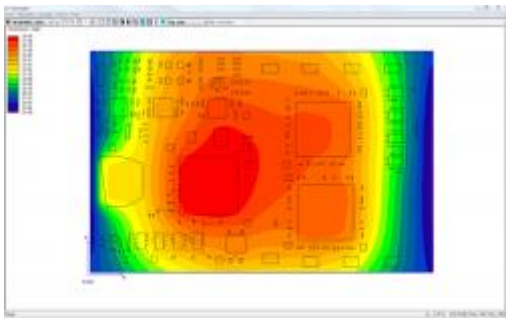
HyperLynx Thermal

Fast, accurate 3D modeling and simulation of thermal impact of PCB placement and routing

Overview

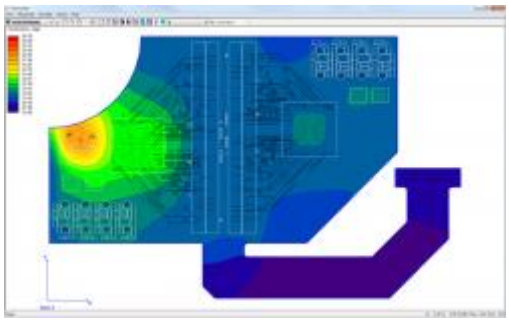
HyperLynx® Thermal analyzes board-level thermal conditions on placed, partially routed, or fully routed PCBs. It simulates conduction, convection and radiation, and produces temperature profiles, gradients, and excess temperature maps, resolving board and component overheating early in the design process.

By adjusting the design using what-if scenarios, engineers and PCB designers can reduce mean time between failures by as much as 50 percent, improving product quality and ultimately decreasing warranty costs.



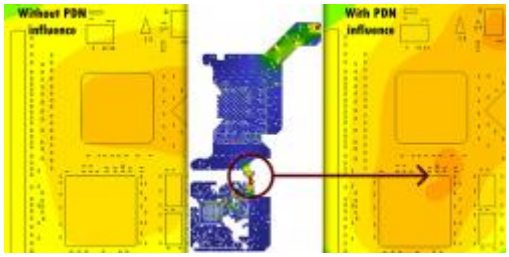
Find component and PCB hot spots quickly and efficiently

HyperLynx Thermal enables effective “what-if” analysis on component placement, stack-up design, and mechanical cooling techniques



Full thermal analysis

Analyze all major heat-transfer mechanisms, including convection, conduction, and radiation



Understand what impacts board temperatures

HyperLynx Thermal allows engineers to simulate thermal and power integrity analysis, enabling better understanding of the effect of power distribution network current densities on board temperatures

Features

- Import and analyze single-sided, double-sided, and multi-layer boards with irregular shapes and reference-plane discontinuities
- Boards and daughter cards can be placed near the edge or interior of a cabinet, and moved during “what-if” analysis
- Snapshot full PCB temperature profiles, including conductive, radiative and convective heat transfer to develop viable solutions for component overheating
- Accuracy within +/- 10%
- Improves reliability predictions with precise calculation of junction temperatures
- Finite difference schemes computed with self-adaptive locally refined meshes, producing extremely fast yet accurate results
- Quickly analyze component temperature constraint violations across the entire board, alerting engineers to potential trouble spots such as stress-inducing temperature gradients
- Ships with a large set of fully defined PCB components; create your own component models in a matter of seconds

Solutions

Space/Avionic A large number of Mentor Graphics users are in the Space/Avionic industries. These industries include satellites, space stations, airplanes, and missiles. The board relies upon thermal screws and wedge locks at the upper and lower edges to conduct the heat to the sink. Thermal radiation is also very important in these designs.	**Automotive** In many automotive applications, high currents pass through heavy traces on the board and generate significant heat. A Trace Version of HyperLynx Thermal is available for these types of special boards. The hot traces are modeled on the board using a power density factor.

Telecom/Industrial Control High reliability is a demand in these industry segments where large numbers of complex boards are encountered. Heat sinks have been used to cool some components. ECAD interfaces give a perfect translation of component placement, and library information to speed the setup process for these densely packed boards.		**Power Supplies** Power supplies have many tall components that generate significant amounts of power. These components also create air flow blockage effects which could be severe. For example, although the transformer has high power, its temperature is low due to the large surface area. The hot components are the ones with medium power and medium size.
Computer/Instrument These boards frequently have a few components, such as CPUs, with high power dissipation. The boards are usually very large with many components. Chip fans, heat sinks, or local impingement jets are used along with strong forced convection as cooling methods. Again, the ECAD interface is essential for these boards because of the vast number of components.		