Organisational Information

Sign up at: www.ecpe.org/events

Registration Deadline:

15 November 2022

Participation Fee:

€ 660,– *	for industry
€ 490,– *	for universities/institutes
€ 165,– *	for students/PhD student (limited spaces; copy of students ID required)

* plus VAT

- The on site participation includes dinner, lunches, coffee/soft drinks and digital proceedings. The reduced (PhD) students fee includes all except for dinner (can be booked for an extra fee of € 50,-*)
- The online participation includes remote access via the meeting software Webex and digital proceedings.
- Digital proceedings will be provided by download link latest one day before start of the event. A printed 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 email.
- Three participants from each ECPE member company free of charge. Allocation in sequence of registration.
- 10% discount on university/institute fee 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 upon to 2 weeks prior to the event. After this date 50 % of the fee is non-refundable (replacement is possible).

11/11/22

Organisational Information

Organiser	ECPE e.V. 90443 Nuremberg, Germany www.ecpe.org
Technical Contact	Gudrun Feix
Organisation	Marietta Di Dio, ECPE e.V. +49 911 81 02 88 – 13 marietta.didio@ecpe.org

Technical Chair

Tina Thomas
Fraunhofer IZM, Germany

Dr. Chunlei Liu
Huawei, Germany

Venue

Helmut-List-Halle
Waagner-Biro-Straße 98a
8020 Graz

Austria

www.helmut-list-halle.com

or online via Webex

Source: HLH GmbH, Graz

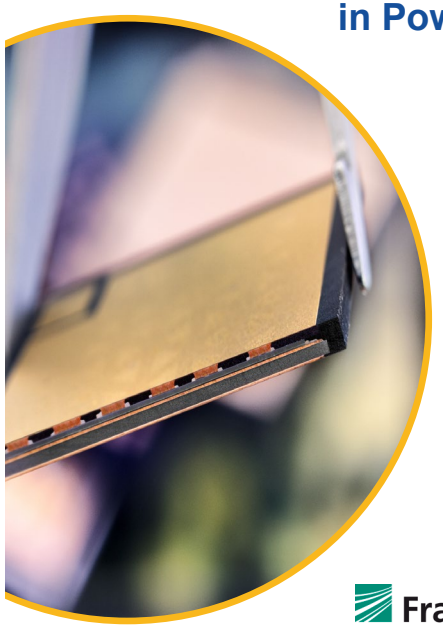
Source frontpage: Fraunhofer IZM

European Center for Power Electronics e.V.

Hybrid Event

ECPE Workshop

Embedding and Advanced Integration Technologies in Power Electronics



23 - 24 November 2022
Graz, Austria / hybrid

in cooperation with

Fraunhofer IZM

HUAWEI

ECPE Hybrid Workshop

Embedding and Advanced Integration Technologies in Power Electronics

23 - 24 November 2022
Graz, Austria / hybrid

Power electronics packaging is a multidisciplinary field. On the one side it enables full performance of power semiconductors, and on the other side it determines the performance of a power converter. Chip embedding technologies mainly used in microelectronics industry have been also investigated for power electronics in recent years. Many advanced power semiconductor packaging and integration concepts have been studied and demonstrated. Some technologies are already adapted by the industry and applied in commercially available products.

The most widely spread technology here is embedding bare dies in FR4 materials and redistribute the contacts on the outer layers. But FR4 is not the only material which can be used, and semiconductors are not the only parts which can be embedded. In this workshop, we will also cast light on other materials, technologies, and components, based on molding and ceramics embedding.

As embedding and advanced integration technologies offer a lot of possibilities to manufacture power modules with a higher integration level than before at a reasonable price, more different materials are brought together than in conventional power electronics packaging. Simulation approaches to couple different steps in package development and taking into account the heterogenous materials are introduced in this workshop. Since power embedding has emerged from low voltage to higher voltage applications, the reliability topics will also be covered.

The workshop is chaired by:

Tina Thomas, Fraunhofer IZM (D)
Dr. Chunlei Liu, Huawei (D)

All presentations and discussions will be in English.

Programme

Wednesday, 23 November 2022

09:30 Registration *Webex started*

10:00 Welcome, Opening and Introduction into the Topic
Gudrun Feix, Tina Thomas, Chunlei Liu

Introduction

10:10 Strategies for Realizing High-voltage Power Modules with Embedded SiC Semiconductors
Lars Böttcher, Fraunhofer IZM (DE)

10:40 From Device to System, can we Design Power Converter without Physical Boundary?
Teng Long, University of Cambridge (UK)

Materials

11:10 Molding Materials for Power Embedded & Power Module Applications
Akihiro Nozaki, Showa Denko (JP)

11:40 Evolution of the sintering technology in Power Electronics
Jacek Rudzki, Danfoss Silicon Power (DE)

12:10 Which Metallized Ceramic Substrates are Best Suited for Chip Embedding Solutions?
Olivier Mathieu, Rogers (DE)

12:40 Lunch break

Embedding Solutions

13:40 Development of a Molded Prepackage
Tina Thomas, Fraunhofer IZM (DE)

14:10 High Voltage Isolation in PCB Embedded Power Electronics
Artur Scheinemann, Schweizer Electronic (DE)

14:40 Ceramic Embedding as Packaging Solution for Future WBG Power Devices
Linh Bach, Fraunhofer IISB (DE)

15:10 Break

15:45 Embedding of SiC Semiconductor Devices in Full Ceramic LTCC Pre-packages for PE Applications
Steffen Ziesche, Fraunhofer IKTS (DE)

Modelling and Simulation

16:15 Thermomechanical Optimization of Power Semiconductor Prepackages
Niko Pavliček, Hitachi Energy (CH)

16:45 Modelling and Simulation of PCB Embedded Power Electronic Layouts
Cyril Buttay, Laboratoire Ampère, CNRS (FR)

17:15 Improvement of Efficiency for Power Modules with Embedded Component
Hannes Stahr, AT & S (A)

17:45 End of 1st Day

19:30 Dinner
Das Weitzer, Grieskai 12 – 16, 8020 Graz

Programme

Thursday, 24 November 2022

09:00 *Webex started*

Reliability

09:30 Warpage Control and Simulation Along the Process Chain
Olaf Wittler, Ole Hölck, Fraunhofer IZM (DE)

10:00 Reliability of 1.2 kV PCB Embedded Power Devices under H3TRB Test Conditions
Till Huesgen, HS Kempten (DE)

10:30 Lifetime of Embedded Power Electronics
Matthias Hammerl, Vitesco Technologies (DE)

11:00 Break

11:30 AQG 324 Based Qualification of Embedded Power Electronics Converter Units
Mathias Gebhardt, SET (DE)

Integration solutions

12:00 US Wire- and Laserbonding Solutions for the Next Generation of Power Electronics
Hans-Georg von Ribbeck, F & K Delvotec Bondtechnik (DE)

12:30 Laser Welding of Copper Terminals on Ceramic Substrates
Kurt-Georg Besendörfer, Semikron (DE)

13:00 Lunch Break

Cooling

14:00 Highest Power Density for Future Generation of SiC Power Modules
Henning Ströbel-Maier, Danfoss Silicon Power (DE)

14:30 Integrated SiC Power Module on Ceramic Cooler
Maximilian Küspert, CeramTec (DE)

15:00 Potential for 3D-Printed Coolers in the Electrical Drive Train
Ake Ewald, ZF (DE) Thomas Ebert, IQ Evolution (DE)

15:30 Sum-up and Final Discussion

16:00 End of Workshop