Organisational Information

Sign up at: www.ecpe.org/events

Registration Deadline:

10 January 2020

Participation Fee:

€ 600,– * for industry
€ 450,– * for universities/institutes
€ 130,– * for students/PhD students**

* plus VAT; **students seats are limited

- The regular participation fee includes dinner, lunches, coffee/soft drinks and handouts. The reduced (PhD) students fee includes all the above except for dinner (can be booked for an extra fee of € 50,-*).
- A printed version of the workshop handout is available on request (€ 50,-*).
- Upon receipt of registration confirmation via email you are signed-up for the event. The invoice will be sent via letter post.
- Three participants from each ECPE member company free of charge. Allocation in sequence of registration.
- 10% discount for participants from ECPE Competence Centres.
- Further information (hotel list and maps) will be provided after registration and can be found on the ECPE web page.
- Cancellation policy: Full amount will be refunded in case of cancellation up to 2 weeks prior to the event. After this date and in case of no-show 50 % of the fee is non-refundable (substitutes are accepted anytime).

16/12/19

Organisational Information

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

Chairmen Prof. Nando Kaminski,
University of Bremen (DE)

Prof. Wataru Saito,
Kyushu University (JP)

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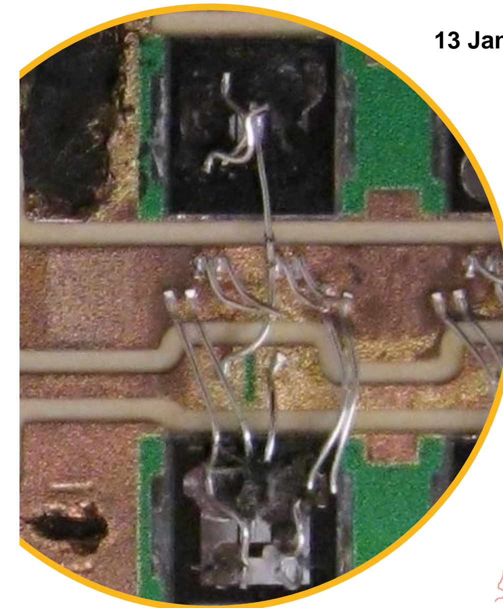
Venue Holiday Inn Munich – City Centre
Hochstrasse 3
81669 Munich | Germany

European Center for
Power Electronics e.V.

ECPE Workshop

Power Semiconductor Robustness- What Kills Power Devices?

13 January (afternoon) –
14 January 2020
Munich, Germany



ECPE Workshop

Power Semiconductor Robustness - What kills Power Devices?

13 (afternoon) – 14 January 2020
Munich, Germany

In their early days, power semiconductor devices were quite limited in their safe operating area (SOA) and any over-stress led to immediate destruction. In the meantime, power devices have become much more robust or rugged and can withstand significant overstress. However, optimising one parameter might imply deteriorating another parameter and the most life-threatening conditions might change from generation to generation, i.e. have to be reassessed always anew. The situation gets even more complex with wide band-gap materials and their most critical stresses are different ones, like short circuit or avalanche breakdown. On top, robustness goes beyond a proper device design and includes thermal properties, smart control as well as the impact of auxiliary components and sometimes even the interaction of all the above.
The invited speakers are all international experts in their fields and cover a wide range of devices from megawatt power level to low voltage Si devices and from wide band-gap to packaging aspects. The speakers will provide an update on the robustness of the respective devices and will identify as well as describe the most critical failure mechanisms. After each talk, there will be time to discuss the results.
The workshop is aiming at experts, who want to get the latest results, but also at starters in the field or experienced practitioners, who want to get an overview. All this will be provided a little more than in a day.

The workshop is chaired by:

Prof. Nando Kaminski, University of Bremen (DE)
Prof. Wataru Saito, Kyushu University (JP)
Honorary Chairman: Prof. Dieter Silber (DE)

All presentations and discussions will be in English.

Programme

Monday, 13 January 2020 (afternoon)

16:00 Start of Registration & Welcome Coffee

16:30 Welcome and Opening
Leo Lorenz, Thomas Harder, ECPE (DE)

16:45 Introduction
Wataru Saito, Kyushu University (JP),
Nando Kaminski, University of Bremen (DE)

Packaging

17:00 Technology on Self-excited Oscillation Suppressing and Sintered Cu for High Power Density Modules
Tomoyuki Miyoshi, Hitachi (JP)

17:30 Packaging Technology for Wide Bandgap Devices: Towards a High Power Density Module
Bassem Mouawad, University of Nottingham (GB)

18:00 Power Cycling of Packages with SiC Devices
Josef Lutz, Technical University Chemnitz (DE)

18:30 End of 1st Workshop Day

19:30 Dinner at „Paulaner am Nockherberg“, Hochstrasse 77
81541 Munich | Germany

Tuesday, 14 January 2020

Low Voltage Devices

08:30 Reliable Design for Trench Field-Plate Power MOSFET
Kenya Kobayashi, Toshiba Electronic Devices & Storage (JP)

09:00 Integration of High Performance Robust Lateral DMOS Devices in Advanced Smart Power BCD Platform
Riccardo Depetro, ST Microelectronics (IT)

09:30 Robustness Evaluation Using Simulations
Amit Paul, ON Semiconductor (US)

10:00 Coffee Break

High Voltage Devices

10:30 HVIGBT and Diode with High Robustness
Shigeto Honda, Mitsubishi Electric (JP)

11:00 To Block, or Not to Block, That is the Question: Towards Reliable Power Semiconductors
Chiara Corvasce, Gontran Pâques, ABB Power Grid, (CH)
Munaf Rahimo, Mtal (CH)

11:30 Analysis and Characterization Strategies for Improving the Robustness and Reliability of Semiconductor Power Devices
Giovanni Breglio, University of Naples Federico II (IT)

12:00 Lunch

Programme

Tuesday, 14 January 2020

Silicon Carbide

13:00 SiC Power MOSFET Reliability
Sei-Hyung Ryu, Wolfspeed – a Cree Company (US)

13:30 Bipolar Forward Degradation Phenomena and Countermeasures in SiC Power Device
Yoshiyuki Yonezawa, AIST (JP)

14:00 Performance and Fabrication of SiC Super Junction MOSFETs
Kung-Yen Lee, National Taiwan University (TW)

14:30 Coffee Break

Gallium Nitride

15:00 Surge Current Capability and Dynamic On-resistance of Vertical GaN Power Diodes
Shaowen Han, Zhejiang University (CN)

15:30 The Robustness of GaN-Based Hybrid Drain Embedded Gate Injection Transistor
Hideyuki Okita, Panasonic (JP)

16:00 GaN Power FinFETs
Tomas Palacios, Massachusetts Inst. of Technology (US)

16:30 Wrap-up

17:00 End of Workshop