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Semiconductor Weekly

Impressive New Intel Processors, Lower Samsung Memory Capex

- One conclusion we drew from the CES trade show is that the emergence of non-Apple tablets remains somewhat muted. We are impressed by the 29 Sandy Bridge desktop and notebook processors Intel has launched, but we do not think AMD's new processor families (Ontario and Zacate for netbooks and value notebooks) will help AMD's sales or competitive position very much. Qualcomm announced an agreement to acquire Atheros. Samsung expects its chip segment capital investment might decline to 10.3 trillion won in 2011 from 12 trillion won in 2010. Hynix Semiconductor plans to invest 3.4 trillion won in 2011, in line with its 2010 spending level of 3.38 trillion won. Volterra and Mindspeed reduced December quarter guidance but Volterra indicated that its orders suggest that its chip sales into notebooks could be up in the March quarter.
- Intel launched its Sandy Bridge processors for desktops and notebooks--a total of 15 notebook and 14 desktop chips. We expect consumer desktops and notebooks using the new quad core chips will first be available this month (January), consumer systems with the dual-core chips in February and business systems in March. The new chips do appear to offer excellent performance/price characteristics, based on third party performance data. AMD made several new processor and graphics introductions at the CES trade show. We do not think that the processor introductions will help AMD's sales or competitive position very much. Given the shifting focus to tablets, we think that the total revenue AMD might generate from selling its new Ontario processors into netbooks is limited, perhaps of the order of \$20-40 million per quarter by the second half of 2011. We think that the value notebook processor Zacate will compete mainly against other AMD processors. AMD has also introduced two new 45nm Phenom performance desktop processors.
- Qualcomm announced it has entered a definitive agreement to acquire the fabless wireline/wireless connection company Atheros Communications, Inc. for \$45 per share in cash (represents an enterprise value of \$3.1 billion). Excluding amortization, Qualcomm expects the deal to be modestly accretive to EPS in FY2012, the first full year of combined operations. The deal is expected to close in the first half of 2011. We view the deal as positive for Qualcomm.
- One conclusion we drew from the CES trade show is that the emergence of non-Apple tablets remains somewhat muted. The first Android 3.0 tablets are just becoming available. Relatively few x86 processor based tablets running Windows have been announced, possibly in part because Intel's Oak Trail processor is not yet completely ready.
- Volterra reduced the midpoint of its December quarter sales guidance to a sequential decline of 15% compared to prior guidance for a 7% drop. Volterra said recent order activity suggests normal seasonality in the March quarter, with the exception of the notebook business which is expected to be up (i.e. better-than-normal seasonality, we believe). Mindspeed reduced December quarter sales guidance to a 30% decline from a prior 28%.
- In the coming week, we expect that Taiwanese technology sales numbers will show ongoing softness through December, a reflection of ongoing focus on inventory management in the electronics supply chain. In Intel's earnings release we are hopeful that March quarter gross margin guidance will be 64% or better.

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Together we'll go far



Our View: Soft end to 2010, solid start for 2011

We do not have particularly high expectations for month of December Taiwanese technology-related sales data that will become available over the next day or two, or for December quarter earnings numbers from semiconductors companies to be released over the next few weeks. Original guidance for the December quarter from many chip companies was for what we consider to be sub-seasonal sales trends, with for example, many broad chip companies including analog companies such as Texas Instruments, Linear Technology and Maxim guiding for December quarter sales to be flat to down sequentially. As the quarter progressed, there was little evidence that we are aware of suggesting that semiconductor demand picked up much above original expectations as the quarter progressed.

Last week Volterra and Mindspeed reduced December quarter guidance. By our count, this brings the tally of chip companies updating December quarter guidance to:

- Three companies lowering guidance--Volterra, Mindspeed, Xilinx
- Four companies reaffirming guidance--Diodes, Lattice, Texas Instruments, Altera
- One company raising guidance--Broadcom

We think it is interesting that semiconductors trends were soft in the December quarter, even as global economic data continued to show growth. The Wells Fargo Economics team is projecting global GDP growth of 4.1% in 2011, following 4.9% growth in 2010. We suspect that the weakness in chip demand towards the end of 2010 is in part a reflection of careful management of inventory in the electronics supply chain. In particular, we are hopeful that the PC supply chain, being one of the first to show weakness (with Intel and AMD seeing sub-seasonal September quarter sales in addition to guiding to a sub-seasonal trend for the December quarter) may be one of the first electronics segments to show signs of a pickup. Volterra, while lowering guidance last week, said recent order activity suggests normal seasonality in the March quarter, with the exception of the notebook business which is expected to be up (i.e. better-than-normal seasonality, we believe). **We are hopeful that March quarter guidance given by many companies will reflect at least a normal seasonal trend, and in some cases perhaps a better-than-seasonal trend.**

