

KIN WAH LOH AIMS TO GET "SIGNIFICANTLY MORE THAN HALF" OF QIMONDA'S CHIP SALES FROM OUTSIDE THE PC ARENA BY YEAR-END.



# WALKING SOLO DOWN MEMORY LANE

BY JULIE MOLINE

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BERNHARD HUBER

AFTER ITS CARVEOUT FROM INFINEON,  
QIMONDA IS AIMING TO BECOME THE  
WORLD'S NO. 1 MAKER OF DRAM CHIPS,  
ACCORDING TO CEO KIN WAH LOH.

## THERE WAS CHEERING

at **QIMONDA AG (QI)** when **SONY CORP. (SNE)** unveiled its long-anticipated PlayStation 3 to plenty of fanfare last fall, according to Kin Wah Loh, Munich-based Qimonda's chairman, president and CEO. Qimonda (pronounced key-MUN-da) produces the dynamic random access memory (DRAM) chips that run PlayStation as well as many of its game-console cousins, among other electronic applications, the CEO explains.

"Our long-term goal is enlarging our share of higher-margin, non-PC markets such as graphics, along with server, con-

sumer and mobile applications," points out Loh. "There we see huge potential as consumers continue to drive those businesses, all of which require the use of more and more DRAM."

DRAM chips have become increasingly ubiquitous in electronic devices — and less noticed by users, insists Loh. "Most people have used three or four Qimonda products before they have their morning coffee," he points out. "When you check your e-mail on your laptop, turn on your cell phone or PDA, your digital TV, your MP3 player — all these devices run on DRAM."

## WHAT, EXACTLY, IS DRAM?

DRAM describes a silicon memory chip that springs into action each time an electronic device with a processor is turned on. The device's hard drive transfers its operating system, application programs and data into the DRAM chip, which stores them until the processor needs them, Loh explains. Unlike a hard drive, which holds data permanently, DRAM chips store data only while the device is running, adds Loh, who notes that DRAM provides crucial buffer memory to enable fast processing of information. More powerful graphics memory-chip capacity allows for higher-resolution graphics and, above all, better performance, says the CEO.

Until the past few years, Loh says, DRAM technology was used for one major application: computing. With dozens of DRAM manufacturers selling nearly identical products, huge price swings regularly swamped the producers as supply-demand cycles in the PC

## KEY TO THE WORLD

Loh explains that Qimonda became an independent company last May after its carveout from **INFINEON TECHNOLOGIES AG** (IFX) (see "Evolution of Memory," page 30). "Clearly, the separation is already paying off," insists Wolfgang Ziebart, Infineon president and CEO. "It is my belief that businesses of a distinct nature do better if they are managed separately and have the freedom to do what is right for them in each instance without having to make constant concessions to the need for synergies."

The company's name is a neologism that takes its first syllable from the Chinese word *qi*, which means "flowing, internal energy." It's a nod, says Loh, to the role memory plays in electronic devices.

# A NEOLOGISM THAT IS MEANT TO SUGGEST "KEY TO THE WORLD."

market played out, he notes. "DRAM got a terrible name," Loh recalls, adding: "The market was overcommoditized and highly volatile." The solution, says the CEO: diversification into more predictable market sectors, such as the memory chips for servers and wireless and landline infrastructure, as well as chips for a variety of consumer and mobile electronics.

Computermakers still account for most DRAM chip sales. But, Loh says, the amount of specialty chips sold for applications other than computers — such as smartphones with e-mail or day-planner functionality, digital cameras, game consoles, TVs, set-top boxes and server systems — has risen to more than 40 percent in 2006 from roughly 25 percent in 2004. The goal was to have customers outside the PC arena, Loh says, and that goal is being met.

Loh has reason to be pleased with the voracious demand for specialty chips, noting that first-quarter 2007 continued to provide earnings growth. Qimonda indicates that it also managed to increase its average selling price by 19 percent in the quarter compared with the same period in 2006, largely due to its dramatic rise in shipments of specialty DRAM with stronger pricing. Overall, Qimonda says, it was a stellar year, reporting net sales of €3.8 billion (\$4.8 billion) for fiscal 2006, an increase of 35 percent from the year before.

*Monda* comes from the Latin *mundus*, "the world." Together, they're meant to suggest "key to the world," he says.

If Qimonda has a global footprint and name, the CEO personifies its international character. Loh, 52, was born in Malaysia, the grandson of Chinese immigrants. He speaks five languages: Cantonese, English, German, Malay and Mandarin. His wife, a teacher, lives in Malaysia. One daughter attends law school in Britain, and the other is an engineer in Singapore. "I have a lot of frequent-flier miles," Loh laughs.

A chemical engineer trained at the University of Malaya, in Kuala Lumpur, with a second undergraduate degree in finance and accounting, Loh counts 30 years of global managerial experience in the semiconductor industry, during which he covered nearly every aspect of manufacturing and production. He was named managing director of Siemens Microelectronics Asia Pacific, a division of **SIEMENS AG** (SI), which spun off Qimonda's parent, Infineon, in 1999. Loh was a member of Infineon's management board between 2004 and 2006.

