

February 2009 Semiconductor Sales

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The opinions contained in the following report are based on quarterly reports and guidance issued by various semiconductor companies, information I have gleaned from field contacts and the monthly data released by the SIA (Semiconductor Industry Association).

If you read the SIA press release or stories about the release, please remember, unless otherwise stated, they typically refer to three month rolling average (TMRA) sales figures rather than actual monthly sales. This is primarily because almost all semi companies operate using calendar quarters with two four-week months followed by a five-week month.

While using a TMRA "smooths" the volatility caused by every third calendar month having five weeks and, in doing so, is convenient for sequential comparisons, it can also disguise what might be very important news. In this report, we'll cover not only the rolling averages and actual sales numbers, but also a variety of perspectives that are designed to provide you with a broader, if not more accurate, view of the worldwide semiconductor industry.

Revenue Analysis

	Y/Y Change	Sequential Change	Lowest Since ¹
Actual February Results	-27.3%	N/A*	Feb 2003
3-Month Rolling Avg.	-30.4%	-7.6%	Aug 2003
6-Month Rolling Avg.	-19.4%	-7.4%	July 2004
9-Month Rolling Avg.	-11.2%	-3.8%	Jan 2006
12-Month Rolling Avg.	-7.2%	-2.1%	June 2006
YTD 2009	-29.2%	N/A*	N/A

* Sequential changes for actual revenue are not valuable due to the fact that every third month (the last month of each quarter) is a five-week month and the other two are four-week months. Year-to-date sequential changes are not of value.

1. For actual results, the "lowest since" compares only to past January results. For all other categories, the comparison is to any month.

Commentary

2008 marked the first year that we've seen full year decline in semiconductor revenue since 2001; in 2002 revenues were up 1.3%. However, the aggregate results are only part of the story.

- In spite of the fact that new revenue records were set in 2008 for the months of March, April, May, June, July, August and September, total 2008 revenue was down 2.8% and only 0.4% higher than what was reported for 2006.
- Revenue for October 2008 was the lowest October revenue reported since October 2005.
- Revenue for November 2008 was the lowest November revenue reported since November 2003.
- Revenue for December 2008 was the lowest December revenue reported since December 2002.
- Revenue for January 2009 was the lowest January we've seen since January 2002.

While the revenue data has been bad, unit volume data was even more disturbing. The 33.2% decline in unit volume for December set an ALL TIME record only to be surpassed by the 37.7% decline we saw in January 2009. The previous record of 32.7% was set in August 2001. Unit volume is very important to watch in that it shows demand changes without including the typical average selling price (ASP) declines we see during down-cycles. While still substantial, the February decline of 28.9% shows a distinct improvement. Based on the data I've been gathering in the field and the monthly revenue reports from Taiwanese companies, I think we'll see further improvement when the March numbers are released.

If we focus just on Integrated Circuits (IC's), the data is just as dismal. While we were saved from setting a new unit volume decline record in December 2008 (December unit volume decreased 26.5%), we were not quite so fortunate in January 2009. For January 2009, IC unit volume declined by 34.4%, surpassing the previous record of 32.5% set in August 2001. However, we again saw notable improvement in February, which posted a volume decline of 24.1%. I again suspect we'll see further improvement in the March data.

The implication in all this data is that a very negative trend developed starting in October 2008 and, with each successive month from October through January, the trend worsened. However, as noted in the table above, on a relative basis, we saw material improvement in February. This February trend reversal is highly consistent with the reports I've been writing about improvements in the demand picture being driven by emerging economies, particularly from China where the broad-based stimulus effort appears to be working.

On a full year basis, 2008 was only the fourth time in history when there was a decline in full year unit volume. The worst of these was in 2001 at 21.3%. Compared to that, the 3.4% decline for full-year 2008 was pretty modest. However, the point here is that any full-year decline in unit volume is unusual, which means the 3.4% decline in 2008 was a pretty big deal; the only other times we've seen full-year declines were 1996 at 2.3% and 1992 at 0.4%.

A somewhat ominous thing to note here is that on a rolling-12-month basis, the record decline was posted in February 2002 at 23.1%. While we are far from approaching that record today (the 12-month rolling unit volume decline stood at -9.8% at the end of February), it is clear the trailing 12-month data will continue to get worse through at least Q3 due to the fact we'll be dealing with strong comparison months through September 2008. What makes this interesting is that given the data I have today, I think the trough of this down-cycle has passed. However, even if I'm right in this contention, I definitely don't think it's time to sound a universal "all-clear."

