FloTHERM + T3Ster

Mechanical Analysis

Thermal Measurement and Precise Analysis

D A T A S H E E T

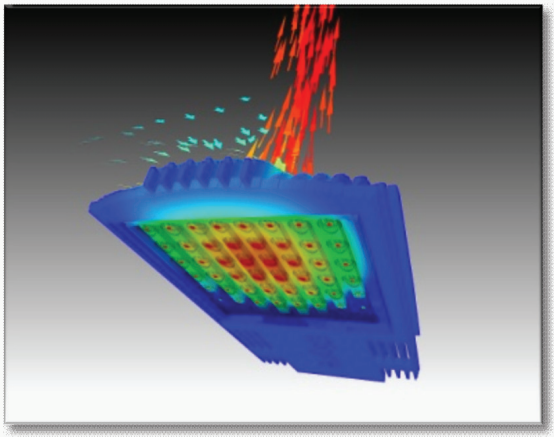
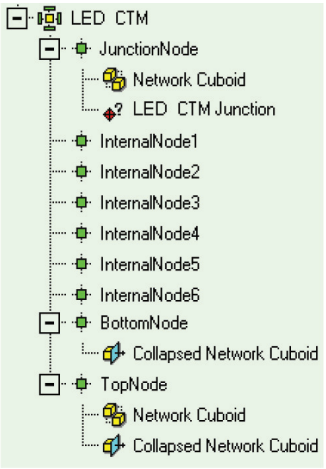


Image courtesy of HungaroLux Ltd., Budapest, Hungary



Key Benefits

- Compliance to the latest thermal testing standards.
- Quick turnaround time in thermal characterization and modeling.
- Tight integration between thermal measurements and simulation, automated flow of thermal information; ensuring unrivaled ease of use combined with speed and accuracy.
- High measurement throughput and consistency between thermal and optical testing of LEDs.

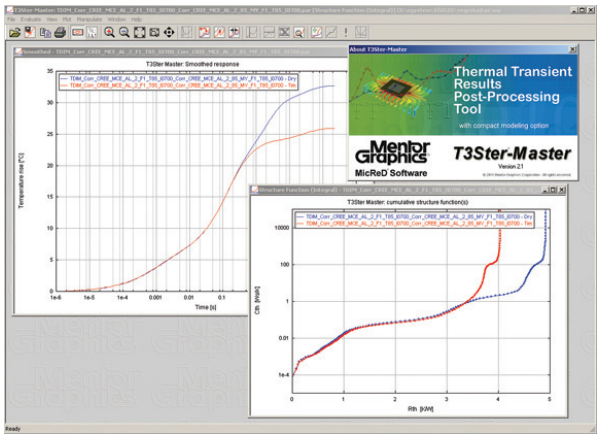
BETTER LED AND IC DESIGNS WITH FASTER THERMAL MEASUREMENT AND ANALYSIS

Mentor Graphics offers an automated process that combines accurate thermal measurement with precise analysis with its market-leading products: T3Ster® and FloTHERM®. These technologies enable suppliers to design better LEDs, power semiconductor and IC packages, create accurate simulation models, and verify systems for proper heat management.

