech		
Switzerland		Zurich	Alcatel Lucent SA		
Switzerland		Geneva	Alcatel Lucent SA		
Switzerland	Romandy	Zurich	Ciena Corp		Office
Switzerland		Bern	Ericsson LM		Sales Office
Switzerland		Bern	JSOI Corp.		
Switzerland		Zurich	Juniper Networks Inc		Office space, manufacturing, research and development
Switzerland		Zurich	Oclaro Inc.	124000	Office
Switzerland		Zurich	Polycom Inc.		Office
Switzerland		Zurich	Riverbed Technology		Office
Switzerland		Geneva	Freescall Semiconductor Ltd.		Office
Switzerland			Marvell	26,000	
Switzerland		Zurich	Intel		Office
Switzerland		Zurich	NVIDIA		Office
Switzerland	Baden	Mägenwil	QUALCOMM Incorporated		
Switzerland			Headquarters - Meyer Burger AG, Meyer Burger Global Ltd, Meyer Burger Technology Ltd		Office - PV Systems, Service Contacts
Switzerland	Bern	Thun	Meyer Burger Technology AG		
Switzerland		Bioggio	Acer Inc		Acer Europe SA - Regional Headquarters
Switzerland		Dietikon	Acer Inc		Acer Computer (Switzerland) AG
Switzerland		Zurich	NEC		NEC Switzerland AG
Switzerland		Bern	Delta Energy Systems(Switzerland) AG		
Switzerland		Zurich	Lenovo Group		Lenovo (Schweiz) GmbH
Switzerland	Geneva	Petit-Lancy	Lenovo Group		Lenovo (Suisse) S.A.r.l
Switzerland	Canton	Villaz-St-Pierre	Advanced Energy Industries, Inc		Solvix GmbH Switzerland
Switzerland		Schaffhausen	Suntech Power Holdings		
Switzerland			Trina Solar Limited		
Switzerland		Geneva	SunPower Corporation	4000	Office
Switzerland			Kyocera		KYOCERA Document Solutions Europe B.V.
Switzerland	Baden	Mägenwil	Murata		Amsterdam (NL) Zurich Branch
Switzerland					Sales Office
Switzerland		Wallisellen	Canon		All product segments (with some exceptions)
Switzerland	Uster	Volkswil	Olympus		Olympus Schweiz AG
Switzerland			Nikon		
Switzerland		Wallisellen	Ricoh Co		Sales & Services - Ricoh Schweiz AG
Switzerland			Seiko Epson		Epson Deutschland GmbH
Switzerland		Trubbach	Tokyo Electron		Development, manufacturing and sales
Switzerland		Ruschlikon	Sharp Corp		SHARP ELECTRONICS (SCHWEIZ) AG [Switzerland]
Switzerland	Regensdorf		Fujitsu		Fujitsu Technology Solutions
Switzerland			3D Systems Corp	13000	general-purpose facility
Switzerland		Geneva	Brocade Communications		Brocade Communications Switzerland Sarl
Switzerland			Brocade Communications		Brocade Communications Switzerland Sarl
Switzerland		Geneva	STMicroelectronics		Headquarters, Manufacturing & Design Center
Switzerland		Schaffhausen	TE Connectivity Ltd.		3 Manufacturing Plants
Switzerland		Bern	Huawei		
Switzerland		Zurich	Huawei		
Switzerland		Münchenstein	Huawei		
Switzerland		Le Grand-Saconnex	Huawei		
Switzerland		Visp	Huawei		
Switzerland		Manno	Huawei		
Switzerland		Thal	Huawei		
Switzerland		Bad Ragaz	Huawei		
Switzerland		Luzern	Huawei		
Switzerland		Lausanne	Huawei		
Switzerland		Morges	Logitech International S A	62300	EMEA headquarters, sales and marketing management, technical support and administration
Switzerland	Lausanne		Logitech International S A	46700	Research and development, product marketing and technical support
Switzerland	Risch-Rotkreuz		Panasonic		Panasonic Electric Works Schweiz AG
Switzerland		Daettwil-Baden	Brother Industries Ltd		Sales Facilities
Switzerland			Toshiba Europe GmbH, Zweigniederlassung		
Switzerland	Uster	Volkswil	Toshiba		
Switzerland		Zurich	Toshiba		Toshiba TEC Switzerland AG
Switzerland		Oetwil am See	Toshiba		Toshiba Medical Systems AG
Turkmenistan	Meilen	Ashgabat	Huawei		

Source: Citi Research

Figure 1037. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
UK		Conventry	Jabil	51,000	Aftermarket
UK		Sollihull	Jabil	22,000	Support, Storage
UK		Manchester	Cypress Semiconductor Corp		Electronics facilities, Service & Software
UK		Swindon	Cypress Semiconductor Corp		Electronics facilities, Service & Software
UK		Whitstable	Amphenol		Amphenol Limited
UK	Northamptonshire		Amphenol		Jaybeam Wireless - UK
UK		Hampshire	Amphenol		Spectra Strip Ltd.
UK					Logistics/Post-Manufacturing Repair/Warranty &
UK		Multiple locations	Sanmina	38,203	Cables
UK	Northern Ireland	Coleraine	AVX Corporation	185,000	Manufacturing/Research — PC
UK		Harrgate	Arrow Electronics		Office
UK		London	Arrow Electronics		Office
UK		Reading	Arrow Electronics		Office
UK		Nottingham	Arrow Electronics		Office
UK		Stockport	Arrow Electronics		Office
UK		Manchester	Arrow Electronics		Office
UK		Bedford	Arrow Electronics		Office
UK	Northamptonshire	Crick	Ingram Micro		
UK		Berkshire	Ingram Micro		
UK	Leicestershire	Lutterworth	Tech Data	386424	
UK	North Yorkshire	York	Tech Data		
UK	Hampshire	Basingstoke	Tech Data		
UK		Tortola	IBM (International Business Machines Corp)		IBM Business Partners
UK	Hampshire	Portsmouth	IBM (International Business Machines Corp)		IBM (United Kingdom) Ltd
UK		Hampshire	IBM (International Business Machines Corp)		IBM (International Business Machines Corp)
UK		Hampshire	IBM (International Business Machines Corp)		IBM (United Kingdom) Ltd
UK		Erskine	Hewlett-Packard		Product Development and Manufacturing
UK	Bristol	Hewlett-Packard			Laboratories
UK	Berkshire	Bracknell	Hewlett-Packard		Bracknell - HP UK Registered Office
UK		London	Hewlett-Packard		Office
UK		Bristol	Hewlett-Packard		Office
UK	Cheshire	Warrington	Hewlett-Packard		Office
UK		Erskine	Hewlett-Packard		HP EMEA Business & Operations Campus
UK	County Antrim	Belfast	Hewlett-Packard		Office
UK		Brentford	EMC Corp		
UK		Aberdeen	EMC Corp		
UK	Oxfordshire	Abingdon	EMC Corp		
UK		Birmingham	EMC Corp		
UK		Bracknell	EMC Corp		
UK		Brentford	EMC Corp		
UK		Bristol	EMC Corp		
UK	Surrey	Camberley	EMC Corp		
UK		Hertfordshire	EMC Corp		
UK	West Yorkshire	Leeds	EMC Corp		
UK		Livingston	EMC Corp		
UK		London	EMC Corp		
UK		Manchester	EMC Corp		
UK	Wensum	Norwich	EMC Corp		
UK	Hampshire	Southampton	EMC Corp		
UK	Surrey	Frimley	EMC Corp		
UK	Hertfordshire	Watford	EMC Corp		
UK		Wydm	EMC Corp		
UK		Uxbridge	NetApp Inc		Waterview House
UK		London	NetApp Inc		
UK		Manchester	NetApp Inc		
UK	Middlesex	Uxbridge	NetApp Inc		
UK		Midlands	NetApp Inc		
UK	Anguilla		Xerox		Office
UK	Bermuda	Hamilton	Xerox		Office
UK	Cayman Islands		Xerox		Office
UK	Falkland Islands		Xerox		Office
UK	Montserrat	St. Johns	Xerox		Office
UK	Turks and Caicos	Provinciales	Xerox		Office
UK		London	Xerox		Office
UK	Shropshire	Telford	Xerox		Office
UK	Gibraltar		Xerox		Office
UK		Uxbridge	Xerox		Office
UK		Mitcheldean	Xerox		Manufacturing plant
UK		Dronfield	Electronics For Imaging, Inc	5	office
UK		Colchester	Electronics For Imaging, Inc		office
UK		Millshaw Beeds	Electronics For Imaging, Inc		office
UK	Berkshire	Maldenhead	Lexmark		Lexmark International Ltd
UK		Corning			Office
UK		London	Nokia		Regional Office
UK	Cambridge		Nokia		Regional Office
UK	Bristol		Nokia		Regional Office
UK	Middlesex	Feltham	Cisco Systems Inc		
UK	Berkshire		Cisco Systems Inc		
UK		London	Cisco Systems Inc		
UK		Manchester	Cisco Systems Inc		
UK	Berkshire	Slough	Blackberry		
UK	Cambridgeshire	Harston	Blackberry		
UK	Birmingham		Blackberry		
UK	Hampshire		Motorola Solutions		Corporate & Regional Office
UK		Aberdeen	Apple Inc		Retail Store
UK	Abdon Street		Apple Inc		Retail Store
UK	Barnet		Apple Inc		Retail Store
UK	Basingstoke		Apple Inc		Retail Store
UK	Bath		Apple Inc		Retail Store
UK	Belfast		Apple Inc		Retail Store
UK	Birmingham		Apple Inc		Retail Store
UK	Brighton		Apple Inc		Retail Store
UK	Bristol		Apple Inc		Retail Store
UK	Bromley		Apple Inc		Retail Store
UK	Cambridge		Apple Inc		Retail Store
UK	Cardiff		Apple Inc		Retail Store
UK	Central London		Apple Inc		Retail Store
UK	Exeter		Apple Inc		Retail Store
UK		Gateshead	Apple Inc		Retail Store
UK	Glasgow		Apple Inc		Retail Store
UK	Kingston		Apple Inc		Retail Store
UK	Leeds		Apple Inc		Retail Store

Source: Citi Research

Figure 1038. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
UK		Leicester	Apple Inc		Retail Store
UK		Liverpool	Apple Inc		Retail Store
UK		London	Apple Inc		Retail Store
UK		Manchester	Apple Inc		Retail Store
UK		Newcastle upon Tyne	Apple Inc		Retail Store
UK		Norwich	Apple Inc		Retail Store
UK		Plymouth	Apple Inc		Retail Store
UK		Reading	Apple Inc		Retail Store
UK		Sheffield	Apple Inc		Retail Store
UK		Solihull	Apple Inc		Retail Store
UK		Southampton	Apple Inc		Retail Store
UK		Stratford	Apple Inc		Retail Store
UK		Watford	Apple Inc		Retail Store
UK		Central London	Apple Inc		Retail Store
UK		Milton Keynes	Apple Inc		Retail Store
UK		London	Apple Inc		Office
UK		London	Apple Inc		Office
UK		Berkshire	Applied Materials Inc		Sales and Services
UK		Manchester	Brooks Automation Inc	42000	Manufacturing, R&D and sales & support
UK		Wootton Bassett	Fairchild Semiconductor International		Office Facilities
UK		Reigate	International Rectifier Corp		
UK		Newport	International Rectifier Corp		
UK			Intersil Corp.		Office
UK		Essex	Intersil Corp.		Sales office & Design Centers
UK	Berkshire	Wokingham	KLA Tencor Corp		
UK		Buckinghamshire	Linear Technology		Office
UK		Berkshire	Maxim Integrated		Office
UK		Bristol	Maxim Integrated		Office
UK		Edinburgh	Maxim Integrated		Office
UK	Berkshire	Wokingham	Microchip Technology		
UK		Norwich	Microchip Technology		
UK	Berkshire		On Semiconductor		Sales Office
UK			Semtech		
UK		Southampton	Semtech		
UK		Bristol	Semtech		
UK		Hertfordshire	Semtech		
UK		Camberley	Silicon Laboratories, Inc		
UK	Berkshire		Teradyne		Local Sales and Support Office
UK		Greenwich	Alcatel Lucent SA	34,000	Manufacturing
UK		Swindon	Alcatel Lucent SA		
UK		London	Alcatel Lucent SA		
UK		Berkshire	Alcatel Lucent SA		
UK		Wiltshire	Alcatel Lucent SA		
UK		Newbury	Alcatel Lucent SA		
UK		Belfast	Ciena Corp		
UK	Northern Ireland		Ciena Corp		
UK		London	Ciena Corp		
UK	Surrey	Guildford	Ericsson LM		Office
UK	Berkshire		Ericsson LM		Office
UK	West Midlands	Coventry	Ericsson LM		Office
UK		Manchester	Ericsson LM		Office
UK		London	F5 Networks		Office
UK		London	F5 Networks		Office
UK		London	F5 Networks		International Technology Center
UK		London	Infina Corp.		Office
UK		London	JDSU Corp.		Sales Office
UK		Hampshire	JDSU Corp.		Sales Office
UK		Adlestone	Juniper Networks Inc		
UK	Surrey	London	Juniper Networks Inc		
UK		Caswell	Oclaro Inc.	183000	development
UK		Paignton	Oclaro Inc.	18000	development facilities
UK	Berkshire		Polycom Inc.		Office
UK			Tellabs, Inc.		Sales Office
UK	Hampshire	Fleet	Advanced Micro Devices, Inc		
UK	Buckinghamshire	Wycombe	Altera Corp		
UK		Bristol	Broadcom		Office
UK		Cambridge	Broadcom		Office
UK	New Hampshire	Nashua	Cypress Semiconductor Corp		
UK	Hertfordshire		Cypress Semiconductor Corp		
UK	Buckinghamshire	Aylesbury	Freescall Semiconductor Ltd.		Office
UK		Cheadle Manchester	Micron		Design
UK		East Kilbride	Micron		Manufacturing
UK		Bracknell	Micron		Sales
UK		East Kilbride	Micron		Sales
UK		Wootton Bassett	Micron		Sales
UK			Marvell		
UK	Hertfordshire	Borehamwood	Intel		
UK	Lincolnshire	Lincoln	Intel		
UK	Westminster	London	Intel		
UK		Wokingham	Intel		
UK	Wiltshire	Swindon	Intel		
UK		Bristol	NVIDIA		Office
UK		Cambridge	NVIDIA		Office
UK		Reading	NVIDIA		Office
UK		London	NVIDIA		Office
UK		Cambridge	QUALCOMM Incorporated		
UK		Farnborough	QUALCOMM Incorporated		
UK		London	QUALCOMM Incorporated		
UK		Poole	QUALCOMM Incorporated		
UK	Hampshire	Farnborough	Spansion		Spansion International Inc
UK		London	Xilinx Inc		
UK	Northern Ireland	Belfast	Xilinx Inc		
UK		Chertsey	Xilinx Inc		
UK	Buckinghamshire	Milton Keynes	SMA Solar Technology		SMA Solar UK Ltd.
UK		Salisbury	SolarWorld AG		
UK	Surrey		SK hynix		Headquarters, SK hynix UK Limited
UK		Berkshire	LG Electronics		LG Electronics United Kingdom Ltd., Marketing
UK	Surrey		Samsung Electro-Mechanics		Overseas Sales Offices
UK	Middlesex	Uxbridge	Mitsubishi Electric		Mitsubishi Electric Europe B.V.
UK	England		Mitsubishi Electric		UK Branch
UK		Livingston	Mitsubishi Electric		Mitsubishi Electric R&D Centre Europe B.V. (MERCE) - UK Branch
UK	Middlesex	Uxbridge	Mitsubishi Electric		Mitsubishi Electric Finance Europe PLC
UK			Mitsubishi Electric		Mitsubishi Electric Air Conditioning Systems Europe Ltd.
UK		England	Acer Inc		Acer UK Ltd.

Source: Citi Research

Figure 1039. Europe (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
UK	Middlesex		Acer Inc		Tech Support
UK			ASUSTek COMPUTER INC		ASUSTek UK Ltd.
UK		London	NEC		NEC Europe
UK			NEC		NEC Capital (UK)
UK			NEC		NEC Technologies (UK)
UK			NEC		NEC Telecom MODUS Limited
UK			NEC		NEC (UK)
UK		Cambridge	MediaTek		MTK Wireless Limited (Cambridge)
UK	Kent	West Malling	MediaTek		MTK Wireless Limited (Kent)
UK		Hook	Lenovo Group		
UK		London	Sun Edison		
UK		Derby	Trina Solar Limited		Trina Solar (UK) Ltd
UK	British Virgin Islands		Vanguard International Semiconductor		IC Business Investment
UK	British Virgin Islands		Novatek		
UK	British Virgin Islands		Powertech Technology		
UK	British Virgin Islands		SPL		
UK	Cayman Islands		SPL		
UK		Solihull	SunPower Corporation		Office
UK	Buckinghamshire	Milton Keynes	Alps Electric		Milton Office
UK	Buckinghamshire	Milton Keynes	Hirose Electric		UK Branch
UK	East Sussex	Hove	Hosiden		Manufacturing Division
UK		London	Ibiden		IBIDEN UK Ltd
UK	Surrey	Frimley	Kyocera		KYOCERA Fineceramics Limited
UK	Berkshire		Kyocera		KYOCERA Document Solutions (U.K.) Limited
UK	Hampshire		Murata		Sales Office
UK		Milton Keynes	Murata		Development
UK			Murata		Development, Production & Sales
UK		Milton Keynes	Rohm		Sales Office - ROHM Semiconductor GmbH
UK	Oxfordshire		Taiyo Yuden		UK Office
UK			TDK Corporation		UK Branch Office
UK	North Yorkshire	Harrogate	Nidec		Technology Center (R&D and Factory)
UK		London	Nidec		IR Activity office in European Region
UK	Middlesex		Canon		All product segments
UK			Canon		All product segments (with some exceptions)
UK	Surrey		Canon		All product segments (with some exceptions)
UK	Luxembourg		Canon		All product segments (with some exceptions)
UK	Durham	Newton Aycliffe	Dainippon Screen		North England Office
UK	Shire	Bedfordshire	Dainippon Screen		Screen Europe (UK)
UK	Essex		Konica Minolta Holdings		Konica Minolta Business Solutions (UK) Ltd.
UK		Sunderland	Konica Minolta Holdings		Sunderland Office
UK		Warrington	Konica Minolta Holdings		Warrington Office
UK		Norwich	Konica Minolta Holdings		Norwich Office
UK		Nottingham	Konica Minolta Holdings		Nottingham Office
UK			Konica Minolta Holdings		Sheffield Office
UK	Sheffield		Konica Minolta Holdings		Basildon Head Office
UK	Essex		Konica Minolta Holdings		Konica Minolta
UK		London	Konica Minolta Holdings		Milton Keynes Office
UK	West Midlands		Konica Minolta Holdings		Birmingham Office
UK		Reading	Konica Minolta Holdings		Reading Office
UK		Aberystwyth	Konica Minolta Holdings		Aberystwyth Office
UK		Bristol	Konica Minolta Holdings		Bristol Office
UK		Swansea	Konica Minolta Holdings		Swansea Office
UK		Denbighshire	Konica Minolta Holdings		St Asaph Office
UK		St Asaph	Hoya Corporation		HOYA LENS U.K. Limited
UK			Olympus		Sales of all product lines, and development and manufacture of endoscopes and related equipment
UK	Essex	Southend-on-Sea	Olympus		Olympus KeyMed
UK			Nikon		
UK			Nikon		
UK			Nikon		
UK		London	Ricoh Co		Sales & Services - Ricoh Europe PLC - Regional HQ
UK		Northampton	Ricoh Co		Sales & Services - Ricoh UK Ltd.
UK		Berks	Ricoh Co		Sales & Services - RICOH IMAGING UK LTD.
UK			Ricoh Co		Sales & Services - European Technology Centre,
UK	Middlesex	Feltham	Ricoh Co		Ricoh Europe PLC
UK			Ricoh Co		Manufacturing - Ricoh UK Products Ltd.
UK		Hemel Hempstead	Seiko Epson		Epson (U.K.) Ltd.
UK			Seiko Epson		Manufacturing Subsidiaries and Affiliates - Epson
UK		Telford	Seiko Epson		Telford Ltd.
UK			Seiko Epson		Head Office - European sales and service
UK	West Sussex	Crawley	Tokyo Electron		Headquarters
UK			Asahi Glass		Automotive glass assembly
UK			Asahi Glass		Fluoropolymers (PTFE/ETFE), Sales & Marketing of AGC Chemicals Products
UK	Lancashire		Asahi Glass		
UK	Middlesex	Uxbridge	Sharp Corp		SHARP ELECTRONICS (U.K.) LTD. [United Kingdom]
UK	Berks		HTC Corporation		Operations Office
UK		Bedford	Fujifilm		
UK		Kent	Fujifilm		
UK		Manchester	Fujifilm		
UK		Billingham	Fujifilm		
UK		London	Fujifilm		
UK			Fujitsu		FUJITSU EMEA PLC
UK			Fujitsu		Fujitsu General (U.K.) Co., Limited
UK			Fujitsu		Fujitsu Technology Solutions Ltd.
UK			Fujitsu		Fujitsu Telecommunications Europe Limited
UK			Fujitsu		Fujitsu Telecommunications Europe Limited
UK			Fujitsu		
UK			3D Systems Corp		Global HQ
UK		Cambridge	ARM Holdings PLC		
UK		Blackburn	ARM Holdings PLC		
UK		Maldenhead	ARM Holdings PLC		
UK		Sheffield	ARM Holdings PLC		
UK		Warrington	ARM Holdings PLC		
UK		Bracknell	Brocade Communications		Brocade Communications UK Ltd
UK			Brocade Communications		
UK		Cambridge	CSR Plc		53000 Headquarters, R&D, Sales and Administration
UK		Cambridge	CSR Plc		33100 Administration
UK		Cambridge	CSR Plc		7000 R&D

Source: Citi Research

Figure 1040. Europe (Continued)

Country	State	City	Company Name	Size (sq ft) Description Comments (manufacturing, office)
UK		Bristol	CSR Plc	2023 R&D
UK		Manchester	CSR Plc	3373 R&D
UK		Belfast	CSR Plc	5800 R&D
UK		Southampton	Garmin Ltd.	155,000 Facilities - Garmin (Europe) Ltd.
UK		Fleet	Flextel Inc.	Sales support offices
UK		Crawley	Spirint Communications Plc	Corporate Head Office
UK		Cambridge	Aiktron	23,465 Manufacturing, Engineering, & R&D
UK		Cambridge	Aiktron	14,919 Sales, Services, Engineering
UK		Edinburgh	STMicroelectronics	Manufacturing & Design Center
UK		Bristol	STMicroelectronics	Manufacturing & Design Center
UK		Marlow	STMicroelectronics	Manufacturing & Design Center
UK		Marlow Bucks	STMicroelectronics	Sales Office & Representative
UK			TE Connectivity Ltd.	7 Manufacturing Plants
UK		Buckinghamshire	Vtech Holdings	Regional Office - Telecommunication Products
UK		Oxfordshire	Vtech Holdings	Regional Office - Electronic Learning Products
UK		Edinburgh	Wolfson	
UK		Newbury	Wolfson	
Corporate Headquarters, Research and				
UK		Edinburgh	Western Digital Corp	467100 development, administrative, marketing and sales
UK	Middlesex	Brentford	ZTE Corp	Sales Office
UK		Manchester	Belden	Sales Offices
UK	Berkshire		Emulex Corp	Office
UK	Berkshire	Wokingham	Emulex Corp	Office
UK		London	Huawei	
UK			Huawei	
UK	Berkshire	Basingstoke	Huawei	
UK	Hampshire		Huawei	
UK	Paddington		Huawei	
UK	Suffolk	Ipswich	Huawei	
UK		London	OmniVision	
UK		Camberley	QLogic Corp	
UK		Reading	RF Microdevices	Sales & Customer Support Center
UK		Newton Aycliffe	RF Microdevices	Manufacturing Unit
UK		Oxfordshire	Siltech Technology	
UK	Hertfordshire		Skyworks	
UK		Cambridge	Veeco Instruments Inc	
UK		Havant	Xyratex	125,000 Headquarters
UK		Havant	Xyratex	Office
UK	Hampshire		Xyratex	Office
UK	Surrey	Farnham	Molex UK	Head Office
UK	Milton Keynes		Panasonic	Head Office
UK	Berkshire	Maidenhead	Hitachi	Hitachi Europe Ltd
UK		London	Hitachi	Interactive Media Solutions Division
UK			Pioneer Corporation	Pioneer Digital Design Centre Ltd
UK		Middlesex HA4	Pioneer Corporation	Pioneer GB LTD
UK		Manchester	Brother Industries Ltd	Sales Facilities
UK		Manchester	Brother Industries Ltd	Sales Facilities
UK		Manchester	Brother Industries Ltd	Sales Facilities
UK		Manchester	Brother Industries Ltd	Others
UK		London	Brother Industries Ltd	Others