As I look around the semiconductor industry today, I see more business models in a state of flux than I can recall seeing at any time during my 30+ year association with the industry. This is particularly true for semiconductor companies based in the U.S. and Europe. As a matter of fact, I think a clumsy meat cutter could probably count on one hand the major semiconductor companies in the U.S. and Europe that are not in a state of flux. Just a couple of examples include **Intel (INTC)** which is moving rapidly to secure markets outside its traditional PC and server focus, and **Texas Instruments (TXN)**, which is backing away from the handset baseband market to focus on its **ARM Holdings (ARMH)** core based OMAP applications processors that is tightly coupled with its continued focus on power management chips.

Details by Product Segment

Description	February 2009 Market Share ¹		February 2009 Year-over-year			Year-to-date Year-over-year		
	Revenue	Units	ASP	Revenue	Units	ASP	Revenue	Units
Total Semis	100.0%	100.0%	+2.3%	-27.3%	-28.9%	+6.5%	-29.2%	-33.5%
Sensors	1.9%	0.9%	-20.8%	-28.5%	-9.7%	-26.9%	-36.2%	-12.7%
Discrete	6.1%	51.1%	+3.5%	-36.9%	-39.0%	+15.6%	-36.9%	-45.4%
Opto	7.2%	19.2%	-31.3%	-26.5%	+7.1%	-30.9%	-21.7%	+13.2%
Total IC's	84.8%	28.9%	-3.1%	-26.5%	-24.1%	+0.5%	-29.0%	-29.4%
Logic	38.2%	27.2%	+14.9%	-12.2%	-23.6%	+17.7%	-17.3%	-29.8%
Analog	16.8%	45.8%	-0.4%	-27.3%	-27.1%	+1.0%	-31.8%	-32.5%
MPU	14.9%	0.3%	-21.5%	-33.5%	-15.3%	-13.3%	-29.0%	-18.0%
DRAM	9.2%	9.5%	-28.0%	-44.1%	-22.3%	-28.0%	-44.1%	-22.3%
NAND Flash	7.8%	2.9%	-11.7%	-15.7%	-4.6%	-16.6%	-26.2%	-11.5%
MCU	5.3%	6.2%	-20.5%	-46.8%	-33.1%	-11.6%	-43.5%	-36.1%
DSP	3.1%	0.9%	-7.8%	-25.5%	-19.1%	-7.2%	-36.7%	-31.8%
NOR Flash	2.7%	2.7%	-31.7%	-36.2%	-6.6%	-25.2%	-40.0%	-19.7%
SRAM	0.8%	0.7%	-15.4%	-38.5%	-27.2%	-7.6%	-38.7%	-33.6%

1. Due to rounding errors, totals may not add up to 100%.

Product Segment Discussions

Throughout most of the product sectors, we can see there was distinct improvement in February. A quick and easy way to ascertain this improvement is to compare the February data for the year-to-date data, which at this stage only includes January and February.

In looking at this data from the top down, we can see that average selling prices (ASP's) generally declined. While it may seem counterintuitive, this is not necessarily bad news. In digging deeper into the data, this decrease was driven mostly by resurgence in demand for consumer electronics where chip prices are generally at the lower end of the ASP spectrum. To be sure, there were instances where the change was driven by other events, but in total, it was predominately driven by a product mix that was more heavily weighted towards consumer electronics than we saw in January. The anomalies outside this mix change include:

- Microprocessor (MPU) ASP's were driven down by a mix favoring netbook processors like the **Intel (INTC)** Atom. I view this as a pattern change since the Atom and netbook phenomena was not a factor in the comparison basis of 2008.
- The decrease in Microcontroller (MCU) ASP's was driven more by the competitive pressures I've been addressing for several months now. In addition to this, we're seeing a number of MCU based designs in the SoC (System on a Chip) market that is generally lumped in with "special purpose logic," which on a relative basis is performing better than the industry averages. I continue to believe this trend will negatively impact sector leader **Microchip (MCHP)**.
- ASP's for both NAND Flash and DRAM improved due to a more favorable balance of supply and demand – mix change here is not terribly relevant.
- NOR Flash ASP's declined due to what I think may prove to be a flushing of inventory.

