Carl Zeiss and Synopsys Collaborate on In-Die Registration Metrology for Photomask Manufacturing

Delivering Sub-nanometer Accuracy Using 193-nm Optics and 2D Measurements

JENA, Germany and MOUNTAIN VIEW, Calif., Oct. 28 /PRNewswire/ -- Carl Zeiss SMS GmbH, a leading supplier for photomask metrology and repair tools and Synopsys, Inc. (Nasdaq: SNPS), a world leader in software and IP for semiconductor design, verification and manufacturing, today announced a collaboration to support the ZEISS tool family for in-die metrology solutions for the 32-nanometer (nm) technology node and below. Synopsys will offer support for ZEISS' PROVE™, the next-generation registration metrology tool, through Synopsys' CATS™, the technology-leading mask data preparation solution. Using CATS as the data preparation engine**,** mask engineers using PROVE can benefit from improved efficiency and usability of a registration metrology system that meets stringent overlay accuracy requirements.

Strong optical proximity correction and double patterning techniques, required to extend 193-nm lithography to the next technology nodes, demand greater photomask pattern placement accuracy. The new PROVE system meets these increased demands with its groundbreaking concept of 193-nm illumination optics. It delivers an in-die metrology capability for measurement of the smallest production features without placing registration marks, enabling mask makers to measure and analyze registration in critical areas on the mask.

The new CATS module, currently in limited customer availability and generally available in March 2011, enables a fast, efficient and fully automated flow for the setup of photomask metrology jobs. Using the industry standard open formats OASIS.MASK and XML, advanced marking capabilities and the PROVE two-dimensional (2D) correlation method, CATS offers a significant enhancement to conventional image analysis schemes. The innovative method compares 2D design clips of the mask provided by CATS with images on the mask captured by PROVE, resulting in higher measurement accuracy compared to standard methods using 1D measurements based on edges only.

"With Synopsys' long-term experience in mask data preparation and Carl Zeiss' know-how in in-die metrology, the new CATS module with its exciting capabilities will significantly help to reduce mask registration errors on arbitrary production features," said Dr. Dirk Beyer, product manager for PROVE at Carl Zeiss SMS GmbH.

Registration errors can now be quantified for each mask with no resolution limitations, giving mask manufacturers a completely new tool for reducing placement errors in double patterning and mask-to-mask overlay.

"Synopsys' collaboration with Carl Zeiss exemplifies our commitment to offering comprehensive lithography, inspection and metrology solutions to the mask manufacturing market," said Fabio Angelillis, vice president of engineering for Synopsys' Silicon Engineering Group. "By extending CATS to support PROVE, we are delivering higher quality metrology solutions to our customers at the 32-nanometer technology node and below," he added.

About Carl Zeiss SMS GmbH

The Semiconductor Metrology Systems (SMS) division is part of the Semiconductor Technology Group of Carl Zeiss. As a leading global supplier of both metrology and manufacturing equipment Carl Zeiss SMS focuses on a key component in semiconductor manufacturing, the photomask. Core expertise in light and electron optics, complemented by a revolutionary femto-second laser technology form the foundation of a product portfolio comprising in-die metrology, actinic qualification, repair, and tuning of photomasks. The division is headquartered in Jena and has two further sites in Rossdorf/Germany and Karmiel/Israel. Approximately 200 people work for SMS. Further information: https://www.zeiss.com/semiconductor-manufacturing-technology/products-solutions/photomask-systems.html.

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, system-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 approximately 70 offices located throughout North America, Europe, Japan, Asia and India. Visit Synopsys online at https://www.synopsys.com/.

Forward-looking Statements

This press release contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934, including statements regarding the expected benefits and date of general availability of the new CATS module. These statements are based on current expectations and beliefs. Actual results could differ materially from these statements as a result of unforeseen engineering difficulties, uncertainties attendant to any new product offering, and certain statements contained in the section of Synopsys' Annual Report on Form 10-K for the fiscal year ended October 31, 2009, and subsequent forms 10-Q, entitled "Risk Factors."

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