Source: Citi Research

Figure 1041. Europe (Continued)

Country	State	City	Company Name	Size (sq ft) Description Comments (manufacturing, office)
Ukraine		Uzhgorod	Jabil	278,000 Manufacturing
Ukraine		Beregovo	REC Solar ASA	538,195 Electronics facilities, Manufacturing
Ukraine		Mukachevo	Hon Hai Precision	Electronics facilities, Manufacturing
Ukraine		Kiev	Arrow Electronics	Office
Ukraine		Kyiv	IBM (International Business Machines Corp)	IBM Ukraine
Ukraine		Kiev	Hewlett Packard	Company HP
Ukraine		Kiev	EMC Corp	
Ukraine		Kiev	Xerox	Office
Ukraine		Kyiv	Nokia	Regional Office
Ukraine		Kiev	Cisco Systems Inc	
Ukraine		Kharkiv	Blackberry	
Ukraine			Motorola Solutions	Sales Office
Ukraine		Kiev	Alcatel Lucent SA	
Ukraine		Kiev	Ericsson LM	Office
Ukraine		Kiev	Tellabs, Inc.	Sales Office
Ukraine	Kyivska Oblast	Kiev	Intel	
Ukraine		Kiev	LG Electronics	LG Electronics Ukraine Inc. - Service
Ukraine		Kiev	Acer Inc	Acer BSEC Inc.
Ukraine			NEC	NEC Ukraine
Ukraine			Lenovo Group	
Ukraine		Kiev	Konica Minolta Holdings	Konica Minolta Business Solutions Ukraine
Ukraine		Kiev	Olympus	Olympus Europa Holding GmbH
Ukraine			Nikon	
Ukraine			Seiko Epson	Epson Europe B.V. Kiev Office
Ukraine		Kyiv city	Fujifilm	
Ukraine			Fujitsu	Office
Ukraine			TE Connectivity Ltd.	1 Manufacturing Plant
Ukraine		Kiev	ZTE Corp	Sales Office
Ukraine		Kyiv	Huawei	

Source: Citi Research

Figure 1042. Oceania – New Zealand

Country	State	City	Company Name	Size (sq ft) Description Comments (manufacturing, office)
New Zealand		Auckland	Arrow Electronics	Office
New Zealand		Christchurch	Arrow Electronics	Office
New Zealand		Auckland	Ingram Micro	
New Zealand		Wellington	Ingram Micro	
New Zealand		Christchurch	Ingram Micro	
New Zealand		Manukau	Ingram Micro	
New Zealand		Wellington	IBM	IBM New Zealand Limited
New Zealand		Auckland	Hewlett Packard	Office
New Zealand		Wellington	Hewlett Packard	Office
New Zealand		Christchurch	Hewlett Packard	Office
New Zealand		Hamilton	Hewlett Packard	Office
New Zealand		Auckland	EMC Corp	
New Zealand		Wellington	EMC Corp	
New Zealand		Wellington	NetApp Inc	
New Zealand		Auckland	NetApp Inc	
New Zealand		Auckland	Xerox	Office
New Zealand		Auckland	Electronics For Imaging, Inc	5 office
New Zealand			Lexmark	
New Zealand		Auckland	Nokia	Regional Office
New Zealand		Auckland	Cisco Systems Inc	
New Zealand		Wellington	Cisco Systems Inc	
New Zealand		Wellington	Alcatel Lucent SA	
New Zealand		Auckland	Alcatel Lucent SA	

Source: Citi Research

Figure 1043. Oceania – New Zealand (Continued)

Country	State	City	Company Name	Size (sq ft) Description Comments (manufacturing, office)
New Zealand		Hamilton	Alcatel Lucent SA	
New Zealand		Auckland	Ciena Corp	
New Zealand		Auckland	Ericsson LM	Office
New Zealand		Auckland	FS Networks	Office
New Zealand		Auckland	Juniper Networks Inc	
New Zealand		Wellington	Juniper Networks Inc	
New Zealand		Auckland	Polycom Inc.	Office
New Zealand		Auckland	Riverbed Technology	
New Zealand		Auckland	QUALCOMM Incorporated	
New Zealand		Auckland	Acer Inc	Acer Computer New Zealand Ltd.
New Zealand		Auckland	Acer Inc	Tech Support
New Zealand		Wellington	NEC	NEC New Zealand Limited
New Zealand		Auckland	Kyocera	KYOCERA Document Solutions New Zealand Ltd.
New Zealand		Auckland	Canon	All product segments
New Zealand				Sale and service of endoscopes and microscopes in New Zealand
New Zealand		Auckland	Olympus	
New Zealand			Nikon	
New Zealand		Auckland	Ricoh Co	Sales & Services - Ricoh New Zealand Ltd.
New Zealand				SHARP CORPORATION OF NEW ZEALAND LTD. [New Zealand]
New Zealand		Auckland	Sharp Corp	
New Zealand		Auckland	Fujifilm	
New Zealand		Wellington	Fujitsu	Fujitsu New Zealand Limited
New Zealand			TE Connectivity Ltd.	1 Manufacturing Plant
New Zealand		Gordon	Belden	Sales Offices
New Zealand		Auckland	Emulex Corp	Office
New Zealand		Hamilton	Emulex Corp	Office
New Zealand		Lower Hutt	Brother Industries Ltd	Sales Facilities

Source: Citi Research

Figure 1044. Oceania - Australia

Australia	Victoria	Carroll Downs	Amphenol	Amphenol Australia Pty Ltd
Australia			Sanmina	7,105
Australia		Adelaide	Arrow Electronics	Office
Australia		Brisbane	Arrow Electronics	Office
Australia		Melbourne	Arrow Electronics	Office
Australia		Sydney	Arrow Electronics	Office
Australia	New South Wales	Sydney	Ingram Micro	
Australia	New South Wales	Sydney	Ingram Micro	
Australia	Victoria	Melbourne	Ingram Micro	
Australia		Brisbane	Ingram Micro	
Australia		Osborne Park	Ingram Micro	
Australia	New South Wales	Melbourne	IBM International Business Machines Corp)	IBM Australia Limited
Australia		Sydney	Hewlett Packard	Office
Australia		Sydney	Hewlett Packard	Office
Australia	Australian Capital Territory	Turner	Hewlett Packard	Office
Australia	Queensland	Brisbane	Hewlett Packard	Office
Australia		Adelaide	Hewlett Packard	Office
Australia		Darwin	Hewlett Packard	Office
Australia		Alice Springs	Hewlett Packard	Office
Australia		West Perth	Hewlett Packard	Office
Australia		Perth	Hewlett Packard	Office
Australia		Adelaide	EMC Corp	
Australia		Brisbane	EMC Corp	
Australia		Canberra	EMC Corp	
Australia		Melbourne	EMC Corp	
Australia	New South Wales	North Ryde	EMC Corp	
Australia	New South Wales	North Sydney	EMC Corp	
Australia		Perth	EMC Corp	
Australia	New South Wales	St Leonard	EMC Corp	
Australia	New South Wales	Sydney	EMC Corp	
Australia		Adelaide	NetApp Inc	
Australia		Brisbane	NetApp Inc	
Australia		Canberra	NetApp Inc	
Australia		Melbourne	NetApp Inc	
Australia		Perth	NetApp Inc	
Australia		Sydney	NetApp Inc	
Australia	New South Wales	North Ryde	Xerox	Office
Australia	New South Wales	Frenchs Forest	Xerox	Office
Australia		Sydney	Xerox	Manufacturing plant
Australia	New South Wales	Queensland	Electronics For Imaging, Inc	Office
Australia			Electronics For Imaging, Inc	Office
Australia	New South Wales	North Ryde	Lexmark	Lexmark International (Australia) Pty Limited & NSW
Australia	Victoria	Melbourne	Lexmark	Melbourne Offices (Sales Only)
Australia	Queensland	Brisbane	Lexmark	Brisbane Office
Australia		Canberra	Lexmark	Canberra Office
Australia	Western Australia	Perth	Lexmark	Perth Office
Australia			Corning	Office
Australia	New South Wales		Corning	Office
Australia	New South Wales	Sydney	Nokia	Regional Office
Australia	New South Wales	North Sydney	Cisco Systems Inc	
Australia		Melbourne	Cisco Systems Inc	
Australia			Cisco Systems Inc	
Australia	Australian Capital Territory	Adelaide	Cisco Systems Inc	
Australia		Perth	Cisco Systems Inc	
Australia	Queensland	Brisbane	Cisco Systems Inc	
Australia	New South Wales	St Leonards	Cisco Systems Inc	
Australia	New South Wales	North Sydney	Cisco Systems Inc	
Australia			BlackBerry	
Australia			Motorola Solutions	Corporate & Regional Office
Australia		Sydney	Motorola Solutions	Sales Office
Australia	Australian Capital Territory	Canberra	Apple Inc	Retail Store
Australia	New South Wales	Bondi	Apple Inc	Retail Store
Australia	New South Wales	Broadway	Apple Inc	Retail Store
Australia	New South Wales	Castle Hill	Apple Inc	Retail Store
Australia		O Charles	Apple Inc	Retail Store
Australia	California	Chatswood	Apple Inc	Retail Store
Australia	California	Hornsby	Apple Inc	Retail Store
Australia	California	Penrith	Apple Inc	Retail Store
Australia	Maharashtra	Sydney	Apple Inc	Retail Store
Australia	Queensland	Carindale	Apple Inc	Retail Store
Australia	Queensland	Chernside	Apple Inc	Retail Store
Australia	Queensland	Robina	Apple Inc	Retail Store
Australia		Adelaide	Apple Inc	Retail Store
Australia		Chadstone	Apple Inc	Retail Store
Australia	Victoria	Cheltenham	Apple Inc	Retail Store
Australia	Victoria	Doncaster	Apple Inc	Retail Store
Australia	Victoria	Fountain Gate	Apple Inc	Retail Store
Australia	Victoria	Maribyrnong	Apple Inc	Retail Store
Australia	Western Australia	Booragoon	Apple Inc	Retail Store
Australia		O Perth	Apple Inc	Retail Store
Australia		Sydney	Apple Inc	Office
Australia			Linear Technology	Office
Australia	New South Wales	Kew Vic	Linear Technology	Office
Australia		Sydney	Microchip Technology	Office
Australia		Melbourne	On Semiconductor	Sales Office
Australia			Adtran	
Australia	Victoria	Melbourne	Adtran	
Australia	New South Wales	Sydney	Alcatel Lucent SA	
Australia	Victoria	Melbourne	Alcatel Lucent SA	
Australia	New South Wales	Sydney	Ciena Corp	
Australia	Victoria	Melbourne	Ciena Corp	
Australia		Brisbane	Ericsson LM	Office
Australia			F5 Networks	Office
Australia		Canberra	F5 Networks	Office
Australia		Melbourne	F5 Networks	Office
Australia		Perth	F5 Networks	Office
Australia		Sydney	F5 Networks	Office
Australia		Sydney	Finisar Corp.	51500 Office
Australia		Chatswood	JSOI Corp.	Sales Office
Australia	Queensland	Brisbane	Juniper Networks Inc	
Australia		Canberra	Juniper Networks Inc	
Australia		Melbourne	Juniper Networks Inc	
Australia	New South Wales	North Sydney	Juniper Networks Inc	
Australia		Sydney	Polycorn Inc.	Office
Australia		Brisbane	Polycorn Inc.	Office
Australia		Canberra	Polycorn Inc.	Office

Source: Citi Research

Figure 1045. Oceania – Australia (Countinued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Australia		Melbourne	Polycom Inc.		Office
Australia		Perth	Polycom Inc.		Office
Australia	New South Wales	North Sydney	Riverbed Technology		
Australia	Queensland	Brisbane	Riverbed Technology		Sales Office
Australia	New South Wales	Sydney	Teladix, Inc.		
Australia	New South Wales	Sydney	Advanced Micro Devices, Inc.		
Australia	New South Wales	Sydney	Intel		
Australia	Queensland	Brisbane	Intel		
Australia	Victoria	Melbourne	Intel		
Australia	New South Wales	Sydney	QUALCOMM Incorporated		
Australia		Tallinn	Xilinx Inc.		
Australia		Brisbane	Xilinx Inc.		
Australia	New South Wales	North Ryde	SMA Solar Technology		SMA Australia Pty Ltd
Australia	New South Wales		LG Electronics		LG Electronics Australia Pty Ltd, Marketing
Australia	New South Wales	Rydalmere	Mitsubishi Electric		Mitsubishi Electric Australia Pty. Ltd.
					Acer Computer Australia Pty. Ltd. (Oceania Regional Office)
Australia	New South Wales	Wentworth Point	Acer Inc.		Tech Support
Australia	New South Wales	Wentworth Point	Acer Inc.		ASUSTek Computer (Aust) Pty. Ltd.
Australia	New South Wales	North Ryde	NEC		NEC Australia Pty. Ltd.
Australia	Victoria	Melbourne	Delta Electronics		Melbourne Office
Australia	New South Wales	Chatswood	Lenovo Group		Australia Head office
Australia	New South Wales	Sydney	First Solar Inc.		Office
Australia	New South Wales	Sydney	Suntech Power Holdings		
Australia	New South Wales	Sydney	Trina Solar Limited		Trina Solar (Australia) Pty Ltd
Australia	New South Wales	Pymont	Yingli Green Energy		Office
Australia		Victoria	SurPower Corporation		Office
					Solar Business - Head Office - KYOCERA Solar Pty Ltd.
Australia	New South Wales	North Ryde	Kyocera		Ltd.
Australia	Queensland	Cannon Hill	Kyocera		Solar Business - Kyocera Solar Pty Ltd.
Australia	Perth	Osborne Park	Kyocera		Solar Business - Kyocera Solar Pty Ltd.
					KYOCERA SOLAR PTY LTD; KYOCERA Document Solutions Australia Pty. Ltd.
Australia	New South Wales	North Ryde	Kyocera		Digital imaging technologies, related applications and solutions
Australia	New South Wales	Sydney	Canon		Dainippon Screen (Australia) Pty. Ltd.
Australia	New South Wales	Macquarie Park	Dainippon Screen		HOYA LENS AUSTRALIA PTY. LTD.
Australia	New South Wales	Sydney	Hoya Corporation		
					Sale and service of medical and industrial endoscopes, microscopes, and UT and ECT instruments in Australia, New Zealand, Papua New Guinea, Tahiti, and the South Pacific region
Australia	Victoria		Olympus		Sale and service of imaging products in Australia, New Zealand, Papua New Guinea, Tahiti, and the South Pacific region
Australia	New South Wales	Notting Hill	Olympus		Olympus Australia Pty Ltd
Australia	Victoria	Macquarie Park	Olympus		Olympus Imaging Australia Pty Ltd
Australia	New South Wales		Nikon		
Australia			Nikon		
Australia		Vienna	Ricoh Co		Sales & Services - Ricoh Austria GmbH
Australia	New South Wales	Sydney	Ricoh Co		Sales & Services - Ricoh Australia Pty. Ltd.
Australia	New South Wales	Sydney	Seiko Epson		Epson Australia Pty. Ltd.
					SHARP CORPORATION OF AUSTRALIA PTY. LTD. [Australia]
Australia	New South Wales	Huntingwood	Sharp Corp		Sony Australia Ltd.
Australia			Sony Corp		
Australia	New South Wales	Brookvale	Fujifilm		
Australia	New South Wales	Sydney	Fujitsu		Fujitsu Australia Limited
Australia	New South Wales	Frenchs Forest	Fujitsu		Fujitsu Australia Software Technology Pty. Ltd.
Australia	New South Wales	Eastern Creek	Fujitsu		Fujitsu General (Aust.) Pty Limited
Australia	New South Wales	Silverwater	Fujitsu		Fujitsu PC Australia
Australia	Victoria	Melbourne	Fujitsu		Fujitsu Ten (Australia) Pty. Ltd.
Australia	New South Wales	North Ryde	Fujitsu		
Australia			3D Systems Corp		
Australia	Victoria	Melbourne	Brocade Communications		
Australia	Victoria	Southbank	Brocade Communications		
Australia	New South Wales	Sydney	Brocade Communications		
Australia		Canberra	Brocade Communications		
Australia	Queensland	Brisbane	Brocade Communications		
Australia		Sydney	STMicroelectronics		Sales Office & Representative
Australia		Melbourne	STMicroelectronics		Sales Office & Representative
Australia			TE Connectivity Ltd.		1 Manufacturing Plant
Australia	Victoria	Richmond	Vtech Holdings		Regional Office - Telecommunication Products
Australia	Victoria	Melbourne	Wolfson		
Australia	Victoria	Melbourne	ZTE Corp		Sales Office
Australia	Victoria	Melbourne	Belden		Sales Office
Australia	New South Wales	North Sydney	Emulex Corp		Office
Australia	Queensland	Brisbane	Huawei		
Australia	Victoria	Melbourne	Huawei		
Australia	New South Wales	Melton	Huawei		
Australia	New South Wales	Melton	Molex		
Australia	New South Wales	North Ryde	Hitachi		Australia Sales
					Hitachi Australia Pty. Ltd.
Australia	New South Wales	Greystanes	Hitachi		Hitachi Construction Machinery Australia Pty. Ltd.
Australia	New South Wales	Macquarie Park	Hitachi		Hitachi Data Systems Australia Pty. Ltd.
Australia		Blacktown	Hitachi		Hitachi Transport System (Australia) Pty. Ltd.
Australia	Victoria	Heatherton	Pioneer Corporation		Pioneer Electronics Australia
Australia	New South Wales	Sydney	Brother Industries Ltd		Sales Facilities
Australia	New South Wales	Parramatta	Toshiba		Toshiba International Corporation Pty., Ltd.
Australia	New South Wales	North Ryde	Toshiba		Toshiba (Australia) Pty., Ltd.
Australia	New South Wales	Rydalmere	Toshiba		Toshiba TEC Australia Pty., Ltd.

Source: Citi Research

Figure 1046. Africa

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Algeria		Algiers	IBM (International Business Machines Corp)		
Algeria		Mohammadia	Hewlett Packard		Office
Algeria	Mohammedia	Algiers	EMC Corp		
Algeria	Mohammedia	Algiers	EMC Corp		
Algeria		Algiers	NetApp Inc		Ascom Algeria, Advanced Computer Engineering,
Algeria	Mohammedia	Algiers	Xerox		Deltafog, Ice
Algeria	Mohammedia	Algiers	Ericsson LM		Office
Algeria			LG Electronics		LG Electronics Algeria SARL
Algeria			NEC		NEC Telecommunications & Information
Algeria			Fujitsu		Technologies Ltd.
Algeria	Mohammedia	Algiers	ZTE Corp		Fujitsu Technology Solutions S.a.r.l.
Algeria	Mohammedia	Algiers	Huawei		Sales Office
Angola		Luanda	IBM (International Business Machines Corp)		IBM Africa BV - Sucursal de Angola
Angola		Luanda	Xerox		Office
Angola		Luanda Sul	Ericsson LM		Office
Angola			LG Electronics		LG Electronics Angola Limitada (Limited)
Angola		Luanda	Huawei		
Benin		Cotonou	Xerox		Office
Benin		Cotonou	ZTE Corp		Sales Office
Botswana		Gaborone	Xerox		Office
Botswana		Gaborone	Ericsson LM		Office
Botswana		Gaborone	Huawei		
Burkina Faso		Ouagadougou	Xerox		Office
Burundi		Bujumbura	ZTE Corp		Sales Office
Burundi		Bujumbura	Xerox		Office
Cameroon		Douala	Xerox		Office
Cameroon		Yaounde	Cisco Systems Inc		
Cameroon		Douala	Ericsson LM		Office
Cameroon		Yaounde	ZTE Corp		Sales Office
Cameroon		Yaounde	Huawei		
Central African Republic		Bangui	Xerox		Office
Chad		N'Djamena	Xerox		Office
Chad		N'Djamena	ZTE Corp		Sales Office
Congo		Brazzaville	NetApp Inc		NEC Telecommunications & Information
Congo		Pointe Noire	NetApp Inc		Egypt Office: Lenovo Egypt
Congo		Kinshasa	Xerox		Headquarters
Congo		Batetela Kinshasa	ZTE Corp		Fujitsu Egypt
Congo		Kinshasa	Huawei		Service office
Egypt		Giza	IBM (International Business Machines Corp)		Sales Office
Egypt		Cairo	EMC Corp		Middle East & North Africa Headquarters
Egypt		Cairo	Xerox		Hitachi, Ltd., Egypt Office
Egypt		Cairo	Nokia		Toshiba El Araby Visual & Appliances Marketing
Egypt		Heligopolis	Cisco Systems Inc		Company
Egypt		Giza	Alcatel Lucent SA		Sales Office
Egypt		Cairo	Ericsson LM		Office
Egypt		Cairo	QUALCOMM Incorporated		Office
Egypt		Cairo	LG Electronics		Office
Egypt		Cairo	NEC		NEC Telecommunications & Information
Egypt		Cairo	Lenovo Group		Technologies Ltd.
Egypt		New Cairo	Fujitsu		Egypt Office: Lenovo Egypt
Egypt		Alexandria	Fujitsu		Headquarters
Egypt		Giza	Fujitsu		Fujitsu Egypt
Egypt		Cairo	ZTE Corp		Service office
Egypt		Cairo	Hitachi		Sales Office
Egypt		Cairo	Hitachi		Middle East & North Africa Headquarters
Egypt		Cairo	Hitachi		Hitachi, Ltd., Egypt Office
Egypt		Cairo	Toshiba		Toshiba El Araby Visual & Appliances Marketing
Eritrea		Asmara	ZTE Corp		Company
Gabon		Libreville	Xerox		Sales Office
Gabon		Libreville	ZTE Corp		Office
Ghana		Accra	IBM (International Business Machines Corp)		Sales Office
Ghana		Accra	Hewlett Packard		Office
Ghana		Accra	EMC Corp		Office
Ghana		Accra	Xerox		Office
Ghana		Accra	Ericsson LM		Office
Ghana		Accra	ZTE Corp		Sales Office
Ghana		Accra	Huawei		
Kenya		Nairobi	IBM (International Business Machines Corp)		IBM Kenya Office
Kenya		Nairobi	Hewlett Packard		Office
Kenya		Nairobi	EMC Corp		Office
Kenya		Mombasa	Xerox		Office
Kenya		Nairobi	Cisco Systems Inc		
Kenya		Nairobi	Blackberry		
Kenya		Nairobi	Ericsson LM		Office
Kenya		Nairobi	Intel		
Kenya		Nairobi	QUALCOMM Incorporated		LG Electronics Service Kenya Limited, Inc.
Kenya		Nairobi	NEC		NEC Nairobi
Kenya		Nairobi	Fujifilm		
Kenya		Nairobi	ZTE Corp		Sales Office
Kenya		Nairobi	Huawei		
Lesotho		Maseru	Xerox		Office
Liberia		Lagos	IBM (International Business Machines Corp)		The IBM West Africa Office
Liberia		Monrovia	Ericsson LM		Office
Liberia		Monrovia	ZTE Corp		Sales Office
Libya		Tripoli	Xerox		Office
Libya		Tripoli	Ericsson LM		Office
Libya		Tripoli	NEC		Office
Libya		Tripoli	ZTE Corp		Sales Office
Madagascar		Saint Denis Cedex	IBM (International Business Machines Corp)		
Madagascar		Isando	Xerox		Office
Madagascar		Antananarivo	ZTE Corp		Sales Office
Malawi		Antananarivo	Huawei		
Malawi		Johannesburg	IBM (International Business Machines Corp)		IBM Representative Office - Central
Malawi		Lilongwe	Xerox		Office
Malawi		Limbe	ZTE Corp		Sales Office
Mali		Bamako	Xerox		Office
Mali		Bamako	ZTE Corp		Sales Office