Given the modest shipment trends for chips in the December quarter, we believe December quarter data will show that inventory levels of semiconductors throughout the electronics supply chain are at appropriate levels or even on the lean side. Also, as we have discussed elsewhere (e.g. chips statistics note dated December 31), semiconductor capital investment levels remain low. The ratio of worldwide semiconductor equipment sales to semiconductor IC sales was 16.6% in November compared to 17% in October, toward the bottom end of the 15-30% historical range of 1990 through 2008. We think that low levels of semiconductor equipment purchases will result in relatively little, if any, capacity growth over the next few months, keeping capacity utilization close to 95% in the December 2010 quarter and in a very healthy 90-100% range through 2011. We had wondered if concerns about the macroeconomic outlook might crimp the growth of semiconductor equipment shipments, and indeed it appears that month-over-month orders reported by North American semiconductor equipment companies have fallen month-over-month in each of the last four months. We expect that 2011 semiconductor equipment spending plans, which many companies are likely to unveil over the next few weeks, will be for the most part close to 2010 levels, implying a drop in the ratio of chip equipment sales to IC sales in 2011 (since we expect semiconductor growth of 10-15% in 2011). Articles in Reuters last week, quoting filing statements from Samsung and Hynix, indicated that Samsung expects its chip segment capital investment might decline to 10.3 trillion won in 2011 from 12 trillion won in 2010 while Hynix Semiconductor plans to invest 3.4 trillion won in 2011, in line with its 2010 spending level of 3.38 trillion won.

We think that 2011 got off to a good start, with many important product introductions last week in conjunction with the CES Trade Show.

- We found Intel's processor refresh, Sandy Bridge, impressive. Intel introduced 29 new desktop and notebook chips, and expects that Sandy Bridge will contribute as much as a third of total revenues in 2011. We think that the investment community, in its excitement over tablets and smartphones, is underestimating the potential of the mainstream computing market for desktops and notebooks, and how strong Intel's position is in this market.
- Also, we expect the explosion of smaller data devices like tablets and smartphones will drive growth of servers.
- We expect that smartphones will continue to be an important growth driver for chips in 2011.
- We also view tablets as an important source of incremental growth in chips demand (although we think that the emergence of non-Apple tablets remains somewhat muted with the first Android 3.0 tablets are just becoming available, relatively few x86 processor based tablets running Windows having been announced recently).

I on Intel

January 7, 2011. Intel collaborating with Bang & Olufsen. Bang & Olufsen announced that it has entered into strategic cooperation with Intel to help develop smart TV products that take advantage of Bang & Olufsen's design and engineering expertise.

January 5, 2011. Intel in talks to acquire Nordic Edge. Bloomberg reported that Intel is in talks to acquire information technology security solutions provider Nordic Edge, which has around 20 employees and had sales of \$4.8 million in 2009.

January, 6, 2011. Intel Nigeria to boost hiring. The Nation reported that Intel Nigeria is planning to boost hiring opportunities this year in an effort to develop hybrid devices that provide a combination of netbooks and the best of tablets. The article did not mention by how much hiring might expand.

January 3, 2011. [X+1] raises \$10 million in funding led by Intel Capital. The online marketing firm [X+1] has just finished a Series B round of fundraising led by Intel Capital in which it raised \$10 million. To date, the company has raised \$28 million in funding. Other investors in the new round of fundraising included Advanced Technology Ventures, Blue Chip Venture Company and Hudson Venture Partners. The funds are expected to be used to promote adoption of the startup's media software services and to expand its international reach.

January 3, 2011. Intel: Sandy Bridge Details Released. Intel released some details on its Sandy Bridge desktop and notebook chips, and a variety of website have provided additional commentary and third-party performance data. Intel is launching a total of 15 notebook and 14 desktop chips. Our understanding is that first availability of systems using the new chips will be as follows;

- o January 2010 for consumer desktops and notebooks using quad-core processors.
- o February 2010 for consumer desktops and notebooks using dual-core processors.
- o March 2010 for business desktops and notebooks using Sandy Bridge processors.

The new chips do appear to offer excellent performance/price characteristics, based on third party performance data. The Sandy Bridge mainstream quad-core chips outperform, in many benchmarks, Intel's top end 6-core and extreme edition chips. The family offers two graphics options, HD 3000 and HD 2000, with graphics speeds ranging from 1.1GHz to 1.35 GHz. The notebook chips all have the higher level HD3000 graphics, while only the top end desktop chips have HD3000 graphics. The processors include options for features such as WiDi (a wireless TV-Computer one touch connection), hyperthreading (for processor multi-tasking), InTru3D (for 3D Blu-Ray playback), and Quick Sync (for rapid video transfer from external devices). Intel is also releasing a variety of chipsets (10 new chipsets – 5 mobile and 5 desktop chipsets) and Centrino Wi-Fi options (4 Wi-Fi options, with one including WiMax) to support the new processors. Sandy Bridge die sizes are 131 mm² or 149 mm² for a dual core chip and 216 mm² for a quad core chip. The dual-core die size is much as we expected, with the quad-core die size smaller than we expected. We expect to receive additional details on the Sandy Bridge platform at the CES Trade Show this week in Las Vegas. For additional details, please see our note dated January 3.

