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Takumi Technology Granted Patent on Effective Proximity Effect Correction Methodology

Technology Improves Quality of Optical Proximity Correction

Santa Clara, Calif.—May 13, 2009—Takumi Technology Corporation, a leading developer of high-performance layout optimization software for equipment and integrated circuit (IC) manufacturers, announced today it has been issued a patent by the United States Patent and Trademark Office for effective proximity effect correction methodology, and a corresponding patent by the State Intellectual Property Office of the People’s Republic of China. The US patent, #7,458,056, covers technology in improving the quality and accuracy of optical proximity correction (OPC).

“As OPC plays an increasingly important role in IC layout and fabrication, techniques to improve the results of that process will be crucial to optimal IC design,” said Akifumi Goto, CEO and President of Takumi Technology.

Improving Pattern Fidelity

Proximity effect correction has become a necessary step in the fabrication of ICs in order to improve pattern fidelity of the current lithography processes. The current methodologies are limited by dramatic increases in data volume and inaccuracies due to extrapolation of the correction.

One of the primary challenges IC designers face when using current model- and rule-based OPC methodologies is the considerable increase in the number of vertices after correction, leading to much larger data volume, typically an order of magnitude larger. Larger data volume increases processing time as well as the time it takes to write the mask. Moreover, the complexity of the correction can generate issues for vector-scan e-beam mask-writing tools when small slivers are created as the data is converted to the mask writer tool format. These small slivers lead to exposure dose inaccuracies when the mask is exposed, which in turn result in dimension inaccuracies. Correction inaccuracy between evaluation points presents another issue with model-based OPC. While the correction is accurate for the evaluation points, there is no guarantee that it will be adequate for a point in-between these evaluation points since the discontinuities in the correction are introduced by the dissection points. Furthermore, correction applied to a point in-between the evaluation points is based on extrapolation, which is inherently prone to errors.

This patent describes a methodology based on the interpolation of the correction between selected evaluation points of the target layout. By connecting these correction points, this technique also provides a mean of reducing data volume and simplifying the mask-writing, inspection and repair processes.

“This patent, in conjunction with other patents previously granted to Takumi Technology, gives a strong technology foundation for our business. Besides protecting our intellectual property in the US, Takumi also seeks intellectual property protection in foreign countries, especially when the semiconductor business is global in nature with suppliers and customers well represented in Asia Pacific and China,” said Akifumi Goto.

About Takumi Technology Corporation

Takumi Technology Corporation (Takumi) is the leader in providing design-for-manufacturing (DFM) system solutions based on its unique criticality aware concept. Takumi’s customers are major semiconductor manufacturers, capital equipment makers and photomask providers. Takumi’s software products include Takumi Enhance™—an automated recommended rule enforcement and CAA layout optimization tool; Takumi HSF™—a full-chip lithography-hotspot removing tool; and Takumi D3A™—an automated mask defect analysis and judgment tool. Takumi Technology B.V. (in The Netherlands) and Takumi Technology KK (in Japan) are wholly-owned subsidiaries of Takumi Technology Corporation.

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