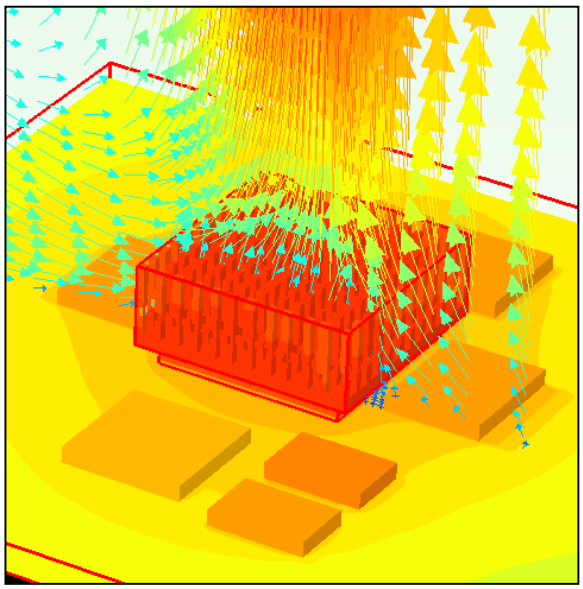
EDA TECHNOLOGIES

Thermal Management of Electronic Systems

2-Day Workshop

EDA Technologies is proud to present this internationally acclaimed workshop for the 2nd time in South Africa.



Course Outline

Thermal management has become a critical aspect in the design of contemporary electronic systems. Power dissipation levels have grown due to increased functionality and greater degrees of integration, and careful thermal design is imperative in order to meet today's stringent requirements for reliability.

The objective of this short course is to provide designers of electronic hardware with an understanding of the principles and practice of thermal management.

A theoretical basis is used to establish useful design techniques, and these techniques are illustrated through a set of six practical case studies. The cases span a range of applications from portable devices and consumer products to telecommunications rack systems and industrial power sets. Each case will include a review of relevant theory, and the application of contemporary tools and techniques to achieve a successful thermal design.

Who should attend?

- Mechanical engineers, particularly those working on high-power or temperature-sensitive applications such as telecommunications, computing or power systems
- Engineers and managers with responsibility for the thermal design of electronics
- Hardware engineers, PCB designers and system integrators

What you will learn

- An overview of thermal management
- Fundamental heat transfer theory – conduction, convection and radiation
- Materials for thermal management – interface materials, gap fillers & heat spreaders
- Thermal characteristics of components – best practice
- Thermal design guidelines for PCBs
- Optimisation of heat sinks for passive and active cooling
- Best practice in deployment of fans
- Acoustic noise minimisation
- Practical use of heat pipes and liquid cooling systems
- Application of contemporary thermal design tools
- How to take accurate measurements of temperature, airflow, pressure and noise
- Trends in materials and technologies for next-generation thermal solutions

Course Presenter

Dr. Jeff Punch is the director of the Stokes Institute, where he leads a group which tackles reliability-related issues in electronic systems. He has over 17 years' experience in collaborating with the Institute's partners and clients on a range of research programmes.

He has published widely on thermal management and reliability physics topics, and presented numerous invited talks worldwide.

Workshop Outline

DAY 1

Introduction
- Thermal management
- Power trends and environmental loads
- Energy considerations
- Overview of course

Principles of heat transfer
- Conduction
- Convection – the boundary layer
- Radiation
- Electro-thermal analogues

Case study 1: Portable devices
- Hand-held communications device

Component- and PCB-level cooling
- Component characteristics
- Compact models
- Dynamic thermal behaviour
- Factors of influence for natural and forced convection cooling
- Conductive heat spread in PCBs
- Current-carrying capability
- Thermal design guidelines for PCBs

Case study 2: Consumer products
- Set-top unit

Temperature effects and reliability
- Contemporary reliability models
- Influence of temperature
- Failure physics approach

Heat sinks
- Overview
- Optimisation for passive cooling
- Forced convection heat sinks
- Baseplate optimisation

DAY 2

Case study 3: Outdoor Systems
- Base station for telecommunications

System cooling
- Fan and system characteristics
- Axial and radial fans
- PCB and fan interactions
- Cooling at altitude

Case study 4: Telecomms Rack Systems
- Fan tray design and air distribution

Case study 5: Power Systems
- Heat sink for a power module

Case study 6: Fan-cooled Systems
- Fan-cooled distributed system

Acoustic noise
- Definitions – sound pressure & power
- Noise sources & minimisation
- Case study

Heat pipes and liquid cooling
- Liquid properties
- Heat pipe fundamentals & application notes
- Pipe flow and pump characteristics
- Primary and secondary heat exchange

Test & Measurement Techniques
- Temperature measurement
- Airflow and pressure measurement
- Acoustic noise characterisation

Thermal management trends
- Drivers and challenges
- Key technologies
- Thermal design tool

Don't get caught in the hot seat.

Consider the benefits for you and your company... Enrol NOW!

When: Cape Town 15-16 Mar 2018
Centurion 19-20 Mar 2018

Cost: R7995,00 pp excl VAT

Discounts: 10% if 3-5 from a company
15% if 6+ from a company

Contact: Roxanne
EDA Technologies
012-665-0375
seminar@edatech.co.za