Upcoming microprocessor price cuts and product introductions. The following is a list of price cuts and new product introductions that we have seen suggested in press and web articles. Intel and AMD do not in general publicly announce future pricing plans, though they do sometimes indicate when product introductions are scheduled. In many cases, where price cuts are indicated, we suspect that these are "waterfall" price adjustments in which Intel introduces new products into the upper price points and reduces prices of older products while keeping the overall price range unchanged.

- **Q1 2011.** Intel possibly launching:
 - o **January 2011.** Intel possibly launching:
 - Celeron B801 - entry-level notebook market
 - Xeon E3-1220L - 2.2GHz dual-core, 3MB of L3 cache, 20W TDP
 - Xeon E3-1260L - quad-core, 8MB L3 cache, HD Graphics 100, 45W TDP
 - Xeon E3-1220 - 3.1GHz quad-core, no Hyper Threading, 8MB of L3 cache, 80W TDP
 - Xeon E3-1230 - 3.2GHz, 8MB of L3 cache, 80W TDP
 - Xeon E3-1240 - 3.3GHz, 8MB of L3 cache, 80W TDP
 - Xeon E3-1270 - 3.4GHz, 8MB of L3 cache, 80W TDP
 - Xeon E3-1280 - 3.5GHz, 8MB of L3 cache, 95W TDP
 - Xeon E3-1225 - 3.1GHz quad-core, no Hyper Threading, 6MB L3 cache, HD Graphics 200, 95W TDP
 - Xeon E3-1235 - 3.2GHz, 8MB of L3 cache, HD Graphics 200, 95W TDP
 - Xeon E3-1245 - 3.3GHz, 8MB of L3 cache, HD Graphics 200, 95W TDP

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- Xeon E3-1275 - 3.4GHz, 8MB of L3 cache, HD Graphics 200, 95W TDP
 - **February 27, 2011.** Intel possibly launching:
 - Pentium G620T – dual core, 2.2GHz, 3MB L3 cache, 35W TDP, \$70
- **Q2 2011.** Intel possibly launching:
 - Westmere-EX family for 4-way servers
 - Pentium G620 – dual core, 2.6GHz, 3MB L3 cache, 65W TDP, \$64
 - Pentium G840 – dual core, 2.8GHz, 3MB L3 cache, 65W TDP, \$75
 - Pentium G850 – dual core, 2.9GHz, 3MB L3 cache, 65W TDP, \$86
- **Q2/Q3 2011.** AMD possibly launching:
 - AMD Llano Fusion. 7 chips - Beavercreek quad-core and triple-core, Winterpark dual-core, Hudson southbridge chipset.
 - 32nm 95W 8-core Zambezi processors with 8MB of L3 cache and turbo
 - 32nm 125W 8-core Zambezi processors with 8MB of L3 cache and turbo
 - 32nm 95W 4-core Zambezi processors with 4MB of L3 cache and turbo
 - 32nm 95W 6-core Zambezi processors with 8MB L3 cache and turbo
- **Q3 2011.** Intel possibly launching:
 - Dual core Sandy Bridge Celeron processors
- **Q4 2011.** Intel possibly launching:
 - Cedar Trail Atom – Cedarview-D platform
- **2H 2011.** AMD possibly launching:
 - Next generation server chips (Interlagos and Valencia) with Bulldozer core, having sampled these products in 2H2010.
 - Next generation desktop chips (Zambezi) with Bulldozer core, having sampled these products in 2H2010. Zambezi does not have integrated graphics. The product, with integrated graphics, is also scheduled for a 2011 launch but we believe that this could be in 2H 2011.
- **2H 2011.** Intel possibly launching:
 - Sandy Bridge family for 2-way servers
- **1H 2012.** Intel possibly launching:
 - Chief River – 22nm Ivy Bridge w/ USB 3.0

Data Roundup

Memory Pricing. DRAM prices fell slightly while and NAND prices increased last week (see Figure 3). The spot price of a 2Gb DDR3 chip was \$1.82 for the week, down from \$1.85 at the end of the prior week. The 32GB NAND spot price was \$6.12, up from \$6.01 in the prior week.

Figure 3: Memory Chip Prices

Date	2Gb DDR3		32Gb NAND MLC	
	Spot	Contract	Spot	Contract
01/07/11	\$1.82		\$6.12	
12/31/10	\$1.85		\$6.01	
12/24/10	\$1.89	\$1.94	\$6.01	\$5.22
12/17/10	\$1.95		\$5.81	
12/10/10	\$2.03	\$2.19	\$5.81	\$5.22
12/03/10	\$2.09		\$5.46	
11/26/10	\$2.30	\$2.44	\$5.22	\$4.98
11/19/10	\$2.40		\$4.85	
11/12/10	\$2.55	\$2.81	\$4.87	\$4.93
11/05/10	\$2.80		\$4.86	
10/29/10	\$3.26	\$3.06	\$4.95	\$5.17
10/22/10	\$3.83		\$5.35	
10/15/10	\$3.87	\$3.62	\$5.72	\$5.23
10/08/10	\$3.89		\$5.87	
10/01/10	\$4.09	\$3.94	\$6.19	\$5.27
09/24/10	\$4.20		\$6.28	
09/17/10	\$4.26	\$4.19	\$6.32	\$5.57
09/10/10	\$4.49		\$6.42	
09/03/10	\$4.72		\$6.43	\$5.92

Source: DRAMeXchange, Wells Fargo Securities, LLC.

