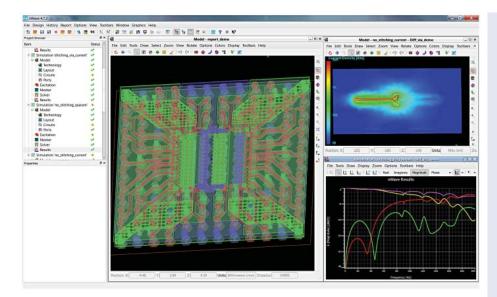
3D Full-Wave EM Simulation From Chip to System

D A T A S H E E T



Mentor Graphics HyperLynx Full-wave Solver is a powerful 3D, broadband, full-wave electromagnetic solver providing unprecedented speed and capacity, while preserving gold-standard Maxwell accuracy. Its multi-core architectures power the best-in-class solver for faster time to correct results, even on the most challenging problems.

Overview

Mentor Graphics HyperLynx Full-wave Solver is a powerful 3D, broadband, full-wave electromagnetic solver, based on proprietary accelerated boundary element technology enabling unprecedented speed and capacity, while preserving gold-standard Maxwell accuracy. The Solver is built from the ground up to exploit multi-core and hybrid architectures with its best-in-class fast solver technology enabling designers to achieve faster time to results to quickly solve their most challenging problems.

FEATURES AND BENEFITS:

- Extreme Accuracy
- 3D full-wave solver for all geometries with no return path assumptions
- Broadband solution in a single solver from DC to 40+ GHz
- Hybrid SI/PI solver accurately captures traces, vias and the power delivery network
- Extreme Performance
- High efficiency meshing reduces memory requirements
- Multi-machine parallelization for fast run times
- Near linear core scaling efficiently uses all CPU resources
- Extreme Usability
- Easy-to-use; any engineer can perform EM analysis
- Automation integrates EM analysis into design flow
- SI, PI, and EMI analysis available in a single environment

Mentor's integrated solution provides analysis capabilities that typically are found in multiple analysis products. In this unified environment, designers can benefit from signal integrity, power integrity, simultaneous switching, and EMI features, all leveraging powerful broadband full-wave EM technology. With powerful automation capabilities, the Solver can be easily integrated into the Xpedition design flow to enable more analysis coverage in the design process. Designers can easily verify all critical nets, perform manufacturing variability analysis, or optimize the design for cost and performance, resulting in a more reliable design.

The Solver features chip, package, and board import capabilities from industry standard formats, with the ability to merge designs from different formats to provide seamless silicon-package-board co-analysis.

The broadband formulation enables generation of DC to high-frequency S-parameters from a single solver providing accuracy across the design spectrum while gaining valuable information about electrical design performance. The powerful EMI features allow users to specify temporal and steady-state voltage and on-chip current noise sources from industry standard formats and observe selected noise spectra, near-field, far-field and EMI/EMC compatibility.



Features

3D Full-wave Electromagnetic Simulation

- Accelerated boundary element technology
- Broadband material and loss modeling
- Accurate frequency-dependent losses, inductance, skin effects, radiation effects
- Current and voltage sources, and multiple plane wave excitations
- Integration with on-chip piecewise linear noise source SPICE models
- Adaptive fast frequency sweep
- Volumetric solution for maximum DC accuracy
- Scalable load-balanced multi-threaded matrix solution

Integration with Circuit Simulators

- Export models directly to HyperLynx, HSPICE, Spectre, Allegro SI, Agilent ADS
- Enhanced passivity and causality model testing and SPICE netlist generation

Enhanced Usability and GUI Features

- Full scripting capabilities based on Python to completely automate any EM analysis
- Package layout editing and creation
- Flexible model cropping options
- Automated port setup
- Intuitive pin-grouping option

