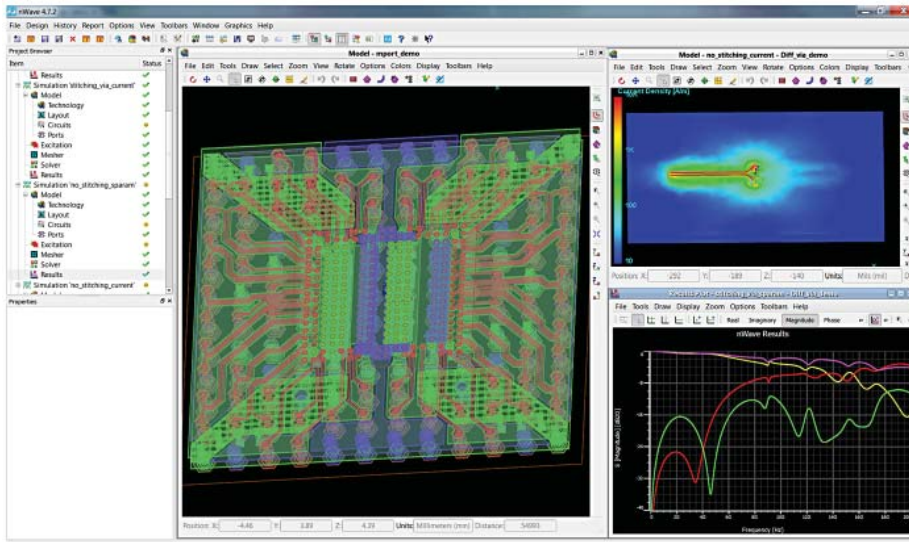


HyperLynx Full-wave Solver

3D Full-Wave EM Simulation From Chip to System

High Speed Design

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.

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 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

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.

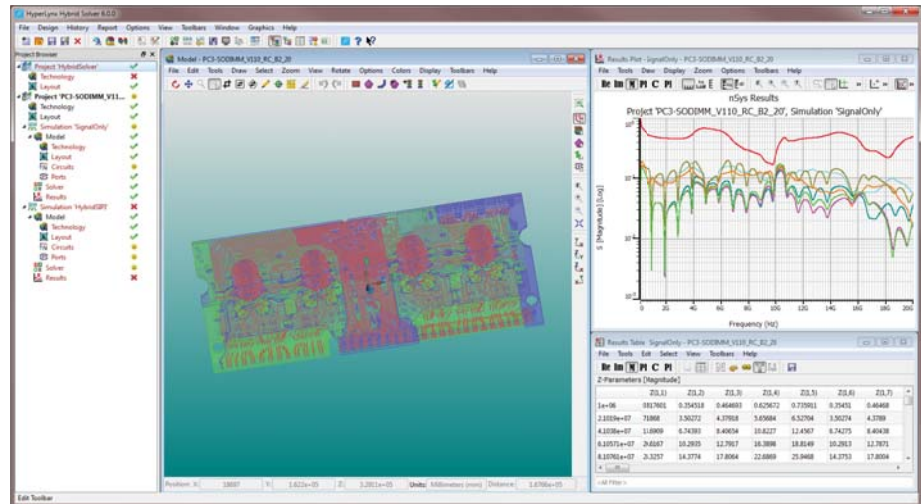
Features

Hybrid SI/PI Electromagnetic Simulation

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

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



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

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