As 2006 draws to a close, we at UMC would like to take this opportunity to thank our customers for all of their support. We have made great efforts to provide the most competitive solutions to enable our customers SoC designs, which in turn have resulted in a win-win situation for UMC and our global customer base. In particular, our customers are benefiting from the tremendous progress we have made in advanced process technology. Over the past year, we clearly saw the benefits of high utilization in leading-edge technology nodes, as well as established new industry milestones for our most advanced processes.

Solid demand for 90nm was a significant contributing factor to better results in Q3 2006. Furthermore, the number of new 90nm customers and products in production for Q3 was still relatively small, and we have many more 90nm customer products in various stages of development that will ramp to production in the following quarters. This validates the direction we have followed for the last two years: to focus on expanding our customer base in advanced technology.

For the 65nm generation, two customers are now in small volume production, with revenue contribution in Q3 for the advanced technology accounting for approximately 1% of total revenue. Today, we are engaged with nine customers from a variety of sectors that include cell phone, FPGA, graphics and broadband applications. Moreover, our yield
improvement for 65nm has been even faster than for the 90nm generation.

We are also very happy to report that our Central R & D team successfully produced functional 45nm SRAM chips, featuring an impressive bit cell size of less than 0.25um². The ICs used sophisticated immersion lithography for its 12 critical layers and incorporated the latest technology advancements, such as ultra shallow junction, mobility enhancement techniques, and ultra low-k dielectrics (k=2.5). You can read more about this exciting technology milestone on page 4 of this issue.

Customer products manufactured using 90nm and 65nm technologies are leveraging the productivity advantages of 300mm wafers. Production is taking place at both of our 300mm fabs: 12A in Tainan, Taiwan, and 12i in Singapore. By the end of 2006, Fab 12A will reach a production capacity of 30,000 wafers per month, while Fab 12i will be capable of 18,500 wafers. Both state-of-the-art fabs have a maximum designed capacity of 40,000 wafers per month.

For 2007, we are excited at the prospect of bringing many more of our customers’ 90nm and 65nm products to market, while we work to speed the qualification of our 45nm process. We will also continue to bring our customers the very best foundry services in the industry, including the most advanced process technology, reliable and efficient manufacturing, DFM solutions, and extensive IP and design support resources. I wish you all the best and a Happy New Year.

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UMC Achieves QC 080000 IECQ HSPM Qualification for All Fabs

UMC became the first semiconductor manufacturer worldwide to achieve QC 080000 IECQ Hazardous Substance Process Management (HSPM) qualification. QC 080000 IECQ HSPM is the standard that the International Electrotechnical Commission (IEC) Quality Assessment System for Electronic Components (IECQ) approved for Hazardous Substance Process Management in October 2005.

Corporations have taken extensive measures to conform to the new RoHS (Restriction of the use of certain Hazardous Substances in electrical and electronic equipment) Directive that became effective July 2006. The RoHS Directive will ban electronic products that contain certain levels of six listed hazardous substances from entering European markets. UMC has led the semiconductor industry in sustainable, environmentally friendly development with its QC 080000 IECQ HSPM Qualification, which stringent requirements go above and beyond the six listed materials in the RoHS guidelines to include the restriction of over 20 different hazardous substances. This qualification assures UMC’s continued access to the European markets to help its customers expand their market share.

The QC 080000 IECQ HSPM standard is based on the ISO 9001:2000 quality management system and is the only green product quality management system that has been widely used and approved around the world.
UMC Receives AIG's "Outstanding Risk Management Performance Award"

UMC has received the "Outstanding Risk Management Performance Award" from American International Group, Inc. (AIG), a world leader in insurance and financial services and one of the top three companies ranked in the Forbes Global 2,000. The award demonstrates UMC's positive corporate image worldwide and underscores the company's achievements in risk management and damage prevention. In the area of risk management, UMC has already received the National Sustainable Development Award from the Executive Yuan and the Gold Medal at the National QCC Awards from the Ministry of Economic Affairs.

UMC fabs have been ranked as top-class following AIG's risk evaluation.

