

Synopsys and IIT Bombay Collaborate on Reliability Modeling of Advanced Transistors

Collaboration enables stochastic modeling of device degradation and reliability through industry leading Sentaurus Device TCAD simulator

MOUNTAIN VIEW, Calif. and MUMBAI, India, June 30, 2014 /PRNewswire/ -- Synopsys, Inc. (Nasdaq: SNPS), a global leader providing software, IP and services used to accelerate innovation in chips and electronic systems, and the Indian Institute of Technology, Bombay, today announced a collaboration to advance the modeling of negative bias temperature instability (NBTI), a key reliability concern for advanced CMOS devices. NBTI has become more critical with the introduction of high-k metal gate (HKMG) processes and is a dominant reliability concern for FinFET devices, contributing to the degradation of threshold voltage, current, transconductance and other electrical parameters. This collaboration will enable leading semiconductor manufacturers to gain insight into NBTI degradation and develop methods to mitigate its effects on FinFETs at the 14-nanometer (nm) node and beyond.

"Our research over the years has helped identify the underlying physical mechanisms contributing to NBTI. We have developed both continuum and stochastic frameworks for predictive DC and AC NBTI modeling in planar transistors. Our collaboration with Synopsys and the implementation of these models in Synopsys' Sentaurus™ Device simulator will enable modeling of NBTI in FinFETs for the 14-nanometer node and beyond," said Professor Souvik Mahapatra of IIT Bombay.

Through this collaboration, IIT Bombay will conduct experiments and measurements to characterize NBTI in FinFET devices. The resulting data will be used to enhance and calibrate physical NBTI models in Sentaurus Device, Synopsys' industry standard TCAD device simulator.

"As 14-nanometer FinFET technology evolves from the development to production phase, many of our customers are concerned about device degradation and reliability caused by NBTI. The combination of IIT Bombay's proven expertise in NBTI characterization and Synopsys' expertise in device modeling will allow us to build a stochastic model to address customer needs for simulating and analyzing NBTI effects on FinFET devices," said Howard Ko, senior vice president and general manager of the Silicon Engineering Group at Synopsys.

About IIT Bombay

Indian Institute of Technology Bombay, the second IIT to be set up in 1958, is recognized worldwide as a leader in the field of engineering education and research. It is reputed for the quality of its faculty and the outstanding caliber of students graduating from its undergraduate and postgraduate programs. The institute has a total of 15 academic departments, ten centers, one school and four Interdisciplinary programs. Over the last five decades, more than 42,000 engineers and scientists have graduated from the institute. It is served by more than 600 faculty members considered not only amongst the best within the country, but are also highly recognized in the world for achievements in the field of education and research. Today the Institute is recognized as one of the centers of academic excellence in the country. Over the years, there has been dynamic progress at IIT Bombay in both academic and research activities, including a parallel improvement in facilities and infrastructure to keep it on par with the best institutions in the world. Visit: www.iitb.ac.in

About Synopsys

Synopsys, Inc. (Nasdaq:SNPS) accelerates innovation in the global electronics market. As a leader in electronic design automation (EDA) and semiconductor IP, Synopsys delivers software, IP and services to

help engineers address their design, verification, system and manufacturing challenges. Since 1986, engineers around the world have been using Synopsys technology to design and create billions of chips and systems. Learn more at www.synopsys.com.

Editorial Contacts:

Sheryl Gulizia
Synopsys, Inc.
650-584-8635
sgulizia@synopsys.com

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

Rashmi Uday Kumar
Public Relations Officer
Indian Institute of Technology Bombay
Powai, Mumbai 400076, India
Ph :+91-222-576-7026-27 ; pro@iitb.ac.in

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