

Optimal Corporation™ Introduces Integrated Power Integrity Tool Suite for Package and PCB Co-Verification

PowerGrid™ analyzes IR drop and ground bounce at up to 100X faster than field solvers

San Jose, California – Jan. 17, 2005 – Optimal Corporation, a leading provider of high-performance EDA solutions serving the semiconductor industry, today announced PowerGrid, a power integrity toolset for IR drop and ground bounce analysis of power distribution networks for integrated IC package and PCB co-verification.

PowerGrid consists of a patent-pending model-based full-wave extractor that is 100x faster than comparable field solvers. PowerGrid is the only commercially available finite-element solver customized for DC analysis in package and PCB environments.

PowerGrid targets advanced IC package and PCB designs to: 1) analyze and model DC IR drop, and voltage and current density distributions; 2) simulate impedance and resonant frequencies of power distribution networks with or without decoupling capacitors; 3) model the contributions of power distribution networks to simultaneous switching noise (SSN); and 4) extract multi-terminal parasitic models of package and PCB interconnects.

Ching-Chao Huang, Senior Vice President of Optimal Corporation stated, “Today it is common for I/O switching speeds to get to one GHz and beyond, and it is equally common to switch 10, 20, even 30 amps on chip. These factors represent enormous design challenges at the interfaces between the IC and package; package and PCB; and PCB and system that are exacerbated by the move to higher speed, higher power, lower supply voltages, higher densities and finer geometries. These trends will require the adoption and use of the sophisticated design tools from Optimal.”

Designers need new power integrity technology

PowerGrid is ideal for rapid design iterations of power distribution networks and signal traces. As IC designs get more complicated, chip power and current are increasing rapidly. At 200 amps, even 0.1 milli-ohm of resistance will translate into 20 mV drops, enough to upset the voltage margins of a one-volt design. The IR drops and electromigration concerns are now moving from the IC to the package and PCB designs. At the same time, the ground bounce, an effect due to fast switching activities, is becoming the bottleneck of high-performance chip designs.

PowerGrid technology

PowerGrid is composed of AC and DC modules and works with most CAD interfaces, including Cadence Allegro, Synopsys Encore BGA, Mentor Graphics MCM Station, Zuken CR-5000 or any Gerber file.

PowerGrid's DC module uses a rigorous finite element method (FEM) in conjunction with triangular meshes to exactly model irregular-shaped geometries layer-by-layer. For very large designs of 30 layers and more, PowerGrid DC solves the combined resistive network using a built-in high-speed solver. The result is accuracy and high performance in: modeling IR drop; computing voltage; current density distributions; and generating equivalent SPICE netlists.

PowerGrid's AC module uses patent-pending model-based full-wave extraction techniques to compute S-parameters of both signal traces and power/ground planes. PowerGrid AC exactly models irregular-shaped geometries and arbitrary locations of ports and decoupling capacitors by triangular plane resonance models. PowerGrid AC delivers results up to 100X faster than 3D full-wave extraction tools, making PowerGrid ideal for rapid design iterations.

Pricing and availability

PowerGrid for complete package-to-PCB co-design is priced at \$70,000. PowerGrid is also available as a standalone tool for IC Package applications for \$50,000 and for PCB applications for \$50,000.

About Optimal Corporation

Optimal is a leading provider of high-performance EDA solutions. The company's breakthrough technology and engineering expertise have helped leading chip and system companies solve challenging high-speed design problems and bring industry-leading products to market. Additional information may be obtained online at www.optimalcorp.com or by e-mailing info@optimalcorp.com.

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