Discrete Semiconductors: Discrete semiconductor data is a pretty good proxy for demand mix. Higher ASP's generally suggest that consumer demand is down and/or industrial demand is up. We

began to see ASP growth in April 2008 and from May 2008 through January 2009, year-over-year ASP growth was in double digits. We saw year-over-year ASP comparisons peak in December at +31.0% and fall only slightly in January 2009 to +29.2%. This trend of rising ASP's started due to an increase in demand for high-power discrete semiconductors and then was supercharged later in the cycle as demand for low-power discrete semiconductors dropped more rapidly than the demand for high-power products. In February, while aggregate demand is still showing sharp a year-over-year decline, on a relative basis, we saw more recovery in low-power than we did in high-power.

Interestingly, while IGBT (Insulated Gate Bipolar Transistor) revenue declined less than aggregate revenue for all Bipolar Transistors, the rate of decline for IGBT's increased versus the decrease in the rate of decline we can see for aggregate bipolar transistor revenue and total discrete revenue. This could be attributable to many factors such as short-term inventory adjustments in the supply channel. However, due to the fact that ASP's declined sharply too, my thinking is there was a temporary lull in the demand for green and possibly medical products that tend to use higher power and therefore more expensive IGBT's.

Based on this perspective, I would probably hold back on buying shares of **Ixys (IXYS)**, a company that is highly dependent on the IGBT market, at the current price and probably consider hedging at least a portion of a long exposure to the stock with October 2009 \$10 calls. At the close Friday, those calls were fetching a very nice premium of \$1.95. However, due to my opinion that green stimulus money will benefit IXYS in the longer run, consider adding shares if the price dips below \$7.50 (about a 15% decline from Friday's close). Please keep in mind here that IXYS is a very volatile stock and could easily drop significantly below my <\$7.50 accumulation target. Therefore, if you are considering IXYS as an investment, I strongly recommend also considering a [multiple buy strategy](#) that is well enough funded to extend to IXYS' 52-week low.

In my view, the situation for other discrete semiconductor manufacturers is similar to what I see at IXYS. When we look at the various companies we typically cover in the discrete semiconductor sector we can see all of the stock prices are sharply higher today than even just one month ago.

Diode, Inc. (DIOD), which I termed as a buy in our [December 1st monthly semiconductor report](#), is up 153% from that point. While I think it has more upside potential and could in fact double yet again, my thinking is that investors who bought in the \$4's should consider hedging some risks. September \$12.50 calls are fetching a \$2.00 premium and, if you want to push out to January, which would convert both the gain on the stock and the call premium to long-term capital gains, those \$12.50 calls are bringing in a very generous premium of about \$2.75 to \$2.80. Using these hedge strategies would knock cash exposure down considerably from the December entry price of \$4.67 and provide an astonishing return in excess of 500% (assuming the stock is trading at or above \$12.50 next January) based on cash exposure.

The same is true for **International Rectifier (IRF)**, **Microsemi (MSCC)** and **ON Semi (ONNN)**. While prices of these stocks are not up nearly as much as DIOD, the rallies have all been notable and call premiums are rich. In the case of IRF, I would look at January 2010 \$15's, which are currently selling for about \$2.10. For MSCC, I would look at the September \$12.50's, which are selling for about \$1.85, and for ONNN, the January 2010 \$5's, which should sell for a premium of about \$1.35.

Bottom Line for Discrete Semiconductors: I think that over the long-term, all of these companies will do well. As it pertains to a long-term holding period of three to five years, in spite of the significant increases we've seen in stock prices, I think current valuations will still prove to be attractive. However, I also think there are short-term performance-to-consensus risks for all four companies with IXYS being the highest and ONNN being the lowest.

Opto: If you're not familiar with how things work in the semiconductor markets and specifically what has been going on in the opto market during the last year, the relative February and year-to-date data above is probably more confusing than it is helpful.

What is happening is demand for high-brightness discrete LED lamps has increased significantly over the last two years. Due to the fact that LED lamps constituted roughly 70% of total opto volume in the first two months of 2009, the demand growth for LED lamps has more than offset the declining unit demand for all other items in the opto sector. However, since the ASP for LED lamps is so low relative to other opto products, it makes the aggregate data appear to suggest there is a severe over-supply situation that has cratered prices in the opto product sector. That is not the case. What we're seeing is significant demand softness in all portions of the opto sector except LED lamps. Due to this, the product mix for the sector has shifted sharply to relatively low ASP LED Lamps and that is dragging down the aggregate ASP for the entire sector.