Executives at Qimonda suggest that its success owes much to its global workforce. "Taking a homogenous approach to our business would mean running the risk of missing a nuance about a particular solution," notes Henry Becker, president of Qimonda North America. "Asians will look at a problem differently than will Europeans and Americans. Through our knowledge-management network, which is what we call our production clusters, the dialogues and problem-solving abilities take into account several different perspectives. Operationally, that gives us a big advantage.

“Let me put it this way,” Becker continues. “The sun never sets on Qimonda. We try to be creative, passionate and fast seven days a week, 24 hours a day around the world, with the singular aim to be successful in the DRAM space.”

Qimonda says it encourages employees to take six-month or longer assignments on another continent. “This provides that two-way transfer of knowledge and perspective,” Becker notes, “which is crucial in an industry as R&D-focused as we are.” With an annual R&D budget of more than €400 million (\$500 million), or more than 10 percent of revenues, the company currently employs 1,100 product designers, up from 550 in 2004.

Qimonda’s eight research sites — in Germany (Munich and Dresden), Italy (Padua), the U.S. (Raleigh, N.C.; San Jose, Calif.; and Burlington, Vt.), Japan (Tokyo) and China (Xi’an) — were chosen largely because of their access to major universities. “There’s a shortage of good engineers, so we had to go to them,” Loh explains.

Although Qimonda has a global R&D charter, each site works autonomously, developing business plans in line with corporate goals, he says. The main centers have up to 250 engineers who work in teams of 50. “This way, they know different aspects of the products and are continuously motivated, refreshing their intellectual capability and mindset,” Loh notes. “Focusing on just one area only leads to burnout.” For now, burnout doesn’t seem to be an issue, says the CEO, who cites the slew of new products and the company’s encouraging financials.

## TRENCH POWER

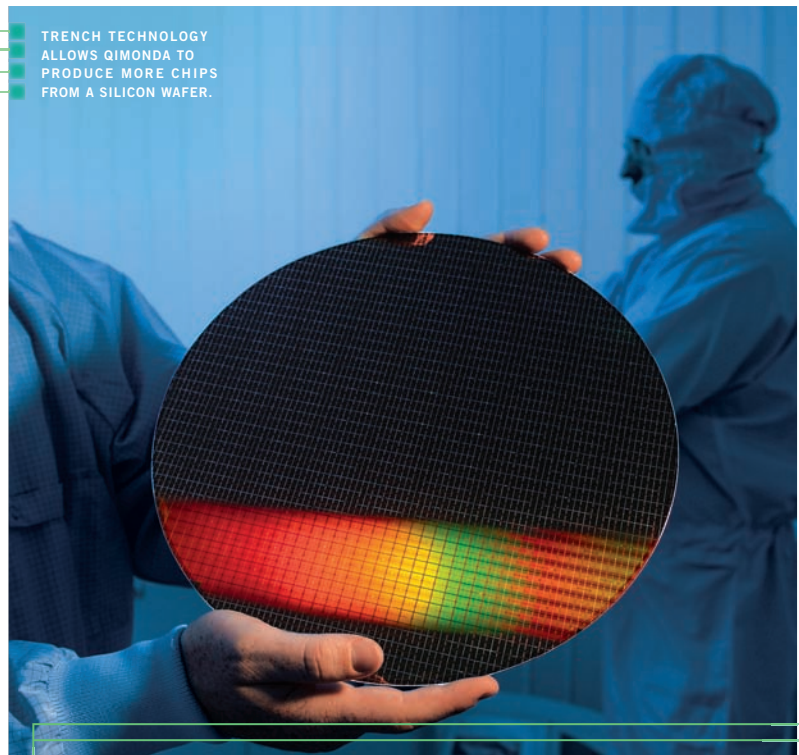
An early area of differentiation is Qimonda’s “trench” technology, notes Becker, who says that Qimonda and Nanya Technology Corp., its Taiwan-based development and production partner, are the only semiconductor companies that do not use the widespread “stack” technology. He describes stack technology as a forest for memory storage, with each tree storing one bit of information. In contrast, “trench technology stores the same bit of information in a hole or trench etched into the silicon,” Becker continues. Developed in the 1980s with partner **IBM CORP.** (IBM), he adds, trench technology allows for smaller memory chips, which in turn means each silicon wafer can generate more chips, thereby reducing production costs.

Trench technology also requires less power consumption than the stack-style DRAM, adds Becker, noting that spiraling energy costs have become a serious issue in data centers and server farms. “Energy costs can start to exceed equipment costs,” says Loh. “We have shown our customers that using our trench DRAM technologies could save them up to 30 percent of power consumption, and these are savings that go directly to the bottom line.” Reduction in power consumption lowers

energy costs in two ways, Loh says: not only directly by lowering the amount of energy used by the server but also indirectly by reducing heat that must be managed by cooling systems.

Cutting back on power consumption is also an important advantage for mobile electronics. “The consumer is greedy for more speed, longer battery life, faster screen startups,” points out Loh, noting that some of the money from Qimonda’s IPO was earmarked for research and development. “We are working with our customers and partners to find ways to leverage our know-how to constantly improve performance,” he asserts.

