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SINGAPORE -- Chartered Semiconductor Manufacturing, the world's third largest foundry, is joining an industrial affiliation program organized by the Interuniversities Microelectronics Center (IMEC) in Leuven, Belgium, to gain access to the 0.18-micron silicon germanium (SiGe) BiCMOS technology developed within the program. Chartered intends to offer to make chips including SiGe transistors before the end of 2003.

So far most of the participants within the program have been integrated device manufacturers (IDMs), IMEC, a leading independent developer of process technology modules, said.

The addition of SiGe BiCMOS is expected to complement Chartered's mixed-signal and RF CMOS technology and give companies more choices for the RF components of system-on-chip (SOC) applications. The demand for SiGe chips is expected to increase to about a $2.7 billion market by 2006 According to a study by Semico Research.

"Chartered's approach uses an existing CMOS baseline process as the starting point and will integrate the SiGe bipolar module to deliver value-added high performance, and in the process reuse their fully-qualified RF passive components," said Joanne Itow, senior analyst at Semico Research
"Also the timing is right, because Chartered’s SiGe module is targeted to be in place as demand hits," she said.

"We conducted an extensive evaluation of SiGe technologies, and concluded that IMEC's best meets our requirements. It is also a strong complement to our existing RF CMOS capabilities for SOC applications," said Shi-Chung Sun, senior vice president of technology development at Chartered.

Chartered is joining an IMEC industrial affiliation program on 0.18-micron BiCMOS process integration that targets the development of BiCMOS technology optimized for RF applications in the 2 to 5GHz frequency range. Under the terms of the agreement IMEC will license its 0.18-micron silicon germanium-based bipolar module to Chartered, along with the test chip structures and bipolar model.

"This agreement expands the reach of our industrial affiliation program into the foundry market," said Gilbert Declerck, president and chief executive officer of IMEC, in a statement. "We have worked primarily with integrated device manufacturers on the SiGe project. By teaming with
Chartered, we combine IMEC's expertise in silicon germanium-based BiCMOS technology, with Chartered's proven mixed-signal and RF CMOS manufacturing processes. This means our latest SiGe developments can be offered to more companies, including the rapidly growing fab-lite and fabless segments."

Chartered's SiGe BiCMOS roadmap starts at the 0.18-micron node and utilizes Chartered's 0.18-micron baseline CMOS and RFCMOS processes, which are already in production.

Although the maximum frequency of the IMEC SiGe BiCMOS can exceed 100-GHz it is the low power features at transition frequencies of about 14-GHz that interests Chartered. A suite of passive components including spiral inductor, varactor, metal-insulator-metal (MIM) capacitor and polysilicon resistors is also fully integrated into the process. The optimized bipolar 0.18-micron SiGe BiCMOS process allows designers to integrate RF front-end and baseband chips for wireless communications or to provide high-speed data rates for wireline applications.

A preliminary process design kit is targeted for release in the third quarter of 2003. The 0.18-micron silicon germanium-based BiCMOS module is expected to be available for pilot production by the end of 2003.