Source: Citi Research

Figure 1047. Africa (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Mauritius		Ebene City	IBM (International Business Machines Corp)		
Mauritius		Port Louis	Xerox		Office
Mauritius		Port Louis	ZTE Corp		Sales Office
Mayotte		Mamoudzou	Xerox		Office
Morocco		Casablanca	Amphenol		Amphenol Morocco
Morocco		Casablanca	Arrow Electronics		Office
Morocco		Casablanca	IBM (International Business Machines Corp)		IBM Maroc
Morocco		Casablanca	Hewlett Packard		Office
Morocco		Casablanca	EMC Corp		
Morocco		Casablanca	NetApp Inc		Bul Maroc, Compagnie Bureautique Informatique,
Morocco		Temara	NetApp Inc		Netcom Technologies, Uniforce Informatique
Morocco		Casablanca	Xerox		Intelcom
MOROCCO		Casablanca	Lexmark		Lexmark International Africa
Morocco		Casablanca	Cisco Systems Inc		
Morocco		Rabat	Ericsson LM		Office
Morocco		Casablanca	Juniper Networks Inc		
Morocco		Casablanca	LG Electronics		LG Electronics Morocco S.A.R.L.
Morocco	Chichaoua	Casablanca	Lenovo Group		Morocco Office: Lenovo Morocco
Morocco		Casablanca	Fujifilm		
Morocco		Casablanca	Fujitsu		Fujitsu Technology Solutions S.A
Morocco		Rabat	STMicroelectronics		Manufacturing & Design Center
Morocco		Casablanca	STMicroelectronics		Manufacturing & Design Center
Morocco		Rabat	ZTE Corp		Sales Office
Morocco		Rabat	Huawei		
Mozambique		Maputo	NetApp Inc		Satec Mocambique
Mozambique		Maputo	Xerox		Office
Mozambique		Maputo	ZTE Corp		Sales Office
Mozambique		Maputo	Huawei		
Namibia		Windhoek	IBM (International Business Machines Corp)		IBM NAMIBIA
Namibia		Windhoek	NetApp Inc		Business Connexion Namibia, Green Enterprise
Namibia		Windhoek	Xerox		Solutions Pty Ltd.
Niger		Niamey	Xerox		Office
Nigeria		Lagos	IBM (International Business Machines Corp)		The IBM West Africa
Nigeria	Ikoyi - Lagos	Lagos	Hewlett Packard		Office
Nigeria		Lagos	EMC Corp		
Nigeria		Lagos	NetApp Inc		
Nigeria		Lagos	Xerox		Office
Nigeria		Lagos	Cisco Systems Inc		
Nigeria		Lagos	Blackberry		
Nigeria	Maitama	Abuja	Alcatel Lucent SA		
Nigeria		Abuja	Alcatel Lucent SA		
Nigeria		Port Harcourt	Alcatel Lucent SA		
Nigeria		Lagos	Ericsson LM		Office
Nigeria		Lagos	Intel		
Nigeria		Lagos	QUALCOMM Incorporated		
Nigeria		Lagos	LG Electronics		LG Electronics Nigeria Limited
Nigeria		Lagos	NEC		NEC West Africa Limited
Nigeria		Lagos	ZTE Corp		Sales Office
Nigeria		Abuja	ZTE Corp		Sales Office
Nigeria		Lagos	ZTE Corp		
Nigeria		Lagos	Huawei		
Nigeria		Victoria Island	Huawei		
Nigeria		Abuja	Huawei		
Rwanda		Nairobi	IBM (International Business Machines Corp)		IBM Representative Office - IBM Central Africa
Rwanda		Kigali	NetApp Inc		MATRIX Business Solutions
Rwanda		Kigali	Xerox		Office
Rwanda		Kigali	Huawei		
Senegal		Dakar	IBM (International Business Machines Corp)		IBM Senegal Office
Senegal		Dakar	NetApp Inc		ABM Technologies SENEGAL, ATM Afrique
Senegal		Dakar	Xerox		Office
Senegal		Dakar	Cisco Systems Inc		
Senegal		Dakar	Ericsson LM		Office
Seychelles		Mahe	Xerox		Office
Sierra Leone		Lagos	IBM (International Business Machines Corp)		The IBM West Africa Office
Sierra Leone		Freetown	Xerox		Office
Sierra Leone		Freetown	ZTE Corp		Sales Office
South Africa		Sierra Leone	Amphenol		Amphenol South Africa
South Africa		Johannesburg	Sanmina		3,670 Logistics/Post-Manufacturing Repair/Warranty
South Africa		Cape Town	Arrow Electronics		Office
South Africa		Durban	Arrow Electronics		Office
South Africa		Johannesburg	Arrow Electronics		Office
South Africa		Sandton	IBM (International Business Machines Corp)		IBM South Africa
South Africa		Sandton	Hewlett Packard		Office
South Africa		Rivonia	Hewlett Packard		Office
South Africa		Johannesburg	Hewlett Packard		Office
South Africa		Cape Town	Hewlett Packard		Office
South Africa		Cape Town	EMC Corp		
South Africa		Durban	EMC Corp		
South Africa		Johannesburg	EMC Corp		
South Africa		Port Elizabeth	EMC Corp		
South Africa		Midrand	NetApp Inc		Blue Turtle, Bytes Systems Integration, Datacentrix
South Africa		Bedfordview	NetApp Inc		EOH
South Africa		Johannesburg	NetApp Inc		
South Africa		Johannesburg	NetApp Inc		
South Africa		Johannesburg	Xerox		Office
South Africa		Johannesburg	Lexmark		Contact Lexmark
South Africa		Johannesburg	Lexmark		South Africa

Source: Citi Research

Figure 1048. Africa (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
South Africa	Port Elizabeth	Corning			Office
South Africa	Von Willich Avenue	Cisco Systems Inc			
South Africa	Johannesburg	Cisco Systems Inc			
South Africa	Cape Town	Cisco Systems Inc			
South Africa	Pretoria	Cisco Systems Inc			
South Africa	Johannesburg	Blackberry			
South Africa	Johannesburg	Motorola Solutions			Corporate & Regional Office
South Africa	Cape Town	Motorola Solutions			Sales Office
South Africa	Gauteng	Motorola Solutions			
South Africa	Centurion	Alcatel Lucent SA			
South Africa	Cape Town	Alcatel Lucent SA			
South Africa	Johannesburg	Ericsson LM			Office
South Africa		F5 Networks			Office
South Africa	Johannesburg	Juniper Networks Inc			
South Africa	Pretoria	Riverbed Technology			
South Africa	Zwartkops	Tellabs, Inc.			Sales Office
South Africa	Woodmead	Intel			
South Africa	Johannesburg	QUALCOMM Incorporated			
South Africa	Pretoria	SMA Solar Technology			SMA Solar Technology South Africa Pty Limited
South Africa	Cape Town	SolarWorld AG			SOLARWORLD AFRICA PTY. LTD.
South Africa	Johannesburg	LG Electronics			LG Electronics S.A. (Pty) Ltd
South Africa	Sandton	Acer Inc			Acer Africa (Pty) Ltd.
South Africa	Johannesburg	Acer Inc			Tech Support
South Africa	Johannesburg	ASUSTeK COMPUTER INC			Asustek Computers (Pty) Ltd
South Africa		NEC			NEC Africa (Pty) Ltd.
South Africa	Johannesburg	NEC			NEC Display Solutions South Africa
South Africa	Johannesburg	Lenovo Group			Lenovo South Africa
South Africa	Cape Town	First Solar Inc			Office
South Africa		Yingli Green Energy			Office
South Africa	Cape Town	SunPower Corporation			KYOCERA Document Solutions South Africa (Pty) Ltd.
South Africa	Midrand	Kyocera			
South Africa		Canon			All product segments (with some exceptions)
South Africa	Johannesburg	Hoya Corporation			HOYA HILL OPTICS SOUTH AFRICA (PTY) LTD.
South Africa		Nikon			
South Africa	Gauteng	Ricoh Co			Sales & Services - Ricoh South Africa (Pty) Ltd.
South Africa		Seiko Epson			Epson Europe B.V. South Africa Office
South Africa	Johannesburg	Fujifilm			
South Africa		Fujitsu			Fujitsu Technology Solutions Ltd.
South Africa		Brocade Communications			
South Africa	Johannesburg	STMicroelectronics			Sales Office & Representative
South Africa	Johannesburg	ZTE Corp			Sales Office

Source: Citi Research

Figure 1049. Africa (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
South Africa	Johannesburg	Huawei			South Africa Headquarters
South Africa	Fourways	Molex			
South Africa	Sandton	Hitachi			Hitachi Europe Ltd. - Johannesburg Representative Office
South Africa	Dunswart	Hitachi			Hitachi Construction Machinery Southern Africa Sales Facilities
South Africa	Pretoria	Brother Industries Ltd			Office
Swaziland	Mbabane	Xerox			Office
Tanzania	Dar es Salaam	IBM (International Business Machines Corp)			IBM Tanzania Office
Tanzania	Dar es Salaam	NetApp Inc			Double Click Consulting Ltd, Sihebs Technologies Ltd.
Tanzania	Dar es Salaam	Xerox			Office
Tanzania	Dar es Salaam	ZTE Corp			Sales Office
Tanzania	Dar es Salaam	Huawei			
Togo	Lome	Xerox			Office
Togo	Lome	ZTE Corp			Sales Office
Tunisia	El Fahs	Amphenol			Amphenol Tunisia SARL
Tunisia	El Fahs	Amphenol			Filec-Lectric SARL
Tunisia	Tunis	IBM (International Business Machines Corp)			Immeuble IBM
Tunisia	Ariana	Hewlett Packard			Office
Tunisia	Tunis	NetApp Inc			One TECH Business Solutions
Tunisia	Tunis	NetApp Inc			Antenna Consulting, Athena Suarl
Tunisia	Tunis	Xerox			Office
Tunisia	Tunis	Ericsson LM			Office
Tunisia	Tunis	Fujitsu			Fujitsu Technology Solutions S.a.r.l.
Tunisia	Tunis	Huawei			
Tunisia	Tunis	Huawei			
Uganda		Nairobi	IBM (International Business Machines Corp)		IBM Representative Office - IBM Central Africa
Uganda	Buganda	Kampala	NetApp Inc		Office
Uganda	Kampala	Xerox			Office
Uganda	Kampala	Ericsson LM			Office
Uganda	Kampala	ZTE Corp			Sales Office
Uganda	Kampala	Huawei			
Zambia	Lusaka	NetApp Inc			Netone Information Technology
Zambia	Lusaka	Xerox			Office
Zambia	Lusaka	Ericsson LM			Office
Zambia	Lusaka	ZTE Corp			Sales Office
Zambia	Lusaka	Huawei			
Zimbabwe	Harare	NetApp Inc			Axis Solutions, Realtime
Zimbabwe	Harare	Xerox			Office
Zimbabwe	Harare	Ericsson LM			Office
Zimbabwe	Harare	ZTE Corp			Sales Office
Zimbabwe	Harare	Huawei			

Source: Citi Research

Figure 1050. Other Countries/Regions

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Antigua	St. Johns		Xerox		Office
Antigua	St. Johns		Xerox		Office
British Virgin Islands			Vanguard International Semiconductor		IC Business Investment
Brunei	Jalan Berakas	Ericsson LM			Office
Cote d'Ivoire	Abidjan	IBM (International Business Machines Corp)			IBM Cote d'Ivoire office
Cote d'Ivoire	Abidjan	Xerox			Office
Cote d'Ivoire	Abidjan	ZTE Corp			Sales Office
Cote d'Ivoire	Abidjan	Huawei			
Curacao	Willemstad	IBM (International Business Machines Corp)			IBM World Trade Corporation
French Guiana	Cayenne	IBM (International Business Machines Corp)			IBM
French Polynesia	Papeete	IBM (International Business Machines Corp)			L'agence IBM de Tahiti
Gambia	Banjul	Xerox			Office
Guadeloupe		IBM (International Business Machines Corp)			Office
Ishoej	Oslo	Brother Industries Ltd			Sales Facilities
Kyrgyzstan	Bishkek	ZTE Corp			Sales Office
Kyrgyzstan	Bishkek	Huawei			
Laos	Vientiane	ZTE Corp			Sales Office
Laos	Vientiane	Huawei			
Macedonia	Skopje	IBM (International Business Machines Corp)			

Source: Citi Research

Figure 1051. Other Countries/Regions (Continued)

Country	State	City	Company Name	Size (sq ft)	Description Comments (manufacturing, office)
Macedonia	Skopje	EMC Corp			
Macedonia	Skopje	Ericsson LM			Office
Mauriti	Ebene City	Huawei			
New Caledonia	Noumea	IBM (International Business Machines Corp)			L'agence IBM de Nouvelle-Calédonie
Republica Dominicana	Santo Domingo	Ricoh Co			Sales & Services - Ricoh Dominicana, S.A.
Reunion	Saint Denis Cedex	IBM (International Business Machines Corp)			
Saint Kitts	Basseterre	IBM (International Business Machines Corp)			IBM Business Partners
Saint Kitts	Basseterre	Xerox			Office
Saint Lucia	Castries	IBM (International Business Machines Corp)			IBM Business Partners
Saint Lucia	Castries	Xerox			Office
Saint Vincent and the Grenadines	Kingstown	Xerox			Office
South Sudan	Juba	Huawei			
Trinidad and Tobago	Port of Spain	IBM (International Business Machines Corp)			IBM World Trade Corporation
Trinidad and Tobago	Port of Spain	Xerox			Office
Trinidad and Tobago	Port of Spain	Xerox			Office
Trinidad and Tobago	St. Clair	Ericsson LM			Office
Trinidad and Tobago		Fujitsu			Branch
Vrexham	Ruabon	Brother Industries Ltd			Production Facilities
Yemen	Sana'a	Xerox			Office
Yemen	Sana	Huawei			

Source: Citi Research

## Citi Global Eye on Tech

The following tables are taken from the most recent version of Citi Global Eye on Tech. This is an internally developed model and provides price performance, comparable valuations and fundamental metrics for all technology stocks under Citi's global coverage.

The following tables segment technology stocks by:

- Sector (Consumer Electronics, Hardware, Infrastructure/Service Providers, Internet, IT Services, Imaging, Semiconductors, Software, Technology – General, and Telecommunications Equipment);
- Geography (Asia, Japan, Latin America, North America, Europe, Australia/New Zealand and CEEMEA); and
- Company within geography and sector by the following metrics: a. Price Performance b. Valuation c. Growth Rates and Ratios.

This product is updated every Monday morning. If you wish to receive weekly updates, send us an email at [jim.suva@citi.com](mailto:jim.suva@citi.com) to be added to our distribution list.

Figure 1052. Sector Performance for Consumer Electronic Stocks

	Company Name	Reuters Code	B'berg Code	Market Cap (\$M)	Citi Rating	Local CCY	3-Apr-14 Price	Dividend Yield (%)	Target Price	ETR (%)	Performance (%)					52 Weeks		Analyst Name
											1 Wk	1 Mo	3 Mo	12 Mo	YTD	High	Low	
Consumer Electronics																		
Asia	Hon Hai Precision	2317.TW	2317 TT	37359	1	TWD	86.20	2.2	112.00	31.8	(0.1)	3.7	8.6	14.1	7.6	87.00	62.55	Wei Chen
	LG Electronics	066570.KS	066570 KS	10348	2	KRW	65,600	0.3	72,000	10.1	2.5	7.2	(0.8)	(18.0)	(3.7)	91,800	58,800	Henry H Kim, CFA
	VTech Holdings	0303.HK	303 HK	3396	1	HKD	103.90	6.4	111.00	13.3	5.4	18.9	1.0	4.3	3.2	122.90	86.50	Eric Lau
Japan	Casio Computer	6952.T	6952 JP	3195	2	JPY	1,236	1.6	1,190	(2.1)	4.6	8.8	(4.0)	70.2	(4.0)	1,296	731	Kota Ezawa
	Fujitsu General	6755.T	6755 JP	1079	1	JPY	1,033	1.1	1,470	43.5	11.1	1.8	(7.9)	36.3	(7.9)	1,236	742	Tsubasa Sasaki
	Funai Electric	6839.T	6839 JP	336	2	JPY	1,028	3.4	1,160	16.2	2.1	(8.3)	(24.9)	(8.4)	(24.9)	1,431	935	Kota Ezawa
	Panasonic	6752.T	6752 JP	27114	3	JPY	1,223	0.8	1,100	(9.2)	2.7	(4.5)	(0.1)	100.5	(0.1)	1,408	594	Kota Ezawa
	Pioneer	6773.T	6773 JP	799	2	JPY	226.00	0.0	240.00	6.2	4.6	1.3	2.7	32.2	2.7	313.00	146.00	Kota Ezawa
	Sharp	6753.T	6753 JP	5369	3	JPY	326.00	0.0	210.00	(35.6)	6.5	2.8	(2.4)	32.5	(2.4)	633	242.00	Kota Ezawa
	Sony	6758.T	6758 JP	19910	1	JPY	1,991	1.3	2,100	6.7	5.8	13.1	9.0	26.8	9.0	2,413	1,497	Kota Ezawa
North America	Ingram Micro Inc	IM.N	IM US	4507	2	USD	29.16	0.0	28.00	(4.0)	2.2	0.2	24.6	53.6	24.3	30.14	16.97	Jim Suva, CPA
	Synnex Corp	SNX.N	SNX US	2440	1	USD	62.42	0.0	85.00	36.2	6.1	8.4	(2.2)	77.7	(7.4)	68.64	32.04	Jim Suva, CPA
	Tech Data Corp	TECD.O	TECD US	2362	2	USD	62.05	0.0	60.00	(3.3)	8.2	10.0	21.9	37.5	20.3	62.80	43.02	Jim Suva, CPA

Source: Citi Research



Figure 1053. Sector Performance for Hardware Stocks

	Company Name	Reuters Code	B'berg Code	Market Cap (\$M)	Citi Rating	Local CCY	3-Apr-14 Price	Dividend Yield (%)	Target Price	ETR (%)	Performance (%)					52 Weeks		Analyst Name
											1 Wk	1 Mo	3 Mo	12 Mo	YTD	High	Low	
Hardware																		
Asia	Acer	2353.TW	2353 TT	1712	3	TWD	18.30	0.0	13.00	(29.0)	2.8	1.9	2.8	(29.2)	0.0	25.65	14.80	Wei Chen
	ASUSTeK Computer	2357.TW	2357 TT	7442	3	TWD	303.50	5.2	225.00	(20.7)	3.2	5.2	12.4	(13.2)	13.2	358.50	204.00	Wei Chen
	Catcher Technology	2474.TW	2474 TT	5675	1H	TWD	229.00	3.3	279.00	25.0	3.2	2.9	17.4	59.0	18.3	229.00	129.00	Wei Chen
	Cheil Industries	001300.KS	001300 KS	3385	1	KRW	68,000	1.1	100,000	48.2	(0.7)	(1.4)	(19.6)	(26.5)	(23.2)	98,900	62,500	Henry H Kim, CFA
	Chicony Electronics	2385.TW	2385 TT	1786	1	TWD	78.80	6.6	88.00	17.5	2.3	(0.3)	2.6	(1.1)	5.2	86.34	67.50	Wei Chen
	Compal Electronics	2324.TW	2324 TT	3205	1	TWD	22.00	6.6	25.00	16.2	7.3	7.3	(1.6)	3.8	(3.7)	24.20	16.05	Wei Chen
	Delta Electronics	2308.TW	2308 TT	14886	1	TWD	185.00	3.9	196.00	9.1	2.2	10.8	11.4	41.8	8.8	191.00	121.50	Wei Chen
	Flexium Interconnect	6269.TW	6269 TT	610	1	TWD	91.80	2.5	122.00	35.0	(0.3)	0.5	(6.5)	(1.9)	(4.4)	121.00	82.98	Roland Shu
	Flextronics International Ltd	FLEX.O	FLEX US	5675	2	USD	9.42	0.0	9.50	0.8	3.6	5.0	22.2	41.4	21.2	9.71	6.60	Jim Suva, CPA
	Foxconn Technology	2354.TW	2354 TT	3101	3	TWD	71.90	1.1	65.00	(8.5)	2.0	6.2	3.5	(7.9)	3.3	79.05	64.00	Wei Chen
	Ju Teng	3336.HK	3336 HK	846	1H	HKD	5.73	3.3	7.90	40.5	5.1	(4.3)	9.1	23.5	11.7	6.47	3.10	Wei Chen
	Kingboard Laminates Holdings	1888.HK	1888 HK	1160	1	HKD	2.98	6.3	4.00	40.6	6.8	2.8	(6.3)	(11.8)	(9.4)	3.64	2.61	Eric Lau
	Kinsus Interconnect Technology	3189.TW	3189 TT	1649	2	TWD	112.00	3.4	109.00	0.4	(0.4)	10.9	13.4	20.8	13.2	118.50	89.90	Roland Shu
	Largan Precision	3008.TW	3008 TT	6687		TWD	1,510	2.2			5.2	9.4	24.3	94.1	24.3	1,555	681	
	Lenovo Group	0992.HK	992 HK	11953	3	HKD	9.00	2.7	7.00	(19.6)	7.3	7.4	(3.1)	18.0	(4.6)	11.28	6.45	Wei Chen
	LG Innotek	011070.KS	011070 KS	2088	3	KRW	103,500	0.0	73,000	(29.5)	4.4	15.6	23.8	20.8	23.7	109,000	74,200	Henry H Kim, CFA
	Pegatron	4938.TW	4938 TT	3548	1	TWD	46.40	5.8	48.00	8.3	7.2	13.7	22.1	1.3	20.8	55.40	33.85	Wei Chen
	Quanta Computer	2382.TW	2382 TT	10468	3	TWD	82.10	4.0	63.00	(19.4)	(6.2)	10.9	21.1	27.3	18.1	88.60	56.40	Wei Chen
	Samsung Electro-Mechanics	009150.KS	009150 KS	4822	2	KRW	67,000	1.1	76,000	14.6	(1.8)	(3.5)	(3.6)	(32.3)	(8.2)	101,000	62,000	Henry H Kim, CFA
	Samsung SDI	006400.KS	006400 KS	6761	2	KRW	155,500	1.0	170,000	10.3	2.6	3.3	1.3	13.9	(4.0)	200,000	120,500	Henry H Kim, CFA
	Samsung Techwin	012450.KS	012450 KS	2898	1	KRW	57,900	0.9	73,000	26.9	2.5	9.7	8.0	(11.5)	6.4	71,000	50,500	Henry H Kim, CFA
	Simplo Technology	6121.TWO	6121 TT	1486	3	TWD	146.00	4.0	105.00	(23.9)	0.0	9.0	9.8	6.2	10.6	153.00	119.00	Wei Chen
	Tripod Technology	3044.TW	3044 TT	1034	1	TWD	59.60	4.4	66.00	14.5	2.1	3.1	9.4	(9.0)	11.6	74.10	45.15	Roland Shu
	Unimicron	3037.TW	3037 TT	1239	2	TWD	24.40	2.2	22.50	(6.3)	1.7	13.0	9.2	(20.9)	8.0	33.30	19.75	Roland Shu
	Venture	VENM.SI	VMS SP	1648	2	SGD	7.53	7.3	7.40	5.6	1.3	0.0	(1.7)	(12.4)	(2.0)	8.63	7.06	Patrick Yau, CFA
	Wistron	3231.TW	3231 TT	1990	3	TWD	25.35	4.5	21.00	(12.0)	2.4	1.8	2.8	(19.7)	1.2	32.10	24.20	Wei Chen
	Zhen Ding Technology	4958.TW	4958 TT	1951	1	TWD	80.00	3.9	101.00	30.0	3.0	9.9	9.9	16.5	11.4	81.20	61.24	Roland Shu
	ZTE	0763.HK	763 HK	6984	1	HKD	15.92	0.5	20.00	26.1	7.1	(2.9)	(0.4)	29.0	3.4	18.34	10.84	Bin Liu
CEEMEA	Stratasys Ltd	SSYS.O	SSYS US	5527	1	USD	112.32	0.0	135.00	20.2	7.9	(9.4)	(17.7)	60.4	(16.6)	138.10	67.92	Kenneth Wong, CFA
Europe	Alcatel-Lucent	ALUA.PA	ALU FP	11679	1	EUR	3.04	0.0	5.00	64.7	7.9	(0.2)	(8.6)	212.1	(6.8)	3.45	0.94	Ehud Gelblum, Ph.D
	EI Towers SpA	EIT.MI	EIT IM	1569	2	EUR	42.65	0.0	na	na	(1.5)	8.5	25.6	83.0	27.5	44.19	22.35	Nicolo' Rolando
	Ericsson LM	ERICB.ST	ERICB SS	43922	2	SEK	87.15	3.4	85.00	0.7	1.9	7.1	12.7	8.5	11.0	90.95	72.40	Ehud Gelblum, Ph.D
	Garmin, Ltd.	GRMN.O	GRMN US	11241	1	USD	57.35	3.3	65.00	16.7	2.4	7.0	23.1	71.6	24.2	58.21	32.52	Jeremy David, CFA
	Nokia Oyj	NOK1V.HE	NOK1V FI	28748	1	EUR	5.60	0.0	7.00	25.1	5.9	2.5	(5.3)	119.6	(3.9)	6.11	2.30	Ehud Gelblum, Ph.D
	Seagate Technology	STX.O	STX US	18867	1	USD	57.39	2.9	62.00	11.0	4.7	9.8	1.0	59.2	2.2	62.76	33.22	Joe Yoo
	Sensata Technologies Holding	ST.N	ST US	7519	2	USD	43.73	0.0	41.00	(6.2)	3.6	8.9	14.6	36.4	12.8	43.83	30.80	Jim Suva, CPA
	Spirent Communications Plc	SPT.L	SPT LN	994	1	GBP	0.97	2.4	1.22	27.6	(4.5)	(4.7)	(5.2)	(34.4)	(6.1)	1.59	0.81	Hugo Mills
	TE Connectivity Ltd.	TEL.N	TEL US	25228	1	USD	61.45	1.6	72.00	18.8	4.0	5.5	12.8	48.7	11.5	62.00	38.75	Jim Suva, CPA
	Voxeljet AG	VJET.N	VJET US	421	2H	USD	25.38	0.0	30.00	18.2	(1.1)	(30.3)	(45.7)	na	(35.7)	70.00	19.30	Kenneth Wong, CFA

