

THERMAL MANAGEMENT BASICS COURSE

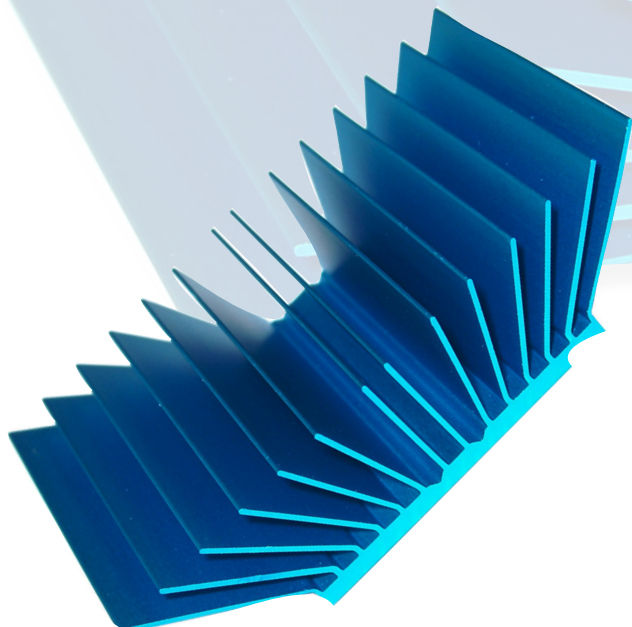
Course Goal:

An introduction to electronics cooling and its basic principles for systems-, electrical- and other engineers involved in electronics systems architecture and design.

Course Deliverables:

Provide the basic tools and understanding to implement good thermal judgment while the system is at the design stage.

The course notes provide many examples and useful calculations for the required basic calculations.



Course Outline:

Part 1: The Basics

1. What is electronics cooling?
2. Why do we need thermal management of electronic systems?
3. Basics of heat transfer and fluid flow - a brief review of the basics.
4. Understanding thermal resistance - R_{ja} , R_{jc} , etc.
5. Effect of fluid flow on the temperature of PCB and system.
6. What is a heat sink and its role in thermal management?
7. Calculating pressure drop and flow resistance in a system and PCB.

Part 2: Tools

1. Role of thermal analysis in the design cycle.
2. Heat sink types and selection.
3. EMI and heat sink.
4. Fan selection - cooling and acoustics.
5. Effect of EMI shields on cooling, component, board and system.
6. Effect of board layout on thermal performance - why do we need to optimize board layout.
7. Understanding system layout and its impact on cooling - filter, shield, PCB, fan tray placement.
8. Advanced cooling- determining when you need to use a higher capacity cooling system.

Duration: 1 full day.

Price € 495 (excl VAT)

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Registration Form

Fax to: +49 0906 70693-50

Name:

Company:

Job Title:

Address:

City:

Phone:

E-mail:

Fax:

HOW TO REGISTER FOR THIS PROGRAM:

The Thermal Management Basics Course is offered at € 495 (exc. VAT). Seating is limited, so please make your reservation soon to guarantee your place.

Please contact Telemeter Electronic GmbH (Robert Jall) via e-mail at rjall@telemeter.de or by telephone at +49 906 706 93 15 Course Location:

Munich Messe
Germany

11 November 2009**12 November 2009****ABOUT THE PRESENTER:****Norbert P. Engelberts**

Norbert P. Engelberts is the director of Advanced Thermal Solutions Europe and has been actively involved in electronics cooling since 1992. Prior to ATS, Engelberts headed the Thermal Design and Environmental Testing Group for Bell Labs,

Lucent Technologies (now Alcatel-Lucent). During his 11 year tenure at Bell Labs he was responsible for the thermal management and environmental testing of all telecommunications system (indoor and outdoor) equipment developed by the company in the Netherlands. In addition, Engelberts also brings with him expertise in HVAC system design, particularly those that house telecommunications and networking equipment.



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