UMC Enhances 90-nm Manufacturability Using Synopsys' Phase Shift Technology

First Foundry to Offer Yield-Enhancing AA-PSM Technology in Volume Production Environment

Synopsys, Inc. (NASDAQ: SNPS), a world leader in semiconductor design software, and UMC (NYSE: UMC)(TSE: 2303) a world leading semiconductor foundry, today announced that UMC is using Synopsys' alternating aperture phase-shift mask (AA-PSM) technology to enhance manufacturability for its 90-nanometer (nm) process. Manufacturability improvements are obtained through increased lithography resolution, a larger process window, and better performance enabled by the AA-PSM technology. UMC can now deliver the benefits of AA-PSM to those customers developing high-performance and low-power integrated circuits on 90-nm technology.

"UMC constantly develops and employs new production techniques to maintain its position as a manufacturing efficiency leader," said Peter Huang, deputy director of the Central Research and Development Advanced Module division at UMC. "We are delighted to see the positive results of our AA-PSM efforts with Synopsys for our mainstream 90 nanometer process. This success not only enhances our current production, but also demonstrates the viability of this solution for future process generations below 90 nanometers. Technologies now under industry development, such as immersion lithography, have yet to be proven in a real-life manufacturing environment, while AA-PSM has already been validated in our fab with production silicon."

UMC and Synopsys engineers worked together to retarget an FPGA chip to the AA-PSM process using Synopsys' DFM flow. The flow consisted of Proteus optical proximity correction (OPC) software, Synopsys' AA-PSM technology, SiVL® lithography verification software, Hercules™ design rule check (DRC) and mask rule check (MRC) tools, and CATS® fracturing software. Synopsys' AA-PSM technology is the only commercially available strong phase-shifting technology currently used by several leading edge semiconductor companies in IC production.

"Synopsys is committed to delivering technology and software products that help semiconductor companies accelerate their production yield ramps on advanced process nodes," said Edmund Cheng, vice president of Marketing, Silicon Engineering group at Synopsys. "We are very pleased to collaborate with UMC in applying the unique capabilities of Synopsys' AA-PSM technology to improve lithography resolution. This successful outcome further validates Synopsys' leadership position in providing a comprehensive DFM solution for high-yield designs at 90-nm and below."

About Synopsys DFM

Synopsys offers the industry's most comprehensive RTL-to-Mask DFM solution. Its DFM product family addresses critical yield and manufacturability issues with its Proteus mask synthesis, Synopsys® PSM, CATS® mask data preparation, SiVL® lithography verification, i-Virtual Stepper™ mask defect dispositioning and Taurus™ TCAD software products. Synopsys leverages this expertise through its industry-leading Galaxy™ design platform implementation solution, including the Hercules™ physical verification suite, in order to help ensure that designs at 90nm and smaller geometries will meet key manufacturing requirements. Synopsys' DFM product family is the solution-of-choice for 130nm yield-sensitive, high-value chips, worldwide. Eighty percent of all sub-180nm microprocessors, 50 percent of all sub-180nm DRAMs, 80 percent of all sub-180nm FPGA and graphics chips, and 75 percent of all sub-180nm cellular baseband chips produced use Proteus, and more than 80 percent of all photomasks produced use CATS.

About UMC

UMC is a leading global semiconductor foundry that manufactures advanced process ICs for applications spanning every major sector of the semiconductor industry. UMC delivers cutting-edge foundry technologies that enable sophisticated system-on-chip (SoC) designs, including 90nm copper, 0.13um copper, and mixed signal/RFCMOS. UMC is also a leader in 300mm manufacturing; Fab 12A in Taiwan and Singapore-based UMCi are both in volume production for a variety of customer products. UMC employs over 10,500 people worldwide and has offices in Taiwan, Japan, Singapore, Europe, and the United States. UMC can be found on the web at http://www.umc.com/ .

About Synopsys

Synopsys, Inc. is a world leader in electronic design automation (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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SOURCE: Synopsys, Inc.

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