Micron Contract		
Date	DDR3	NAND
2H Dec 10	Down 5-10%	
1H Dec 10	Down 5%	Down 2%
2H Nov 10	Down 5-10%	
1H Nov 10	Down 6-8%	Down 2%
2H Oct 10	Down 5-6%	
1H Oct 10	Down 2-4%	Down 1-2%
2H Sept 10	Down 2-4%	
1H Sept 10	Down 3-4%	Down 2%
2H Aug 10	Down 2%	
1H Aug 10	Down 2-4%	Down 2-4%
2H Jul 10	Down 2%	Down 1-2%
1H Jul 10	Flat	Flat
2H Jun 10	Flat	
1H Jun 10	Flat	Down 2%

* The NAND changes are not really "contract" prices but rather our estimate of how Micron's average selling price may have changed.

Source: Micron and Wells Fargo Securities, LLC estimates

Other news items:

January 7, 2011. Samsung December quarter profits tracking below expectations. According to an AP article, Samsung commented its December quarter profit level is expected to decline to \$2.67 billion or roughly 3 trillion won (compared to consensus expectations of 3.33 trillion won) reflecting a slowdown in consumer electronics demand from European consumers. The revised profit expectation represents a 38% sequential decline and a 13% decline from the year ago period. December quarter sales are expected to reach a record 41 trillion won (+2% sequentially and +5% yr/yr).

January 7, 2011. Macronix December quarter sales were below prior guidance. According to a DigiTimes article, Macronix International showed a 33% sequential decline in December quarter sales to NT\$5.5 billion. The company's guidance was for December quarter sales to reach NT\$5.8-6.0 billion. The company blamed the shortfall on postponed shipments at a particular customer.

January 6, 2011. SUR40 Using Microsoft Surface 2.0 to feature AMD processor. AMD announced that its Athlon II X2 embedded processors and Radeon HD 6700M Series GPUs will be used in the large display Samsung SUR40 which is driven by Microsoft Surface 2.0.

January 6, 2011. DRAM market supply/demand imbalance concern for 2011. According to an article on DigitDigiTimes Research is forecasting that the worldwide supply of DRAM will exceed demand by 28% in 2011 based off expectations for bit supply of 3.23 billion 1Gb-density-equivalent chips and bit demand of 2.32 billion 1Gb-density-equivalent chips.

January 6, 2011. Microsoft Windows to support ARM. Microsoft announced that its next generation of Windows processors will support SoC architectures, including ARM-based systems from Nvidia, Qualcomm and Texas Instruments.

January 6, 2011. Snowstorms in Europe pressure Acer's December quarter sales outlook. According to an article in the TaipeiTimes, Acer stated that the European snowstorms placed undue pressure on its December quarter and that it would miss its previously issued guidance. Acer did not revise its guidance lower to a new range. Previously, Acer had expected December quarter sales to increase 5-10% sequentially. The snowstorms negatively impacted freight and passenger travel from Dublin to Frankfurt ahead of the peak holiday season.

January 6, 2011. Samsung targets smartphone sales to double in 2011. According to Reuters news, Samsung aims to double its smartphone shipments in 2011 to 50 million plus units. Samsung sold roughly 24 million smartphones in 2010.

January 6, 2011. Catcher Technology shows healthy December quarter revenue growth. According to a DigiTimes article, Catcher Technology showed consolidated sales reach NT\$7.19 billion in the December quarter, which grew 24% sequentially. The company benefited from strong smartphone chassis order trends.

January 6, 2011. CES 2011: Full Intel processor refresh, not that many tablets. We found Intel's processor refresh, Sandy Bridge, impressive. Intel introduced 29 new desktop and notebook chips, and expects that Sandy Bridge will contribute as much as a third of total revenues in 2011. We think that the investment community, in its excitement over tablets and smartphones, is underestimating the potential of the mainstream computing market for desktops and notebooks, and how strong Intel's position is in this market. Also, we expect the explosion of smaller data devices like tablets and smartphones will drive growth of servers powered by Intel chips. We think the emergence of non-Apple tablets remains somewhat muted. The first Android 3.0 tablets are just becoming available. Relatively few x86 processor based tablets running Windows have been announced, possibly in part because Intel's Oak Trail processor is not yet completely ready. Intel's Oak Trail platform for tablets will probably not be officially launched till later in the current quarter with first availability of tablets based on Oak Trail perhaps in the June 2010 quarter. We question whether AMD's Ontario processor a low enough power specification to be very interesting in the tablet space. Even when Oak Trail is available, our understanding is that Windows 7 does not have quite the same power management as Apple's operating system or Android. We view the smartphone market and the tablet market as important emerging processor markets. Makers of ARM-based processors, including Qualcomm and Texas Instruments have a large and growing opportunity in smartphones today, and we believe that smartphone market offers a good opportunity for incremental growth in Intel Atom shipments in the future. We do expect that the tablet market will grow over time. The current strength in Apple iPad demand does not benefit any chip processor maker directly since Apple makes its own processors for the iPad (though since the Apple processors are ARM based, ARM clearly is a beneficiary of iPad strength). However, Nvidia appears to have made a good early start in the tablet market with its Tegra 2 processor, and we think that tablets may well be a good market for Intel's Atom too, while posing some cannibalization risk to Intel Atom based netbooks. For additional details, please see our note dated January 6.

