Organisational information

For registration please use the registration form which is available on the ECPE web page: www.ecpe.org
> ECPE Events > ECPE Tutorial: Reliability of Power Electronic Systems > Registration Form

www.ecpe.org/ecpe-events

Deadline for registration:

- **25 August 2015**

Participation fee:

- **€ 550,–** * for industry
- € **435,–** * for universities/institutes
- **€ 150,–** * for students/PhD students
  (copy of student ID requested)
  (limited number only)

* plus 24 % VAT

- The participation fee includes dinner, lunch, coffee/soft drinks and handouts.
- With the confirmation of registration by email you are registered for the workshop and the invoice will be sent by post. The registration will be confirmed by email.
- 50 % discount for each participant from ECPE Member Companies.
- Further information (hotel list and maps) will be provided after registration and is available on the ECPE web page.
- In case of cancellation after **18 August 2015** or non-attendance 50 % of the participation fee is payable.
- The number of participants is limited to 35 attendees.

Organisational information

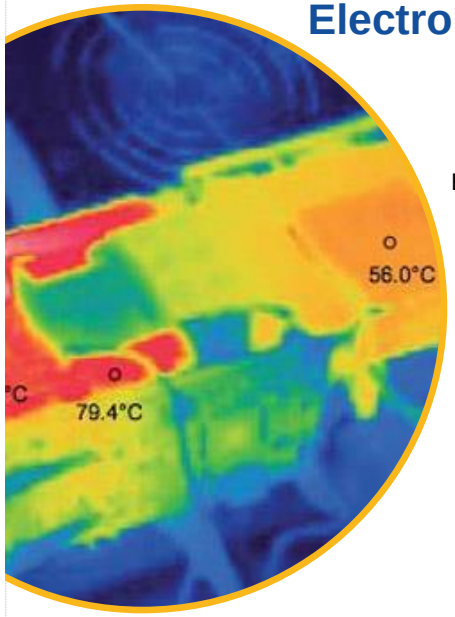
Organiser	ECPE e.V. 90443 Nuremberg, Germany www.ecpe.org
Course instructor	Prof. Dr. Eckhard Wolfgang, ECPE e.V. Dr. Wolfgang Gerling, Consultant
Organisation	Lena Somschor, ECPE e.V. +49 (0)911 / 81 02 88 – 18 lena.somschor@ecpe.org
Venue	Aalto University Micronova, Tietotie 3, Otaniemi, 02150 Espoo, Finland

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

ECPE
European Center for
Power Electronics e.V.

ECPE Tutorial

Reliability of Power Electronic Systems



1 – 2 September 2015
Aalto University
Espoo/Helsinki, Finland

ECPE Tutorial

Reliability of Power Electronic Systems

1 - 2 September 2015
Espoo/Helsinki, Finland

The intention of this tutorial is to communicate the basics of reliability assurance and confirmation by simulation and test for the application of power devices at system design.

The methodology is based on the planned application profile (mission profile) and the “Physics-of-Failure”- concept concerning the effects of the loads implied by the mission profile.

Also the requirements trends to lower system volumes, application in harsher environments and increasing reliability demands are considered.

The “mission profile” incorporates the combination of loads and their duration to which the electronic system will be subjected. They determine depending on the construction (design) the physical processes and thus the life-time of the system.

Essential are therefore:

- knowledge / identification of the load profiles,
- system design with respect to the loads acting on power devices,
- understanding / investigating the degrading physical processes, their modeling and application,
- application related confirmation of life-time / reliability including appropriate accelerating “End-of-Life”- test methods

to implement the required life-time (“Building-in Reliability”- concept) including a safety margin (“Robustness Margin).

Appropriate procedures are discussed for system design, simulation and test referring to the “Robustness Validation Process” and explained by examples.

Besides the very successful ECPE Seminar and Workshop series, ECPE offers a tutorial program focusing more on education of young engineers and engineers from neighbouring disciplines.

All presentations and discussions will be in English.

Programme

Tuesday, 1 September 2015

9:00 **Start of Registration**

9:20 **Welcome,**
ECPE e.V.

Requirements

9:30 **Overview**
- Content and goals
E. Wolfgang

Reliability

9:50 **1. Reliability Basics**
- Definitions, parameters, models
- Failure mechanisms
W. Gerling

11:00 **2. Functional Requirements**
- Specification
- Mission Profile
E. Wolfgang

12:00 Lunch

Virtual Performance Assessment

13:00 **3.1 Electrical and Thermal Design**
- Design for reliability
- Advanced cooling
E. Wolfgang

13:20 **3.2 Thermomechanical behavior of thermal interface materials and solder interconnections for power modules**
J. Li

14:00 **3.3 Advanced Cooling**
E. Wolfgang

15:00 Coffee Break

Virtual Reliability Assessment

15:30 **4.1 Physics-of-Failure Concept**
W. Gerling

16:10 **4.2 Qualification Concept**
- example components
W. Gerling

16:50 **Introduction to Aalto University**

17:30 **Lab Tour**

18:30 **End of 1st day**

19:30 Dinner

Programme

Wednesday, 2 September 2015

8:30 **Summary 1st day, open questions**

8:40 **4.3 Robustness Margin of Bond Wires**
E. Wolfgang

9:20 **4.4 Die attach metallurgy and reliability in power devices**
V. Vuorinen

10:00 Coffee Break

10:30 **4.5 Lifetime Passive Components**
E. Wolfgang

11:20 **4.6 Risk Assessment**
- FMEA
E. Wolfgang

12:00 Lunch

Reliability Validation

13:00 **5.1 AEC Q101 and Robustness Validation**
W. Gerling

13:40 **5.2 Accelerated Testing of a Power Module**
W. Gerling

14:20 Coffee Break

14:40 **5.3 Simulation and Test of an ECU**
E. Wolfgang

15:20 **5.4 Requirement Engineering**
- methodology for performance and reliability
W. Gerling

16:00 **Final Discussion, Feedback**

16:30 **End**

The course instructor of the Reliability Tutorial is
Prof. Dr. Eckhard Wolfgang, ECPE e.V., Germany

Co-instructors are :
Dr. Wolfgang Gerling, Consultant, Germany
Dr. Jue Li, Aalto University, Finland
Dr. Vesa Vuorinen, Aalto University, Finland