

Registration (Fax Reply)

To: Engineering Center for Power Electronics e.V.
Att.: Ingrid Bollens

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Register before **22 December 2004**

Participation fee: €450,- * plus VAT

Participation for ECPE Members and invited Speakers only. Number of participants is limited to 60.

* Three participants from each ECPE member company are free of charge. Allocation in sequence of registration.

Sender:

title, given name, name

company, department

full address

phone, fax

e-Mail

date, signature

Organisational information

Organiser: ECPE e.V.
D-90443 Nuremberg
www.ecpe.org

Chair of seminar: Prof. Dr. E. Wolfgang, Siemens AG
Thomas Harder, ECPE

Organisation: Ingrid Bollens, ECPE
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ingrid.bollens@ecpe.org

Place of seminar: Conference Center
Frankencampus
Frankenstraße 152
D-90461 Nuremberg



- Ø U 2 from Nuremberg Airport to Nuremberg
“Hauptbahnhof” (main station)
U 1 from main station (direction Langwasser) to
stop “Frankenstraße”
- Ø For public transport see www.vgn.de

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



**Engineering Center for
Power Electronics**

Workshop Building-in Reliability into Power Electronic Systems

13 – 14 January 2005
in Nuremberg,
Germany

**Internal ECPE Workshop
in cooperation with
Siemens AG
for ECPE Members only**

Introduction

ECPE Building-in Reliability into Power Electronic Systems Workshop

13 – 14 January 2005
Nuremberg, Germany

15 years ago Intel introduced the concept of building-in reliability. It basically means to control design, processes and materials which are used for producing chips rather than testing the chip itself. This concept is also very well suited to secure the reliability of power electronics systems. Today “zero defect” throughout the supply chain is a requirement. Everything has to be done right from the beginning, starting with design up to thermal management, EMI and environmental protection, system test, manufacturing and final test. In the design phase the stress applied to the devices has to be determined by simulations and measurements. Extremely important is cooling because most of the failures are caused by thermo-mechanical stresses. EMI protection has to be built-in from the very beginning. The physics of potential failures has to be considered all the time. During manufacturing all the materials and processes have to be controlled by statistical process control SPC. The process windows should be narrowed down according to the 6 σ requirements. Continuous improvements are necessary to reach “zero defects”. Prof. Eckhard Wolfgang (Siemens Corporate Technology, Munich) will chair the workshop together with Mr. Thomas Harder (ECPE). All presentations and discussions will be in English.

Program

Thursday, 13 January 2005

- 11:00 Venue and Registration
- 12:00 Lunch**
- 12.50 Opening
E. Wolfgang, Siemens AG CT
T. Harder, ECPE e.V.
- 13:00 Introduction
E. Wolfgang, Siemens AG CT
- 13:45 [Power Electronics Circuit Design: Electrical and Thermal Stresses](#)
U. Drofenik, ETH Zürich
- 14:45 [Active and Passive Cooling](#)
G. Mitic, Siemens AG
- 15:30 Coffee Break**
- 16:00 [Vibrational and Environmental Stresses](#)
F.P. McCluskey, University of Maryland
- 16:45 [Reliability of Lead-free Solders](#)
F.P. McCluskey, University of Maryland
- 17:30 [Mission Profiles and Accelerated Tests](#)
E. Wolfgang, Siemens AG
- 18:15 End
- 19:30 Dinner**
- [Cosmic Ray Failures](#)
G. Sölkner, Infineon Technologies

Program

Friday, 14 January 2005

- 8:30 Case studies (I)
from ECPE-members
- 10:00 Coffee Break**
- 10.30 Case studies (II)
from ECPE-Members
- 11:30 [Physics of Failures and Failure Analysis](#)
M. Ciappa, ETH Zürich
- 12:30 Lunch**
- 13:30 [Standards for Reliability Tests](#)
M. Goroll, W. Kanert, Infineon Technologies
- 14:15 [Building-in Reliability](#)
E. Wolfgang, Siemens AG
- 15:00 Discussion
Needs in Research (Topics)
- 15:30 End