TEA

SERVICES

♦ Thermal Characterization

TEA offers this service to customers having need for precise thermal parameter values for product development, data sheets, package selection, product selection, purchase specifications, and/or device comparisons. This service is offered for a wide range of Diode Devices (i.e., Schottky, PIN, Laser, Varactor, rectifier, etc.) and Integrated Circuits (i.e., digital, linear and mixed-signal devices). Measurements include:

θ_{JC}	Thermal Resistance junction-to-case	Optional thermal metrics data includes Ψ_{JB}
θ_{JA}	Thermal Resistance junction-to-ambient in JESD51-2 specified Environmental Chamber	Optional thermal metrics data includes Ψ_{JB} and Ψ_{JT}
θ_{JMA}	Thermal Resistance junction-to-moving air in accordance with JESD51-6 specified Wind Tunnel; air velocities over the rang of 0.5 to 5 m/s are available	Optional thermal metrics data includes Ψ_{JB} and Ψ_{JT}
θ_{JB}	Thermal Resistance junction-to-board in accordance with JESD51-8 specified Ring Cold Plate measurements	Optional thermal metrics data includes Ψ_{JT}
θ_{JX}	Thermal Resistance junction-to-reference point; suitable for measurements for non-standard mounting and/or environmental conditions	Optional thermal metrics data includes Ψ_{JB} and Ψ_{JT}

Normal practice is to make measurements on a 5 unit lot; other lot sizes are possible. Characterization efforts includes wiring of thermal test boards (if required), diode calibration, and a complete report detailing measurement procedure, all measurement data, Heating & Cooling Curves, and analysis.

♦ Contract Testing

This service provides thermal transient screening of medium and large device lots for die attachment integrity. The information derived from this service is also useful for statistical control of the die/chip attachment process in production applications.

♦ Referee Measurements

This service is offered to resolve differences in thermal test results between two or more parties (customer & supplier, between suppliers, etc.). TEA can review testing procedures of the parties and/or make fully-documented independent measurements on the same devices used for comparison by the parties involved.

♦ Component Modeling

TEA can provide thermal modeling of your components using a variety of commercially available software packages.

♦ Test Fixture Design

Custom-designed test fixtures for thermal testing under specific environmental conditions. Fixture designs for ambient, forced air, liquid-cooled, etc. applications.

♦ Thermal Project Management

Management of thermal projects involving your company personnel, outside consultants or a combination of both for specific objectives.

♦ Short Courses

TEA offers one- or two-day courses on the basics of thermal measurements. The courses focus on the practical side of the topics, rather than the theoretical side, allowing the audience to gather information that can be immediately applied. Attendees receive a copy of all course presentation material in bound form, making this material and the attendee's notes a valuable reference tool for future activities in the field.

♦ Lectures

Lasting one to three hours, lectures concentrate on a single thermally-related topic and provide attendees with practical information that can be put to use in a relatively short time. Attendees receive a bound copy of presentation material.

> ***Short Courses* and *Lectures* can be presented either at client company's facility, an off-site location near the client company's facility, or at TEA's facility. Course content descriptions are available upon request. Cost is dependent on location, number of attendees, and content modifications requested by the client company. TEA can also offer open *Short Courses* and *Lectures* in central locations if several client companies wish to share the cost or if educational institution(s) and/or professional organization(s) sponsor the presentation.**

♦ Measurement Training

Training sessions on Thermal Measurements are divided into two parts - a lecture session to cover the basics and introduce the practical side of the topic and a laboratory session in which the lecture material is applied to actual thermal measurements or modeling examples. The examples can be either generic ones supplied by TEA or specific ones supplied by the client company. Training sessions can be one or more days in duration, depending on the training depth and examples chosen by the client company. Participation in training sessions is limited to a maximum of four client company personnel. Each participant receives bound copies of lecture presentation and reference material. Sessions are held either at client company's facility or at TEA's facility. Cost is dependent on session duration, location, number of attendees, and topic chosen.

Further information for each of these services can be found at
http://www.thermengr.com
(click on Services/Products, then click on desired service.)

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