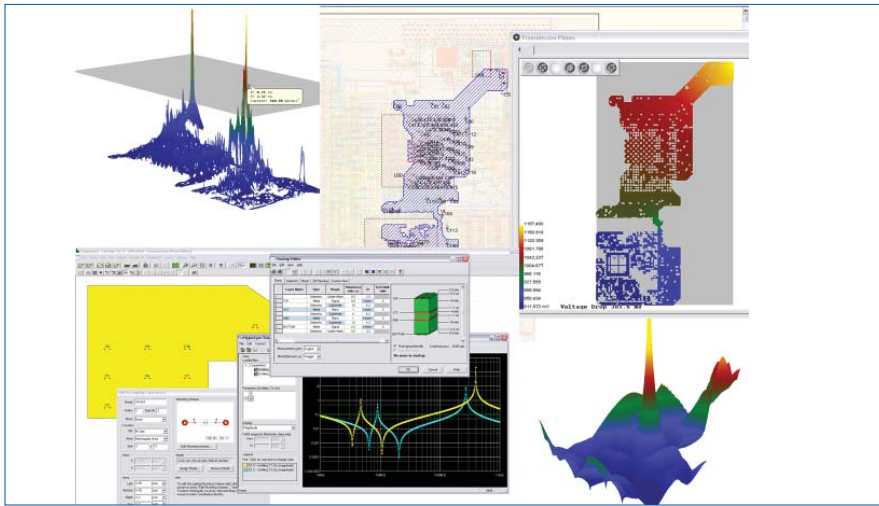# HyperLynx PI

HyperLynx PI includes pre- and post-layout power integrity analysis, such as DC drop analysis, AC decoupling analysis, plane noise analysis, and model extraction.

Overview

Power integrity (PI) analysis is an essential part of modern electronic design. The ever-increasing number of voltages being used by ICs, in addition to dramatic increases in power consumption, make proper power delivery an exceedingly difficult task. Compounding these issues are reduced layer counts, smaller noise margins, and increasing operating frequencies. With inadequate power delivery, designs exhibit signal integrity errors, which cause the logic on the board to fail.

Hardware engineers, PCB designers, and signal integrity specialists alike can use HyperLynx PI, getting simulation results without requiring weeks of software training. You can identify power distribution problems early in the design, even prior to layout. You can also identify problems with your design that would be difficult to identify in the lab, and investigate solutions in an easy-to-use "what-if" environment. Once the layout is complete, you can validate the results to ensure that appropriate guidelines were followed. This will ultimately help you reduce prototype spins and get to market faster, while creating more reliable products.

MAJOR BENEFITS:

■ Industry-renowned ease of use, enabling shorter time to results

■ Accurate modeling of plane structures as power delivery and noise propagation mechanisms

■ Analyze voltage drop of power supply rails due to copper losses

■ Identify areas of excessive current density in layout

■ Predict temperature rise with PI/Thermal co-simulation

■ Analyze power distribution impedance at multiple locations on PCBs

■ Explore different stackups, capacitor selections, placements, mounting schemes

■ Simulate propagation of noise throughout the planes from IC supply pins and signal vias

■ Extract models of the power distribution network

■ Create accurate via models which include effects of all bypassing and plane resonances

■ Works with all major PCB layout and routing applications

Mentor Graphics®

Analyze voltage drop

HyperLynx PI can identify potential DC power delivery issues such as excessive voltage drop, which can lead to IC malfunction. Other issues such as high current densities or excessive via currents, which can lead to damage to the board and/or disconnected power, can also be identified, along with the associated temperature rise. All simulation results can be viewed in graphical and report format, making problems in DC power delivery quick and easy to identify.

Pre-layout

- Set up voltage plane shapes, powers sources and loads before the board goes to CAD

Post-layout

- Read board data into HyperLynx

- Analyze DC behavior per net or the whole board

- Export to the pre-layout environment to do what-if analysis on changing copper islands, adding vias, etc.

Analyze and optimize your PDN

Optimize the impedance of your power distribution network (PDN). Use analysis to make effective decisions on how many capacitors are really needed to make your PDN work, and where to place those caps and how to mount them. Also investigate the benefits of new technologies on your PDN, and how the impedance will affect the propagation of noise on the planes.

Pre-layout

- Transmission Plane Editor

- Complete what-if analysis

- Create board outlines, plane voids, add copper

- Place and move caps, change models and parasitics, modify mounting

- Change stackup and dielectric

- Add power pins, stitching and bypass vias

- Select and place decoupling capacitors

- Decoupling and noise analysis

Post-layout

- Read board data into HyperLynx

- Analyze impedance profile of power distribution network

- Export to the pre-layout environment to do what-if analysis on adding/removing caps, changing values, changing mounting, changing stackup

- Perform a noise analysis to visualize the decoupling effects

Model Extraction

The need to properly characterize vias is essential. With HyperLynx PI you can create highly accurate models of vias that include the entire bypassing network of the board, including all stitching capacitors and vias, as well as the effect of energy radiated into the planes due to plane resonances.

HyperLynx PI also allows for extraction of PDN models. These can be extracted as S-parameters, Z-parameters, or Y-parameters and are portable among simulators.

Supported PCB layout systems:

- Mentor Graphics PADS® Layout, Expedition™ and Board Station®

- Cadence Allegro and OrCAD Layout tools

- Zuken CADStar, Visula and CR3000/5000 PWS or Board Designer

Platforms Supported

- 32-bit Windows 7/Vista/XP/Server2003/2008

- 64-bit Windows 7/Vista/Server2003/2008

- 32- and 64-bit Linux RHEL 4/5 and SLES 10

- Solaris 10

For the latest product information, call us or visit: w w w . m e n t o r . c o m / h y p e r l y n x