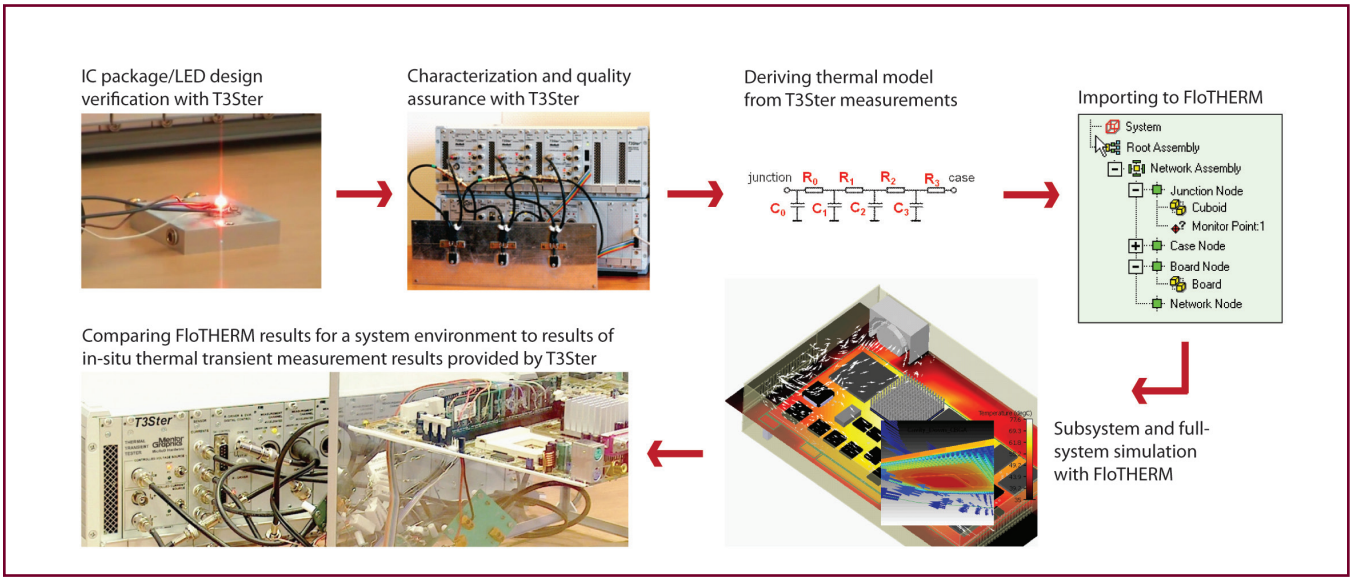
T3Ster is a unique and advanced thermal transient tester for thermal characterization of semiconductor device packages, producing several types of package thermal characteristics in just a few minutes. FloTHERM, a powerful 3D computational fluid dynamics (CFD) software and the de facto standard solution for the electronics market, predicts airflow and heat transfer in and around electronic equipment, from components and boards up to complete systems.

T3Ster and its related data processing software is the most advanced, commercially available system that implements the latest thermal testing standard (JESD51-14) for the measurement of junction-to-case thermal resistance for wide class of semiconductor device packages. A positive consequence of the Mentor Graphics MicReD realization of the JESD51-14 standard is that, besides the required standard thermal metric, a dynamic compact thermal model of the part being characterized is also automatically generated in a format directly applicable in the FloTHERM software.

FloTHERM enables engineers to create virtual models of electronic equipment, perform thermal analysis, and test design modifications quickly and easily in the early stages of the design process well before any physical prototypes are built.



Mentor Graphics®



FloTHERM is the first commercial CFD tool that provides a direct interface to physical testing, which allows validation of detailed CFD models of packages or creation of package compact models if detailed CFD modeling of the part is not supported by its manufacturer.

T3Ster technology is comprised of a flexible range of hardware, including the thermal transient tester station itself and numerous accessories (thermostat, booster, thermocouple pre-amplifiers, JEDEC standard still-air chambers, test-boards and special fixtures, e.g., for TIM measurements). Using a smart implementation of the JEDEC static-test method (JESD51-1), the thermal tester forces a packaged semiconductor chip from a “hot” to a ”cool” state (or vice versa) using a single step change in input power. It then uses the measured internal transient temperature response to generate a complete thermal characterization of the package in just a few minutes.

The equipment yields very accurate temperature versus time trace for a packaged chip in a given environment. This information can then be used to obtain metrics such as RthJC, RthJB, or RthJA directly from the measurements, to get information about the heat-flow path, to find and locate failures such as die attach delamination, or to create a compact thermal model of the part. Measurements are controlled through a USB port, and the advanced results post-processing program enables easy viewing and comparison of the results.

When T3Ster is combined with the TERALED system, which is specifically designed for testing power LEDs, engineers are able to consider the light output of the LED under test. LED thermal metrics (similar to thermal metrics of conventional power semiconductors) obtained this way are 100% consistent with the measured light output characteristics. Data gathered by the comprehensive LED testing station offered by T3Ster + TERALED can be used in multiple-domain simulation of LED-based products to predict the “hot lumens”—the ultimate SSL device parameter required by engineers who are using such products.

Because T3Ster can be used to characterize the heat-flow path from the heat source to the environment, it also can be used for characterizing complete systems or thermal management devices, such as heat sinks and the resistance of any thermal interfaces.

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