Synopsys' Sentaurus Calibration Library Incorporates Varian Semiconductor Ion Implantation Process Data for Highly Predictable TCAD Simulation

Increased Predictability of Manufacturing Process through TCAD Lowers Product Development Cost and Time

Synopsys, Inc. (NASDAQ: SNPS), a world leader in semiconductor design software, today announced the addition of the Varian Semiconductor Equipment Associates, Inc.'s ion implantation process data to its Sentaurus Calibration Library. By incorporating the Varian Semiconductor data, Synopsys has increased the predictability and accuracy of TCAD process simulation for advanced ultra- shallow junction (USJ) CMOS technology, allowing semiconductor manufacturers to reduce the overall cost and time for product development. Synopsys is the first full service EDA company to include manufacturing data directly from Varian Semiconductor, the leading supplier of single wafer ion implantation systems used in semiconductor manufacturing.

"We use TCAD to accurately predict the response of semiconductor processes and devices to variations of implant process parameters of dose, energy and angle," said Yuri Erokhin, senior director of the Global Applications Engineering Group at Varian Semiconductor. "The calibration to Varian Semiconductor equipment of implant data in the Sentaurus Calibration Library improves the accuracy of TCAD for Varian Semiconductor's customers and enables a reduction in the number of silicon runs required to achieve the established device performance targets."

Synopsys has integrated Varian Semiconductor's ion implantation process data called Secondary Ion Mass Spectrometry (SIMS) data into the Sentaurus Calibration Library. SIMS data is widely used by process development and TCAD engineers to obtain accurate measurements of dopant depth profiles; it can be directly compared to the results of 1D process simulations and has proven to be the most fundamental resource for the calibration of front-end process simulators. Comprehensive sets of SIMS profiles are essential for developing and calibrating accurate dopant implantation and diffusion models and also increasing TCAD accuracy. With the Sentaurus Calibration Library, users have, at their fingertips, a set of manufacturing data -- that would otherwise require extensive processing of test wafers and SIMS characterization -- for TCAD simulation, thus saving money, time and resources.

"Achieving accurate process prediction is key to making TCAD useful. Synopsys is a leader in offering predictable TCAD solutions backed by process data from leading-edge equipment vendors such as Varian Semiconductor," said Lars Bomholt, director of TCAD for manufacturing at Synopsys. "Fundamental calibration work based on process data provided by Varian Semiconductor facilitates the use of TCAD for its customers. Working with leading semiconductor equipment manufacturers on advanced technologies like this, users can better optimize semiconductor process technology and improve yield."

TCAD simulations are used by all major semiconductor companies to develop and optimize semiconductor technologies. TCAD is also used to identify potential yield problems that need to be addressed in the process design prior to volume production. Through proper calibration with prototype wafers and measurement data, TCAD can accurately predict the behavior of silicon in the manufacturing line for new technology nodes. This information, coupled with design tools, enables Synopsys to reach beyond the traditional boundaries of EDA by identifying and addressing manufacturing problems early in the design process. Ultimately, higher yield can be achieved with Synopsys' bi-directional link that provides a bridge between design and manufacturing, all the way from place and route to physical verification (RET -- resolution enhancement technology), mask optimization and TCAD.

Availability

Synopsys' Sentaurus Calibration Library, including Varian Semiconductor process measurements, is available now.

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. is a world leader in EDA software for semiconductor design. The company delivers technology-leading semiconductor design and verification platforms and IC manufacturing software products to the global electronics market, enabling the development and production of complex systems-on-chips (SoCs). Synopsys also provides intellectual property and design services to simplify the design process and accelerate time-to-market for its customers. Synopsys is headquartered

in Mountain View, California and has offices in more than 60 locations throughout North America, Europe, Japan and Asia. Visit Synopsys online at https://www.synopsys.com/ .

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