Synopsys and Applied Materials Collaborate on TCAD Models for Next-Generation Logic and Memory Technologies

Enhanced TCAD Sentaurus Models to Speed Process Development for 14-nm Node and Beyond

MOUNTAIN VIEW, Calif. and SANTA CLARA, Calif., March 15, 2012 /PRNewswire/ -- Synopsys, Inc. (NASDAQ: SNPS) and Applied Materials, Inc. (NASDAQ: AMAT) today announced a collaboration to develop technology computer-aided design (TCAD) models for next-generation semiconductor devices. The models derived from this TCAD collaboration will enable customers to speed up process development for 14-nanometer (nm) and 11-nm logic and new memory chip technologies, allowing them to lower cost and reduce time-to-market.

The continued scaling of logic transistors and memory cells to smaller and smaller dimensions requires new materials and architectures, which increase chip complexity and extend process development time for semiconductor manufacturers. The Synopsys TCAD tools have proven very effective in helping to reduce the number of engineering wafers needed to develop new technologies, acting both as a prototyping tool to explore new device architectures before a process is defined and as an engineering tool for process integration and optimization. In this collaboration, Applied Materials will supply critical film properties and device characterization data from its advanced process systems to Synopsys, thereby enabling the development of models using Synopsys' Sentaurus TCAD tool suite.

"We have a long and successful history of working with Synopsys on TCAD process modeling that has resulted in faster qualification of our manufacturing systems by customers for new applications," said Dr. Klaus Schuegraf, vice president and CTO of the Silicon Systems Group at Applied Materials. "As new materials and designs make their way into leading-edge technology nodes, this new collaboration will enable our customers to take advantage of TCAD modeling to more rapidly develop and characterize new processes on our systems, saving them costly development time."

The collaboration encompasses front-end-of-line (FEOL) processing, including process, topography and device simulation, and back-end-of-line (BEOL) reliability, including interconnect simulation. Previously, the two companies worked together on Silicon Germanium (SiGe) source/drain stressors where Synopsys TCAD models were calibrated with epitaxial films grown in an Applied Materials system. The companies have also collaborated on calibrating multiple ion implant schemes and through-silicon via (TSV) development.

"TCAD modeling has been essential for the development of 3D FinFET and memory technologies," said Howard Ko, senior vice president and general manager of the Silicon Engineering Group at Synopsys. "The combination of Applied Materials' equipment and Synopsys' TCAD software will enable process engineers to continue scaling logic and memory devices. This collaboration combines the strengths of both companies and will provide leading-edge semiconductor companies tools to tackle the challenges and reduce the cost of technology development."

About Applied Materials, Inc.

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. At Applied Materials, we turn today's innovations into the industries of tomorrow. Learn more at www.appliedmaterials.com.

About Synopsys®

Synopsys, Inc. (Nasdaq:SNPS) is a world leader in electronic design automation (EDA), supplying the global electronics market with the software, intellectual property (IP) and services used in semiconductor design, verification and manufacturing. Synopsys' comprehensive, integrated portfolio of implementation, verification, IP, manufacturing and field-programmable gate array (FPGA) solutions helps address the key challenges designers and manufacturers face today, such as power and yield management, system-to-silicon verification and time-to-results. These technology-leading solutions help give Synopsys customers a competitive edge in bringing the best products to market quickly while reducing costs and schedule risk. Synopsys is headquartered in Mountain View, California, and has approximately 70 offices located throughout North America, Europe, Japan, Asia and India. Visit Synopsys online at https://www.synopsys.com/.

Forward Looking Statements

This press release contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934, including statements regarding the expected outcome of the TCAD collaboration between Synopsys and Applied Materials. These statements are based on current expectations and beliefs.

Actual results could differ materially from those described by these statements due to risks and uncertainties including, but not limited to, unforeseen production or delivery delays, failure to perform as expected, product errors or defects and other risks detailed in Synopsys' filings with the U.S. Securities and Exchange Commission, including those described in the "Risk Factors" section of Synopsys' Annual Report on Form 10-K for the fiscal year ended October 31, 2011.

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