Toshiba Adopts Synopsys Sentaurus TCAD Simulation for Development of Next-Generation Device Technologies

Physical Etching and Deposition Models Enable Efficient Optimization of Device Structures, Reducing R&D Time and Trial Production Costs

MOUNTAIN VIEW, Calif., April 23 /PRNewswire-FirstCall/ -- Synopsys, Inc. (NASDAQ: SNPS), a world leader in software and IP for semiconductor design and manufacturing, today announced that Toshiba Semiconductor Company has adopted Synopsys' Sentaurus™ TCAD software for simulating etching and deposition in the development of next-generation devices. As a result, Toshiba is able to reduce research and development time and trial production costs, while optimizing next-generation device structures and yield, by quantitatively estimating process margin before and during volume production.

With shrinking device feature sizes, physically based simulation of deposition, etching and other topographical processes becomes increasingly important. This is because even minor changes to device shapes can have a major impact on process margin and electrical performance for many kinds of devices. Moreover, deposition and etching processes can also impact macroscopic features due to micro-loading effects. Sentaurus TCAD software, specifically Sentaurus Process and Device, use detailed physical models for simulating the fabrication process and electrical behavior of a wide range of semiconductor devices, and are broadly used in the research, development and optimization of semiconductor technologies. Sentaurus Topography extends these capabilities to physical etching and deposition.

"We have recognized for many years the importance of physical etching and deposition simulation in developing our process technologies. With TCAD being an essential part of our technology development, we have been able to reduce trial production cost and improve device yield," said Shigeru Komatsu, Toshiba Semiconductor Company's chief knowledge officer. "We are happy with Sentaurus Topography's performance, accuracy, and integration with other Sentaurus TCAD tools, and that's why we will be using it for our daily work in optimizing and characterizing next-generation devices."

The Sentaurus TCAD platform provides a comprehensive capability to simulate detailed and realistic process structures for subsequent electrical analysis by Sentaurus Device. In addition to the core etching and deposition models, Synopsys and Toshiba have also been collaborating to incorporate Toshiba's surface reaction kinetics modeling technology into Sentaurus Topography, allowing specific gas chemistries to be included as part of the simulation of topography modifying processes. This advanced module is expected to be commercially available in the second half of 2008 as part of the Sentaurus Topography offering.

"Physical etching and deposition simulation is a key component in our roadmap for addressing advanced process technologies and device structure designs," said Terry Ma, group director, TCAD R&D at Synopsys. "The advanced surface kinetics modeling technology we obtained from Toshiba represents a great collaboration, bringing key technological advances in physical modeling to the TCAD community."

About Synopsys TCAD

Technology CAD (TCAD) refers to the use of computer simulation to model semiconductor processing and device operation. TCAD provides insight into the fundamental physical phenomena that ultimately impact performance and yield. Synopsys' DFM solution incorporates TCAD to provide a bi-directional link between manufacturing and design.

About Synopsys

Synopsys, Inc. (NASDAQ: SNPS) is a world leader in electronic design automation (EDA) software for semiconductor design and manufacturing. The company delivers technology-leading system and semiconductor design and verification platforms, IC manufacturing and yield optimization solutions, semiconductor intellectual property and design services to the global electronics market. These solutions enable the development and production of complex integrated circuits and electronic systems. Through its comprehensive solutions, Synopsys addresses the key challenges designers and manufacturers face today, including power management, accelerated time to yield and system- to-silicon verification. Synopsys is headquartered in Mountain View, California, and has more than 60 offices located throughout North America, Europe, Japan and Asia. Visit Synopsys online at https://www.synopsys.com/.

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Editorial Contacts:
Sheryl Gulizia
Synopsys, Inc.

650-584-8635
sgulizia@synopsys.com
Lisa Gillette-Martin
MCA, Inc.
650-968-8900 x115
lgmartin@mcapr.com

SOURCE: Synopsys, Inc.

CONTACT: Sheryl Gulizia of Synopsys, Inc., +1-650-584-8635,
sgulizia@synopsys.com; or Lisa Gillette-Martin of MCA, Inc., +1-650-968-8900,
ext. 115, lgmartin@mcapr.com

Web site: https://www.synopsys.com/