The following are some tablets announced last week:

- **Toshiba**
 - Unnamed - 10.1in screen, Android 3.0 (Honeycomb), Nvidia Tegra 2 processor, dual cameras, GPS, Bluetooth, available 1H11.
- **ASUS**
 - **Eee Pad Slider** - 10.1 in screen, Android 3.0, Nvidia Tegra 2 processor, dual-cameras, slide out keyboard.
 - **Eee Pad Transformer** - 10.1 in screen, Android 3.0, Nvidia Tegra 2 processor, dual-cameras, a docking station that transforms the tablet into a notebook with extended battery life.
 - **Eee Pad MeMO** - 7.1 in screen, Android 3.0, a stylus for note taking.
 - **Eee Slate EP 121** - 12.1 in screen, Windows 7 Home Premium, Intel Core i5 processor, 32GB-64GB SSD, up to 4GB DDR3 RAM, 2MP camera, Bluetooth for an optional keyboard.
- **Samsung**
 - **Sliding PC 7 Series** - 10.1in screen, Windows 7 Home Premium, Intel Oak Trail Atom Z670 processor, sliding keyboard, optional 3G connectivity, 32GB or 64GB SSD, 2GB DDR2, 2.2lbs
- **Lenovo**
 - **Le Pad slate** - 10.1in screen, Android 2.2, Qualcomm Snapdragon processor, front facing camera, 3G, under 2lbs, starts at \$520
 - **Ideapad U1 Hybrid** - includes Le Pad and base, starts at \$1,300; base provides full keyboard, switches interface to Windows 7 Home Premium and switches CPU to an Intel CULV processor

Other tablet announcements include:

- Gigabyte announced a Wintel based tablet.
- MSI announced their Android-based MSI Windpad 100A and Windows-based MSI Windpad 100W tablets.
- Acer showed its 10" Iconia Tab A500 prototype featuring Android 3.0 and an Nvidia Tegra 2 processor.
- Enspert announced its IDENTITY line of tablets.
- Motion launched its CL900 tablet, which is designed for the outdoors.
- NEC showed its dual screen Android Cloud Communicator, which may not come to the US.
- Microvision announced its mini-tablet prototype with embedded pico-projector.
- ViewSonic unveiled its 4in ViewPad 4 tablet with a qualcomm chip and Android-based ViewPad 10s, which uses an Nvidia Cortex A9 processor in place of the Intel Atom processor that was in the earlier ViewPad 10.

January 6, 2011. Volterra lowers December quarter guidance. Volterra Semiconductor reduced its December quarter sales guidance to the \$35.4-35.6 million range (midpoint=down 15% sequentially) compared to prior guidance of \$37-40 million (midpoint=down 7% sequentially). The shortfall was blamed on worse than expected inventory correction in the communications, server and storage markets. Volterra said recent order activity suggests normal seasonality in the March quarter, with the exception of the notebook business which is expected to be up (i.e. better-than-normal seasonality, we believe).

January 6, 2011. Qualcomm plans to invest up to \$975 million in Taiwanese plant. According to an article on the website socaltech.com, Qualcomm MEMS Technologies announced it will invest up to \$975 million to build a new fab in Taiwan. The new fab will manufacture Qualcomm's Mirasol brand displays used for e-book readers and tablet devices. The new fab is forecasted to be running in 2012.

January 5, 2011. National Semiconductor increases gross margin guidance in its November quarter 10Q filing. In its 10Q filing for the November quarter, National Semiconductor guided for February quarter gross margin profitability in the 65-67% range, slightly better than its original guidance range of 65-66%. Revenue guidance for the February quarter continues to be an 8-12% sequential decline and capacity utilization levels are expected to track below 60%.

January 5, 2011. Hynix plans to invest 3.4 trillion won in capex investments in 2011. According to Reuters news, referencing a regulatory filing, Hynix Semiconductor plans to invest 3.4 trillion won in 2011, in line with its 2010 spending level of 3.38 trillion won.

