

Packaged LED Manufacturers and Suppliers - Design, Simulate, Test

MECHANICAL ANALYSIS
LED/Lighting

D A T A S H E E T

Mentor Graphics' Mechanical Analysis Division has been the leader in the simulation of electronics cooling and thermal characterization for the engineering community since 1989. With award winning hardware and software solutions, LED manufacturers and semiconductor packaging houses are overcoming reliability and pricing obstacles from upfront design through to manufacture and test.

Thermal management is critical in LED design in order to meet performance, lifetime and cost requirements. The latest generation of thermal testing hardware and fluid simulation software enables design engineers to diagnose thermal problems, evaluate alternative designs and iterate rapidly to reach an optimal packaged LED solution. The final design can be qualified with measurements at the prototyping stage to ensure that manufactured tolerances (e.g. interface thicknesses) meet thermal design requirements and to identify any initial manufacturing problems. The knowledge gained can be used to improve future design iterations.

LED Manufacturers Achieve High ROI Ratios Using Mentor's Solutions

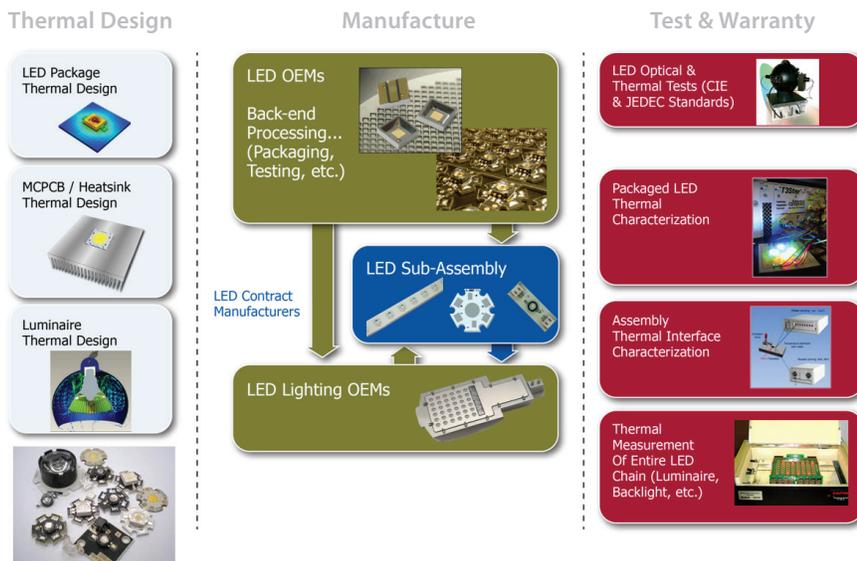
Mentor's unique combination of Computational Fluid Dynamics (CFD) software and thermal and optical characterization hardware is playing a key role in helping OEMs meet product performance, reliability and cost targets to stay ahead of their competition in an industry that is experiencing rapid technological advances and massive cost reduction pressures. This ROI can be met with a combination of time savings, fewer physical prototypes, production line stoppages and lower field returns.

Customer Testimonial:

"T3Ster's accuracy and repeatability enable us to verify our thermal designs and confirm the stability and reliability of our products. By testing in bulk we get increased statistical confidence in the measurement results. The structure functions built into the T3Ster software are extremely powerful for identifying different thermal attach issues during our extensive reliability testing"

Dr. Thomas Zahner, Quality Manager, OSRAM Opto Semiconductors

With regulation driving the adoption of solid state lighting worldwide, LEDs are predicted to be as much as 50% of the general lighting market by 2016. This growth provides both opportunities and challenges for vendors.

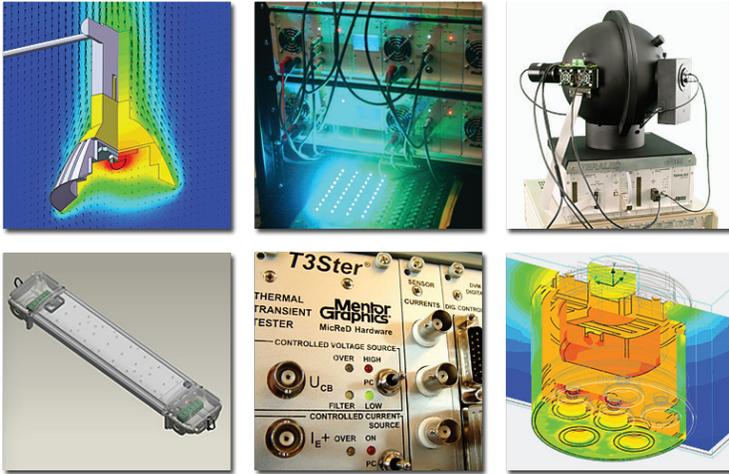


The flowchart outlined above illustrates the impact of thermal design and characterization on the supply chain for a multitude of LEDs and packages manufactured by OEMs. Many variables go into producing the optimal end product. As a designer and integrator of LEDs, getting the best thermal performance at each step is critical to long-term product success.



"What the engineering community needs is a change of their mindset... think thermal first, and electrical later."

Rudi Hechfellner, Philips Lumileds Lighting



Hardware and Software Solutions for LED and Lighting Manufacturers

Mentor Graphics provides a unique set of tools for LED design, simulation and optimization. No other vendor offers this level of predictive capability to save time, cost and warranty issues.

T3Ster & TERALED

T3Ster is designed with the needs of the semiconductor, electronic appliance and LED industries plus R&D laboratories in mind. As an advanced thermal tester for thermal characterization, it can produce package thermal characteristics in just a few minutes. TERALED is CIE 127:2007 compliant, providing combined thermal and radiometric/photometric characterization of high-power LEDs, either in combination with T3Ster thermal transient tester to form a comprehensive LED testing station or as a stand-alone, automated optical testing solution.

FloTHERM

FloTHERM is the undisputed world leader for electronics thermal analysis. FloTHERM uses advanced CFD techniques and compact thermal models to predict airflow, temperature, and heat transfer for LED applications.

FloEFD

Multi CAD-embedded CFD (Siemens NX™, CATIA V5®, Creo Parametric™ and SolidWorks®) and Inventor-integrated, with an electronics cooling module; FloEFD provides powerful thermal capabilities for analysis by specialists who support electronics cooling applications such as LED component design.

Solutions from Mentor Graphics Mechanical Analysis Division can assist LED manufacturers and packaging houses with the following:

- Ensuring correct repeatable LED light metrics
- Ensure LED datasheets are correct
- Creation of thermal models for customers
- Assure component compliance with very strict end-user product ratings for light output and lifetime
- Measurement of real component thermal resistance metrics
- Hot lumen output qualification based on actual LED temperature
- LED TIM thermal resistance measurements
- Large-scale (high throughput) reliability testing of LED lines and arrays
- Competitive intelligence through measurement of competitive components
- Thermal characterization of LED component prototypes
- Model verification of LED components
- Achieve over 50 temperature and forward current measurements per hour

LED  **Light for you**
powered by OSRAM

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

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