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# KLA-Tencor Launches First Computational Lithography Tool To Address Double-Patterning Challenges

SAN JOSE, Calif.--(BUSINESS WIRE)--

Today KLA-Tencor (NASDAQ:KLAC) introduced the latest version of its industry-leading computational lithography tool, PROLITH(TM) 11. The new tool enables users for the first time to evaluate current double-patterning schemes and cost-effectively explore alternate solutions to lithography challenges in design, materials and process development. This new computational lithography tool also supports single-pass patterning and immersion technologies.

"The emergence of double-patterning lithography has challenged circuit designers and chipmakers because of the dramatic increase in lithography complexity and experimental costs," noted Ed Charrier, vice president and general manager of KLA-Tencor's Process Control Information Division. "Computational lithography has become an essential tool for controlling these costs. Among computational lithography tools, PROLITH 11 has the unique ability to allow engineers to explore wide ranges of design, material or process conditions in order to solve a particular problem -- without having to spend the resources of a fab."

Double-patterning lithography (DPL) is a method for constructing the small features of advanced devices by dividing the pattern into two interleaved patterns. This means that a double mask set and new photoresist materials are required for DPL layers, amplifying process complexity and cost. With experts predicting the price of a mask set to exceed \$4M at the 32nm node, fabs are strongly motivated to thoroughly characterize how a two-pass, double-mask, dual-resist strategy will print on the wafer under the natural range of process conditions, so that the mask designs, materials and process parameters are right the first time.

PROLITH 11 allows engineers to model this complex system with unprecedented precision, and then use the model to optimize the system by exploring the effects of small or large changes in mask design, photoresist properties, and scanner or process parameters on the printed pattern. By using PROLITH 11, fabs avoid time-consuming, expensive experiments on product wafers which delay time to market and result in thousands of scrapped processed wafers.

As one tool in a complete suite of systems from KLA-Tencor designed to address advanced lithography challenges, PROLITH 11 has been shipped to leading chipmakers in the U.S., Japan and Taiwan. The PROLITH platform comprises the most widely used lithography simulation toolset on the market, installed in the development groups of virtually every chipmaker currently producing 65nm and 45nm devices.

#### Fundamental and Rigorous Calculations

- PROLITH 11 is the only lithography simulator to model the topography specific to double patterning and calculate how variability in printing the first layer could affect the second layer.
- PROLITH 11 results are based on fundamental optical and kinetic models.
- PROLITH can accommodate:
  - Complex film stacks
  - Embedded substrate topography
- PROLITH 11 resist models can be calibrated using data from IC manufactures, resist vendors, research groups and consortia.

#### Extrapolation of Results for Problem Solving

- The PROLITH 11 model can be used to explore:
  - New mask designs
  - New photoresists
  - Different scanner settings
  - Different process parameters

#### Complementary to Full-Chip Simulators

Complementary to full-chip simulators, which are designed to optimize an entire chip in less than 24 hours, PROLITH models a small area of the die in full detail in a few minutes. While the results of full-chip simulators apply to one set of design and process conditions, PROLITH results can be extrapolated significantly from the conditions under which the model was generated, so that various solutions can be explored. PROLITH results can be used to determine the optimum conditions under which full-chip simulators are run.

About KLA-Tencor: KLA-Tencor is the world's leading provider of process control and yield management solutions for the semiconductor and related microelectronics industries. Headquartered in San Jose, California, the Company has sales and service offices around the world. An S&P 500 company, KLA-Tencor is traded on the NASDAQ Global Select Market under the symbol KLAC. Additional information about the Company is available at <http://www.kla-tencor.com>. (KLAC-P)

Source: KLA-Tencor