TRENCH TECHNOLOGY  
ALLOWS QIMONDA TO  
PRODUCE MORE CHIPS  
FROM A SILICON WAFER.



One way to attain this goal is through miniaturization. With partner Nanya, Qimonda has made a chip using 75nm (nanometer) DRAM trench technology, down from 90nm, while improving potential chip output by about 40 percent, says Becker. “Miniaturization is a milestone on our technology road map,” he adds. “The 75nm technology satisfies performance requirements of high-speed interfaces and lowers our costs.”

True to the company’s value statement of “creative-passionate-fast,” R&D teams were working on 58nm chips even before the 75nm chip went into production in September, says Loh. Although the company declines to speculate on when 58nm will be viable, Qimonda engineers are far enough along to deliver papers on it at industry conferences.

Besides the focus on size, Qimonda has more than doubled its number of chip designs over the past two years, Loh says. The new, higher-margin products bring with them a number of innovations, explains the CEO. For example, he says, Qimonda was the first company to produce chips with integrated temperature sensors. Qimonda's mobile-RAM product, he notes, adds memory density and bandwidth while offering what he calls "ultralow power consumption for mobile-phone handsets."

In May 2006, Qimonda introduced fully buffered dual in-line memory modules, which boost memory capacity and performance in volume-server platforms. The goal, says Thomas Seifert, Qimonda chief operating officer, is for the company to control 50 percent of that market by the end of 2007.

### INNOVATION IN PARTNERSHIPS

Loh says that the company stretches its R&D budget through its "production partnership model," an approach that dates back to Infineon. By working with joint-venture and other partners, Qimonda can leverage its capital and investment dollars more efficiently than can its rivals, "which mostly see direct investment in their own facilities as an option," says Becker.

Today, he adds, Qimonda's in-house production mix comes from a combination of wholly owned manufacturing facilities, joint ventures (with Inotera Memories Inc. in Taiwan, for example) and flex capacity, thanks to partnerships with foundries such as **SEMICONDUCTOR MANUFACTURING INTERNATIONAL CORP.** (SMI) in China and Winbond Electronics Corp. in Taiwan. The long-term goal, Becker says, is to conduct 55 percent to 60 percent of production in-house, 30 percent with partnerships and the remainder with foundry chipmakers, allowing the company maximum flexibility at optimal cost efficiency.

### MOBILE MEMORY

Meeting future product needs involves further enhancements to Qimonda's consumer-centric product line, often in tandem with customers, says Loh. One of the more exciting evolutions is a next-generation convergence device developed in conjunction with Sony, he reports. "We are fundamentally in a world that has at its core the notion of mobility, and now the universality of mobile devices," Loh says. "We are always traveling, and so we expect to be able to carry memory with us, as much as maybe even a terabyte or so in our pockets. That is the future of our business: to enable people to carry knowledge everywhere they go. And preparing for that future, I think, is what will ultimately carry Qimonda ahead." ▢

## EVOLUTION OF MEMORY

**QIMONDA WAS CARVED OUT OF** Infineon Technologies with great fanfare last May. But its history dates back to the early 1980s, when Infineon was a division of Siemens, which was considered one of the world's largest electronics and electrical engineering companies. Infineon itself was carved out of Siemens in 1999, taking the memory chipmaker along with it.

For some time, says the company, it was assumed that Infineon would sell its memory operations to competitors. But in November 2005, the board announced the carveout. Last May's reorganization split Infineon into two distinct operations: the parent, Infineon, which focuses on advanced logic, largely for the automotive and communications industries; and Qimonda, which maintains an emphasis on memory.

Various teams working on the reorganization were so productive, says Infineon President and

CEO Wolfgang Ziebart, that the carveout "was accomplished two months ahead of the original schedule." Currently, Infineon's stake in Qimonda remains at around 86 percent, but Ziebart has said that he aims to lower the stake below 50 percent "at some point." In August 2006, Qimonda raised \$546 million on the NYSE.

### LOH'S VISION

Colleagues say that it was Loh — known inside the company for his sharp wit, straight-shooting assessments and inclusive management style — who persuasively built the business case for independence. Loh, who was chief of the company's memory division at the time, also formulated Qimonda's mission: "to become the No. 1 creative memory company in the world."

"Before the split, Infineon and Qimonda were always delaying each other," recalls Loh. He points

out that the introduction of products in the two separate semiconductor areas, logic and memory, generally happens on different timetables. "Now," he continues, "we are two very strong companies with leading-edge applications focusing in the markets where we think we have a clear advantage and differentiation."

By 2006, Infineon's memory-products group had nearly 12,000 employees worldwide and, at the time of the split, was ranked by **GARTNER INC.** (IT) as the second largest memory supplier in the world based on volume and revenues.

In an industry dominated by numerous small Korean and Taiwanese companies, Qimonda is the only European-based DRAM player, as well as fabricating fully one-third of its chips in the U.S., points out Loh. He adds that revenue, similarly, is balanced 40 percent in North America, 40 percent in Asia and 20 percent in Europe.