January 5, 2011. Qualcomm agrees to acquire Atheros. Qualcomm announced it has entered a definitive agreement to acquire the fabless wireline/wireless connection company Atheros Communications, Inc. for \$45 per share in cash (represents an enterprise value of \$3.1 billion). Excluding amortization, Qualcomm expects the deal to be modestly accretive to EPS in FY2012, the first full year of combined operations. The deal is expected to close in the first half of 2011. We view the deal as positive for Qualcomm. Qualcomm mentioned that it expected to benefit from Atheros' presence outside Qualcomm's core markets. We think this is true, and in particular we think that the acquisition of Atheros may strengthen Qualcomm ability to win tablet designs with Snapdragon and notebook opportunities with Gobi. Qualcomm already has WiFi capability in-house, but we suspect that Atheros will bring substantial additional expertise in WiFi to Qualcomm, which should help Qualcomm build its presence as a supplier of connectivity technology in wireless handsets. According to Atheros, the company's product solutions address a \$6 billion TAM in 2010 growing to over \$9 billion in 2015. From a unit perspective, Atheros view the computing end market size to be about 300 million units, networking 750 million units and consumer greater than 2 billion units. Atheros' revenue has shown a 36% CAGR from 2003-09. In the September 2010 quarter 51% of Atheros' revenues were from the networking end market, 26% from the consumer market and 23% from the computing market. Atheros' GAAP gross margin was 49.6% and operating margin 12% in the September 2010 quarter, lower than Qualcomm's overall GAAP gross margin profile of 66.5% and operating margin of 28.4% in the same quarter. However, with revenue of \$247 million in the September 2010 quarter Atheros is small compared to Qualcomm. It appears likely that the inclusion of Atheros operations in QCT may suppress the pro-forma operating margin Qualcomm reports for QCT (27.9% in the September 2010 quarter). For additional details, please see our note dated January 5.

January 5, 2011. Mindspeed reduces December quarter guidance. Mindspeed now expects December quarter sales of \$40.5 million (comprised of \$38 million in product sales and \$2.5 million in patent sales). The revised guidance equates to a 30% sequential revenue decline. Previously, Mindspeed guided to \$41.2 million in sales, which represents a 28% sequential decline (comprised of \$40.3 million in products sales and \$2.5 million in patent sales). The company noted pressure in its legacy wide area networking business from a few large wireless communications customers.

January 5, 2011. Samsung chip capital investment expected to decline in 2010. According to a Reuters news article quoting a statement from Samsung, Samsung Group is expected to increase its capital spending to a record level in 2011 to 43 trillion won, up 18% from the year ago period. Samsung group is made up of around 70 member companies. Samsung expects its chip segment capital investment might decline to 10.3 trillion won in 2011 from 12 trillion won in 2010.

January 5, 2011. Eight wafer plants to close in 2011. DigiTimes reported that SEMI forecasts are calling for eight wafer fabs to close in 2011, following the close of fifteen fabs in 2010 and twenty seven fabs in 2009. Of the eight fabs, one will be a 8-in fab, three will be 6-in fabs, two will be five-in fabs and two will be 4-in fabs. Most of the fabs will belong to IDMs, meaning that foundries like TSMC, UMC, SMIC, Globalfoundries and Samsung could benefit from the closes.

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January 5, 2011. Lexar introduced new microSDHC card for mobile phones. Lexar, a subsidiary of Micron, has introduced a new line of 32GB Class 10 microSDHC memory cards for mobile phones. The cards read up to 20MB/s and write at a minimum of 10MB/s. The cards are available now for \$149.99.

January 4, 2011. Lexar introduced new backup drives. Micron subsidiary, Lexar, introduced its Echo MX and Echo ZX backup drives which feature high performance read/write speeds and no-touch backup software. The Echo MX, which features an always-on capacity meter, comes in 8GB, 16GB, 32GB, 64GB, and 128GB versions, while the Echo ZX comes in 8GB, 16GB, and 32GB versions. Prices for the Echo MX range from \$44.99 to \$499.99, while prices for the ECHO ZX range from \$44.99 to \$139.99. The Echo MX is expected to be available in Q1'11 while the Echo ZX is expected to be available in the spring of 2011.

January, 4, 2011. Micron introduced high capacity SSDs for notebooks. Micron unveiled a line of 25nm flash based solid state drives (SSDs), which range from 64GB to 512GB and come in 1.8in and 2.5in form factors. The drives support SATA 6Gb/s interfaces, read up to 415MB/s, and write up to 260MB/s depending on the model. Micron is working with notebook manufacturers to qualify the new RealSSD line under the C400 name and expects to begin producing the drives in February.

