



Computer Hardware Software

Flash Burnout

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The flash market is no longer playing nice for everyone involved.

Tokyo-based Renesas Technology announced earlier this month that it intends to stop development of new NAND products, effectively signaling that its days of competing in this hot, \$11 billion market segment are over.

NAND is a type of flash memory commonly used for mass-storage applications, like digital cameras and MP3 players, and is cheaper than other similar forms of memory.

"The NAND market has claimed its first victim," says Jim Handy, flash memory analyst with Semico Research. "The only way to compete in the NAND market is to put the pedal to the metal."

It's a strategy that has served well Samsung and Toshiba, the top-two makers of NAND flash, as they collectively control more than 75% of this market. The companies have built their fiefdom by constructing more advanced factories and holding more capacity than their competitors.

That strategy, mimicked to an extent by a slew of late-comers, which includes Intel (nasdaq: INTC - news - people) and Micron Technology (nyse: MU - news - people), shows signs of wear, as profits may come under attack due to increasing supplies that drive prices down faster than expected.

Flash memory chips retain data when power is turned off, and NAND--so-called because of the mathematical function it performs--is ideal for its low cost and ability to quickly store data.

The NAND flash market during the past few years has exploded, thanks first to the wide-scale adoption of digital cameras, and now due to portable music players, especially some Apple Computer (nasdaq: AAPL - news - people) iPod models.

Like other memory-chip markets, declining prices are largely seen as inevitable and a good enabler of wider product use. For instance, video applications are seen as the next wave of devices capable of taking advantage of NAND price declines.

Still, the timing of adoption and the always-precarious supply and demand situation have in the past derailed the best-laid plans in the memory segment. This seems to be repeating itself here, with Renesas serving as an initial indicator that happy days today eventually will give way to tougher business conditions.

"NAND flash is very cut-throat and ultracompetitive, and I think it will become more commoditized than DRAM," says Joseph Unsworth, flash analyst with Gartner. "Renesas is not suited to compete in a commodity memory business."

This hasn't prevented other companies from trying--even lately--to get a piece of the action. Micron and Intel have teamed up on a NAND joint venture, with Apple signing up as an early customer, and Hynix Semiconductor and STMicroelectronics (nyse: STM - news - people) continuing to add capacity in an effort to carve out share here.

These companies, as well as the established NAND heavyweights, say they are able to better ride the demand and supply rollercoaster by shifting capacity away from oversupplied markets to another

type of semiconductor--for example, dynamic random access chips, which are made with similar process tools and which Renesas no longer manufactures.

Forecasting oversupply and undersupply is not an exact science, though, and shifting production from one chip type to another doesn't happen overnight. The end result of this surge into the NAND market will likely be the same as in other blownout areas of the memory market: Good profits and undersupply soon give way to oversupply and weak or no profits.

Semico's Handy sees an overcapacity situation in the NAND market coming as early as the second half of 2006, with manufacturers losing money in 2007. He also sees another round of losses occurring only two years after that.

Gartner's Unsworth predicts that NAND revenue will increase at a declining rate through the end of the decade, with the 70% and 53% growth rates of 2004 and 2005, respectively, giving way to 37% growth in 2006, and a compound annual growth rate of 17% spanning 2004 to 2010.

The weaker growth is even more startling considering that number of units sold is expected to continue expanding exponentially, logging a compound annual growth rate of 114% between 2004 and 2010.

The culprit here is price declines brought on by technological advances, increased competition and a desire to capture more of the market. Last year, the average price of a 512-MB flash chip was \$6.84, according to Gartner. This year the price dropped to under \$3, next year it's seen falling to \$1.50. By 2010, it's anticipated the chip will cost 18 cents.

Unit growth has thus far offset price declines in the NAND market, but that will cease to be the case if the supply and demand situation tips unfavorably.

Unsworth anticipates the NAND market losing steam in 2007 due to "massive supply" and the "maturation of several new [factories], which will overwhelm healthy demand." But he also acknowledges that forecasting this market is very difficult.

"No one knows what new applications will come from this technology," he says, adding that knowing ahead of time or gauging the success of Apple's NAND-based iPods wasn't possible.

Indeed, the iPod has been a killer app in this area. Its wide popularity--and Apple's dependence on NAND this past year to feed the demand--has rocked the market.

Apple reportedly struck a deal midway through the year to secure almost half of Samsung's NAND output for the remainder of 2005, sending a ripple effect through to other MP3 player manufacturers to secure their own NAND supplies.

This has kept prices in check, but more supply is building to meet demand. And that's when the real tests will begin for this commodity product.