Source: Citi Research

Figure 1054. Sector Performance for Hardware Stocks (Continued)

	Company Name	Reuters Code	B'berg Code	Market Cap (\$M)	Citi Rating	Local CCY	3-Apr-14 Price	Dividend Yield (%)	Target Price	ETR (%)	Performance (%)					52 Weeks		Analyst Name
											1 Wk	1 Mo	3 Mo	12 Mo	YTD	High	Low	
Hardware																		
Japan																		
	Alps Electric	6770.T	6770 JP	2082	3	JPY	1,210	0.8	1,200	0.0	(0.8)	(3.9)	1.3	109.7	1.3	1,441	544	Yuta Fukasawa
	Brother Industries	6448.T	6448 JP	3746	1	JPY	1,473	1.6	1,600	10.3	6.1	3.1	2.5	62.2	2.5	1,545	892	Masahiro Shibano
	Canon	7751.T	7751 JP	34767	2	JPY	3,220	4.0	3,400	9.6	2.5	3.9	(3.3)	(1.5)	(3.3)	4,115	2,889	Masahiro Shibano
	Dainippon Screen Mfg	7735.T	7735 JP	1176	2	JPY	509	0.6	580	14.5	6.0	(2.3)	(14.6)	20.3	(14.6)	675	411.00	Masahiro Shibano
	Fujifilm Holdings	4901.T	4901 JP	13255	1	JPY	2,872	1.7	3,300	16.6	3.9	1.6	(3.7)	61.5	(3.7)	3,172	1,773	Masahiro Shibano
	Fujitsu	6702.T	6702 JP	12245	2	JPY	627	0.8	620	(0.3)	2.1	1.5	15.3	62.0	15.3	655	350.00	Kota Ezawa
	GS Yuasa	6674.T	6674 JP	2284	1	JPY	572	1.4	730	29.0	5.1	(0.5)	(5.5)	50.5	(5.5)	657	362.00	Tsubasa Sasaki
	Hirose Electric	6806.T	6806 JP	4811	1	JPY	14,620	1.4	19,000	31.3	3.0	2.6	(2.4)	18.3	(2.4)	16,270	12,040	Yuta Fukasawa
	Hitachi	6501.T	6501 JP	36390	1	JPY	781	1.5	940	21.9	4.4	(0.8)	(1.9)	47.4	(1.9)	877	508	Kota Ezawa
	Hosiden	6804.T	6804 JP	314	2	JPY	502	2.0	600	21.5	(0.8)	2.2	(11.6)	0.6	(11.6)	655	468.00	Yuta Fukasawa
	Hoya	7741.T	7741 JP	13178	3	JPY	3,217	2.0	2,400	(23.4)	(1.9)	8.6	10.1	83.5	10.1	3,287	1,715	Masahiro Shibano
	Ibiden	4062.T	4062 JP	2708	1	JPY	2,056	1.5	2,500	23.1	1.3	5.2	4.6	48.4	4.6	2,142	1,320	Yuta Fukasawa
	Konica Minolta	4902.T	4902 JP	4971	1	JPY	985	1.8	1,200	23.6	3.2	(2.2)	(6.1)	53.9	(6.1)	1,140	639	Masahiro Shibano
	Kyocera	6971.T	6971 JP	16680	2	JPY	4,737	2.5	5,000	8.1	2.9	1.8	(9.8)	10.3	(9.8)	5,880	4,175	Yuta Fukasawa
	Mabuchi Motor	6592.T	6592 JP	2250	2	JPY	6,770	2.1	7,200	8.4	2.3	(0.3)	8.3	39.3	8.3	7,180	4,555	Yuta Fukasawa
	Mitsubishi Electric	6503.T	6503 JP	25017	1	JPY	1,220	1.2	1,400	15.8	7.3	3.4	(7.6)	66.0	(7.6)	1,350	720	Kota Ezawa
	Mitsumi Electric	6767.T	6767 JP	595	2	JPY	714	0.7	850	19.7	(2.3)	(7.9)	(18.6)	40.6	(18.6)	968	491.00	Yuta Fukasawa
	Murata	6981.T	6981 JP	19632	2	JPY	9,698	1.3	10,000	4.5	(0.6)	3.2	3.8	45.2	3.8	10,485	6,510	Yuta Fukasawa
	NEC	6701.T	6701 JP	8125	1	JPY	317.00	1.2	350.00	11.7	0.0	(3.9)	33.8	29.4	33.8	355.00	201.00	Kota Ezawa
	NGK Spark Plug	5334.T	5334 JP	5078	2	JPY	2,437	1.1	2,450	1.6	9.6	8.8	(2.1)	77.8	(2.1)	2,643	1,335	Manabu Hagiwara
	Nidec	6594.T	6594 JP	16523	1	JPY	6,369	0.8	7,100	12.3	4.1	5.0	23.7	136.3	23.7	6,487	2,635	Yuta Fukasawa
	Nikon	7731.T	7731 JP	6412	2	JPY	1,668	1.9	1,800	9.8	1.1	(9.0)	(17.0)	(21.7)	(17.0)	2,971	1,605	Masahiro Shibano
	Olympus	7733.T	7733 JP	10802	1	JPY	3,290	0.0	3,600	9.4	(4.2)	(3.9)	(1.2)	53.5	(1.2)	3,570	2,046	Masahiro Shibano
	Ricoh	7752.T	7752 JP	8301	1	JPY	1,192	2.8	1,400	20.2	3.2	(4.0)	6.6	22.5	6.6	1,422	952	Masahiro Shibano
	Rohm	6963.T	6963 JP	5031	2	JPY	4,820	0.8	5,400	12.9	5.9	(5.7)	(5.9)	54.5	(5.9)	5,540	3,080	Yuta Fukasawa
	Seiko Epson	6724.T	6724 JP	5672	2	JPY	3,285	1.5	3,400	5.0	6.0	10.9	16.3	291.1	16.3	3,390	795	Masahiro Shibano
	Shinko Electric Industries	6967.T	6967 JP	966	1	JPY	746	2.7	1,100	50.1	1.5	0.5	(14.4)	2.9	(14.4)	1,299	698	Yuta Fukasawa
	Taiyo Yuden	6976.T	6976 JP	1445	2	JPY	1,279	0.8	1,300	2.4	0.1	3.5	(6.7)	14.4	(6.7)	1,910	1,063	Yuta Fukasawa
	Tamron Co Ltd	7740.T	7740 JP	645	2	JPY	2,464	2.0	2,500	3.5	2.2	(2.7)	(3.4)	22.6	(3.4)	2,962	1,870	Masahiro Shibano
	TDK	6762.T	6762 JP	5375	2	JPY	4,450	1.6	4,600	4.9	2.3	2.2	(11.7)	38.8	(11.7)	5,360	3,095	Yuta Fukasawa
	Tokyo Electron	8035.T	8035 JP	11425	2	JPY	6,662	0.8	5,800	(12.2)	4.6	14.7	15.7	60.9	15.7	6,688	3,980	Masahiro Shibano
	Toshiba	6502.T	6502 JP	18051	1	JPY	440.00	1.8	520	20.0	2.3	(0.9)	(0.5)	(5.4)	(0.5)	565	375.00	Kota Ezawa
North America																		
	3D Systems	DDD.N	DDD US	5827	1	USD	56.46	0.0	90.00	59.4	(3.6)	(24.6)	(41.4)	83.0	(39.2)	97.25	30.08	Kenneth Wong, CFA
	Amphenol Corp	APH.N	APH US	14830	1	USD	93.74	0.9	105.00	12.9	3.3	6.8	6.5	27.9	5.1	94.19	71.18	Jim Suva, CPA
	Apple, Inc.	AAPL.O	AAPL US	480595	2	USD	539	2.4	560	6.2	0.2	2.1	(0.4)	24.7	(4.0)	575	385.10	Glen Yeung
	Arrow Electronics Inc	ARW.N	ARW US	6010	1	USD	60.12	0.0	70.00	16.4	5.5	9.2	14.1	55.0	10.8	61.16	36.13	Jim Suva, CPA
	Avnet Inc	AVT.N	AVT US	6529	1	USD	47.20	0.6	52.00	11.4	4.6	10.4	10.6	37.6	7.0	47.69	31.03	Jim Suva, CPA
	AVX Corp	AVX.N	AVX US	2362	2	USD	14.04	2.5	14.00	2.2	9.8	10.0	2.6	20.2	0.8	14.15	11.11	Jim Suva, CPA
	Benchmark Electronics Inc	BHE.N	BHE US	1253	3	USD	23.20	0.0	20.00	(13.8)	2.7	(1.8)	1.8	34.3	0.5	24.57	16.08	Jim Suva, CPA
	BlackBerry	BBRY.O	BBRY US	4328	3H	USD	8.22	0.0	8.00	(2.7)	(9.2)	(20.7)	8.0	(45.3)	10.5	16.59	5.44	Ehud Gelblum, Ph.D
	Brocade Communications Syst	BRCD.O	BRCD US	4644	3	USD	10.67	0.0	8.00	(25.0)	5.2	11.1	20.4	93.6	20.4	10.96	5.14	Kimberly Watkins, CFA
	Celestica Inc	CLS.N	CLS US	2529	3	USD	11.05	0.0	9.00	(18.6)	5.7	13.4	5.7	35.7	6.3	11.49	7.60	Jim Suva, CPA
	Ciena Corporation	CIEN.K	CIEN US	2445	2	USD	23.28	0.0	25.00	7.4	3.8	(5.1)	(0.8)	51.6	(2.7)	27.94	14.14	Ehud Gelblum, Ph.D
	Cisco Systems, Inc.	CSCO.O	CSCO US	118943	3	USD	23.09	3.1	18.00	(18.7)	4.9	7.0	5.1	8.9	2.9	26.49	19.98	Ehud Gelblum, Ph.D
	Corning Incorporated	GLW.N	GLW US	30028	2	USD	21.59	1.9	17.00	(19.4)	5.5	13.4	20.7	61.8	21.2	21.76	12.64	Ehud Gelblum, Ph.D
	Electronics for Imaging Inc	EFII.O	EFII US	2063	2	USD	43.92	0.0	41.00	(6.6)	3.1	(1.0)	14.0	79.7	13.4	47.75	23.82	Jim Suva, CPA
	EMC Corp	EMC.N	EMC US	56544	2	USD	27.89	0.0	28.00	1.8	1.8	6.6	11.2	18.2	10.9	28.25	21.45	Jim Suva, CPA
	F5 Networks, Inc.	FFIV.O	FFIV US	7242	1	USD	106.97	0.0	120.00	12.2	0.6	(3.8)	21.5	18.2	17.7	116.71	67.53	Ehud Gelblum, Ph.D
	Hewlett-Packard Co	HPQ.N	HPQ US	62539	1	USD	33.00	1.9	40.00	23.0	3.4	11.0	16.4	50.6	17.9	33.66	19.07	Jim Suva, CPA
	Infoblox Inc.	BLOX.N	BLOX US	1079	2H	USD	20.03	0.0	25.00	24.8	3.1	(11.2)	(41.4)	(4.7)	(39.3)	48.91	17.10	Jeremy David, CFA
	International Business Machine	IBM.N	IBM US	200656	1	USD	192.69	1.8	235.00	23.5	1.5	4.6	3.2	(9.4)	2.7	213.09	172.34	Jim Suva, CPA
	Jabil Circuit Inc	JBL.N	JBL US	3821	3	USD	18.53	1.8	15.00	(17.3)	5.1	1.2	7.8	1.8	6.3	24.32	15.31	Jim Suva, CPA
	Juniper Networks, Inc	JNPR.N	JNPR US	13430	2	USD	26.80	0.7	28.00	4.5	5.8	1.2	17.7	46.7	18.7	28.75	15.62	Ehud Gelblum, Ph.D
	Lexmark International Inc	LXK.N	LXK US	2958	3	USD	47.59	2.9	34.00	(26.0)	5.5	14.2	34.4	80.4	34.0	47.97	24.68	Jim Suva, CPA
	Motorola Solutions Inc	MSI.N	MSI US	16538	1	USD	65.09	1.9	75.00	17.1	1.1	(1.3)	(1.7)	3.6	(3.6)	67.69	53.50	Ehud Gelblum, Ph.D
	NetApp Inc	NTAP.O	NTAP US	12429	2	USD	37.52	1.6	43.00	16.2	3.5	(7.4)	(7.0)	8.9	(8.8)	45.96	32.75	Jim Suva, CPA
	Plexus Corp	PLXS.O	PLXS US	1396	2	USD	41.15	0.0	47.00	14.2	5.2	0.3	(3.8)	68.7	(4.9)	44.16	23.89	Jim Suva, CPA
	Polycom, Inc.	PLCM.O	PLCM US	1904	1	USD	13.91	0.0	16.00	15.0	5.0	5.9	20.3	28.6	23.9	14.06	9.36	Kimberly Watkins, CFA
	Riverbed Technology, Inc.	RVBD.O	RVBD US	3225	1	USD	20.16	0.0	23.00	14.1	4.7	(7.4)	12.5	35.0	11.5	22.76	13.77	Kimberly Watkins, CFA
	Sanmina-SCI Corporation	SANM.O	SANM US	1477	2H	USD	17.84	0.0	17.00	(4.7)	3.3	4.9	7.6	64.9	6.8	18.44	10.18	Jim Suva, CPA
	Vishay Intertechnology Inc	VSH.N	VSH US	2257	2	USD	15.31	0.0	15.00	(0.5)	6.1	9.3	15.5	20.6	15.5	15.44	11.54	Jim Suva, CPA
	Western Digital Corp	WDC.O	WDC US	22081	1	USD	93.46	1.2	100.00	8.3	4.2	6.3	12.2	84.7	11.4	94.56	48.78	Joe Yoo
	Xerox Corp	XRX.N	XRX US	13947	1	USD	11.77	2.1	13.00	12.6	7.9	8.3	(1.8)	37.5	(3.3)	12.65	8.11	Jim Suva, CPA

Source: Citi Research

Figure 1055. Sector Performance for Internet Stocks

	Company Name	Reuters Code	B'berg Code	Market Cap (\$M)	Citi Rating	Local CCY	3-Apr-14 Price	Dividend Yield (%)	Target Price	ETR (%)	Performance (%)					52 Weeks		Analyst Name
											1 Wk	1 Mo	3 Mo	12 Mo	YTD	High	Low	
Internet																		
Asia	58.com	WUBA.N	WUBA US	3444	1H	USD	42.29	0.0	59.60	40.9	8.0	(16.4)	15.2	na	10.3	58.87	21.15	Ravi Sarathy
	Autohome	ATHM.N	ATHM US	4047	2H	USD	38.49	0.0	55.40	43.9	5.1	(7.0)	15.8	na	5.2	51.80	26.52	Gregory Zhao
	Baidu.com	BIDU.O	BIDU US	55155	1	USD	157.45	0.0	215.00	36.6	4.3	(7.2)	(10.2)	83.2	(11.5)	189.34	82.98	Ravi Sarathy
	Bitauto Holdings	BITA.N	BITA US	1611	1H	USD	37.11	0.0	62.60	68.7	11.7	(6.3)	21.0	271.1	16.1	46.93	9.56	Gregory Zhao
	Daum Communications	035720.KQ	035720 KS	972	2	KRW	76,900	1.6	81,000	6.9	(0.6)	10.8	(9.0)	(14.5)	(8.5)	95,900	68,400	Irene Cho
	Info Edge	INED.BO	INFOE IN	1107	1	INR	602	0.2	690	14.7	(4.6)	(2.6)	30.0	66.5	30.1	707	285.00	Gaurav Malhotra, CFA
	Jiayuan.com International	DATE.O	DATE US	205	2	USD	6.39	0.0	na	na	(0.9)	(14.9)	6.7	23.6	6.5	9.48	4.88	Ravi Sarathy
	Just Dial	JUST.BO	JUST IN	1845	2	INR	1,595	0.0	1,350	(15.4)	(1.1)	7.9	(3.2)	na	10.8	1,774	589	Gaurav Malhotra, CFA
	Naver Corp	035420.KS	035420 KS	24613	2	KRW	803,000	0.1	800,000	(0.3)	3.9	(1.2)	14.9	127.9	10.9	880,000	322,365	Irene Cho
	NCsoft	036570.KS	036570 KS	4580	3	KRW	224,500	0.4	150,000	(32.8)	0.9	15.7	(5.3)	44.4	(9.7)	253,000	138,500	Irene Cho
	Qihoo 360 Technology	QIHU.N	QIHU US	11409	1	USD	92.93	0.0	160.00	72.2	(0.2)	(14.8)	16.5	223.8	13.3	124.17	28.11	Bin Liu
	Sina	SINA.O	SINA US	3960	1	USD	59.32	0.0	104.00	75.3	(1.0)	(11.8)	(28.3)	18.0	(29.6)	92.83	45.54	Ravi Sarathy
	Sky-mobi	MOBI.O	MOBI US	261	1H	USD	8.82	0.0	7.50	(15.0)	4.3	29.3	117.8	392.5	137.1	12.69	1.54	Bin Liu
	Soufun Holdings	SFUN.N	SFUN US	5706	1	USD	69.78	0.0	97.20	39.3	5.6	(11.8)	(15.2)	215.2	(15.3)	99.71	20.58	Ravi Sarathy
	Tencent Holdings	0700.HK	700 HK	126179	1	HKD	547	0.3	480.00	(12.0)	4.8	(9.2)	10.6	125.1	10.5	646	237.00	Ravi Sarathy
	YY	YY.O	YY US	4077	1H	USD	73.56	0.0	63.00	(14.4)	3.6	(3.1)	26.8	347.2	46.3	90.93	15.52	Ravi Sarathy
Australia/NZ	Carsales.com Ltd	CRZ.AX	CRZ AU	2377	1	AUD	10.88	3.1	12.40	17.1	1.4	3.5	6.4	20.9	6.8	12.61	8.45	Justin Diddams
	SEEK Ltd	SEK.AX	SEK AU	5392	2	AUD	17.42	1.8	15.45	(9.1)	1.0	3.4	33.1	69.8	29.9	18.54	8.55	Justin Diddams
CEEMEA	Mail Ru Group	MAILRq.L	MAIL LI	7206	1	USD	35.35	0.0	44.00	32.4	4.6	(3.7)	(17.6)	27.7	(20.7)	44.86	24.15	Brady Martin, CFA
Europe	Moneysupermarket	MONY.L	MONY LN	1682	1	GBP	1.86	4.3	2.20	21.9	(0.5)	3.3	0.6	(0.8)	3.0	2.14	1.41	Hugo Mills
	Rightmove	RMV.L	RMV LN	4338	1	GBP	26.10	1.3	36.50	40.9	0.2	(2.9)	(5.2)	46.8	(4.7)	28.14	17.38	Thomas A Singlehurst, CFA
	United Internet AG	UTDI.DE	UTDI GR	9470	2	EUR	34.92	1.3	32.00	(7.2)	3.3	8.1	11.3	81.4	12.9	35.09	18.47	Simon Weeden
	Yandex NV	YNDX.O	YNDX US	9859	1	USD	30.46	0.0	46.00	51.0	5.9	(5.5)	(29.0)	31.7	(29.4)	45.42	19.93	Brady Martin, CFA
Japan	CyberAgent	4751.T	4751 JP	2342	2	JPY	4,045	1.0	2,240	(43.6)	7.3	(6.0)	(5.5)	139.8	(5.5)	5,490	1,653	Hideki Takoh
	DeNA	2432.T	2432 JP	2355	2	JPY	1,849	2.6	2,500	37.9	0.9	(12.0)	(16.4)	(20.9)	(16.4)	2,871	1,754	Soichiro Fukuda
	Gree	3632.T	3632 JP	2539	2H	JPY	1,137	1.2	1,200	6.8	0.4	4.8	9.4	3.7	9.4	1,365	676	Soichiro Fukuda
	GungHo Online Entertainment	3765.T	3765 JP	6350	1H	JPY	575	0.4	1,000	74.3	3.8	(6.8)	(24.0)	54.6	(24.0)	1,633	349.00	Soichiro Fukuda
	Kakaku.Com	2371.T	2371 JP	3789	1	JPY	1,805	0.7	2,600	44.8	13.4	10.3	(2.3)	62.8	(2.3)	2,354	1,079	Hideki Takoh
	Nexon	3659.T	3659 JP	3628	1	JPY	850	1.2	1,700	101.2	3.8	(0.4)	(12.6)	(7.3)	(12.6)	1,369	789	Soichiro Fukuda
	Rakuten	4755.T	4755 JP	18009	2	JPY	1,433	0.4	1,300	(8.9)	8.9	1.0	(8.4)	49.3	(8.4)	1,843	930	Hideki Takoh
Latin America	MercadoLibre Inc	MELI.O	MELI US	4105	3	USD	92.96	0.7	80.00	(13.2)	(1.8)	(9.0)	(10.6)	(3.4)	(13.8)	145.99	87.88	Lucio Aldworth
North America	Amazon.com, Inc.	AMZN.O	AMZN US	153220	1	USD	333.62	0.0	454.00	36.1	(1.4)	(7.3)	(15.8)	28.8	(16.3)	408.06	245.75	Mark May
	AOL Inc.	AOL.N	AOL US	3497	1	USD	44.01	0.0	54.00	22.7	2.3	0.9	(0.9)	14.9	(5.6)	53.28	32.19	Kevin Allen
	eBay Inc.	EBAY.O	EBAY US	70662	1	USD	54.58	0.0	68.00	24.6	(1.1)	(6.4)	2.5	(1.7)	(0.5)	59.70	48.06	Mark May
	Facebook, Inc	FB.O	FB US	152526	1	USD	59.49	0.0	85.00	42.9	(2.4)	(11.7)	9.0	126.6	8.9	72.59	22.67	Mark May
	Google Inc.	GOOGL.O	GOOGL U:	192392	1	USD	572	0.0	676	18.2	2.5	(5.1)	3.3	41.6	1.9	615	381.00	Mark May
	LinkedIn Corp	LNKD.N	LNKD US	21330	2	USD	176.97	0.0	na	na	(6.1)	(12.2)	(14.7)	5.8	(18.4)	257.54	161.00	Mark May
	OpenTable, Inc	OPEN.O	OPEN US	1841	1	USD	78.51	0.0	90.00	14.6	2.4	(0.5)	(0.9)	28.4	(1.1)	87.48	54.38	Mark May
	Rocket Fuel Inc.	FUEL.O	FUEL US	1358	1	USD	38.75	0.0	63.00	62.6	(17.5)	(28.1)	(34.7)	na	(37.0)	71.89	37.81	Kevin Allen
	Yelp Inc.	YELP.N	YELP US	5039	2	USD	70.61	0.0	76.00	7.6	(9.7)	(25.7)	4.4	206.3	2.4	101.59	22.78	Mark May
	YuMe Inc.	YUME.N	YUME US	226	2	USD	7.00	0.0	8.00	14.3	(3.3)	8.0	(5.8)	na	(6.0)	12.08	5.79	Kevin Allen
	Zillow, Inc.	Z.O	Z US	3592	2	USD	90.99	0.0	na	na	6.0	10.0	11.1	81.4	11.3	103.00	48.52	Mark May
	zulily, inc.	ZU.O	ZU US	6382	2	USD	51.43	0.0	46.00	(10.6)	5.4	(20.8)	33.1	na	24.1	73.50	34.19	Mark May