I expect this trend to continue as we move forward. As we move through 2009, I expect we'll see the trend of moving towards LED backlight in favor of the more traditional CCFL backlight accelerate in the computer monitor and LCD TV markets. While I think we'll also see LED lighting build traction as a replacement for incandescent lighting applications in 2009, it will take another year for it to gain enough strength to develop critical mass. As we move into 2010, the home and commercial lighting trend will build significant momentum as prices for LED bulbs that can be used in conjunction with standard dimmer circuits come down in price at mainstream retailers like **Wal-Mart (WMT)**. This will, of course, benefit **Cree (CREE)**.

In the case of CREE, it seems like a month can't pass without a new rumor that some very large company is trying to acquire it. Last week, the rumor de jour was that **Intel (INTC)** was the suspected suitor offering something around \$40 a share for CREE. However, since that rumor came out on April 1st and had little or no logic to support the supposition, I quickly wrote it off as an April Fool's joke; if you hear something that leads you to believe I was too hasty in this, please drop me a note.

In my view, the price of CREE as of the Friday close is a bit above where I would accumulate shares, but not above what I see as a rational valuation relative to its long-term potential. Be that as it may, the price is highly volatile and, as such, call premiums tend to run rich. While I'm not personally ready to hedge at the current price, I'm keeping a very close eye on the January \$35 and \$40 calls. If the former should move up to \$2.50 or so, a premium we would expect to see at a stock price around \$28.50 to \$29.00, I may elect to hedge some of the trading shares I picked up last year when the price temporarily dipped below \$15.

In our December 1st monthly semiconductor report, I noted that with **OmniVision (OVTI)** then trading at only about 20% premium to its net cash value, the stock merited consideration and if we saw a resurgence in smartphone demand, the stock could double or, possibly, even triple. OVTI was trading at \$6 when that report was published.

In looking at OVTI today, we can see that it, like most tech stocks, has moved up slightly more than 42% since we published our December report. We also heard last week that **Research in Motion (RIMM)**, a leader in the smartphone space, reported very impressive results for its February ending quarter. In addition to this, we've also seen OVTI make aggressive moves in China and last Thursday we fielded a rumor that OVTI won a design in the new **Apple (AAPL)** iPhone for a 3.2 megapixel image sensor. In addition to these rumors regarding mainstream applications, we're also seeing OVTI begin to leverage its module strategy to open new markets. All good stuff for sure. However, weighing on the other side of the ledger for the short term is another month of unimpressive SIA revenue data for CMOS image sensors.

Personally, since I view OVTI only as an opportunistic short-term play (others think the module strategy will provide lasting differentiation and improved profit margins), I would likely hedge at least a portion of my holdings if I had a long position in the stock. If we look at the January 2010 \$10 calls, the price is beginning to creep up to \$2.00 and, if that premium were to materialize, I would probably take it. For investors who bought at \$6.00 when our December report was published, this would reduce cash exposure to \$4 (below OVTI's net cash value) and create a reasonable opportunity to cash out next January with a 150% gain based on adjusted cash exposure.

Logic: On a relative basis, the Logic sector continues to outperform the other sectors. There are two drivers behind this situation:

1. We are continuing to see the shift to mixed signal and SoC designs that scoop functions from other sectors and move them into the "Special Purpose Logic" sector. This phenomenon is very much in line with the predictions I shared over two years ago in our Paradigm Paper titled "[Moore's Law Bites.](#)"
2. We are seeing relatively strong demand for expensive programmable logic and a wide selection of Special Purpose Logic devices used in wireless and wired communications infrastructure projects. The demand has been particularly strong in China and appears to be picking up in other emerging nations.

I expect these trends will continue and that these and broader industry trends will continue to favor programmable logic leaders **Altera (ALTR)** and **Xilinx (XLNX)**. To read more about this, please see our Paradigm Paper, "[Industry Trends Favor Programmable Logic.](#)"

Analog: We've seen considerable disruption and change in the Analog sector during the last few years. The first wave of this was due to the "Moore's Law Bites" paradigm I outlined in 2006 and the second is being driven by Asian semiconductor manufacturers that have finally developed the technology to become serious players in the complex world of analog and mixed signal. Together, these changes and disruptions have led or are in the process of leading virtually every U.S. company in the space to realign their strategy and, in some cases, radically alter their fundamental business model.