UMC and NDL Establish R & D Sponsorship Program

UMC and National Nano Device Laboratories (NDL), a research affiliate of Taiwan's National Applied Research Laboratories (NARL) recently signed a collaborative agreement to cultivate researchers in Taiwan's nanotechnology field. The agreement establishes the "UMC-NDL Scholar Sponsorship Program," which will offer financial assistance to qualified young talent conducting studies in nanotechnology. The program will also help with the early identification and development of emerging technologies that may play prominent industry roles in the future, thus further enhancing Taiwan's competitiveness in nanotechnology and the semiconductor industry.

Throughout its history, UMC has been active in the development of new talent in Taiwan's high-tech industry. UMC's collaboration with NDL to support local research scholars will focus on semiconductor and nanotechnology research areas expected to gain importance in the next 3-5 years. The agreement will enhance Taiwan's technological innovation and help transform Taiwan from being a technology follower to a technology leader.
UMC Produces Working 45nm ICs

UMC has successfully produced functional 45nm SRAM chips. The ICs, produced using UMC’s independently developed logic process, used sophisticated immersion lithography for its 12 critical layers and incorporate the latest technology advancements such as ultra shallow junction, mobility enhancement techniques, and ultra low-k dielectrics (k=2.5). The SRAM also features an impressive bit cell size of less than 0.25um².

UMC’s 45nm process features a 30 percent design rule shrink, 50 percent 6-transistor SRAM cell size shrink, and a 30 percent device performance gain over the 65nm technology node, which is in production at UMC for several customer products. Development for UMC’s 45nm process is taking place at the foundry’s 300mm Fab 12A, located in Tainan Science Park in southern Taiwan.

The 45nm SRAM memory bit-cell produced by UMC demonstrates good minimum power supply capability, which is an important aspect for 45nm due to the demanding power saving requirements of today’s advanced portable electronics. In addition, by using optional circuits built into the test vehicle, the minimum level can be further enhanced to achieve excellent power behavior.

UMC is among the first companies in the world to produce working 45nm silicon, with initial results realized for the initial 45nm wafer lots very encouraging. UMC will continue to build on its 45nm momentum to enhance yields and prepare the technology for adoption by its foundry customers.

Extreme DA and UMC Collaborate on Sub-90nm Variation Aware IC Design Flows

UMC and Extreme DA™ have collaborated on variation-aware IC design flows for 90nm and below process technologies. The flows aim to accelerate time-to-manufacturing and reduce design uncertainty by focusing on design-for-manufacturing (DFM) issues such as timing and power variability prediction and optimization in the presence of process variations. The first flow, based on Extreme DA’s production-ready Extreme XT™ sign-off tools, has already been applied to a UMC test-chip at UMC’s 90nm process node.

The partnership between Extreme DA and UMC focuses on 65nm design flow development, including:
UMC DELIVERS LEADING-EDGE 65NM FPGAS TO XILINX

UMC has delivered the world’s largest 65nm FPGAs to Xilinx. These new devices deliver a 65 percent logic capacity increase over previous generation FPGAs to enable the industry’s highest gate count, with approximately 1.1 billion transistors. The chips, which feature triple gate oxide technology and 11 copper metal layers, have demonstrated excellent initial yields.

UMC’s 65nm technology has seen widespread acceptance from leading-edge manufacturers of cell phones, FPGA, graphics and broadband applications. Particularly noteworthy is the number of new customers engaged at this technology node, which demonstrates the confidence that customers have in the competitiveness of UMC’s 65nm process.

Wim Roelandts, chairman, president and CEO of Xilinx, said, “Xilinx is currently ramping 65nm wafer starts at UMC. We are quite pleased with our progress—in fact, UMC’s yields have exceeded our expectations for our most advanced products. We’ll continue to leverage UMC’s advanced 65nm technology for our upcoming product lines to strengthen our leading position in the FPGA industry.”

UMC is the foundry leader in 65nm process technology, which delivered the foundry industry’s first 65nm customer products in June of 2005. UMC is currently in volume production for multiple customers using the leading-edge process, and has engaged with nine customers so far, for a variety of market applications. Though performance gains vary across applications, compared with the 90nm generation, 65nm products exhibit an average of 30 percent higher performance, and a 35 percent reduction in dynamic power consumption.

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EXTREME DA

- Design of test structures for collecting specific process variation data
- Extraction of pure random, spatially-correlated random, die-to-die random, and systematic variations in the front- and back-end processes
- Silicon verification of XT’s statistical timing and extraction results.