Source: Citi Research

Figure 1056. Sector Performance for IT Services Stocks

	Company	Reuters	B'berg	Market	Citi	Local	3-Apr-14	Dividend	Target	ETR	Performance (%)					52 Weeks		Analyst
	Name	Code	Code	Cap (\$M)	Rating	CCY	Price	Yield (%)	Price	(%)	1 Wk	1 Mo	3 Mo	12 Mo	YTD	High	Low	
IT Services																		
Asia	CSE Global	CSES.SI	CSE SP	241	1	SGD	0.59	8.0	0.70	28.4	0.0	(6.4)	(20.9)	(7.8)	(23.5)	0.80	0.58	Horng Han Low
	HCL Technologies	HCLT.BO	HCLT IN	16459	1	INR	1,421	1.6	1,625	16.3	2.2	(5.5)	12.6	82.1	12.5	1,589	674	Surendra Goyal, CFA
	Infosys	INFY.BO	INFO IN	31650	1	INR	3,338	1.6	3,760	14.7	3.6	(11.7)	(6.3)	12.6	(4.2)	3,847	2,190	Surendra Goyal, CFA
	MindTree	MINT.BO	MTCL IN	997	1	INR	1,428	1.3	1,580	12.0	5.8	(12.2)	(10.5)	57.6	(6.7)	1,725	783	Surendra Goyal, CFA
	Tata Consultancy Services	TCS.BO	TCS IN	70178	2	INR	2,172	1.4	2,370	10.8	3.4	(2.8)	(2.3)	40.7	0.0	2,384	1,364	Surendra Goyal, CFA
	Tech Mahindra	TEML.BO	TECHM IN	7038	2	INR	1,815	0.4	1,895	4.8	(0.5)	(4.9)	(1.1)	85.6	(1.3)	1,936	895	Surendra Goyal, CFA
	Wipro	WIPR.BO	WPRO IN	23000	1	INR	560	1.6	650	17.9	0.9	(4.2)	0.3	42.0	0.1	611	315.30	Surendra Goyal, CFA
Europe	Accenture Ltd	ACN.N	ACN US	53393	1	USD	79.35	2.3	88.00	13.2	0.7	(3.8)	(2.5)	3.6	(3.5)	85.87	69.00	Ashwin Shirvaikar, CFA
	ATOS	ATOS.PA	ATO FP	8682	1	EUR	64.79	1.2	74.00	15.4	(3.8)	(5.8)	(1.0)	19.3	(1.5)	71.50	49.53	Amit B Harchandani
	Capgemini SA	CAPP.PA	CAP FP	11770	2	EUR	53.25	2.2	60.00	14.9	(4.8)	(3.3)	8.4	50.1	8.4	57.87	32.92	Amit B Harchandani
	Wirecard	WDIG.DE	WDI GR	5239	2	EUR	30.92	0.5	30.00	(2.6)	3.1	(4.8)	7.2	42.6	7.7	34.35	19.32	Jason Channell
Japan	Nomura Research Institute	4307.T	4307 JP	6253	1	JPY	3,285	1.6	3,900	20.3	5.6	0.5	(0.9)	39.0	(0.9)	3,640	2,350	Soichiro Fukuda
	NTT Data	9613.T	9613 JP	10783	2	JPY	4,090	1.5	3,900	(3.2)	3.4	(0.4)	5.4	34.5	5.4	4,315	2,935	Soichiro Fukuda
	Oracle Japan	4716.T	4716 JP	5657	2	JPY	4,655	2.0	4,300	(5.6)	5.1	10.7	21.1	15.7	21.1	4,680	3,485	Soichiro Fukuda
	Secom	9735.T	9735 JP	12442	1	JPY	5,878	1.9	6,600	14.2	(0.0)	2.3	(7.3)	24.3	(7.3)	6,430	4,660	Soichiro Fukuda
	Trend Micro	4704.T	4704 JP	4179	2	JPY	3,235	3.0	3,500	11.1	0.0	(2.7)	(12.1)	26.9	(12.1)	4,180	2,494	Soichiro Fukuda
Latin America	Cielo	CIEL3.SA	CIEL3 BZ	25418	2	BRL	36.85	3.4	36.25	1.7	3.6	16.1	10.8	49.0	12.3	37.15	24.50	Daniel A. Abut
North America	Alliance Data Systems Corp	ADS.N	ADS US	14161	2	USD	266.33	0.0	278.00	4.4	(2.5)	(4.3)	1.0	68.1	1.3	298.32	152.81	Philip Stiller, CFA
	Automatic Data Processing Inc	ADP.O	ADP US	37279	2	USD	77.37	2.4	80.00	5.9	0.9	0.9	(4.2)	19.5	(4.2)	83.82	63.30	Ashwin Shirvaikar, CFA
	Computer Sciences Corporation	CSC.N	CSC US	8943	2H	USD	61.38	1.3	60.00	(0.9)	2.1	(1.3)	9.8	28.4	9.8	64.10	42.43	Ashwin Shirvaikar, CFA
	EPAM Systems, Inc.	EPAM.N	EPAM US	1592	1	USD	33.99	0.0	50.00	47.1	3.0	6.2	(2.9)	45.9	(2.7)	46.67	20.52	Ashwin Shirvaikar, CFA
	Fidelity National Info Svcs, Inc	FIS.N	FIS US	15743	1	USD	54.16	1.8	59.00	10.7	3.5	(1.9)	1.9	35.7	0.9	56.67	38.85	Ashwin Shirvaikar, CFA
	Fiserv, Inc.	FISV.O	FISV US	14699	2	USD	57.76	0.0	60.00	3.9	4.2	0.2	(0.5)	34.6	(2.2)	59.29	42.19	Ashwin Shirvaikar, CFA
	FleetCor Technologies Inc	FLT.N	FLT US	9471	1	USD	114.83	0.0	147.00	28.0	1.5	(9.8)	(1.5)	48.6	(2.0)	132.17	70.11	Philip Stiller, CFA
	Global Payments, Inc.	GP.N	GPN US	5152	1	USD	71.64	0.1	84.00	17.4	2.5	2.2	7.5	60.9	10.2	73.46	43.74	Ashwin Shirvaikar, CFA
	Green Dot Corp	GDOT.N	GDOT US	873	2	USD	19.54	0.0	na	na	1.0	(3.2)	(21.5)	19.6	(22.3)	26.87	15.22	Ashwin Shirvaikar, CFA
	Paychex Inc	PAYX.O	PAYX US	15568	3	USD	42.80	3.3	40.00	(3.1)	0.7	3.9	(5.4)	20.7	(6.0)	45.95	34.65	Ashwin Shirvaikar, CFA
	Total System Services	TSS.N	TSS US	5668	1	USD	30.17	1.3	36.00	20.6	1.6	(0.2)	(8.2)	25.6	(9.3)	33.43	22.59	Ashwin Shirvaikar, CFA
	Vantiv, Inc.	VNTV.N	VNTV US	5717	1	USD	30.17	0.0	37.00	22.6	(0.3)	(4.3)	(6.2)	31.9	(7.5)	34.41	21.73	Ashwin Shirvaikar, CFA
	VeriFone Systems Inc	PAY.N	PAY US	3758	2	USD	33.82	0.0	34.00	0.5	2.2	15.6	31.1	65.6	26.1	35.06	15.34	Philip Stiller, CFA
	Verisign, Inc.	VRSN.O	VRSN US	6896	3	USD	51.59	0.0	48.00	(7.0)	(3.2)	(6.5)	(13.8)	11.0	(13.7)	62.96	43.28	Walter H Pritchard, CFA
	Web.Com Group	WWWV.O	WWWV L	1687	1	USD	32.69	0.0	37.50	14.7	(0.7)	(10.8)	4.3	100.4	2.8	37.72	15.87	Walter H Pritchard, CFA
	West Corp	WSTC.O	WSTC US	2008	1	USD	23.95	3.8	28.00	20.7	0.5	(2.3)	(6.6)	22.5	(6.8)	33.51	19.45	Ashwin Shirvaikar, CFA
	Western Union Co.	WU.N	WU US	8907	3	USD	16.53	3.0	15.00	(6.2)	1.2	(0.4)	(2.3)	12.2	(4.2)	19.50	14.24	Ashwin Shirvaikar, CFA
	WEX Inc	WEX.N	WEX US	3737	1	USD	96.09	0.0	109.00	13.4	4.7	0.3	(1.0)	28.8	(3.0)	101.58	66.53	Philip Stiller, CFA

Source: Citi Research

Figure 1057. Sector Performance for Semiconductors &amp; Components Stocks

	Company Name	Reuters Code	B'berg Code	Market Cap (\$M)	Citi Rating	Local CCY	3-Apr-14 Price	Dividend Yield (%)	Target Price	ETR (%)	Performance (%)					52 Weeks		Analyst Name
											1 Wk	1 Mo	3 Mo	12 Mo	YTD	High	Low	
Semiconductors & Components																		
Asia	ASE	2311.TW	2311 TT	8453	1	TWD	32.95	3.5	41.00	27.1	0.0	9.8	21.6	34.2	19.0	34.20	23.75	Roland Shu
	AU Optronics	2409.TW	2409 TT	3749		TWD	11.80	0.0			11.8	16.3	23.4	(10.6)	23.9	14.20	8.43	
	Chipbond Technology	6147.TWO	6147 TT	1192	3	TWD	55.70	4.1	40.00	(23.4)	4.5	6.7	20.7	(14.3)	18.9	83.40	42.85	Roland Shu
	Epistar	2448.TW	2448 TT	2315		TWD	74.90	2.0			1.6	6.2	23.4	38.2	30.5	78.80	42.55	
	Everlight	2393.TW	2393 TT	1121		TWD	80.00	4.5			0.6	6.7	9.7	61.6	16.8	82.80	44.75	
	Innolux Corp	3481.TW	3481 TT	3278		TWD	10.90	0.0			5.3	2.8	(2.2)	(42.2)	(4.0)	20.95	9.75	
	LG Display	034220.KS	034220 KS	9419	1	KRW	27,800	0.0	32,000	15.1	5.5	17.1	11.9	(10.8)	9.7	32,400	21,800	Henry H Kim, CFA
	MagnaChip Semiconductor	MX.N	MX US	481	2	USD	13.77	0.0	20.00	45.2	(3.2)	(7.8)	(28.5)	(10.9)	(29.4)	23.86	12.50	Terence Whalen
	MediaTek	2454.TW	2454 TT	23750	3	TWD	458.00	3.4	370.00	(15.8)	1.3	1.8	5.2	28.7	3.3	481.50	302.00	Roland Shu
	Novatek	3034.TW	3034 TT	2913	3	TWD	145.00	4.4	99.00	(27.7)	2.8	(0.7)	17.4	5.1	18.9	158.00	105.50	Roland Shu
	Powertech Technology	6239.TW	6239 TT	1199	3	TWD	46.60	3.8	42.00	(5.6)	2.2	10.6	(0.6)	(6.0)	2.3	59.60	40.00	Roland Shu
	Radiant Opto-Electronics	6176.TW	6176 TT	1980		TWD	129.00	6.0			4.9	7.1	16.2	13.6	18.3	142.00	85.83	
	Samsung Electronics	005930.KS	005930 KS	192130	1	KRW	1,390,000	1.0	1,800,000	30.5	4.3	4.9	7.3	(8.6)	1.3	1,566,000	1,209,000	Henry H Kim, CFA
	SK Hynix	000660.KS	000660 KS	25005	1	KRW	36,550	0.0	52,000	42.3	(3.1)	(6.2)	0.7	26.5	(0.7)	40,200	26,000	Henry H Kim, CFA
	SPIL	2325.TW	2325 TT	4362	1	TWD	42.40	5.6	47.00	15.1	6.0	12.6	17.1	24.7	19.1	43.25	31.35	Roland Shu
	TPK	3673.TW	3673 TT	1999		TWD	184.00	3.6			2.8	4.0	0.3	(69.8)	4.5	642	152.00	
	TSMC	2330.TW	2330 TT	101432	1	TWD	118.50	2.5	133.00	14.8	2.2	9.7	15.6	17.9	12.3	121.00	92.90	Roland Shu
UMC	2303.TW	2303 TT	5469	2	TWD	13.05	2.4	13.00	3.4	1.2	4.4	6.5	15.5	5.7	15.40	10.95	Roland Shu	
Vanguard International Semicon	5347.TWO	5347 TT	2596	3	TWD	48.05	4.8	33.00	(27.6)	9.0	7.9	33.8	76.0	35.7	50.70	26.60	Roland Shu	
WPG Holdings	3702.TW	3702 TT	2017	3	TWD	36.90	7.3	27.00	(19.9)	0.3	2.6	7.6	6.0	7.6	38.15	32.60	Roland Shu	
Europe	ARM Holdings PLC	ARM.L	ARM LN	23866	1	GBP	10.26	0.7	10.20	0.1	5.6	4.1	(5.6)	12.0	(6.6)	11.12	7.52	Amit B Harchandani
	ASML Holding NV	ASML.AS	ASML NA	41313	1	EUR	67.55	1.0	78.00	16.5	0.7	8.4	(0.3)	30.4	(0.7)	75.05	50.11	Amit B Harchandani
	CSR Plc	CSR.L	CSR LN	1955	2	GBP	7.10	1.3	5.25	(25.1)	0.1	(5.3)	9.1	49.5	12.3	8.20	4.63	Amit B Harchandani
	Infineon Technologies	IFXGn.DE	IFX GR	13585	1	EUR	8.84	1.4	8.70	(0.2)	3.3	10.4	14.3	43.1	13.9	8.98	5.36	Amit B Harchandani
	STMicroelectronics	STM.PA	STM FP	8446	2	EUR	6.78	4.3	6.00	(7.0)	0.0	5.5	17.1	9.8	16.0	7.69	5.24	Amit B Harchandani
Japan	Wolfsen	WLF.L	WLF LN	266	2	GBP	1.36	0.0	1.36	0.4	4.2	8.4	(6.4)	(22.6)	(7.7)	2.29	1.09	Amit B Harchandani
	Asahi Glass	5201.T	5201 JP	6684	2	JPY	600	3.0	610	4.7	1.4	7.7	(8.3)	(2.6)	(8.3)	832	538	Atsushi Ikeda
	Nippon Electric Glass	5214.T	5214 JP	2551	3	JPY	530	3.0	400.00	(21.5)	4.3	16.7	(4.0)	19.1	(4.0)	660	429.00	Atsushi Ikeda
	Nippon Sheet Glass	5202.T	5202 JP	1268	2H	JPY	149.00	0.0	130.00	(12.8)	3.5	7.2	8.8	47.5	8.8	157.00	83.00	Atsushi Ikeda
	SUMCO	3436.T	3436 JP	1977	1	JPY	797	0.1	1,030	29.4	5.3	5.8	(14.1)	(21.3)	(14.1)	1,422	675	Takao Kanai
North America	Advanced Micro Devices	AMD.N	AMD US	3046	2H	USD	4.00	0.0	4.00	0.0	2.3	9.0	0.0	72.4	3.4	4.65	2.26	Glen Yeung
	Altera Corp	ALTR.O	ALTR US	11458	1	USD	36.40	1.6	41.00	13.7	2.2	1.6	13.1	9.8	12.0	39.18	30.62	Glen Yeung
	Amkor Technology Inc	AMKR.O	AMKR US	1569	1	USD	7.20	0.0	6.00	(16.7)	10.4	22.0	17.6	89.5	17.5	7.33	3.55	Terence Whalen
	Analog Devices	ADI.O	ADI US	16870	1	USD	53.98	2.5	59.00	12.0	2.7	6.7	8.8	22.5	6.0	54.40	41.81	Terence Whalen
	Applied Materials Inc	AMAT.O	AMAT US	25239	1	USD	20.84	1.9	20.50	0.3	5.8	11.4	19.0	58.5	17.9	21.16	12.65	Terence Whalen
	ATMI Inc	ATMI.O	ATMI US	1127	2	USD	34.05	0.0	27.50	(19.2)	0.2	0.1	11.9	59.3	12.7	34.58	20.36	Terence Whalen
	Broadcom Corporation	BRCM.O	BRCM US	18257	2	USD	31.21	1.5	33.00	7.1	1.1	4.9	7.7	(6.1)	5.3	37.85	23.25	Glen Yeung
	Brooks Automation Inc	BRKS.O	BRKS US	754	2H	USD	11.32	2.8	10.50	(4.4)	6.2	11.1	7.6	19.7	7.9	11.64	8.74	Terence Whalen
	Cypress Semiconductor Corp	CY.O	CY US	1638	2H	USD	10.44	4.2	11.00	9.6	4.0	7.0	0.2	(0.1)	(0.6)	13.23	8.61	Glen Yeung
	Entegris Inc	ENTG.O	ENTG US	1722	2H	USD	12.41	0.0	10.50	(15.4)	4.6	2.6	8.5	31.2	7.1	12.64	8.89	Terence Whalen
	Fairchild Semiconductor	FCS.O	FCS US	1771	1	USD	14.13	0.0	16.00	13.2	8.3	1.7	5.3	6.9	5.8	14.99	11.48	Terence Whalen
	FormFactor Inc	FORM.O	FORM US	360	2	USD	6.50	0.0	5.70	(12.3)	1.7	(9.1)	2.0	44.4	8.2	7.75	4.30	Terence Whalen
	Freescale Semiconductor Holdi	FSL.N	FSL US	7523	1H	USD	24.99	0.0	23.00	(8.0)	6.6	10.5	62.6	81.1	55.7	26.00	12.35	Glen Yeung
	Integrated Device Technology I	IDTI.O	IDTI US	1838	1H	USD	12.26	0.0	13.00	6.0	3.5	3.9	22.8	71.0	20.4	13.29	6.48	Glen Yeung
	Intel Corp	INTC.O	INTC US	131311	1	USD	26.41	3.6	29.00	13.1	4.3	7.8	2.4	25.5	1.8	27.12	20.75	Glen Yeung
	International Rectifier	IRF.N	IRF US	1988	1	USD	27.90	0.0	33.00	18.3	4.1	3.8	8.0	46.3	7.0	28.27	17.62	Terence Whalen
	Intersil Corporation	ISIL.O	ISIL US	1714	3	USD	13.41	3.6	10.00	(21.8)	6.9	6.9	21.0	67.8	16.9	13.58	7.17	Terence Whalen
	KLA Tencor Corp	KLAC.O	KLAC US	11864	1	USD	71.22	2.5	69.50	0.1	4.0	10.7	12.2	38.8	10.5	71.93	50.23	Terence Whalen
	Lam Research Corp	LRCX.O	LRCX US	9362	2	USD	57.68	0.0	55.00	(4.6)	5.9	12.8	6.9	42.5	5.9	58.94	39.94	Terence Whalen
	Linear Technology	LLTC.O	LLTC US	11725	1	USD	49.70	2.2	53.00	8.8	3.7	6.8	10.5	39.1	9.1	50.99	34.21	Terence Whalen
	Marvell Technology Group Ltd.	MRVL.O	MRVL US	7994	2	USD	15.88	1.5	17.00	8.6	3.7	2.9	12.1	58.6	10.4	16.65	9.46	Glen Yeung
	Maxim Integrated	MXIM.O	MXIM US	9455	2	USD	33.52	3.1	30.00	(7.4)	4.8	4.5	16.7	7.5	20.1	33.74	26.49	Terence Whalen
	Microchip Technology	MCHP.O	MCHP US	9672	1	USD	48.57	2.9	53.00	12.0	4.6	8.1	9.0	37.3	8.5	49.03	33.72	Terence Whalen
	Micron Technology Inc	MU.O	MU US	25461	1H	USD	24.00	0.0	30.00	25.0	7.9	(2.0)	14.4	163.7	10.3	25.68	9.04	Glen Yeung
	NVIDIA Corp	NVDA.O	NVDA US	10381	2H	USD	18.73	1.7	19.00	3.0	5.3	2.4	19.5	54.5	16.9	19.19	12.04	Glen Yeung
	ON Semiconductor	ONNN.O	ONNN US	4294	2	USD	9.75	0.0	9.00	(7.7)	7.0	4.3	21.1	25.8	18.3	9.94	6.80	Terence Whalen
	Qualcomm Inc	QCOM.O	QCOM US	136216	1	USD	80.55	1.7	88.00	11.0	1.9	9.4	10.5	22.1	8.5	81.30	59.02	Ehud Gelblum, Ph.D
	Rambus	RMBS.O	RMBS US	1307	1	USD	11.50	0.0	12.00	4.3	7.6	25.3	19.8	109.1	21.4	11.82	5.41	Terence Whalen
	Semtech	SMTC.O	SMTC US	1747	1	USD	25.92	0.0	31.00	19.6	4.0	5.1	4.3	(22.0)	2.5	37.45	21.38	Terence Whalen
	Silicon Laboratories	SLAB.O	SLAB US	2284	1	USD	52.86	0.0	56.00	5.9	3.0	2.4	24.5	35.5	22.1	54.00	37.57	Terence Whalen
	Spansion Inc.	CODE.N	CODE US	1093	2H	USD	18.19	0.0	16.00	(12.0)	5.8	11.1	31.9	57.4	31.0	18.38	9.70	Glen Yeung
	Teradyne Inc	TER.N	TER US	3951	1	USD	20.37	0.0	22.00	8.0	5.1	2.2	16.0	33.6	15.6	20.72	14.05	Terence Whalen
	Texas Instruments Inc	TXN.O	TXN US	51588	1	USD	47.69	2.5	49.00	4.5	3.5	7.0	10.2	39.6	8.6	49.77	33.56	Glen Yeung
	Xilinx Inc	XLNX.O	XLNX US	14560	1	USD	54.56	1.7	55.00	2.6	1.7	5.1	19.6	50.7	18.8	55.59	34.98	Glen Yeung

Source: Citi Research

Figure 1058. Sector Performance for Software Stocks

	Company	Reuters	B'berg	Market	Citi	Local	3-Apr-14	Dividend	Target	ETR	Performance (%)					52 Weeks		Analyst
	Name	Code	Code	Cap (\$M)	Rating	CCY	Price	Yield (%)	Price	(%)	1 Wk	1 Mo	3 Mo	12 Mo	YTD	High	Low	
Software																		
CEEMEA	CheckPoint Software Technol	CHKP.O	CHKP US	12889	1	USD	67.04	0.0	75.00	11.9	0.9	(0.3)	4.3	48.1	3.9	69.92	44.41	Walter H Pritchard, CFA
Europe	AVEVA Plc	AVV.L	AVV LN	2154	1	GBP	20.30	1.4	24.50	22.2	(4.3)	(4.1)	(5.6)	(10.4)	(6.2)	26.68	20.19	Hugo Mills
	Dassault Systemes SA	DAST.PA	DSY FP	14756	1	EUR	85.08	1.2	96.00	14.0	0.3	3.2	(5.7)	(6.4)	(5.7)	103.00	78.46	Amit B Harchandani
	Fidessa	FDSA.L	FDSA LN	1631	2	GBP	25.68	1.5	24.85	(1.7)	0.3	4.9	12.3	32.4	14.0	27.25	16.95	Hugo Mills
	Micro Focus International Plc	MCRO.L	MCRO LN	1910	2	GBP	8.30	3.2	8.50	5.8	1.3	7.8	6.4	18.2	8.1	8.60	6.22	Hugo Mills
	Sage Group PLC	SGE.L	SGE LN	7530	1	GBP	4.14	3.0	3.95	(1.6)	(1.1)	(2.1)	3.3	22.1	2.5	4.40	3.12	Hugo Mills
	SAP AG	SAPG.DE	SAP GR	99091	1	EUR	58.99	1.6	62.00	6.7	1.2	4.2	(4.4)	(6.1)	(5.3)	64.25	51.87	Walter H Pritchard, CFA
	SDL	SDL.L	SDL LN	452	1	GBP	3.37	0.7	4.20	25.3	6.1	(10.3)	(0.8)	(17.6)	(6.3)	4.26	2.20	Hugo Mills
	Software AG	SOWG.DE	SOW GR	3169	2	EUR	26.50	1.9	27.00	3.8	1.0	(5.7)	5.6	(11.7)	4.3	30.02	22.34	Amit B Harchandani
	Telecity Group Plc	TCY.L	TCY LN	2336	1	GBP	6.94	1.9	8.50	24.5	0.6	6.4	(9.5)	(24.9)	(4.4)	10.26	6.25	Hugo Mills
North America	Adobe Systems Inc.	ADBE.O	ADBE US	31083	1	USD	62.45	0.0	79.00	26.5	(3.2)	(8.0)	5.6	42.9	4.3	71.11	41.91	Walter H Pritchard, CFA
	Autodesk, Inc.	ADSK.O	ADSK US	10975	3	USD	48.31	0.0	36.00	(25.5)	0.1	(6.5)	(1.2)	25.4	(4.0)	58.68	33.01	Walter H Pritchard, CFA
	CA Inc.	CA.O	CA US	14181	2	USD	31.67	3.2	32.00	4.2	3.7	(4.4)	(4.3)	29.1	(5.9)	36.22	24.01	Walter H Pritchard, CFA
	Citrix Systems, Inc.	CTXS.O	CTXS US	10485	2	USD	57.06	0.0	58.00	1.6	(2.0)	(4.6)	(8.7)	(19.0)	(9.8)	77.16	51.18	Walter H Pritchard, CFA
	FireEye, Inc.	FEYE.O	FEYE US	7907	2H	USD	54.86	0.0	60.00	9.4	(12.8)	(35.1)	(3.8)	na	25.8	97.35	33.30	Walter H Pritchard, CFA
	Fortinet, Inc.	FTNT.O	FTNT US	3663	2H	USD	22.49	0.0	23.00	2.3	2.8	(1.2)	16.7	1.3	17.6	23.93	16.29	Walter H Pritchard, CFA
	Guidewire Software, Inc.	GWRE.N	GWRE US	3302	3	USD	48.59	0.0	43.00	(11.5)	0.8	(8.6)	0.2	33.2	(1.0)	58.00	35.10	Walter H Pritchard, CFA
	Intuit Inc.	INTU.O	INTU US	22263	1	USD	78.58	0.9	94.00	20.6	1.3	0.9	3.7	21.7	3.0	82.40	55.54	Walter H Pritchard, CFA
	Jive Software, Inc.	JIVE.O	JIVE US	558	2H	USD	7.94	0.0	9.00	13.4	1.3	(1.4)	(28.6)	(44.4)	(29.4)	18.48	7.11	Walter H Pritchard, CFA
	Microsoft Corp.	MSFT.O	MSFT US	340383	2	USD	41.01	2.3	35.00	(12.4)	4.2	8.5	11.1	43.6	9.6	41.66	28.11	Walter H Pritchard, CFA
	Oracle Corporation	ORCL.K	ORCL US	180005	1	USD	40.37	1.2	44.00	10.2	2.9	4.8	7.3	24.6	5.5	42.00	29.86	Walter H Pritchard, CFA
	Palo Alto Networks, Inc.	PANW.N	PANW US	4835	2H	USD	65.28	0.0	66.00	1.1	(8.4)	(3.7)	13.6	21.7	13.6	80.84	39.11	Walter H Pritchard, CFA
	Proofpoint, Inc.	PFPT.O	PFPT US	1343	1	USD	36.53	0.0	46.00	25.9	0.3	(11.8)	6.9	114.8	10.1	45.66	16.23	Walter H Pritchard, CFA
	Qlik Technologies Inc.	QLIK.O	QLIK US	2343	1	USD	26.16	0.0	33.00	26.1	(0.2)	(12.4)	2.2	7.1	(1.8)	37.57	23.23	Walter H Pritchard, CFA
	Red Hat, Inc.	RHT.N	RHT US	9731	2	USD	51.34	0.0	49.00	(4.6)	(8.5)	(11.9)	(8.0)	7.6	(8.4)	61.44	41.91	Walter H Pritchard, CFA
	salesforce.com, inc.	CRM.N	CRM US	34007	1	USD	55.74	0.0	81.00	45.3	(0.4)	(9.4)	1.1	32.3	1.0	67.00	36.09	Walter H Pritchard, CFA
	ServiceNow, Inc.	NOW.N	NOW US	7715	1	USD	54.68	0.0	70.00	28.0	(7.3)	(19.5)	(0.9)	58.4	(2.4)	71.75	34.19	Walter H Pritchard, CFA
	Symantec Corp.	SYMC.O	SYMC US	13852	1	USD	20.03	3.0	28.00	42.8	3.9	(6.4)	(13.3)	(18.1)	(15.1)	27.10	17.95	Walter H Pritchard, CFA
	VMware, Inc.	VMW.N	VMW US	46490	1	USD	107.92	0.0	120.00	11.2	1.2	12.8	20.7	41.8	20.3	112.88	64.86	Walter H Pritchard, CFA
	Workday Inc	WDAY.N	WDAY US	15389	2	USD	83.91	0.0	104.00	23.9	(7.7)	(21.1)	1.7	42.1	0.9	116.46	55.25	Walter H Pritchard, CFA