Analog Devices (ADI) was early to recognize it needed to alter its model by selling off both its handset and PC power control product lines. Just because a product line is good, doesn't mean it fits in every business model. As we've seen, both the companies that acquired ADI product lines, MediaTek for the handset stuff and **ON Semi (ONNN)** for the PC power control, are doing well with the products. However, since neither product group had the right synergy for ADI, stripping them from the core was the right decision. Due in part to ADI's early recognition that it needed to make a serious change, I continue to rank it as my favorite play in the sector. In addition to this, I think there is a reasonable chance that ADI will report better than currently expected results for its calendar Q1. It's darn hard to build a wireless basestation without using ADI parts and my thinking is the strong basestation demand we're seeing in China will lead to better than expected revenues at ADI.

Maxim (MXIM) made some early changes to its business model by directing its strategic focus towards the top 25 consumer electronics manufacturers and lowering gross profit expectations. However, I'm pretty sure it needs to do more if it is to optimize its focus. I also think that buying the storage IC business from **Vitesse (VTSS)** will prove to be a strategic blunder. Even if the product line is successful, I think it lacks serious synergy with MXIM's core strategy and is taking time from other projects that would have much more favorable long-term impacts. However, due more to MXIM's dumb luck and temporary NASDAQ delisting, it didn't strip out its balance sheet like **Linear Tech (LLTC)** and **National (NSM)** did a couple years ago and therefore has the cash to fund its generous dividend even if it continues to traverse a rough patch for several more quarters.

Due to the generous dividend, I continue to view MXIM as a good stock to hold, but don't be shy to hedge it with covered calls – the premiums there are generous too.

Consistent with what I wrote in 2007 when selling the last shares of my **Intersil (ISIL)** position at \$30, the company is now undergoing a significant rebuilding process. Basically, the company grew far too dependent on the PC market and, as time passed, found the competition to be stiffer than expected. Sadly, while it built its PC market share, ISIL didn't focus properly on its standard product businesses or on other areas where it could build more durable differentiation. It appears today that ISIL has retrained its focus and I'm optimistic its current CEO will eventually develop a sound foundation for the company. However, I don't expect miracles in the short-term. I think the odds favor a fairly long rebuilding process and potentially more acquisitions.

To a great degree, this is a classic "handoff across the chasm situation." If the timing of the model transition works out cleanly, there will be no need to reduce dividends and profitability will build well ahead of Wall Street expectations. However, due to the soft market conditions we face today and my thinking that the rebuilding will require more acquisitions, I think the risks of a baton being dropped into the chasm are higher than I want to assume.

NSM, which I wrote quite a while back was vulnerable to the "Moore's Law Bites" paradigm, appears to have finally shown signs that it has fallen prey. My read of the last conference call, which I [outlined in a subsequent report](#), is that NSM is entering a very significant rebuilding process and that I'll look for what I think will prove to be one last surge of smartphone business to bring the stock up to a price at which I'll either sell or hedge with covered calls.

MPU (Microprocessor): Based on the data we can see today, I think there is some degree of jeopardy in INTC hitting the \$7B consensus of the covering analysts for Q1. My thinking is we'll see INTC come in somewhere between that and \$6.5B and even at the best case, see revenue only marginally higher than the \$6.8B INTC reported in Q1 2003. However, more important than Q1 will be what INTC provides for Q2 guidance and, when we analyze the moving pieces for Q2, there is considerable give and take that makes it very hard to predict.

