Synopsys' Sentaurus TCAD Used to Simulate Solar Cell Performance Characteristics at NREL

Simulation Provides Key Insights in the Design and Optimization of Solar Cells

PRNewswire
MOUNTAIN VIEW, Calif.
(NASDAQ-NMS:SNPS)

MOUNTAIN VIEW, Calif., Oct. 6 /PRNewswire-FirstCall/ -- Synopsys, Inc. (NASDAQ: SNPS), a world leader in software and IP for semiconductor design, verification and manufacturing, today announced that the U.S. Department of Energy's National Renewable Energy Laboratory (NREL), a leading government laboratory pursuing research in photovoltaic devices, has adopted Synopsys' Sentaurus TCAD for simulating solar cell characteristics to improve performance.

Photovoltaic technologies play a significant role in the worldwide push for the development and deployment of renewable sources of energy to reduce carbon emissions. NREL is at the forefront of these developments through its research in wind and solar energy. Its many accomplishments include the development and demonstration of an inverted metamorphic triple-junction solar cell with world-record efficiency of 40.8 percent. NREL also has research programs in thin-film and third-generation solar cells. Sentaurus TCAD simulations provide NREL scientists with valuable insight into the physical mechanisms that drive solar cell performance, thereby supporting the development of more efficient solar cell designs. The simulations include the definition of the solar radiation incident on the cell, its reflection and transmission through anti-reflective coatings and surface texturing, and the absorption of the light and conversion to electrical current within semiconductor regions of the cell.

"Solar cells are very complex, with many material layers and design trade-offs affecting major performance metrics such as efficiency," said Dean Levi, a principal scientist at NREL. "We view simulation as an important tool to understand the internal physics of our designs and to point towards ways to improve them."

NREL has recently implemented Sentaurus TCAD to create polycrystalline thin-film CuInGaSe2, Cadmium telluride (CdTe), and silicon solar cell models. These models have illustrated how material properties, grain boundaries, non-uniformity and interdigitated designs affect both device performance and characterization.

"The photovoltaic industry is experiencing tremendous growth and continues to drive toward higher efficiency and innovative solar cell designs," said Howard Ko, general manager and senior vice president of the Silicon Engineering Group at Synopsys. "Our Sentaurus TCAD tools offer many capabilities to simulate solar cell operation and performance characteristics to guide design improvements. Having NREL as a user of our tools enables us to better understand the challenges and new directions of the fast-changing photovoltaic field."

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.

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, software-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 more than 65 offices located throughout North America, Europe, Japan, Asia and India. Visit Synopsys online at http://www.synopsys.com/.

Synopsys is a registered trademark of Synopsys, Inc. Any other trademarks or registered trademarks mentioned in this release are the intellectual property of their respective owners.

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.

SOURCE: Synopsys, Inc.

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