

Tachyon™ 2.5

THE INDUSTRY'S LEADING IMAGE-BASED HARDWARE
ACCELERATED COMPUTATIONAL LITHOGRAPHY
PLATFORM WITH UNCOMPROMISED PERFORMANCE

Based on the revolutionary Tachyon 2.0 architecture, Tachyon 2.5 continues to lead the industry with simulation accuracy, computational performance and cost of ownership to meet the low k_1 lithography challenges of the 32nm and 22nm technology nodes.

Pioneering Technology

Tachyon 2.5 builds upon the pioneering technology of Brion's Tachyon, the industry's first high-performance, image-based, dense-simulation computational lithography platform. Since first shipped in 2003, two generations of Tachyon systems have been widely adopted by the global semiconductor industry for full-chip, model-based optical proximity correction (OPC) and OPC verification. Optimized for fast and accurate lithography simulation, Tachyon represents a fundamental improvement over polygon-based sparse simulation approaches. Tachyon 2.5 inherits its predecessor Tachyon 2.0's hybrid computing architecture, which combines tier-1 Linux servers with a flexible coprocessing configuration. Tachyon 2.5 represents another milestone in computational lithography, combining innovations in hardware design, software design, and system integration. Tachyon 2.5 continues to deliver outstanding performance that surpasses anything that can be achieved using generic computing platforms for computational lithography applications. Now, with the flexible Tachyon 2.0 architecture, all existing Tachyon 2.0 systems are field upgradable to Tachyon 2.5.



Product Features

Platform Highlights

- Fully integrated
- Hardware accelerated
- Dense image-based computations
- Full-chip lithography applications

Supported Application Products

- Lithography modeling: Tachyon FEM, Tachyon M3D, Tachyon iCAL
- Optical Proximity Correction: Tachyon OPC+
- Lithography verification: Tachyon RDI/LMC
- Resolution Enhancement Techniques: Tachyon DDL, Tachyon DPT

Uncompromised Performance

- Up to 256 complex kernels for optical modeling
- Up to 8µm diameter optical interaction range for 45nm node, and 7µm for 32nm and 22nm nodes
- Fast 3D mask simulation

Fast, Predictable Turnaround Time

- Linearly scales with chip area
- Linearly scales with system configuration
- Insensitive to design hierarchy, pattern complexity and file size

Supports Lithography Process Variability-Aware Correction and Verification

- Wafer focus-exposure variations
- Mask CD variations
- Scanner optical characteristics
- Overlay misalignment

System Configuration

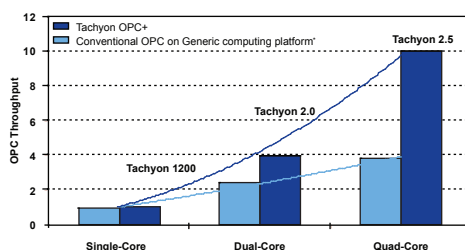
- Flexible coprocessors
- Powerful tier-1 Linux servers
- Fast quad-core dual processors
- Large RAID, extendable to 34TB
- Integrated diagnostics and monitoring
- Field upgradable from Tachyon 2.0

Tachyon™ 2.5

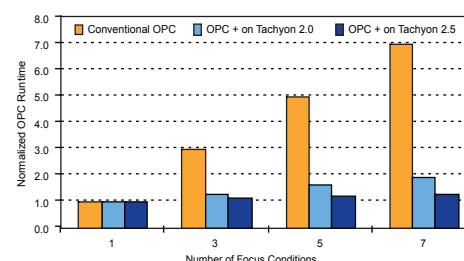
Uncompromised Performance

Tachyon 2.5 gives users the uncompromised performance of a fully integrated and optimized system solution for computational lithography. It offers up to a 2.5x performance improvement over the already powerful Tachyon 2.0 for resolution enhancement technology (RET), OPC and verification applications. It continues to support up to 256 complex optical simulation kernels, up to 8 micron diameter optical interaction range for the 45nm node, and up to 7 micron diameter for 32nm and 22nm nodes. With Tachyon 2.5's speed, a single system rack provides the equivalent production capacity of up to two and a half Tachyon 2.0 racks, and ten first-generation Tachyon racks. Tachyon 2.5 features new quad-core servers, fully re-engineered acceleration hardware and software, and numerous system level enhancements. With Tachyon 2.5, more computationally intensive operations are off-loaded to the acceleration hardware, making full process window optimization and verification even more accessible for production uses. Tachyon 2.5 also introduces built-in coprocessing monitoring and management to ensure optimum use of the servers and the acceleration hardware. Tachyon 2.5 provides a powerful, fast and efficient low k_1 computational lithography platform for advanced semiconductor design and manufacturing.

Tachyon 2.5 platform yields enhanced Quad-Core performance



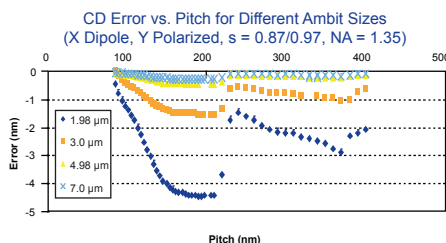
Tachyon 2.5 decreases process window OPC overhead



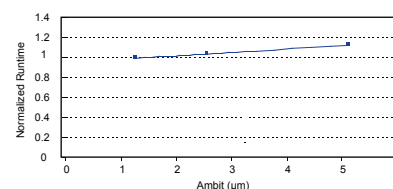
The Tachyon platform consistently delivers performance surpassing that of generic computing platform. Tachyon 2.5 upgrades enable additional speed improvements relative to Quad-Core upgrades only.

* Intel Performance Benchmark Testing, May 2007.

By porting additional computations to the FPGA, Tachyon 2.5 further improves the computational efficiency of process window based applications. Unlike conventional OPC, Tachyon 2.5 enables process window OPC with minimal overhead for each additional focus condition.



Runtime vs. Ambit



Rigorous simulations show the need for an ambit greater than 3 micron to achieve the necessary accuracy for sub-32nm process generations. Tachyon 2.5 provides optical ambits of up to 7 microns with 256 simulation kernels delivering best-in-class model accuracy without any productivity trade-off.