- INTC has cut the prices of its processors, which according to reports include entry level versions of its new CULV (Ultra-low Volatge) to as low as \$65 for its largest customers with emerging companies like ASUS paying just a tad more at \$70. However, I think INTC sees that having new and attractive netbooks at low prices to compete against the **ARM Holding (ARMH)** core designs set to hit the market this summer, particularly those based on the **Qualcomm (QCOM)** Snapdragon, is a good idea. INTC has created a new high-volume market and needs to lead the competition both at price and performance if it is to maintain dominance. With rumors now suggesting we'll begin to see CULV netbooks in April or May instead of June when the ARHM units are supposed to hit the street, the implication is that INTC is serious in this battle. Personally, I think owning INTC, QCOM and ARMH for the long-haul will prove to be a good decision.
- We don't know today how much of the netbook phenomenon is being driven by it opening a new market and how much of it is cannibalizing traditional PC markets. While many pundits are guessing today, the reality is we won't know this for sure until the next economic up-cycle. My contention is that while the netbook has clearly cannibalized traditional markets to some degree, the majority of the sales have been driven by opening new computing markets in emerging economies and the creation of new market classes in traditional markets. International wireless broadband service providers were the first to recognize this new market potential by leveraging the same strategy that they have in the cell phone markets; offering a netbook for a heavily discounted price in exchange for a long-term broadband agreement. **AT&T (T)** and **Verizon (VZ)** have announced they will both employ a similar strategy this year in the U.S. **Sprint (S)** has been aggressively marketing data services, but so far is just

doing it with a subsidized broadband adapter. I suspect it will move to the subsidized netbook model as well.

- INTC will introduce new server chips mid-year. This should lead to an uptick in demand and, with it, improved profit margins. However, it could also lead to some discounting ahead of the introduction. That implies the discounting would likely materialize during Q2.
- Fortunately for INTC, it captured share from **Advanced Micro Devices (AMD)** during each of the last four quarters. I suspect we'll learn it's five once Q1 is on the books. This means INTC will have a larger cut of any aggregate improvement in demand versus what it would have gotten last year or, for that matter, for the last several years.

Personally, I think INTC is making all the right moves to develop what I believe will be an exciting and solid growth business model focused on "x86 everywhere." While numerous pundits are ruminating about the rapid decline in ASP's that have been driven by the new Atom processor and the emerging netbook phenomena, I think it will prove to be exactly the right strategy for INTC. Not only will it spread computing to new markets where we'll later see users upgrade to more powerful PC's, it is the most logical way for INTC to transition its processor technology to applications beyond the PC and server markets that has fueled the company for nearly 30 years now.

I think that over the next couple years we'll begin to see x86 chips in everything from handheld devices to set-top-boxes that provide broadband gateway functions and throughout a wide variety of industrial, medical and home healthcare applications. To this latter point, INTC and **GE (GE)** announced an alliance to develop a wide variety of connected home healthcare products designed to help our aging baby boomers maintain independence and, at the same time, lower the aggregate cost for healthcare. This emerging market that is expected to grow to nearly \$8B by 2012 is the subject of Andy Kessler's book, "The End of Medicine: How Silicon Valley (and Naked Mice) Will Reboot Your Doctor."

While I think it will take INTC several years to roll out and develop its strategy, I think there is a good chance we'll see some upside in the second half above the roughly \$16B consensus that was current as of last Friday. My problem is I think the first quarter could be softer than the \$7B consensus and that there are situations in Q2 that could swing it either way.

Bottom Line for MPU: If you loaded up on INTC last year when it was trolling though the \$12's, it's probably a good time to reassess your risks. If you find them to be high, I would consider hedging a portion of your INTC position with January 2010 calls (this would push gains into long-term territory) with a strike price of either \$15.00 or \$17.50; in both cases, the premiums are generous enough to make it worthwhile.

Memories (DRAM, SRAM, NAND and NOR Flash): With **DRAM** prices firming I moved from a "no investment" to "speculative" stance on **Micron (MU)** on March 20th. For me, that was a big change; in December 2006 I wrote that investors should sell DRAM makers MU and **Qimonda (QMNDQ.PK)**. Personally, even though I think we'll see a trend of higher DRAM prices this year, I would keep MU on a short leash and plan to sell over several price points, it's often that one early sell at around a double that keeps you out of trouble if there is a sudden change in sentiment.

NAND Flash news has been solid and it appears that new demand channels for solid state drives (SSD) will create more than enough demand to offset the excess capacity that has plagued the sector for more than a year. In English, that means I think prices will go up and profit will return to income statements. As I've noted in past reports, I think owning **SanDisk (SNDK)** is the best way to leverage this change. Again, the same story applies here as does with **Micron (MU)** – short leash and sell in stages.

With **Spansion (SPSN)** drifting towards obscurity, my mantra remains as it has been for years, "Just say no to NOR" (**NOR Flash** that is).

I don't do **SRAM** either.

