Applied Materials Unveils New Epitaxy Technology for High-Performance Transistors

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- *New NMOS epitaxy deposition process is essential for faster transistors inside next-generation mobile processor chips*
- *NMOS epitaxy boosts transistor speed by the equivalent of half a device node without increasing off-state power consumption*

SANTA CLARA, Calif., July 8, 2012 - Applied Materials, Inc. is extending its decade-long leadership in epitaxial (epi) technology with a newly developed NMOS transistor application for its Applied Centura® RP Epi system. This capability supports the industry's move to extend epi deposition from PMOS transistors to NMOS transistors at the 20nm node, enabling chipmakers to build faster devices and deliver next-generation mobile computing power.

"Epi is an essential building block for high-performance transistors, delivering a gain in speed equivalent to that obtained by scaling half a device node," said Steve Ghanayem, vice president, Transistor and Metallization Products in Applied Materials' Silicon Systems Group. "By implementing an NMOS epi process in addition to established PMOS epi, we're enabling foundry customers to further enhance their transistor performance for next-generation devices."

Since the 90nm device node, strained selective epi films with in-situ doping have improved mobility and reduced electrical resistance in PMOS transistors, thereby increasing their speed. Applying selective epi in NMOS transistors delivers a similar boost, which enhances overall chip performance. By delivering this enabling technology for both types of transistors, Applied Materials is supporting industry efforts to meet the ever increasing demand for faster and greater computational power for multi-functional mobile products. This increase in performance helps our customers to deliver advanced capabilities, such as improved multi-tasking and higher-quality graphics and image processing.

The Centura RP Epi system is the production-proven leader in PMOS epi applications. With today's announcement, the system's portfolio now includes selective deposition of films in targeted regions of NMOS transistors. Applied Materials' market-leading, proprietary epi technologies enable deposition of high quality strained films with precise placement of dopant atoms. Tight manufacturing process controls result in excellent film properties, uniformity, and exceptionally low defect levels. These qualities resolve multiple performance issues, including resistivity of critical electrical layers.

Central to the market leadership of the Applied CenturaRP Epi system is its integrated low-temperature pre-clean Siconi® technology. Integrating the pre-clean and epi processes on the same vacuum platform, eliminates queue time and reduces interfacial contamination by more than an order of magnitude over stand-alone systems, creating pristine silicon surfaces for defect-free epi crystal growth.

Applied Materials, Inc. (Nasdaq:AMAT) is the global leader in providing innovative equipment, services and software to enable the manufacture of advanced semiconductor, flat panel display and solar photovoltaic products. Our technologies help make innovations like smartphones, flat screen TVs and solar panels more affordable and accessible to consumers and businesses around the world. Learn more at www.appliedmaterials.com.

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PHOTO: The Applied Materials Centura® RP Epi system

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