Source: Citi Research

Figure 1059. Comparable Valuation for Consumer Electronics Stocks

	Company	Reuters	B'berg	Fiscal	Last	PE (x)		EV / FCF (x)		EV / EBITDA (x)		EV / Sales (x)		Price / Sales (x)		Price / BV (x)		Price / Tang BV (x)		FCY Yield (%)	
	Name	Code	Code	Year End	Rep Yr	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015
Consumer Electronics																					
Asia	Hon Hai Precision	2317.TW	2317 TT	31-Dec	2012	9.3	8.4	6.7	5.2	4.3	3.3	0.2	0.2	0.3	0.2	1.3	1.1	1.3	1.1	11.5	13.0
	LG Electronics	066570.KS	066570 KS	31-Dec	2013	13.8	12.7	(17.4)	(20.8)	5.0	4.5	0.2	0.2	0.2	0.2	0.9	0.8	1.1	1.0	(7.7)	(6.5)
	VTech Holdings	0303.HK	303 HK	31-Mar	2013	15.7	14.5	15.7	15.9	11.8	11.0	1.6	1.5	1.7	1.6	6.2	6.0	6.2	6.0	5.8	5.8
							12.9	11.9	1.7	0.1	7.0	6.3	0.7	0.6	0.7	0.7	2.8	2.7	2.9	2.7	3.2
Japan	Casio Computer	6952.T	6952 JP	31-Mar	2013	23.1	19.9	17.8	22.7	8.1	6.9	0.9	0.8	1.1	1.0	1.8	1.7	1.9	1.7	4.4	3.3
	Fujitsu General	6755.T	6755 JP	31-Mar	2013	9.1	9.0	17.5	9.7	5.3	4.9	0.5	0.5	0.5	0.5	2.2	1.8	2.3	1.9	5.9	10.3
	Funai Electric	6839.T	6839 JP	31-Mar	2013	(5.4)	58.5	1.6	(14.5)	(28.3)	(2.0)	(0.1)	(0.1)	0.2	0.1	0.3	0.3	0.3	0.3	(46.4)	3.7
	Panasonic	6752.T	6752 JP	31-Mar	2013	25.8	7.7	95.7	41.0	5.7	5.3	0.4	0.4	0.4	0.4	2.0	1.6	8.4	3.9	1.2	2.5
	Pioneer	6773.T	6773 JP	31-Mar	2013	nm	19.8	(36.2)	17.9	2.7	2.1	0.2	0.2	0.2	0.2	0.9	0.9	0.9	0.9	(3.5)	5.5
	Sharp	6753.T	6753 JP	31-Mar	2013	60.5	20.0	(34.9)	36.9	5.2	5.2	0.4	0.4	0.2	0.2	2.6	2.7	2.7	2.7	(7.2)	5.2
	Sony	6758.T	6758 JP	31-Mar	2013	(23.1)	39.1	33.1	11.2	4.5	3.5	0.2	0.2	0.3	0.3	0.9	0.9	(0.3)	(0.2)	2.4	7.0
						15.0	24.9	13.5	17.8	0.5	3.7	0.4	0.3	0.4	0.4	1.5	1.4	2.3	1.6	(6.2)	5.4
North America	Ingram Micro Inc	IM.N	IM US	31-Dec	2013	11.2	9.5	12.9	11.0	5.8	4.6	0.1	0.1	0.1	0.1	1.1	1.0	1.4	1.2	7.6	8.2
	Synnex Corp	SNX.N	SNX US	30-Nov	2013	10.0	8.9	14.5	14.6	6.4	5.7	0.2	0.2	0.2	0.2	1.4	1.2	2.1	1.8	7.6	7.5
	Tech Data Corp	TECD.O	TECD US	31-Jan	2013	14.3	11.4	42.3	10.9	7.4	6.2	0.1	0.1	0.1	0.1	1.1	1.1	1.5	1.4	2.5	9.5
							11.8	9.9	23.2	12.1	6.5	5.5	0.1	0.1	0.1	0.1	1.2	1.1	1.7	1.5	5.9

Source: Citi Research



Figure 1060. Comparable Valuation for Hardware Stocks

	Company Name	Reuters Code	B'berg Code	Fiscal Year End	Last Rep Yr	PE (x)		EV / FCF (x)		EV / EBITDA (x)		EV / Sales (x)		Price / Sales (x)		Price / BV (x)		Price / Tang BV (x)		FCY Yield (%)		
						2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014
Hardware																						
Asia	Acer	2353.TW	2353 TT	31-Dec	2012	(45.7)	(84.4)	(7.2)	(3.6)	(5.3)	(3.4)	(0.0)	(0.0)	0.2	0.2	0.9	0.9	0.9	0.9	2.3	4.3	
	ASUSTeK Computer	2357.TW	2357 TT	31-Dec	2012	12.6	11.6	5.3	8.7	6.1	5.4	0.3	0.3	0.5	0.5	1.6	1.6	1.6	1.6	11.0	6.4	
	Catcher Technology	2474.TW	2474 TT	31-Dec	2012	12.5	9.4	51.8	9.4	6.0	4.7	2.8	2.1	3.3	2.6	2.1	1.8	2.1	1.8	1.6	8.7	
	Cheil Industries	001300.KS	001300 KS	31-Dec	2012	15.4	10.5	60.0	12.6	4.1	3.0	0.5	0.4	0.7	0.6	1.1	1.0	1.2	1.1	1.2	5.6	
	Chicony Electronics	2385.TW	2385 TT	31-Dec	2012	11.7	10.0	7.4	7.5	8.0	6.5	0.6	0.5	0.6	0.5	2.4	2.2	2.4	2.2	13.7	12.7	
	Compal Electronics	2324.TW	2324 TT	31-Dec	2012	9.9	7.2	5.9	8.0	4.9	3.5	0.1	0.1	0.1	0.1	0.9	0.9	0.9	0.9	14.2	9.4	
	Delta Electronics	2308.TW	2308 TT	31-Dec	2012	20.5	17.4	12.7	12.0	11.5	9.6	1.9	1.7	2.2	2.0	4.4	4.0	4.4	4.0	6.8	6.9	
	Flexium Interconnect	6269.TW	6269 TT	31-Dec	2012	9.7	8.5	14.7	8.5	5.1	4.0	1.1	0.9	1.3	1.2	1.9	1.6	1.9	1.6	5.4	8.8	
	Flextronics International Ltd	FLEX.O	FLEX US	31-Mar	2013	11.2	9.4	7.2	13.8	5.5	5.1	0.2	0.2	0.2	0.2	2.5	2.5	3.0	3.1	13.7	7.6	
	Foxconn Technology	2354.TW	2354 TT	31-Dec	2012	13.9	13.1	20.1	2.7	2.3	1.8	0.2	0.2	0.8	0.8	1.3	1.1	1.3	1.1	1.5	9.7	
	Ju Teng	3336.HK	3336 HK	31-Dec	2012	7.2	5.9	16.2	37.0	5.2	4.4	1.1	1.0	0.7	0.6	0.9	0.8	0.9	0.8	10.3	4.4	
	Kingboard Laminates Holdings	1888.HK	1888 HK	31-Dec	2013	7.1	6.6	5.8	7.0	3.8	3.4	0.6	0.6	0.7	0.6	0.7	0.6	0.7	0.6	16.8	13.2	
	Kinsus Interconnect Technology	3189.TW	3189 TT	31-Dec	2012	14.9	14.4	14.7	8.7	5.7	5.2	1.6	1.4	2.0	1.8	1.9	1.7	1.9	1.7	5.6	9.0	
	Largan Precision	3008.TW	3008 TT	31-Dec	2012																	
	Lenovo Group	0992.HK	992 HK	31-Mar	2013	14.4	16.1	9.9	4.2	3.9	3.9	0.1	0.1	0.3	0.3	4.1	3.6	4.1	3.6	4.3	9.5	
	LG Innotek	011070.KS	011070 KS	31-Dec	2012	27.9	21.6	21.9	26.2	5.5	4.9	0.6	0.5	0.4	0.4	1.5	1.4	1.6	1.5	6.5	5.0	
	Pegatron	4938.TW	4938 TT	31-Dec	2012	9.0	8.1	6.7	6.3	3.1	3.2	0.1	0.1	0.1	0.1	0.9	0.9	0.9	0.9	15.6	15.6	
	Quanta Computer	2382.TW	2382 TT	31-Dec	2012	17.0	16.8	4.8	10.3	12.2	10.9	0.3	0.3	0.3	0.3	2.4	2.3	2.4	2.3	17.4	7.2	
	Samsung Electro-Mechanics	009150.KS	009150 KS	31-Dec	2013	17.4	17.2	nm	nm	4.5	4.3	0.6	0.5	0.6	0.6	1.2	1.1	1.3	1.2	0.7	(0.3)	
	Samsung SDI	006400.KS	006400 KS	31-Dec	2012	34.2	22.1	(4.0)	(3.3)	1.7	1.8	0.2	0.2	1.5	1.4	0.9	0.9	0.9	0.9	(3.8)	(5.2)	
	Samsung Techwin	012450.KS	012450 KS	31-Dec	2012	18.9	10.9	22.7	12.8	13.4	7.5	0.9	0.7	1.0	0.8	1.7	1.5	1.9	1.7	4.0	6.7	
	Simplo Technology	6121.TWO	6121 TT	31-Dec	2012	15.1	14.7	7.5	7.1	7.3	6.6	0.6	0.5	0.8	0.8	2.5	2.3	2.5	2.3	9.8	9.5	
	Tripod Technology	3044.TW	3044 TT	31-Dec	2012	11.3	10.2	4.8	7.2	4.0	3.3	0.6	0.5	0.7	0.7	1.1	1.1	1.1	1.1	17.4	10.2	
	Unimicron	3037.TW	3037 TT	31-Dec	2012	20.4	14.5	(45.1)	8.2	4.5	3.8	0.7	0.7	0.6	0.6	0.8	0.8	0.8	0.8	(2.7)	14.4	
	Venture	VENM.SI	VMS SP	31-Dec	2013	13.9	12.8	9.5	26.1	9.0	8.6	0.7	0.6	0.8	0.8	1.1	1.1	1.8	1.8	8.7	3.2	
	Wistron	3231.TW	3231 TT	31-Dec	2012	11.1	11.0	17.5	30.8	4.8	4.9	0.1	0.1	0.1	0.1	0.9	0.8	0.9	0.8	7.1	4.0	
	Zhen Ding Technology	4958.TW	4958 TT	31-Dec	2012	11.0	10.1	12.7	9.1	6.4	5.7	1.0	0.9	0.9	0.8	2.0	1.8	2.0	1.8	8.9	12.1	
	ZTE	0763.HK	763 HK	31-Dec	2013	17.0	14.0	11.8	28.2	7.4	6.7	0.5	0.5	0.5	0.5	1.7	1.6	1.8	1.6	8.9	3.8	
							12.8	9.1	11.8	11.8	5.8	5.0	0.8	0.7	1.0	0.9	1.8	1.7	1.9	1.7	7.5	7.5
	CEEMEA	Stratasys Ltd	SSYS.O	SSYS US	31-Dec	2013	51.3	44.3	69.9	30.9	44.0	31.0	7.5	6.0	8.8	8.3	2.4	2.6	7.6	7.1	1.2	2.3
						51.3	44.3	69.9	30.9	44.0	31.0	7.5	6.0	8.8	8.3	2.4	2.6	7.6	7.1	1.2	2.3	
Europe	Alcatel-Lucent	ALUA.PA	ALU FP	31-Dec	2013	nm	28.1	nm	nm	9.7	7.0	0.8	0.8	0.7	0.7	3.3	3.9	(3.5)	(3.1)	(0.0)	1.2	
	EI Towers SpA	EIT.MI	EIT IM	31-Dec	2013	34.0	30.4	17.4	16.8	11.3	10.6	5.3	5.0	4.9	4.8	1.9	1.9	24.1	17.7	6.2	6.2	
	Ericsson LM	ERICB.ST	ERICB SS	31-Dec	2013	18.8	16.3	10.1	13.0	9.3	7.8	1.1	1.0	1.3	1.2	2.0	1.9	2.8	2.6	8.1	6.1	
	Garmin, Ltd.	GRMN.O	GRMN US	31-Dec	2013	20.7	18.5	15.1	15.6	12.4	11.3	3.1	2.9	4.1	3.9	3.0	2.9	3.2	3.0	5.0	4.8	
	Nokia Oyj	NOK1V.HE	NOK1V FH	31-Dec	2013	23.6	21.5	(37.9)	60.4	10.2	7.4	1.1	0.8	1.8	1.7	1.7	1.6	2.3	2.1	(1.4)	0.9	
	Seagate Technology	STX.O	STX US	30-Jun	2013	11.2	9.5	8.6	9.0	6.6	6.3	1.4	1.4	1.4	1.3	6.6	7.0	9.1	10.2	11.3	11.7	
	Sensata Technologies Holding	ST.N	ST US	31-Dec	2013	18.1	16.8	30.4	24.1	18.6	16.2	4.0	3.6	3.5	3.3	5.5	4.5	(10.1)	(21.8)	3.8	4.6	
	Spirent Communications Plc	SPT.L	SPT LN	31-Dec	2013	24.5	17.8	15.7	12.5	11.0	8.4	1.7	1.6	2.1	2.0	2.3	2.1	4.5	3.9	5.1	6.4	
	TE Connectivity Ltd.	TEL.N	TEL US	30-Sep	2013	16.0	14.4	21.9	17.7	9.2	8.6	1.8	1.6	1.8	1.6	2.8	2.6	7.4	6.2	4.6	5.8	
	Voxeljet AG	VJET.N	VJET US	31-Dec	2013	(26.9)	nm	(94.8)	nm	nm	50.5	15.4	10.0	3.3	2.3	1.4	1.5	1.4	1.5	(5.0)	(1.8)	
						15.6	19.3	(1.5)	21.1	10.9	13.4	3.6	2.9	2.5	2.3	3.1	3.0	4.1	2.2	3.8	4.6	

Source: Citi Research



Figure 1061. Comparable Valuation for Hardware Stocks (Continued)

	Company Name	Reuters Code	B'berg Code	Fiscal Year End	Last Rep Yr	PE (x)		EV / FCF (x)		EV / EBITDA (x)		EV / Sales (x)		Price / Sales (x)		Price / BV (x)		Price / Tang BV (x)		FCY Yield (%)	
						2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015
Hardware																					
Japan	Alps Electric	6770.T	6770 JP	31-Mar	2013	16.5	15.1	nm	17.5	5.6	4.9	0.4	0.4	0.3	0.3	1.6	1.5	1.7	1.6	0.4	7.5
	Brother Industries	6448.T	6448 JP	31-Mar	2013	25.2	10.9	26.1	7.2	4.0	3.6	0.4	0.4	0.6	0.6	1.3	1.3	1.3	1.3	2.7	9.4
	Canon	7751.T	7751 JP	31-Dec	2013	13.7	12.4	8.0	7.1	3.4	3.1	0.6	0.5	1.0	0.9	1.2	1.2	1.2	1.2	7.6	8.1
	Dainippon Screen Mfg	7735.T	7735 JP	31-Mar	2013	21.4	12.5	4.7	10.3	7.8	4.5	0.5	0.4	0.5	0.5	1.3	1.2	1.3	1.2	18.3	6.8
	Fujifilm Holdings	4901.T	4901 JP	31-Mar	2013	16.9	14.1	2.7	1.8	1.4	0.8	0.2	0.1	0.6	0.6	0.7	0.6	0.7	0.6	10.2	9.3
	Fujitsu	6702.T	6702 JP	31-Mar	2013	32.4	14.5	(24.2)	25.6	6.2	5.8	0.3	0.3	0.3	0.3	2.3	2.1	3.6	3.0	(5.1)	4.9
	GS Yuasa	6674.T	6674 JP	31-Mar	2013	20.0	12.5	(39.5)	65.0	9.4	7.0	0.8	0.7	0.7	0.6	2.0	1.8	2.0	1.8	(3.0)	1.8
	Hirose Electric	6806.T	6806 JP	31-Mar	2013	22.1	19.3	21.8	12.5	6.6	5.6	2.3	2.0	4.0	3.6	2.2	2.0	2.2	2.0	2.6	4.4
	Hitachi	6501.T	6501 JP	31-Mar	2013	15.4	12.3	21.5	13.1	6.1	5.6	0.6	0.6	0.4	0.4	1.5	1.3	7.7	6.7	7.2	12.0
	Hosiden	6804.T	6804 JP	31-Mar	2013	26.6	15.4	1.6	(6.8)	(3.1)	(1.7)	(0.1)	(0.1)	0.2	0.2	0.4	0.4	0.4	0.4	(28.3)	5.7
	Hoya	7741.T	7741 JP	31-Mar	2013	23.6	21.8	16.2	15.7	9.3	8.6	2.7	2.5	3.3	3.3	2.5	2.4	2.5	2.4	4.9	4.8
	Ibiden	4062.T	4062 JP	31-Mar	2013	17.7	16.9	36.4	(14.6)	3.9	3.2	0.8	0.7	0.9	0.9	1.0	1.0	1.0	1.0	2.2	(5.6)
	Konica Minolta	4902.T	4902 JP	31-Mar	2013	19.3	11.2	11.4	7.7	3.9	2.9	0.5	0.4	0.6	0.5	1.0	0.9	1.0	0.9	7.3	9.5
	Kyocera	6971.T	6971 JP	31-Mar	2013	19.8	18.4	7.8	4.1	2.9	1.7	0.4	0.2	1.2	1.1	0.9	0.9	1.0	1.0	4.0	4.7
	Mabuchi Motor	6592.T	6592 JP	31-Dec	2013	24.2	20.1	37.4	14.9	5.8	5.1	0.9	0.8	2.0	1.8	1.2	1.2	1.2	1.2	1.2	3.0
	Mitsubishi Electric	6503.T	6503 JP	31-Mar	2013	18.0	14.3	11.4	32.0	6.5	5.2	0.6	0.5	0.7	0.6	1.7	1.5	1.9	1.7	7.9	2.6
	Mitsumi Electric	6767.T	6767 JP	31-Mar	2013	45.1	26.0	(19.7)	(4.1)	2.6	1.6	0.1	0.1	0.4	0.4	0.6	0.6	0.6	0.6	(1.4)	(7.2)
	Murata	6981.T	6981 JP	31-Mar	2013	22.4	20.8	nm	23.3	8.2	7.5	2.0	1.8	2.4	2.2	2.3	2.1	2.3	2.1	(0.0)	3.4
	NEC	6701.T	6701 JP	31-Mar	2013	42.9	15.8	30.5	17.4	8.1	6.6	0.4	0.4	0.3	0.3	1.6	1.5	4.4	3.7	4.5	8.1
	NGK Spark Plug	5334.T	5334 JP	31-Mar	2013	16.0	14.4	(37.7)	21.5	7.1	6.2	1.4	1.3	1.6	1.5	1.7	1.5	1.7	1.6	(2.3)	4.0
	Nidec	6594.T	6594 JP	31-Mar	2013	31.3	24.3	67.2	29.2	13.8	10.7	2.0	1.7	2.1	1.8	3.4	3.1	4.7	4.1	1.5	3.2
	Nikon	7731.T	7731 JP	31-Mar	2013	13.8	14.4	10.4	8.8	4.8	3.9	0.5	0.5	0.7	0.7	1.2	1.1	1.2	1.1	6.9	7.4
	Olympus	7733.T	7733 JP	31-Mar	2013	77.0	23.5	35.2	16.1	10.2	7.6	1.7	1.5	1.5	1.5	3.3	2.9	6.5	4.9	3.3	6.0
	Ricoh	7752.T	7752 JP	31-Mar	2013	12.3	9.6	nm	5.2	2.7	2.1	0.2	0.2	0.4	0.4	0.8	0.8	0.8	0.8	(0.0)	10.6
	Rohm	6963.T	6963 JP	31-Mar	2013	21.4	24.9	(24.1)	74.7	4.5	3.1	0.6	0.6	1.6	1.5	0.8	0.8	0.8	0.8	(1.7)	0.5
	Seiko Epson	6724.T	6724 JP	31-Mar	2013	10.3	9.6	15.5	8.8	5.3	4.7	0.7	0.6	0.6	0.6	1.8	1.5	1.8	1.5	7.4	11.9
	Shinko Electric Industries	6967.T	6967 JP	31-Mar	2013	12.4	13.0	18.7	20.6	3.1	2.6	0.6	0.5	0.7	0.7	0.7	0.7	0.7	0.7	4.4	3.9
	Taiyo Yuden	6976.T	6976 JP	31-Mar	2013	17.8	14.6	21.2	26.5	4.9	4.2	0.8	0.7	0.7	0.7	1.2	1.1	1.2	1.1	5.0	3.8
	Tamron Co Ltd	7740.T	7740 JP	31-Dec	2013	12.7	11.1	9.5	6.6	4.4	3.5	0.7	0.6	0.9	0.9	1.3	1.2	1.3	1.2	8.2	10.3
	TDK	6762.T	6762 JP	31-Mar	2013	32.5	16.0	21.8	12.5	4.4	3.6	0.5	0.5	0.6	0.5	0.9	0.9	1.1	1.1	4.3	6.7
	Tokyo Electron	8035.T	8035 JP	31-Mar	2013	(61.2)	26.1	(25.0)	19.6	13.6	9.2	1.4	1.3	2.0	1.8	2.1	1.9	2.1	1.9	(2.9)	3.6
	Toshiba	6502.T	6502 JP	31-Mar	2013	15.8	11.7	(56.8)	23.0	5.3	4.7	0.4	0.4	0.3	0.3	1.4	1.3	4.4	3.4	(2.6)	6.6
							20.5	16.2	7.2	16.3	5.7	4.6	0.8	0.7	1.1	1.0	1.5	1.4	2.1	1.8	2.3
North America	3D Systems	DDD.N	DDD US	31-Dec	2013	69.6	46.4	nm	46.3	41.5	25.6	7.8	5.8	8.8	7.3	6.6	6.3	12.7	10.6	0.9	1.7
	Amphenol Corp	APH.N	APH US	31-Dec	2013	22.2	20.3	27.3	24.6	13.8	12.5	3.0	2.8	3.0	2.8	4.3	3.9	13.4	10.3	3.7	4.1
	Apple, Inc.	AAPL.O	AAPL US	30-Sep	2013	13.0	12.5	9.0	9.7	6.1	6.0	2.0	1.9	2.7	2.6	3.6	3.3	3.8	3.5	8.0	7.6
	Arrow Electronics Inc	ARW.N	ARW US	31-Dec	2013	10.5	9.3	13.9	13.3	7.5	6.4	0.3	0.3	0.3	0.3	1.3	1.1	1.4	1.2	8.9	8.8
	Avnet Inc	AVT.N	AVT US	30-Jun	2013	11.1	10.5	31.1	10.5	7.0	6.4	0.3	0.3	0.2	0.2	1.3	1.2	1.8	1.6	3.7	10.5
	AVX Corp	AVX.N	AVX US	31-Mar	2013	20.7	19.0	15.2	30.3	6.3	6.5	0.9	0.9	1.6	1.5	1.2	1.2	1.4	1.4	3.4	1.9
	Benchmark Electronics Inc	BHE.N	BHE US	31-Dec	2013	16.0	14.9	7.2	9.0	6.0	5.1	0.3	0.3	0.5	0.4	1.0	0.9	1.1	1.0	9.5	6.8
	BlackBerry	BBRY.O	BBRY US	28-Feb	2014	(6.1)	(51.0)	(5.4)	(3.4)	7.1	7.5	0.3	1.0	0.6	1.1	1.2	1.4	2.0	3.1	(10.2)	(26.8)
	Brocade Communications Systems	BRCD.O	BRCD US	31-Oct	2013	13.3	13.8	10.6	9.3	6.4	6.9	2.0	1.9	2.2	2.2	1.9	1.7	6.0	4.8	8.3	9.4
	Celestica Inc	CLS.N	CLS US	31-Dec	2013	11.4	10.6	29.9	21.3	7.1	6.6	0.3	0.3	0.3	0.3	1.3	1.2	1.4	1.3	3.2	4.5
	Ciena Corporation	CIEN.K	CIEN US	31-Oct	2013	24.1	17.6	nm	nm	11.7	9.9	1.4	1.3	1.4	1.5	(74.1)	27.8	(15.2)	nm	0.3	1.2
	Cisco Systems, Inc.	CSCO.O	CSCO US	31-Jul	2013	11.7	11.4	9.1	7.9	5.6	5.7	1.9	1.8	2.6	2.5	2.1	2.0	4.0	3.7	7.8	9.2
	Corning Incorporated	GLW.N	GLW US	31-Dec	2013	16.3	15.9	10.7	15.7	7.5	8.0	2.8	3.1	3.3	3.2	1.4	1.3	1.6	1.5	8.2	6.1
	Electronics for Imaging Inc	EFII.O	EFII US	31-Dec	2013	23.0	20.1	17.4	14.6	11.9	10.3	2.1	1.9	2.7	2.5	2.5	2.4	3.9	3.4	4.5	5.2
	EMC Corp	EMC.N	EMC US	31-Dec	2013	14.3	12.7	8.7	6.9	7.7	6.6	1.9	1.7	2.3	2.2	2.2	2.0	6.8	5.0	9.2	11.1
	F5 Networks, Inc.	FFIV.O	FFIV US	30-Sep	2013	20.4	17.6	12.0	10.3	10.5	8.9	3.5	3.0	4.8	4.2	5.0	4.2	7.4	5.8	5.9	6.8
	Hewlett-Packard Co	HPQ.N	HPQ US	31-Oct	2013	8.7	8.2	11.3	9.1	4.6	4.3	0.6	0.6	0.6	0.5	2.1	1.9	(25.9)	31.0	9.5	11.4
	Infoblox Inc.	BLOX.N	BLOX US	31-Jul	2013	62.8	75.1	20.8	24.1	29.2	24.9	3.4	2.8	4.6	4.0	4.9	4.7	5.9	5.6	3.5	2.9
	International Business Machines	IBM.N	IBM US	31-Dec	2013	10.7	9.6	14.9	12.6	8.0	7.7	2.2	2.2	1.9	1.8	9.5	7.0	(7.6)	(8.5)	7.6	9.6
	Jabil Circuit Inc	JBL.N	JBL US	31-Aug	2013	37.0	11.2	10.1	3.2	3.4	2.1	0.3	0.2	0.2	0.2	1.3	1.2	1.7	1.5	11.0	28.0
	Juniper Networks, Inc	JNPR.N	JNPR US	31-Dec	2013	16.9	13.1	11.7	10.9	8.3	7.3	2.2	2.1	2.5	2.3	1.8	1.8	5.1	4.7	7.3	8.5
	Lexmark International Inc	LXK.N	LXK US	31-Dec	2013	12.2	12.5	12.2	10.9	4.2	4.4	0.7	0.7	0.8	0.8	2.1	1.9	4.3	3.5	7.1	7.8
	Motorola Solutions Inc	MSI.N	MSI US	31-Dec	2013	16.1	13.4	17.5	17.3	9.0	9.0	1.9	1.9	1.8	1.5	7.2	11.1	28.5	(39.6)	6.0	7.3
	NetApp Inc	NTAP.O	NTAP US	30-Apr	2013	13.6	12.0	6.9	7.8	6.9	6.4	1.2	1.2	2.0	1.9	3.3	3.1	4.8	4.3	8.7	8.3
	Plexus Corp	PLXS.O	PLXS US	30-Sep	2013	15.8	13.5	nm	21.3	7.9	6.8	0.6	0.5	0.6	0.6	1.8	1.5	1.8	1.5	0.8	4.1
	Polycorn, Inc.	PLCM.O	PLCM US	31-Dec	2013	19.1	14.4	13.4	9.4	7.9	6.1	1.1	1.0	1.4	1.4	1.8	1.6	4.0	3.1	5.8	7.6
	Riverbed Technology, Inc.	RVBD.O	RVBD US	31-Dec	2013	16.8	14.2	10.9	10.2	7.8	6.6	2.7	2.4	2.8	2.6	3.8	3.6	(20.5)	nm	8.7	8.8
	Sanmina-SCI Corporation	SANM.O	SANM US	30-Sep	2013	10.5	9.0	6.9													