Using Extreme XT’s statistical extraction and timing tools will allow mutual customers to utilize this unique variation-aware sign-off capability on UMC’s proven 65nm process, enabling improved parametric yield, reduced pessimism, and robust design capabilities.

Extreme DA's IC design and sign-off tools provide a valuable resource to help UMC customers better achieve parametric yield prediction and optimization for a robust design closure. UMC’s collaboration with Extreme DA has so far produced very encouraging results.
UMC and National Taiwan University’s (NTU) research collaboration has resulted in the delivery of a high performance, fully integrated RF receiver design for WiMax. The low noise amplifier in the 0.18um RF receiver has demonstrated the world's lowest noise figure (1.78dB) in a 5 GHz range. The receiver radio frequency front end with ultra low operating voltage (1 volt) also achieved a low noise level of 5~6 dB. In addition, by adopting a new type of system architecture, the design effectively suppresses the DC offset resulting from direct conversion receivers well below noise levels. This design will be packaged as an IP for commercial applications.

UMC has a successful history in partnering with educational institutions to support and conduct mutual research and development. UMC and NTU have filed several patent applications for this new system, which are expected to be granted next year. The successful result of this collaboration is part of a two-year joint research program between UMC and NTU that began in 2005.

**About WiMAX Technology**

WiMAX is a standards-based technology enabling the delivery of last mile wireless broadband access as an alternative to cable and DSL. WiMAX will provide fixed, nomadic, portable and, eventually, mobile wireless broadband connectivity without the need for direct line-of-sight with a base station. In a typical cell radius deployment of three to ten kilometers, WiMAX Forum Certified™ systems can be expected to deliver capacity of up to 40 Mbps per channel, for fixed and portable access applications. This is enough bandwidth to simultaneously support hundreds of businesses with T-1 speed connectivity and thousands of residences with DSL speed connectivity.

Mobile network deployments are expected to provide up to 15 Mbps of capacity within a typical cell radius deployment of up to three kilometers. It is expected that WiMAX technology will be incorporated in notebook computers and PDAs by 2007, allowing for urban areas and cities to become "metro zones" for portable outdoor broadband wireless access.
UMC and IME to Partner on Advanced Noise Modeling for 90nm Technologies

UMC and Singapore's Institute of Microelectronics (IME) have sealed a partnership to jointly develop Radio Frequency (RF) modeling solutions for 90nm technologies. The cooperation will result in the development of new methodologies that are applicable for advanced technologies at 90nm and below.

The newly formed joint development program encompasses two areas of research: high frequency noise characterization and modeling for RF applications at nanometer process technologies, as well as circuit modeling verification and validation flow development based on IME's RF circuits and tests. Progress in these areas will help facilitate the development of a Mixed Mode (MM)/RF circuit and a modeling validation methodology for advanced system-on-chip (SoC) applications. These resources will help accelerate design-in and reduce risk for customers developing SoCs that incorporate RF applications for wireless segments such as 3G, WLAN and Bluetooth.

The partnership will allow the organizations to leverage one another's engineering resources to create high quality, accurate modeling solutions for issues such as thermal noise, and to help ensure accurate design-in for those customers wishing to develop advanced RF SoCs using UMC's most sophisticated technologies.

The joint efforts will take place at UMC’s 300mm Fab 12i in Singapore.
Cadence and UMC Deliver Silicon Validated Wireless Reference Design

UMC and Cadence Design Systems, Inc. have successfully achieved RF integrated-circuit design and verification on a co-developed wireless SoC reference flow. The flow, featuring the Cadence® QRC Extraction and the Virtuoso® UltraSim Full-chip Simulator, combines the Cadence Virtuoso custom design platform and UMC’s RFCMOS process to deliver silicon-accurate chip simulation and verification flows.

Designers building SoCs for wireless applications can gain a competitive advantage when they use Virtuoso combined with UMC’s RFCMOS process. For back annotation verification, Cadence QRC Extraction provides a convenient and accurate methodology to predict the performance in critical building blocks such as LC-tank VCO. Further, the extraction that covers RLCK can be used to predict with greater accuracy the frequencies and how the design will perform in silicon. The result is a seamless design environment for the analog/RF design communities.