



Applied Materials Announces Unique Capacitor Dielectric Solution for Advanced DRAM Manufacturing

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SANTA CLARA, Calif.--(BUSINESS WIRE)--July 5, 2000--

High Productivity Giga-Cap(TM) TanOx(TM) Centura(R)System

Combines Ta2O5 CVD with RTP To Enable Gigabit DRAM Chips

Applied Materials, Inc. introduces the Giga-Cap(TM) TanOx(TM) Centura(R), a high-productivity system for the deposition of high k tantalum pentoxide (Ta2O5) dielectric films in advanced DRAMs.

The system integrates the company's proven CVD (chemical vapor deposition) and RTP (rapid thermal processing) technologies to provide customers with a production-worthy process to enable denser, more powerful memory chips.

"Our new Giga-Cap TanOx Centura addresses many of the process integration and fab efficiency challenges involved in the formation of high k dielectric capacitors for 0.15 micron and below DRAM devices," said Dr. Dan Carl, vice president and general manager of the STI, Capacitor and PMD Division at Applied Materials. "While conventional Ta2O5 processing typically consists of a deposition system with a separate furnace for annealing, the Giga-Cap TanOx Centura's integrated deposition and anneal process combines these functions on a single system. It offers a 2x increase in productivity over conventional approaches, with a much smaller footprint and excellent device reliability down to at least 0.13 micron."

The SIA (Semiconductor Industry Association) Roadmap defines the need for high k dielectric materials such as Ta2O5 to replace currently-used silicon oxides and nitrides in order to continue reducing memory cell size and achieve higher chip densities required for new high performance devices. Ta2O5 allows chipmakers to reduce capacitor dimensions by enabling the storage of the required charge in a smaller structure.

The Giga-Cap TanOx Centura system's Ta2O5 deposition/anneal process enables precise control of capacitance and leakage current, meeting the electrical and thermal budget requirements for DRAM (and embedded DRAM) devices with 0.15um geometries and below. Thin TanOx films (80 angstroms) deposited at low temperature (

After the TanOx deposition, the system's integrated RTP anneal chamber performs a remote plasma oxidation and crystallization anneal which enhances dielectric film k value and reduces electrical current leakage. To further enhance electrical characteristics of the capacitor, a multiple deposition and anneal sequence can be performed without breaking vacuum. This efficient approach enables extension of TanOx to at least 0.13um device applications with high productivity.

The Giga-Cap TanOx Centura System is the latest integrated process solution from Applied Materials. The company has also developed integrated processes for fabricating shallow trench isolation (STI) structures, ultra-shallow junctions (USJ) and copper interconnects. These solutions offer customers the distinct advantage of processes that have been designed, tested and proven to work together in an optimized production flow.

Applied Materials, Inc. is a Fortune 500 global growth company and the world's largest supplier of wafer fabrication systems and services to the global semiconductor industry. Applied Materials is traded on the Nasdaq National Market System under the symbol "AMAT." Applied Materials' web site is <http://www.appliedmaterials.com>.

Note: A Photo is available at URL:

<http://www.businesswire.com/cgi-bin/photo.cgi?pw.070500/bb8>

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