Figure 1062. Comparable Valuation for Internet Stocks

	Company	Reuters	B'berg	Fiscal	Last	PE (x)		EV / FCF (x)		EV / EBITDA (x)		EV / Sales (x)		Price / Sales (x)		Price / BV (x)		Price / Tang BV (x)		FCY Yield (%)	
	Name	Code	Code	Year End	Rep Yr	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015
Internet																					
Asia	58.com	WUBA.N	WUBA US	31-Dec	2012	73.0	32.7	41.4	21.7	60.4	22.9	13.1	8.5	15.1	10.2	12.5	9.0	12.5	9.0	2.1	3.8
	Autohome	ATHM.N	ATHM US	31-Dec	2012	35.3	24.4	46.6	28.2	26.7	17.7	12.2	8.2	13.4	9.3	7.0	5.5	11.9	8.1	2.0	3.1
	Baidu.com	BIDU.O	BIDU US	31-Dec	2012	29.9	22.3	23.4	18.7	21.2	14.9	6.6	4.8	7.7	5.8	6.9	5.6	7.8	6.2	3.7	4.4
	Bitauto Holdings	BITA.N	BITA US	31-Dec	2012	27.1	18.2	20.4	11.9	19.8	12.4	4.5	3.1	5.1	3.8	5.8	4.4	6.1	4.6	4.3	6.8
	Daum Communications	035720.KQ	035720 KS	31-Dec	2012	14.3	11.7	11.9	9.6	7.3	6.0	1.6	1.4	1.8	1.6	1.7	1.5	2.0	1.8	7.4	9.0
	Info Edge	INED.BO	INFOE IN	31-Mar	2013	61.9	41.6	67.2	50.9	39.1	28.8	10.9	9.3	12.1	10.6	9.6	7.9	10.5	8.5	1.3	1.7
	Jiayuan.com International	DATE.O	DATE US	31-Dec	2012	17.9	13.0	22.3	15.1	12.3	8.1	1.6	1.3	2.2	1.8	1.8	1.6	1.8	1.6	3.3	4.7
	Just Dial	JUST.BO	JUST IN	31-Mar	2013	90.1	67.1	98.3	74.4	74.3	52.6	22.7	17.8	23.9	19.1	20.1	15.5	20.4	15.6	1.0	1.3
	Naver Corp	035420.KS	035420 KS	31-Dec	2012	50.3	39.0	38.4	30.7	31.6	24.5	9.5	8.0	9.8	8.5	13.0	9.7	14.1	10.4	2.5	3.1
	NCsoft	036570.KS	036570 KS	31-Dec	2012	21.0	18.6	12.5	16.0	12.6	10.3	4.7	3.9	5.5	4.9	3.5	2.9	3.9	3.1	6.9	5.0
	Qihoo 360 Technology	QIHU.N	QIHU US	31-Dec	2013	37.8	24.9	31.9	18.2	28.8	17.1	9.2	5.8	10.9	7.4	12.3	8.4	12.8	8.6	2.7	4.3
	Sina	SINA.O	SINA US	31-Dec	2012	28.2	18.3	18.8	10.5	15.5	9.0	3.2	2.5	4.8	4.1	2.9	2.5	2.9	2.5	3.5	5.7
	Sky-mobi	MOBI.O	MOBI US	31-Mar	2013	73.9	34.3	18.5	15.5	22.2	13.5	1.4	1.1	2.6	2.1	2.8	2.6	2.8	2.6	2.9	3.3
	Soufun Holdings	SFUN.N	SFUN US	31-Dec	2012	15.2	13.3	11.0	8.5	10.9	8.6	6.3	4.6	7.3	6.0	6.8	4.6	6.8	4.6	7.8	8.9
	Tencent Holdings	0700.HK	700 HK	31-Dec	2012	34.8	27.0	35.1	25.1	25.0	19.0	9.5	7.1	10.5	8.2	10.1	7.5	10.8	7.9	2.6	3.4
	YY	YY.O	YY US	31-Dec	2012	37.3	27.0	28.7	19.1	32.7	21.1	9.2	6.2	11.2	8.0	9.9	7.1	9.9	7.2	2.9	4.1
						40.5	27.1	32.9	23.4	27.5	17.9	7.9	5.8	9.0	7.0	7.9	6.0	8.6	6.4	3.5	4.5
Australia/NZ	Carsales.com Ltd	CRZ.AX	CRZ AU	30-Jun	2013	26.0	21.8	25.9	23.8	18.5	16.3	10.7	9.8	10.8	9.8	57.2	37.4	(64.8)	nm	3.8	4.2
	SEEK Ltd	SEK.AX	SEK AU	30-Jun	2013	34.7	29.2	40.7	35.5	19.7	16.8	8.0	7.5	8.0	7.8	3.9	3.7	(38.9)	(79.5)	2.5	2.7
						30.4	25.5	33.3	29.6	19.1	16.6	9.4	8.7	9.4	8.8	30.6	20.6	(51.8)	(79.5)	3.1	3.5
CEEMEA	Mail Ru Group	MAILRq.L	MAIL LI	31-Dec	2012	24.6	20.3	18.6	15.6	15.2	12.4	6.7	5.5	7.8	6.4	3.9	3.2	8.0	5.4	4.6	5.4
						24.6	20.3	18.6	15.6	15.2	12.4	6.7	5.5	7.8	6.4	3.9	3.2	8.0	5.4	4.6	5.4
Europe	Moneysupermarket	MONY.L	MONY LN	31-Dec	2013	15.3	14.2	14.8	11.2	12.8	11.5	4.3	3.8	4.3	4.0	7.3	6.9	(67.7)	65.9	6.8	8.7
	Rightmove	RMV.L	RMV LN	31-Dec	2013	27.5	23.9	28.0	25.0	22.3	19.8	16.0	14.3	16.1	14.0	nm	nm	nm	nm	3.5	4.1
	United Internet AG	UTDI.DE	UTDI GR	31-Dec	2012	25.5	19.7	24.6	20.2	14.0	11.7	2.4	2.2	2.4	2.2	18.8	13.2	(56.0)	nm	4.1	5.0
	Yandex NV	YNDX.O	YNDX US	31-Dec	2012	24.7	20.3	24.7	19.1	14.9	11.8	6.4	5.1	7.2	5.9	6.8	4.9	6.9	5.0	3.6	4.5
						23.2	19.5	23.0	18.9	16.0	13.7	7.3	6.3	7.5	6.5	10.9	8.3	(38.9)	35.5	4.5	5.5
Japan	CyberAgent	4751.T	4751 JP	30-Sep	2013	24.8	22.0	24.4	21.6	8.6	7.5	1.2	1.1	1.4	1.3	4.5	3.9	5.6	4.6	3.6	4.0
	DeNA	2432.T	2432 JP	31-Mar	2013	7.8	9.8	5.0	5.6	2.7	3.0	0.9	0.9	1.4	1.5	1.8	1.6	2.7	2.2	13.0	10.4
	Gree	3632.T	3632 JP	30-Jun	2013	13.8	10.1	10.5	8.2	5.4	4.0	1.6	1.3	2.0	1.8	2.3	1.9	4.2	3.1	7.7	9.1
	GungHo Online Entertainment	3765.T	3765 JP	31-Dec	2013	8.8	8.4	6.6	5.2	4.4	3.6	2.5	2.1	3.2	3.1	4.5	3.0	4.6	3.0	12.0	13.0
	Kakaku.Com	2371.T	2371 JP	31-Mar	2013	44.0	32.6	41.0	30.3	23.9	17.5	12.6	9.6	13.5	10.6	14.9	10.9	15.4	11.1	2.3	3.0
	Nexon	3659.T	3659 JP	31-Dec	2013	8.0	7.6	3.7	3.2	1.8	1.5	0.9	0.7	2.3	2.1	1.2	1.0	1.6	1.4	10.3	10.6
	Rakuten	4755.T	4755 JP	31-Dec	2013	30.8	28.0	50.6	13.6	13.2	11.5	3.1	2.8	3.2	3.0	5.3	4.5	38.3	18.1	1.9	6.9
						19.7	16.9	20.2	12.5	8.6	6.9	3.3	2.6	3.9	3.3	4.9	3.8	10.3	6.2	7.3	8.1
Latin America	MercadoLibre Inc	MELI.O	MELI US	31-Dec	2013	32.0	25.7	30.8	23.4	21.5	17.4	7.6	6.1	7.9	6.5	9.3	7.2	10.8	8.1	3.1	4.0
						32.0	25.7	30.8	23.4	21.5	17.4	7.6	6.1	7.9	6.5	9.3	7.2	10.8	8.1	3.1	4.0
North America	Amazon.com, Inc.	AMZN.O	AMZN US	31-Dec	2013	84.9	58.4	41.4	21.4	28.1	18.7	1.6	1.2	1.7	1.4	16.3	12.8	22.7	16.4	2.2	4.1
	AOL Inc.	AOL.N	AOL US	31-Dec	2013	19.6	18.5	10.1	9.2	7.2	6.3	1.8	1.6	2.1	2.1	1.5	1.5	4.8	4.2	8.5	8.3
	eBay Inc.	EBAY.O	EBAY US	31-Dec	2013	18.2	15.6	15.2	11.7	11.2	8.9	3.3	2.7	3.9	3.4	2.6	2.3	4.0	3.3	5.5	6.8
	Facebook, Inc	FB.O	FB US	31-Dec	2013	55.4	43.3	71.4	36.3	27.5	20.4	12.9	10.0	14.8	12.3	11.5	8.6	13.0	9.4	1.2	2.2
	Google Inc.	GOOGL.O	GOOGL U:	31-Dec	2013	12.3	10.3	9.4	6.6	6.1	4.4	1.9	1.5	2.9	2.7	1.8	1.6	2.2	1.8	7.0	8.5
	LinkedIn Corp	LNKD.N	LNKD US	31-Dec	2013	nm	93.2	nm	53.3	92.3	57.6	9.0	6.8	10.6	8.3	7.8	6.7	8.3	7.0	0.5	1.5
	OpenTable, Inc	OPEN.O	OPEN US	31-Dec	2013	41.8	37.0	25.6	22.6	24.9	20.2	7.4	6.0	8.5	7.4	6.7	5.3	10.2	7.5	3.4	3.6
	Rocket Fuel Inc.	FUEL.O	FUEL US	31-Dec	2013	nm	77.5	(24.3)	nm	(79.4)	74.6	2.9	1.8	3.2	2.5	5.5	5.2	5.5	5.2	(3.8)	0.3
	Yelp Inc.	YELP.N	YELP US	31-Dec	2013	nm	88.5	nm	66.7	nm	59.4	12.8	9.6	14.1	12.2	9.8	8.7	11.1	9.6	0.7	1.2
	YuMe Inc	YUME.N	YUME US	31-Dec	2013	(50.5)	nm	(44.3)	nm	(62.5)	90.9	0.9	0.7	1.2	1.0	2.2	2.2	2.3	2.3	(1.7)	(0.8)
	Zillow, Inc.	Z.O	Z US	31-Dec	2013	nm	nm	nm	75.2	nm	nm	10.7	7.8	13.8	10.6	5.7	7.8	7.1	9.6	0.7	1.0
	zulily, inc.	ZU.O	ZU US	31-Dec	2013	nm	nm	nm	58.8	nm	64.1	5.4	3.7	6.1	4.3	22.9	18.8	22.9	18.8	0.5	1.5
							26.0	49.1	13.1	36.2	6.2	38.7	5.9	4.5	6.9	5.7	7.9	6.8	9.5	7.9	2.1

Source: Citi Research

Figure 1063. Comparable Valuation for IT Services Stocks

	Company	Reuters	B'berg	Fiscal	Last	PE (x)		EV / FCF (x)		EV / EBITDA (x)		EV / Sales (x)		Price / Sales (x)		Price / BV (x)		Price / Tang BV (x)		FCY Yield (%)	
	Name	Code	Code	Year End	Rep Yr	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015
IT Services																					
Asia	CSE Global	CSES.SI	CSE SP	31-Dec	2012	5.1	4.8	5.0	5.3	3.3	2.8	0.5	0.4	0.6	0.5	1.1	0.9	1.6	1.4	19.3	16.3
	HCL Technologies	HCLT.BO	HCLT IN	30-Jun	2013	17.0	15.2	17.0	15.0	10.8	9.6	2.7	2.3	3.0	2.7	5.1	4.0	7.0	5.0	5.3	5.7
	Infosys	INFY.BO	INFO IN	31-Mar	2013	18.2	16.2	24.7	19.5	11.9	10.4	3.2	2.8	3.8	3.5	4.2	3.6	4.2	3.6	3.4	4.1
	MindTree	MINT.BO	MTCL IN	31-Mar	2013	13.2	11.5	35.2	16.9	9.1	7.5	1.8	1.5	2.0	1.8	3.7	2.9	3.7	3.0	2.5	5.1
	Tata Consultancy Services	TCS.BO	TCS IN	31-Mar	2013	22.3	19.7	29.0	24.4	16.1	14.2	4.9	4.2	5.2	4.5	7.8	6.2	8.4	6.5	3.3	3.8
	Tech Mahindra	TEML.BO	TECHM IN	31-Mar	2013	15.6	14.0	22.8	19.9	9.3	8.5	2.1	1.8	2.3	2.1	4.7	3.6	5.0	4.0	4.0	4.4
	Wipro	WIPR.BO	WPRO IN	31-Mar	2013	17.8	15.6	19.0	16.5	12.9	11.2	2.9	2.6	3.2	2.9	4.1	3.5	5.1	4.1	4.7	5.3
						15.6	13.9	21.8	16.8	10.5	9.2	2.6	2.2	2.9	2.6	4.4	3.5	5.0	3.9	6.1	6.4
Europe	Accenture Ltd	ACN.N	ACN US	31-Aug	2013	17.6	16.1	16.4	15.1	10.2	9.6	1.7	1.6	1.9	1.8	8.1	6.0	22.0	10.3	5.5	6.0
	ATOS	ATOS.PA	ATO FP	31-Dec	2012	13.0	11.7	15.3	14.8	6.4	5.8	0.7	0.7	0.7	0.7	2.0	1.8	10.2	6.5	6.8	6.8
	Capgemini SA	CAPP.PA	CAP FP	31-Dec	2013	15.8	14.4	15.2	13.5	7.7	6.9	0.7	0.7	0.9	0.8	1.8	1.7	8.4	6.0	5.6	6.1
	Wirecard	WDIG.DE	WDI GR	31-Dec	2012	29.4	23.8	65.3	49.4	20.8	16.8	6.1	5.1	6.2	5.2	4.9	4.3	14.2	11.6	1.5	2.0
						19.0	16.5	28.1	23.2	11.3	9.8	2.3	2.0	2.4	2.1	4.2	3.4	13.7	8.6	4.9	5.2
Japan	Nomura Research Institute	4307.T	4307 JP	31-Mar	2013	20.4	19.4	14.3	12.6	5.6	5.2	1.3	1.2	1.8	1.8	1.8	1.6	2.0	1.8	4.9	5.3
	NTT Data	9613.T	9613 JP	31-Mar	2013	51.6	25.3	47.1	34.7	6.6	5.8	1.0	0.9	0.8	0.8	1.7	1.6	7.0	5.9	2.6	3.5
	Oracle Japan	4716.T	4716 JP	31-May	2013	20.3	19.2	15.1	13.9	10.4	9.5	3.1	2.8	3.6	3.4	6.1	5.1	6.1	5.1	5.7	5.9
	Secom	9735.T	9735 JP	31-Mar	2013	18.3	17.4	14.5	14.2	5.9	5.5	1.2	1.1	1.6	1.6	1.8	1.7	1.9	1.8	5.0	5.0
	Trend Micro	4704.T	4704 JP	31-Dec	2013	21.5	20.6	9.5	8.9	6.0	5.4	2.0	1.8	3.8	3.7	2.7	2.5	2.9	2.6	5.5	5.5
						26.4	20.4	20.1	16.8	6.9	6.3	1.7	1.6	2.3	2.2	2.8	2.5	4.0	3.5	4.7	5.0
Latin America	Cielo	CIEL3.SA	CIEL3 BZ	31-Dec	2012	19.3	17.2	28.3	25.8	10.9	9.6	6.5	5.8	6.6	5.9	12.4	10.0	25.2	18.4	3.5	3.8
						19.3	17.2	28.3	25.8	10.9	9.6	6.5	5.8	6.6	5.9	12.4	10.0	25.2	18.4	3.5	3.8
North America	Alliance Data Systems Corp	ADS.N	ADS US	31-Dec	2013	21.7	18.7	13.1	10.5	10.6	9.2	3.1	2.7	3.2	2.9	7.3	4.6	(18.8)	28.6	7.2	9.0
	Automatic Data Processing Inc	ADP.O	ADP US	30-Jun	2013	24.5	22.1	27.6	21.8	13.9	12.9	2.9	2.7	3.1	2.8	6.0	6.1	15.3	16.3	3.5	4.5
	Computer Sciences Corporator	CSC.N	CSC US	31-Mar	2013	15.7	13.9	14.7	13.1	4.5	4.3	0.7	0.7	0.7	0.7	2.1	1.9	5.6	4.3	7.0	7.7
	EPAM Systems, Inc.	EPAM.N	EPAM US	31-Dec	2013	17.7	14.9	26.4	19.4	12.5	9.6	2.1	1.6	2.5	2.1	3.5	2.9	3.7	3.0	3.1	3.9
	Fidelity National Info Svcs, Inc	FIS.N	FIS US	31-Dec	2013	17.6	15.5	24.9	20.9	10.2	9.3	3.0	2.8	2.4	2.2	2.2	2.1	(4.3)	(5.0)	5.0	6.0
	Fiserv, Inc.	FISV.O	FISV US	31-Dec	2013	17.3	15.6	18.9	17.0	10.7	10.0	3.6	3.4	2.9	2.7	3.7	3.4	(3.9)	(4.2)	6.4	7.3
	FleetCor Technologies Inc	FLT.N	FLT US	31-Dec	2013	22.9	20.0	26.3	20.8	15.7	13.2	9.5	8.3	9.0	8.3	5.9	4.7	(13.8)	(60.1)	4.0	4.8
	Global Payments, Inc.	GPN.N	GPN US	31-May	2013	17.4	15.2	10.9	17.0	10.9	10.1	2.3	2.1	2.0	1.8	4.4	4.0	(7.6)	(9.1)	10.3	7.0
	Green Dot Corp	GDOT.N	GDOT US	31-Dec	2013	15.6	13.9	5.3	3.5	2.5	1.7	0.5	0.3	1.4	1.3	1.9	1.7	2.0	1.8	6.2	7.1
	Paychex Inc	PAYX.O	PAYX US	31-May	2013	25.0	23.0	21.8	19.5	13.5	12.5	5.9	5.5	6.3	6.0	8.5	7.6	12.5	10.7	4.3	4.8
	Total System Services	TSS.N	TSS US	31-Dec	2013	15.5	13.4	19.3	15.0	9.6	8.5	2.7	2.4	2.2	2.0	3.3	3.0	(12.6)	(18.5)	6.2	8.0
	Vantiv, Inc.	VNTV.N	VNTV US	31-Dec	2013	16.5	14.6	25.9	19.2	13.1	11.8	6.2	5.7	4.8	4.3	7.9	6.8	(3.2)	(3.7)	5.0	6.8
	VeriFone Systems Inc	PAY.N	PAY US	31-Oct	2013	23.3	17.4	46.1	21.2	14.6	11.3	2.5	2.2	2.1	1.9	3.3	3.0	(6.3)	(11.2)	2.6	5.3
	Verisign, Inc.	VRSN.O	VRSN US	31-Dec	2013	19.7	16.3	13.4	13.5	9.9	10.0	6.2	6.2	7.2	6.1	(5.6)	(4.8)	(5.4)	(4.6)	6.4	7.6
	Web.Com Group	WWWV.O	WWWV U	31-Dec	2013	12.9	10.8	20.9	16.0	15.8	11.7	3.7	3.1	3.1	2.8	7.5	5.2	(2.4)	(3.1)	5.7	7.0
	West Corp	WSTC.O	WSTC US	31-Dec	2013	8.5	8.2	22.8	20.3	7.7	7.2	1.9	1.8	0.8	0.7	(3.4)	(4.5)	(0.8)	(0.8)	11.2	12.1
	Western Union Co.	WU.N	WU US	31-Dec	2013	11.2	10.8	12.5	9.9	5.6	5.3	1.4	1.3	1.6	1.5	6.7	5.3	(3.4)	(3.9)	6.8	8.5
	WEX Inc	WEX.N	WEX US	31-Dec	2013	19.4	16.7	(28.1)	nm	10.4	9.2	5.4	4.8	4.9	4.4	3.5	2.9	nm	14.0	(3.9)	(0.0)
						17.9	15.6	17.9	16.4	10.7	9.3	3.5	3.2	3.3	3.0	3.8	3.1	(2.5)	(2.5)	5.4	6.5

