

IBM Alliance Announces Availability of Advanced 28-Nanometer, Low-Power Semiconductor Technology

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IBM, Chartered Semiconductor Manufacturing, GLOBALFOUNDRIES, Infineon Technologies, Samsung Electronics, and STMicroelectronics have defined and are jointly developing a 28-nanometer, high-k metal gate (HKMG), low-power bulk complementary metal oxide semiconductor (CMOS) process technology.

The low-power, 28nm technology platform can provide power-performance and time-to-market advantages for producers of a broad range of power-sensitive mobile and consumer electronics applications, including the fast-growing mobile Internet device market segment. The favorable leakage characteristics of the HKMG technology result in optimized battery life for the next generation of mobile products.

This announcement represents an extension of existing joint development agreements, and further progression in the technology offerings of the alliance partners, building on the success of earlier joint development work in 32nm HKMG technology.

A 28nm low-power technology evaluation kit was previously made available in December 2008 to early access clients, followed by release in March 2009 of an evaluation kit for open access to the general marketplace. Early risk production is anticipated in the second half of 2010.

Already working with clients on 32nm low-power technology, the alliance has gained valuable experience in the implementation of HKMG technology, and is offering a migration path from 32nm to 28nm technology. Clients can begin their designs today in leadership 32nm HKMG technology and then transition to 28nm technology for density and power advantages, without the need for a major redesign. By assuring a path from 32nm to 28nm technology, this migration methodology offers clients lower risk, reduced cost and faster time-to-market.

"Through this collaboration, IBM and its alliance partners are helping to accelerate development of next-generation technology to achieve high-performance, energy-efficient chips at the 28nm process level, maintaining our focus on technology leadership for our clients and partners." said Gary Patton, vice president for IBM's Semiconductor Research and Development Center on behalf of the technology alliance.

Preliminary results working with early access clients and partners indicate that the 28nm technology platform can provide a 40 percent performance improvement and a more than 20 percent reduction in power - all in a chip that is half the size - compared with 45nm technology. The high-k metal gate implementation allows one of the industry's smallest SRAM cells at 0.120 square microns, with low minimum voltage operation and competitive performance, leakage and stability.

These improvements enable microchip designs with outstanding performance, smaller feature sizes and low standby power, contributing to faster processing speed and longer battery life in next-generation mobile Internet devices and other systems.

"This statement of commitment to 28nm low-power technology by the IBM Joint Development Alliance is an important progression from 32nm

high-k metal gate technology," said Jorgen Lantto, chief technology officer of ST-Ericsson. "Leaders in the mobile industry can utilize 28nm low-power technology to meet the increasingly aggressive demands for performance and improved battery life."

"28nm low-power technology will provide a significant step function in terms of performance, consumption and density versus the 40nm node, enabling competitive solutions for consumer and automotive segments served by STMicroelectronics," said Jean-Marc Chery, executive vice president, chief technology officer of STMicroelectronics.

In September 2008, ARM and the Common Platform alliance ([IBM](#), Chartered and Samsung) announced a collaboration agreement to develop a comprehensive 32nm and 28nm Systems-on-a-Chip design platform. The first milestone from this collaboration was the announcement of the ARM Cortex processor in Common Platform 32nm HKMG technology at the Mobile World Congress in February.

"Through industry collaboration and integration of our processor and physical IP with advanced manufacturing technologies, ARM and the Common Platform alliance continue to drive the adoption of next-generation consumer electronics," said Simon Segars, executive vice president and general manager, physical IP division, ARM. "We believe this announcement is a significant advancement of the HKMG technology to enable our customers' aggressive product designs while accelerating their time to market."

Unlike poly/SiON, the HKMG low-power technology breaks down the historical barrier of scaling, allowing significant power and performance advantage without the need for complex processes, thereby lowering clients' total development cost.

Today's announcement marks the latest development achievement from

this alliance of semiconductor manufacturing, development and technology companies who collaborate to address the product design and advanced process development challenges central to producing a smaller, faster, more cost efficient generation of semiconductors.

Source: IBM

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