To read more about semiconductor memories, please see our Paradigm Paper, "[Memories – Silicon by the Pound.](#)"

MCU (Microcontroller Unit): Two things have been happening in the MCU world. The first is specialized MCU's that include essentially everything it takes to be a SoC (System on a Chip) have been developed to address a number of very low cost industrial and consumer markets. This significantly boosted volumes during the good times, but has led to a sharp decline as both of these markets have been hit hard by the worldwide economic downturn. Between this and the competitive pressures in the low-cost MCU market, both unit volume and ASP's for 8-bit MCU's are in the tank. As a result, revenues are down sharply and, when we hear Q1 results, I suspect profitability will be notably down as well. While the second trend for 32-bit MCU's appears to be doing well relative to the broader semiconductor market, it doesn't have the critical mass to offset the falling demand for 8-bit and 16-bit products at this juncture.

My thinking is that the future profits in the MCU space will be in 32-bit products that are densely integrated and that the competitive pressures that we've seen develop in the 8-bit market will persist even when aggregate demand picks back up. Due to this, I continue to believe it's best to avoid sector leader **Microchip (MCHP)**. Not only will MCHP suffer with the sector, it's not been terribly successful in building a 32-bit business and that could weigh heavily on it even as aggregate demand recovers.

While I don't want to come across as though I'm writing off MCHP's fine management team, I simply believe there are better places to look today where the systemic challenges are significantly less.

DSP (Digital Signal Processor): Contrary to what the data would lead you to believe, DSP technology is used more today than ever before. However, just as has been the case with SRAM technology, the DSP function is more often than not integrated into special purpose logic parts. To put this in perspective, every single cell phone handset has at least two DSP circuits, but not a single one has a discrete DSP chip. While this trend of integrating the DSP function will persist, so will the opportunities to sell very high performance DSP's into certain applications like cell phone base-stations.

Revenue by Geography

2009 Year-to-date Results by Geography

	Market Share	Change Y/Y
Americas	17.9%	-20.1%
Europe	15.5%	-33.5%
Japan	18.4%	-34.7%
Asia ex-Japan	48.2%	-28.5%
Totals:	100%*	-31.2%

* Rounding errors may cause the individual markets to add up to less than 100%.

There has clearly been a major share shift to both Asia and the Americas that is consistent with broader economic activity.

2005 Full Year Results by Geography

	Total Revenue	Market Share	Change Y/Y
Americas	\$40.74B	17.9%	+4.3%
Europe	\$39.28B	17.3%	-0.4%
Japan	\$44.08B	19.4%	-3.7%
Asia ex-Japan	\$103.39B	45.4%	+16.5%
Totals:	\$227.48B	100%*	+6.8%

* Rounding errors may cause the individual markets to add up to less than 100%.

2006 Full Year Results by Geography

	Total Revenue	Market Share	Change Y/Y
Americas	\$44.91B	18.1%	+10.3%
Europe	\$39.90B	16.1%	+1.6%
Japan	\$46.42B	18.7%	+5.3%
Asia ex-Japan	\$116.48B	47.0%	+12.7%
Totals:	\$247.72B	100.0%*	+8.9%

* Rounding errors may cause the individual markets to add up to less than 100%.

2007 Full Year Results by Geography

	Total Revenue	Market Share	Change Y/Y
Americas	\$42.34B	16.6%	-5.7%
Europe	\$40.97B	16.0%	+2.7%
Japan	\$48.85B	19.1%	+5.2%
Asia ex-Japan	\$123.49B	48.3%	+6.0%
Totals:	\$255.65B	100.0%*	+3.2%

* Rounding errors may cause the individual markets to add up to less than 100%.

2008 Full Year Results by Geography

	Total Revenue	Market Share	Change Y/Y
Americas	\$37.88B	15.2%	-10.5%
Europe	\$38.25B	15.4%	-6.6%
Japan	\$48.99B	19.5%	-0.7%
Asia ex-Japan	123.97B	49.9%	+0.4%
Totals:	\$248.60B	100%*	-2.3%

* Rounding errors may cause the individual markets to add up to less than 100%.

Disclosure: At the time of the publication of this report, Paul McWilliams had long positions in ADI, ALTR, ARMH, CREE, INTC, IRF, NSM, QCOM, SNDK, TXN, VTSS and XLNX. In addition to these, he also had short positions in TXN July and January \$17.50 calls.

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