Source: Citi Research

Figure 1064. Comparable Valuation for Semiconductors & Components Stocks

	Company Name	Reuters Code	B'berg Code	Fiscal Year End	Last Rep Yr	PE (x)		EV / FCF (x)		EV / EBITDA (x)		EV / Sales (x)		Price / Sales (x)		Price / BV (x)		Price / Tang BV (x)		FCY Yield (%)	
						2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015
Semiconductors & Components																					
Asia	ASE	2311.TW	2311 TT	31-Dec	2013	13.0	12.0	12.9	10.7	5.9	5.2	1.2	1.1	1.1	1.0	2.0	1.8	2.0	1.8	8.8	9.9
	AU Optronics	2409.TW	2409 TT	31-Dec	2012																
	Chipbond Technology	6147.TWO	6147 TT	31-Dec	2013	16.9	15.9	13.2	9.8	7.3	6.7	2.3	2.1	2.0	2.0	1.6	1.6	1.6	1.6	8.6	11.0
	Epistar	2448.TW	2448 TT	31-Dec	2012																
	Everlight	2393.TW	2393 TT	31-Dec	2012																
	Innolux Corp	3481.TW	3481 TT	31-Dec	2012																
	LG Display	034220.KS	034220 KS	31-Dec	2013	13.0	11.3	17.6	20.9	2.4	2.0	0.4	0.4	0.4	0.4	0.9	0.8	1.0	0.9	6.2	4.9
	MagnaChip Semiconductor	MX.N	MX US	31-Dec	2012	6.4	5.5	7.2	4.5	3.5	2.8	0.6	0.5	0.6	0.6	1.1	0.9	1.1	0.9	13.1	19.0
	MediaTek	2454.TW	2454 TT	31-Dec	2013	21.6	23.9	29.8	19.6	15.1	16.3	2.9	2.9	3.9	4.0	3.3	3.3	3.3	3.3	2.5	3.7
	Novatek	3034.TW	3034 TT	31-Dec	2012	17.2	16.4	19.0	16.6	12.2	11.5	1.7	1.6	2.0	1.9	3.4	3.2	3.4	3.2	4.5	5.1
	Powertech Technology	6239.TW	6239 TT	31-Dec	2013	15.9	15.1	8.0	6.8	3.4	3.0	1.1	1.0	0.9	0.9	1.2	1.1	1.2	1.1	14.6	16.0
	Radiant Opto-Electronics	6176.TW	6176 TT	31-Dec	2012																
	Samsung Electronics	005930.KS	005930 KS	31-Dec	2013	6.9	6.5	5.9	4.8	2.5	2.0	0.6	0.5	0.9	0.8	1.2	1.0	1.2	1.1	11.5	12.4
	SK Hynix	000660.KS	000660 KS	31-Dec	2013	6.5	6.1	8.8	7.8	3.0	2.4	1.5	1.2	1.6	1.5	1.5	1.2	1.6	1.3	10.7	10.6
	SPIL	2325.TW	2325 TT	31-Dec	2013	16.1	14.3	25.2	10.7	5.8	5.1	1.7	1.5	1.7	1.5	2.0	2.0	2.0	2.0	3.9	9.0
	TPK	3673.TW	3673 TT	31-Dec	2012																
	TSMC	2330.TW	2330 TT	31-Dec	2012	14.0	12.6	30.7	16.7	6.3	5.5	4.1	3.6	4.3	3.8	3.1	2.7	3.1	2.7	3.1	5.6
	UMC	2303.TW	2303 TT	31-Dec	2013	21.1	17.4	20.9	11.4	2.9	2.4	0.9	0.8	1.2	1.1	0.8	0.8	0.8	0.8	3.7	6.6
	Vanguard International Semiconductors	5347.TWO	5347 TT	31-Dec	2012	16.4	17.8	21.0	10.2	8.1	8.0	2.7	2.4	3.4	3.3	2.7	2.4	2.7	2.4	3.8	7.2
	WPG Holdings	3702.TW	3702 TT	31-Dec	2012	12.2	11.3	(81.1)	5.0	14.4	12.7	0.2	0.2	0.1	0.1	1.5	1.5	1.5	1.5	(2.0)	30.8
						19.6	19.4	9.8	10.8	6.2	5.6	1.4	1.2	1.5	1.4	1.7	1.6	1.8	1.6	9.3	13.6
Europe	ARM Holdings PLC	ARML.L	ARM LN	31-Dec	2013	43.4	34.5	49.9	37.4	39.3	30.2	17.3	14.8	18.4	15.8	9.5	8.5	16.4	13.4	1.9	2.5
	ASML Holding NV	ASML.AS	ASML NA	31-Dec	2013	20.6	17.4	43.3	25.4	15.5	13.5	4.3	4.1	4.5	4.2	3.9	3.5	6.1	5.1	2.2	3.9
	CSR Plc	CSR.L	CSR LN	31-Dec	2012	25.0	na	16.9	na	12.1	na	1.8	na	2.2	na	2.6	na	4.0	na	4.7	na
	Infineon Technologies	IFXGn.DE	IFX GR	30-Sep	2013	23.5	18.2	32.3	21.5	7.3	6.3	1.8	1.6	2.3	2.1	2.6	2.4	2.7	2.5	2.4	3.6
	STMicroelectronics	STM.PA	STM FR	31-Dec	2012	30.5	18.7	16.0	14.2	6.8	5.7	0.9	0.8	1.0	1.0	1.5	1.4	1.6	1.5	5.7	6.3
	Wolfson	WLF.L	WLF LN	31-Dec	2013	43.2	20.8	72.5	17.8	24.7	13.3	1.2	1.1	1.4	1.3	2.0	1.8	2.7	2.3	1.2	4.8
						31.0	21.9	38.5	23.2	17.6	13.8	4.6	4.5	5.0	4.9	3.7	3.5	5.6	5.0	3.0	4.2
Japan	Asahi Glass	5201.T	5201 JP	31-Dec	2013	40.1	24.2	(13.3)	(40.1)	4.0	4.0	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.6	(8.8)	(2.9)
	Nippon Electric Glass	5214.T	5214 JP	31-Mar	2013	23.8	nm	7.0	12.5	3.2	4.2	0.7	0.7	1.1	1.1	0.5	0.5	0.5	0.5	9.2	4.8
	Nippon Sheet Glass	5202.T	5202 JP	31-Mar	2013	(6.7)	nm	(5.9)	nm	5.0	3.5	0.3	0.3	0.2	0.2	0.9	0.9	0.9	0.9	(24.4)	0.3
	SUMCO	3436.T	3436 JP	31-Dec	2013	13.7	7.3	51.6	19.0	9.0	6.9	1.9	1.8	1.0	0.9	1.1	1.3	1.1	1.3	3.8	10.6
						17.7	15.7	9.8	(2.9)	5.3	4.6	0.9	0.9	0.7	0.7	0.8	0.8	0.8	0.8	(5.1)	3.2
North America	Advanced Micro Devices	AMD.N	AMD US	31-Dec	2013	22.4	9.1	(32.3)	12.8	6.3	4.5	0.6	0.5	0.5	0.5	3.8	2.5	18.6	4.9	(3.5)	8.4
	Altera Corp	ALTR.O	ALTR US	31-Dec	2013	25.5	22.2	13.6	12.6	13.9	12.5	4.4	4.2	6.2	5.8	3.5	3.6	3.5	3.7	5.2	5.7
	Amkor Technology Inc	AMKR.O	AMKR US	31-Dec	2013	11.2	8.3	43.3	31.4	3.9	3.5	0.9	0.8	0.6	0.5	1.0	0.9	1.0	0.9	3.6	4.8
	Analog Devices	ADI.O	ADI US	31-Oct	2013	23.3	20.6	18.2	14.6	13.2	11.4	4.7	4.3	6.4	6.1	3.1	2.9	3.3	3.1	4.1	4.9
	Applied Materials Inc	AMAT.O	AMAT US	31-Oct	2013	18.6	13.7	17.4	11.3	11.4	8.5	2.6	2.2	2.7	2.4	3.1	2.5	6.7	4.6	5.4	8.2
	ATMI Inc	ATMI.O	ATMI US	31-Dec	2012	20.5	15.4	17.7	14.6	8.9	6.7	2.1	1.7	2.5	2.1	1.8	1.5	2.1	1.7	4.8	5.5
	Broadcom Corporation	BRCM.O	BRCM US	31-Dec	2013	27.5	21.8	13.5	11.0	16.3	12.9	1.8	1.7	2.2	2.2	1.8	1.7	4.0	3.4	6.0	6.9
	Brooks Automation Inc	BRKS.O	BRKS US	30-Sep	2013	28.4	21.4	19.5	10.1	10.5	8.3	1.1	1.0	1.5	1.4	1.2	1.1	1.6	1.6	3.9	7.3
	Cypress Semiconductor Corp	CY.O	CY US	31-Dec	2013	23.8	18.2	17.5	16.0	12.8	10.6	2.3	2.1	2.4	2.3	8.4	8.2	19.2	18.0	5.4	5.8
	Entegris Inc	ENTG.O	ENTG US	31-Dec	2012	20.5	19.2	15.9	11.7	8.2	7.1	1.8	1.6	2.4	2.3	2.1	1.9	2.2	2.0	4.7	5.8
	Fairchild Semiconductor	FCS.O	FCS US	31-Dec	2013	24.7	11.9	11.7	6.1	6.9	4.3	1.0	0.9	1.2	1.2	1.3	1.2	1.5	1.3	7.0	11.9
	FormFactor Inc	FORM.O	FORM US	31-Dec	2012	96.5	na	9.6	na	6.4	na	0.8	na	1.3	na	1.1	na	1.4	na	6.1	na
	Freescale Semiconductor Holdings	FSL.N	FSL US	31-Dec	2013	18.9	15.3	29.3	21.1	12.5	10.8	2.8	2.6	1.6	1.6	(2.0)	(2.4)	(2.0)	(2.3)	6.1	7.9
	Integrated Device Technology Inc	IDTI.O	IDTI US	31-Mar	2013	26.8	21.3	nm	16.5	15.8	11.8	3.1	2.8	4.0	3.9	2.4	2.4	3.1	3.0	(0.3)	4.3
	Intel Corp	INTC.O	INTC US	31-Dec	2013	15.1	14.1	17.6	16.5	6.1	5.9	2.2	2.2	2.5	2.4	2.2	2.1	3.3	3.0	5.0	5.6
	International Rectifier	IRF.N	IRF US	30-Jun	2013	32.2	20.3	16.6	9.3	8.6	6.3	1.4	1.2	1.8	1.7	1.5	1.4	1.6	1.4	4.4	7.2
	Intersil Corporation	ISIL.O	ISIL US	31-Dec	2013	44.4	42.3	17.9	18.1	16.5	17.6	2.7	2.7	3.2	3.3	1.8	1.8	4.9	4.8	4.8	4.6
	KLA Tencor Corp	KLAC.O	KLAC US	30-Jun	2013	18.2	14.8	23.1	11.4	10.0	8.0	3.2	2.7	3.9	3.5	3.1	2.7	3.4	2.9	3.5	6.9
	Lam Research Corp	LRCX.O	LRCX US	30-Jun	2013	13.0	15.2	17.0	7.3	7.1	7.5	1.6	1.7	2.2	2.4	1.9	1.7	3.6	2.9	4.5	9.6
	Linear Technology	LLTC.O	LLTC US	30-Jun	2013	26.3	20.8	17.9	15.0	14.3	11.9	7.2	6.2	8.6	7.8	8.5	6.6	8.5	6.6	4.7	5.3
	Marvell Technology Group Ltd.	MRVL.O	MRVL US	31-Jan	2014	15.4	15.2	15.8	10.3	13.8	11.7	1.8	1.6	2.4	2.3	1.7	1.6	3.1	2.8	4.6	6.8
	Maxim Integrated	MXIM.O	MXIM US	30-Jun	2013	21.6	17.2	16.5	14.2	12.0	10.4	3.7	3.5	3.9	3.6	4.5	4.5	7.8	7.9	5.6	6.8
	Microchip Technology	MCHP.O	MCHP US	31-Mar	2013	22.1	18.3	16.9	13.0	13.4	10.7	4.5	3.9	5.5	5.0	4.2	3.7	6.5	5.4	4.9	6.1
	Micron Technology Inc	MU.O	MU US	31-Aug	2013	10.6	7.4	11.9	8.9	4.7	3.7	1.7	1.4	1.8	1.8	1.6	1.1	1.7	1.1	7.8	8.9
	NVIDIA Corp	NVDA.O	NVDA US	31-Jan	2014	25.1	28.0	16.4	14.6	9.2	9.4	1.7	1.6	2.7	2.3	2.5	2.4	3.1	3.0	3.8	4.8
	ON Semiconductor	ONNN.O	ONNN US	31-Dec	2013	12.4	10.8	12.7	10.3	7.2	6.1	1.5	1.3	1.5	1.4	2.5	2.0	3.2	2.5	8.1	9.1
	Qualcomm Inc	QCOM.O	QCOM US	30-Sep	2013	15.7	14.1	15.5	13.2	9.9	8.5	3.9	3.5	5.1	4.6	3.6	3.2	4.3	3.8	5.0	5.7
	Rambus	RMBS.O	RMBS US	31-Dec	2013	38.8	26.7	10.4	8.7	9.7	8.1	3.9	3.4	4.4	4.3	3.3	2.8	6.6	4.3	8.6	9.0
	Semtech	SMT.C	SMTC US	31-Jan	2014	17.8	14.8	22.5	11.4	11.1	10.7	3.1	2.9	3.0	3.0	2.9	2.6	13.3	7.5	4.5	8.6
	Silicon Laboratories	SLAB.O	SLAB US	31-Dec	2013	24.7	19.7	41.2	20.9	21.6	15.6	3.3	2.9	3.7	3.5	2.6	2.3	4.6	3.6	2.2	4.1
Spanion Inc.	CODE.N	CODE US	31-Dec	2013	12.0	10.6	8.6	7.4	5.8	4.8	1.0	0.8	0.9	0.9	1.7	1.5	3.4	2.5	12.9	12.8	
Teradyne Inc																					

Figure 1065. Comparable Valuation for Software Stocks

	Company	Reuters	B'berg	Fiscal	Last	PE (x)		EV / FCF (x)		EV / EBITDA (x)		EV / Sales (x)		Price / Sales (x)		Price / BV (x)		Price / Tang BV (x)		FCY Yield (%)	
	Name	Code	Code	Year End	Rep Yr	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015
Software																					
CEEMEA	CheckPoint Software Technolo	CHKP.O	CHKP US	31-Dec	2013	18.4	16.7	11.1	9.5	11.5	10.9	6.3	5.9	8.7	7.8	3.6	3.5	4.6	4.5	6.5	8.0
						18.4	16.7	11.1	9.5	11.5	10.9	6.3	5.9	8.7	7.8	3.6	3.5	4.6	4.5	6.5	8.0
Europe	AVEVA Plc	AVV.L	AVV LN	31-Mar	2013	23.8	20.2	23.3	18.7	14.5	12.9	4.8	4.4	5.6	4.9	7.0	5.9	11.0	8.3	3.7	4.8
	Dassault Systemes SA	DAST.PA	DSY FP	31-Dec	2013	24.1	21.5	22.8	19.4	13.7	11.6	4.3	3.8	4.9	4.6	3.5	3.0	7.2	5.7	3.8	4.3
	Fidessa	FDSA.L	FDSA LN	31-Dec	2013	30.3	27.4	14.5	13.1	11.1	10.3	3.2	2.9	3.4	3.2	5.8	5.2	12.9	10.5	6.3	6.8
	Micro Focus International Plc	MCRO.L	MCRO LN	30-Apr	2013	14.9	13.4	13.6	11.9	10.9	10.5	5.0	5.0	4.8	4.3	nm	(22.3)	(4.7)	(3.8)	7.6	9.7
	Sage Group PLC	SGE.L	SGE LN	30-Sep	2013	16.8	15.2	19.6	15.3	12.2	11.4	3.5	3.4	3.2	2.9	6.8	7.4	(6.7)	(6.3)	5.7	7.5
	SAP AG	SAPG.DE	SAP GR	31-Dec	2013	16.7	14.8	18.9	15.9	12.3	10.3	4.1	3.6	4.0	3.6	3.8	3.3	27.5	11.3	5.4	6.2
	SDL	SDL.L	SDL LN	31-Dec	2013	23.1	13.1	16.5	9.9	12.0	7.6	1.0	0.9	1.0	1.0	1.3	1.3	80.8	14.9	5.8	9.2
	Software AG	SOWG.DE	SOW GR	31-Dec	2012	11.8	10.9	14.6	13.7	9.2	8.2	2.5	2.3	2.1	2.0	2.2	1.9	nm	11.7	8.3	8.4
	Telecity Group Plc	TCY.L	TCY LN	31-Dec	2013	17.3	15.5	34.3	31.3	10.0	8.9	4.8	4.3	4.0	3.6	2.9	2.6	4.7	3.8	3.5	3.8
						19.9	16.9	19.8	16.6	11.8	10.2	3.7	3.4	3.7	3.3	4.2	0.9	16.6	6.2	5.6	6.8
North America	Adobe Systems Inc.	ADBE.O	ADBE US	30-Nov	2013	51.1	32.8	38.7	26.1	40.0	24.5	7.1	6.1	7.8	6.7	4.6	4.3	21.1	14.7	2.4	3.5
	Autodesk, Inc.	ADSK.O	ADSK US	31-Jan	2014	28.8	37.0	18.3	17.4	21.4	27.0	4.1	3.8	4.9	4.7	4.8	4.9	9.1	9.1	4.6	4.7
	CA Inc.	CA.O	CA US	31-Mar	2013	10.1	12.7	13.7	8.7	8.0	7.5	2.8	2.8	3.1	3.1	2.5	2.4	(10.5)	(18.7)	6.6	10.1
	Citrix Systems, Inc.	CTXS.O	CTXS US	31-Dec	2013	19.5	17.4	11.1	9.6	13.1	10.8	2.7	2.4	3.4	3.2	3.1	3.0	8.5	6.9	7.2	7.8
	FireEye, Inc.	FEYE.O	FEYE US	31-Dec	2013	(26.9)	(35.7)	(54.6)	(60.3)	(24.6)	(27.6)	18.3	12.0	20.0	16.0	6.8	10.5	16.5	41.7	(1.7)	(1.2)
	Fortinet, Inc.	FTNT.O	FTNT US	31-Dec	2013	44.9	36.3	20.3	16.1	30.8	24.4	3.9	3.2	5.4	4.8	5.4	4.7	5.5	4.7	3.5	4.1
	Guidewire Software, Inc.	GWRE.N	GWRE US	31-Jul	2013	nm	85.4	60.9	46.7	nm	52.4	8.3	6.5	10.1	9.4	3.8	3.6	3.8	3.6	1.4	1.5
	Intuit Inc.	INTU.O	INTU US	31-Jul	2013	21.9	19.0	15.3	12.7	13.5	11.7	4.6	4.2	5.0	4.5	7.7	6.6	15.3	11.6	6.1	7.2
	Jive Software, Inc.	JIVE.O	JIVE US	31-Dec	2013	(18.1)	(21.0)	(24.3)	(26.4)	(7.8)	(7.6)	2.5	2.0	3.2	2.7	8.5	13.8	21.2	nm	(3.2)	(2.9)
	Microsoft Corp.	MSFT.O	MSFT US	30-Jun	2013	15.2	13.9	11.3	8.9	8.1	7.1	3.0	2.4	3.9	3.2	3.7	3.2	4.6	3.8	6.8	8.2
	Oracle Corporation	ORCL.K	ORCL US	31-May	2013	13.8	12.5	11.9	11.0	9.2	8.8	4.3	4.1	4.8	4.4	3.9	3.7	17.0	14.7	7.5	8.5
	Palo Alto Networks, Inc.	PANW.N	PANW US	31-Jul	2013	nm	nm	43.2	22.3	(84.0)	nm	7.5	5.3	8.9	6.8	17.8	14.8	19.9	16.6	2.0	3.5
	Proofpoint, Inc.	PFPT.O	PFPT US	31-Dec	2013	(72.4)	(96.0)	nm	51.5	(35.4)	(40.0)	6.9	5.5	7.7	6.8	20.3	24.1	(74.1)	(59.7)	0.7	1.6
	Qlik Technologies Inc.	QLIK.O	QLIK US	31-Dec	2013	95.8	72.1	60.8	46.3	nm	nm	3.8	3.2	4.3	3.8	7.5	6.6	8.4	7.2	1.4	1.8
	Red Hat, Inc.	RHT.N	RHT US	28-Feb	2014	34.5	33.1	17.9	14.8	26.8	23.6	5.4	4.5	6.4	5.6	6.3	5.6	13.3	10.8	4.7	5.4
	salesforce.com, inc.	CRM.N	CRM US	31-Jan	2014	nm	nm	58.9	50.9	nm	nm	8.3	6.4	8.7	6.9	11.1	10.2	(78.4)	nm	1.6	1.8
	ServiceNow, Inc.	NOW.N	NOW US	31-Dec	2013	nm	nm	nm	45.0	nm	nm	11.1	7.2	13.4	10.2	18.6	15.5	20.9	17.3	0.7	1.6
	Symantec Corp.	SYMC.O	SYMC US	31-Mar	2013	10.7	10.2	9.8	7.2	6.7	4.8	1.8	1.6	2.1	2.0	2.3	2.2	(16.4)	(51.6)	8.6	11.3
	VMware, Inc.	VMW.N	VMW US	31-Dec	2013	30.0	25.3	17.9	15.2	28.0	23.2	6.6	5.5	7.7	6.7	5.6	4.6	14.8	9.5	4.8	5.4
	Workday Inc	WDAY.N	WDAY US	31-Jan	2014	nm	nm	nm	nm	nm	nm	30.5	19.2	30.9	20.8	12.4	13.9	12.7	14.3	(0.1)	0.1
						17.3	15.9	19.5	17.0	3.6	10.0	7.2	5.4	8.1	6.6	7.8	7.9	1.7	3.2	3.3	4.2

\* (x) multiples outside the -99 to +99 range are considered not meaningful and denoted as "nm"  
(%) percentages outside the -99% to +99% range are considered not meaningful and denoted as "nm"

Source: Citi Research

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## Appendix A-1

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