January 4, 2011. AMD: Zacate and Ontario Fusion processors introduced. AMD made several new processor and graphics introductions at the CES trade show today. We do not think that the processor introductions will help AMD's sales or competitive position very much. Given the shifting focus to tablets, we think that the total revenue AMD might generate from selling its new Ontario processors into netbooks is limited, perhaps of the order of \$20-40 million per quarter by the second half of 2011. We think that the value notebook processor Zacate will compete mainly against other AMD processors. AMD has also introduced two new 45nm Phenom performance desktop processors. We view these two chips as minor additions to AMD's desktop processor lineup. AMD has entered the netbook space for the first time, with its Ontario processors. We expect AMD will get a slice of the netbook market, which we estimate to be of the order of 8-10 million units per quarter, just by having a product for netbooks. However, given the shifting focus to tablets, we think that the total revenue AMD might generate from selling processors into netbooks is limited, perhaps of the order of \$20-40 million per quarter by the second half of 2011. Nevertheless, the ramping Ontario shipments will probably help AMD's unit market share somewhat. AMD has said that it expects tablets powered by Fusion APUs (presumably Ontario) will appear in the March 2011 quarter but we think that with a thermal specification of 9W, AMD's ability to penetrate the tablet market is limited at the moment. The AMD Zacate processors address the value notebook space. Given that AMD's current notebook processor ASP is below \$50, compared to Intel's notebook ASP of close to \$100, AMD's notebook processor sales are already concentrated in the value notebook space. We think that Zacate will compete mainly against other AMD processors. Also, insofar as Zacate competes against Intel processors, it comes up against Intel 32nm Celeron Westmere chips with higher frequency and far more cache memory which we expect will have far better processor performance (though perhaps inferior graphics performance). AMD introduced its RADEON HD 6000M series mobile graphics technology. Notebooks based on this new graphics technology are expected to be previewed at CES. For additional details, please see our note dated January 4.

January 3, 2011. Lexar introduced 128GB SDXC memory card for photographers. Lexar, a subsidiary of Micron, has released a new line of Professional Secure Digital Extended Capacity memory cards, which come in 64GB and 128GB, provide a transfer speed of 20MB/s and come with a Class 10 speed designation. The chips are expected to be available in Q1 2011 with prices of \$399 and \$699.

Running list of mid quarter updates:

January 6, 2011. Volterra lowers December quarter guidance. Volterra Semiconductor reduced its December quarter sales guidance to the \$35.4-35.6 million range (midpoint=down 15% sequentially) compared to prior guidance of \$37-40 million (midpoint=down 7% sequentially).

January 5, 2011. National Semiconductor increases gross margin guidance in its November quarter 10Q filing. In its 10Q filing for the November quarter, National Semiconductor guided February quarter gross margin profitability to be in the 65-67% range, slightly better than original guidance range of 65-66%.

January 5, 2011. Mindspeed reduces December quarter guidance. Mindspeed now expects December quarter sales to reach \$40.5 million (comprised of \$38 million in product sales and \$2.5 million in patent sales). The revised guidance equates to a 30% sequential revenue decline. Previously, Mindspeed guided to \$41.2 million in sales, which represents a 28% sequential decline (comprised of \$40.3 million in products sales and \$2.5 million in patent sales).

December 21, 2010. Xilinx reduces December quarter guidance. The revised guidance calls for December quarter sales to be down 7-9% sequentially, versus previous guidance for sales to be flat to down 4% sequentially.

December 14, 2010. Broadcom raised December quarter guidance. Revenue for the December quarter is now expected to be about \$1.9 billion, at the top end of original guidance for revenues to be \$1.8-1.9 billion. The upside in revenue was driven by stronger than expected demand for Broadcom's Mobile & Wireless products.

December 9, 2010. Diodes maintained December quarter guidance. Diodes maintained its revenue guidance of \$160-168 million (down 2% to up 3% sequentially).

December 9, 2010. Lattice Semiconductor maintained its December quarter guidance. Lattice Semiconductor maintained its December quarter sales guidance of down 2% to 7% sequentially.

December 9, 2010. ASML lifts December quarter bookings guidance. ASML increased its December quarter order forecast with December quarter bookings expected to reach above EUR 2 billion, up 54% sequentially (versus prior expectations of EUR 1.3 billion, flat sequentially).

December 7, 2010. Texas Instruments reaffirmed guidance midpoint. Texas Instruments narrowed its guidance for the December quarter to a decline of 5-8%, maintaining its guidance midpoint and also the midpoint of its EPS guidance.

November 29, 2010. Altera reaffirmed guidance. The company reaffirmed its previous December quarter guidance for sales growth of 3-6%.

Upcoming Events:

January 3-10, 2011. Taiwanese sales numbers released for the month of December. We expect that Taiwanese technology sales numbers will show ongoing softness through December, a reflection of ongoing focus on inventory management in the electronics supply chain. However, we are hopeful that technology-related sales trends will begin to pace above normal seasonality in the first few months of 2011, driven by an ongoing global economic recovery. In November many of our composites showed relatively flat month/month sales trends, increasing slightly for fabless ICs and notebooks, flat for packagers and handset components, and declining slightly for foundries, memory and motherboards.

