

Achieving Sub-Half-Micron I-Line Manufacturability Through Automated OPC

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ABSTRACT

We present results of a verification study of totally automated optical proximity correction (OPC) for mask redesign to enhance process capability. OPC was performed on an aggressive 0.35 μ m i-line LSI simulation code FAIM, both from Vector Technologies, Inc.* Three different tests were performed, varying in the aggressiveness and type of corrections made. The key issues addressed in this work are the predictive capability of the aerial image simulation and, particularly, the ability of automatically generated OPC to significantly improve the fidelity of the final printed resist image for different geometries.

The results of our study clearly demonstrate the utility of automated OPC based on aerial image simulation. Key experimental results include: two-fold increase of depth of focus latitude; demonstration of the feasibility of full off-axis illumination on the stepper; successful resolution of different feature types (posts, lines and spaces) on the wafer to correct CD at a single common exposure and focus condition. Future research will address detailed issues in reticle manufacture and inspection which are critical for cost-effective large-scale OPC.

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