

Registration (Fax Reply)

To: ECPE e.V.
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Register before **12 October 2010**

Participation fee:

Part I 27-28 July	Part II 19 – 20 Oct.	Both Tutorials	
<input type="checkbox"/> 680.00 €	<input type="checkbox"/> 580.00 €	<input type="checkbox"/> 990.00 €	Industry
<input type="checkbox"/> 580.00 €	<input type="checkbox"/> 480.00 €	<input type="checkbox"/> 850.00 €	University

The fee includes the tutorial dinner, lunch, coffee/soft drinks and handouts.

With the confirmation of seminar registration you will receive the invoice. (* plus 19 % VAT); 50 % discount for ECPE Member Companies. In case of cancellation after 6 October 2009 or non-attendance 50 % of the participation fee are payable.

Number of participants is limited to 30 attendees.

Sender:

title, given name, name

company, department

full address

phone, fax

e-mail

date, signature

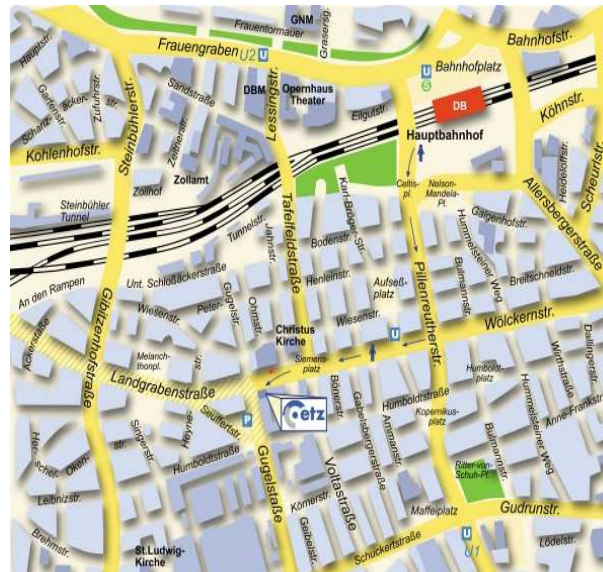
Organisational information

Organiser: ECPE e.V.
90443 Nuremberg, Germany
www.ecpe.org

Course instructor: Prof. Eckhard Wolfgang
ECPE e.V.
Dr. Uwe Scheuermann
Semikron Elektronik

Organisation: Ingrid Bollens, ECPE e.V.
+49 (0)911 / 81 02 88 – 10
ingrid.bollens@ecpe.org

Place of seminar: ECPE e.V. (in etz-building)
Landgrabenstrasse 94
90443 Nuremberg, Germany



Further information (hotel list and maps) will be provided after registration.



**ECPE European Center for
Power Electronics e.V.**

ECPE Tutorial

Thermal Engineering of Power Electronic Systems

Part 2: Thermal Management and Reliability

**19 - 20 October 2010
at ECPE (etz-Building)
Nuremberg, Germany**

Introduction

ECPE Tutorial “Thermal Engineering of Power Electronics Systems” Part 2: Thermal Management and Reliability

19 -20 October 2010
Nuremberg, Germany

Thermal engineering of power electronic systems is a key to achieve high performance and reliability. In the focus of the new ECPE tutorial is the thermal simulation and verification of the SEMIKUBE IGBT converter which is equipped with thermal sensors for verification.

Part 1: At first the topology of the IGBT converter and it's components are described as well as the data sheet. Then the results of the electrical simulation are presented in regard to performance and thermal losses. The following sections deal with basics of heat conduction, convection and exchange. Practical examples will be used for a good understanding of cooling the hot parts in the system. After an introduction to analytical and FEM methods five groups are formed to exercise thermal simulations and measurements.

Part 2: After a detailed description of the results of the first part the impact of thermal behavior of the converter on the reliability is discussed in detail. The knowledge of functional requirements, mission profiles, physics of failure, thermal measurements (thermal images and impedance) are needed for building-in reliability and for the robustness validation process.

All presentations and discussions will be in English.

Programme

Tuesday, 19 October 2010

9:30 *Start of Registration*

9:45 Welcome and Introduction
T. Harder, ECPE e.V.
E. Wolfgang, ECPE e.V.

10:00 **Results of Tutorial Part 1**
A. Wintrich, Semikron Elektronik

11:00 **Requirements, Mission Profile**
E. Wolfgang, ECPE e.V.

12:00 *Lunch*

13:00 **Temperature and Reliability: Failure Mechanisms**
U. Scheuermann, Semikron Elektronik

14:00 **Thermal Measurements**
U. Scheuermann, Semikron Elektronik

15:00 **Introduction to the Experiment**
A. Wintrich, Semikron Elektronik

15:15 *Coffee Break*

15:45 **Experiment: Thermal Impedance of System**
A. Wintrich, Semikron Elektronik

16:30 **Interpretation of Thermal Impedance Results**
U. Scheuermann, Semikron Elektronik

17:45 **Wrap-up 1st day**

18:00 End of 1st Day

19:30 *Dinner*

Programme

Wednesday, 20 October 2010

08:30 Thermal Impedance: FEM Simulation
E. Rudnyi, CADFEM

09:30 **Thermo-mechanical Simulation**
E. Rudnyi, CADFEM

10:30 *Coffee Break*

11:00 **Design for Reliability**
U. Scheuermann, Semikron Elektronik

12:15 *Lunch*

13:15 **Robustness Validation**
E. Wolfgang, ECPE e.V.

14:00 **Cooling Technologies and Thermal Interface Materials**
E. Wolfgang, ECPE e.V.

15:00 **Wrap up 2nd day,
Final discussion**

15:30 End of Tutorial