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

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Synopsys, Inc., a world leader in semiconductor design software, and UMC 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, HerculesTM

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."