January 13, 2011. Intel scheduled to report December quarter results. Intel guided for sales to be \$11.4 billion (plus or minus \$400 million) in the December quarter, with the midpoint of this range up 2.7% sequentially. This is far below what we would consider to be normal seasonality (anywhere in the 7% to 15% range) off what was already a weak September quarter. We view normal seasonal growth for Intel to be high-single-digit to double-digit growth sequentially in both the September and December quarters. Our estimates for December quarter revenues imply just 3.6% sequential growth off of September quarter sales, while guidance and consensus estimates are calling for 2.7% sequential growth. We expect that Intel will indicate that its current capital spending plan for 2011 is at most slightly above the approximately \$5.2 billion spent in 2010. We are hopeful that Intel's March 2011 quarter gross margin guidance will be in line with or better than the 64% we are modeling. The March 2011 quarter is a 14-week quarter and so Intel's revenue guidance will include consideration of this additional week; we are hopeful that Intel's March quarter revenue guidance will imply business conditions that are in line with or better than normal seasonality. Our own estimates, which do not yet incorporate the extra week, assume a somewhat seasonal 6% sequential drop in revenues in the March 2011 quarter.

Stocks we cover/Dividend monitor:

Company Name	Ticker	Closing Price <i>1/7/2011</i>	Annual Dividend	Annualized Dividend Yield	Rating
Altera	ALTR	\$36.20	\$0.24	0.7%	Outperform
Advanced Micro Devices	AMD	\$8.83	-	-	Market Perform
Analog Devices	ADI	\$37.59	\$0.88	2.3%	Outperform
Broadcom	BRCM	\$44.89	\$0.32	0.7%	Market Perform
Intel	INTC	\$20.66	\$0.72	3.5%	Outperform
Linear Technology	LLTC	\$34.61	\$0.92	2.7%	Outperform
Maxim Integrated Products	MXIM	\$23.99	\$0.84	3.5%	Market Perform
National Semiconductor	NSM	\$13.95	\$0.40	2.9%	Market Perform
Micron Technology	MU	\$8.65	-	-	Outperform
Microsemi	MSCC	\$22.81	-	-	Outperform
Qualcomm	QCOM	\$51.73	\$0.76	1.5%	Outperform
Texas Instruments	TXN	\$33.22	\$0.52	1.6%	Market Perform
Xilinx	XLNX	\$29.97	\$0.64	2.1%	Outperform

Source: FactSet, Wells Fargo Securities, LLC

Required Disclosures

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ADI: Company-specific risks include gross margin pressures and the possibility that ADI might find it does not have sufficient scale to compete effectively in the DSP market. Sector risks include inventory risk and pricing pressures.

ALTR: Company-specific risks include inventory risk and competition, chiefly from Xilinx. Sector risks include possible slowing in end-market demand, especially in communications.

AMD: Company-specific risks include the possibility of market-share losses, a potential inability to keep pace with Intel on microprocessor innovation, potential delays in manufacturing transitions or new product introductions, and a weak balance sheet. Sector risks include the likelihood of decelerating PC growth in the current economic environment.

BRM: Company-specific risks include low GAAP operating margin, low GAAP tax rate, the possibility that Broadcom might show a slowing of growth in the future, and the possibility Broadcom might make large, dilutive acquisitions in the future. Sector risks include our belief that some of Broadcom's end markets have relatively low growth prospects.

INTC: Company-specific risks include competition from Advanced Micro Devices (AMD), and outstanding legal actions. Sector risks include the possibility of decelerating growth in PC shipments.

LLTC: Company-specific risks include the possibility Linear may face a margin/growth trade-off in the future. Sector risks include cycle and inventory risk.

MSCC: Company-specific risks include a high concentration of revenue in the defense/aerospace and medical markets, and a highly competitive environment in various integrated circuit segments. Sector risks include potential slowing in the semiconductor cycle.

MU: Risks include highly volatile pricing for DRAM and NAND flash, the need for relatively high levels of capital investment, and large swings in Micron's profitability that have occurred in the past and which we think are likely in the future.

MXIM: Company-specific risks include the possibility Maxim may not be able to effectively balance both healthy margins and growth in the future, and that its high proportion of consumer-related revenue could lead to revenue fluctuations. Sector risks include semiconductor cycle and inventory risks.

QCOM: Company-specific risks include legal and licensing disputes, and technology transitions that could impact Qualcomm's royalty rate. Sector risks include pricing pressures and slowing growth in the handset market.

TXN: Company-specific risks include TI's ongoing exit from the wireless baseband business and a number of other segments of TI which we consider to have the risk of declining sales or low growth. Sector risks include the possibility of disruptions in the semiconductor market, including inventory corrections, slowing growth, and pricing pressures.

XLNX: Company-specific risks include inventory risk and competition, chiefly from Altera. Sector risks include possible slowing in end-market demand, especially in communications.

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2=Market Perform: The stock appears appropriately valued, and we believe the stock's total return will be in line with the market over the next 12 months. HOLD

3=Underperform: The stock appears overvalued, and we believe the stock's total return will be below the market over the next 12 months. SELL

SECTOR RATING

O=Overweight: Industry expected to outperform the relevant broad market benchmark over the next 12 months.

M=Market Weight: Industry expected to perform in-line with the relevant broad market benchmark over the next 12 months.

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V = A stock is defined as volatile if the stock price has fluctuated by +/-20% or greater in at least 8 of the past 24 months or if the analyst expects significant volatility. All IPO stocks are automatically rated volatile within the first 24 months of trading.

Semiconductors

As of: January 10, 2011

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