- Chip metal layers, RDL, package, and board merging from industry-standard file formats from Mentor Graphics, Zuken, AutoCAD, and Cadence
- PoP, SiP, SoC, MCM, and stacked die support
- Automated refined meshing
- Full 3D control on bond wire, solder ball, solder bump and lead design
- Incorporation of linear passives such as decoupling capacitors directly into the generated model
- Windows and Linux, 64-bit

Visualization and Data Transfer

- S,Y, and Z output, and visualization
- Single-ended as well as mixed mode differential mode and common mode S-parameters
- Touchstone S-parameter import and export (standard and 2.0 version with individual reference impedance)
- Near field and far field plots
- Noise spectrum plots
- Current density plots
- Enhanced passive and causal model tester and SPICE netlist generator

Performance

- LSF / SGE support for distributed simulation
- Extended large number of cores multi-core and multi-CPU engine
- Parallel adaptive frequency sweep solving



Hybrid Signal and Power Integrity Analysis

The HyperLynx Full-Wave Solver includes hybrid signal and power integrity analysis capabilities that deliver accelerated power-aware SI results while maintaining Maxwell accuracy via powerful multi-solver hybrid technology. From frequency domain analysis for crosstalk, loss, and impedance analysis for signal integrity to current density, decoupling design and AC analysis for power integrity, designers can optimize their design for performance and cost from chip to package to PCB.

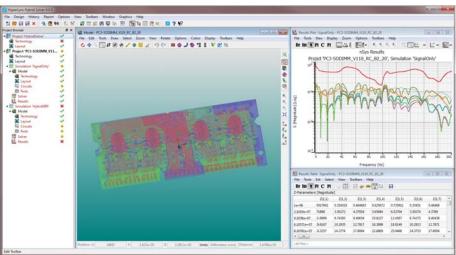
3D Power Integrity Simulation

- DC and AC power integrity analysis
- Accelerated boundary element technology
- Accurate frequency-dependent losses, inductance, and skin effects
- Current and voltage sources, and multiple port excitations
- Adaptive fast frequency sweep

Features

Hybrid SI/PI Electromagnetic Simulation

- Power-aware SI model extraction of large interfaces
- Broadband material, loss and nonideal reference modeling
- Accurate 3D modeling of via-toplane coupling
- Support for on-chip piecewise-linear noise source SPICE models
- Frequency domain analysis for crosstalk, impedance matching, and loss



The HyperLynx Full-Wave Solver includes hybrid signal and power integrity analysis capabilities.

For the latest product information, call us or visit: www.mentor.com/pcb

©2016 Mentor Graphics Corporation, all rights reserved. This document contains information that is proprietary to Mentor Graphics Corporation and may be duplicated in whole or in part by the original recipient for internal business purposes only, provided that this entire notice appears in all copies. In accepting this document, the recipient agrees to make every reasonable effort to prevent unauthorized use of this information. All trademarks mentioned in this document are the trademarks of their respective owners.

Corporate Headquarters Mentor Graphics Corporation 8005 SW Boeckman Road Wilsonville, OR 97070-7777 Phone: 503.685.7000 Fax: 503.685.1204

Sales and Product Information Phone: 800.547.3000 sales_info@mentor.com

Silicon Valley Mentor Graphics Corporation 46871 Bayside Parkway Fremont, CA 94538 USA Phone: 510.354.7400

Fax: 510.354.7467 **North American Support Center** Phone: 800.547.4303 Europe Mentor Graphics Deutschland GmbH Arnulfstrasse 201 80634 Munich

Germany Phone: +49.89.57096.0 Fax: +49.89.57096.400 Pacific Rim Mentor Graphics (Taiwan) 11F, No. 120, Section 2, Gongdao 5th Road HsinChu City 300.

Taiwan, ROC Phone: 886.3.513.1000 Fax: 886.3.573.4734 Japan Mentor Graphics Japan Co., Ltd.

Gotenyama Garden 7-35, Kita-Shinagawa 4-chome Shinagawa-Ku, Tokyo 140-0001 Japan

Phone: +81.3.5488.3033 Fax: +81.3.5488.3004



MF 2-16 1032811-w