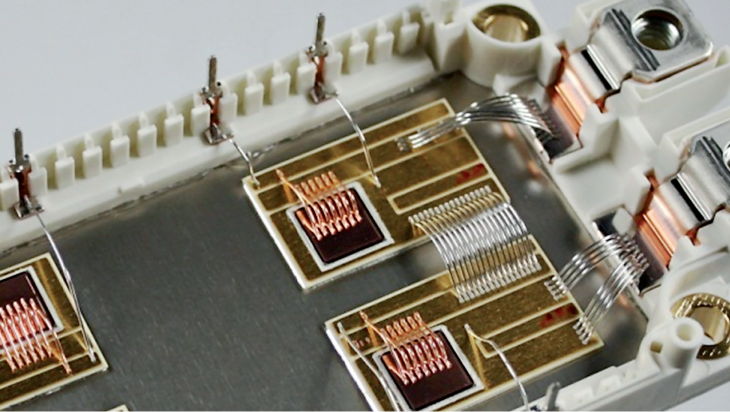


Power Module with Al- and Cu-Wirebonds

WORKSHOP PROFILE

Power electronics are employed in more and more fields of application and are becoming increasingly complex and sophisticated. With the growing importance of power generation from renewables and the ongoing electrification of vehicles, the environment in which they are used becomes harsher. This creates new challenges regarding reliability and thus availability. Similar to other areas of electronics, power electronics experience an ongoing trend towards miniaturization. New packaging and interconnection technologies are introduced continuously and impact reliability in terms of cause, time and location of failures within the system.

This workshop explains the most important process factors regarding reliability in interconnection and packaging. Main degradation mechanisms are presented together with options to increase robustness and lifetime. Also, a focus is set on mission profiles, test planning, (accelerated) reliability testing and lifetime modelling. In five joint departments Fraunhofer IZM scientists are conducting research in all fields of electronic packaging, covering everything from material selection, simulation, design and interconnection technologies at wafer, chip and board-level to the environmental impact of microelectronics. This unique and broad approach makes possible extremely reliable solutions.

How to find us

REGISTRATION

Please register by September the 4th, 2015 at the latest by our web tool www.mcc-pr.de/formulare/power_reliability/form

Contact: Georg Weigelt | Phone: +49 30 46403-279

Fax: -650 | georg.weigelt@izm.fraunhofer.de

PARTICIPATION FEE

495,00 € per person incl. handout, lunch and evening event

The fees are VAT-exempt according to § 4 No. 22 UStG.

CANCELLATION

The registration of participation is binding. Cancellation until 14 days before the event is free of charge. If you have to cancel up to 7 days before the start of the event the charge is 50 €. In all other cases, the financial responsibilities of the participants remain fully effective. Participation is not guaranteed until full payment of the registration fee is received.

VENUE

Fraunhofer-Forum Berlin im SpreePalais

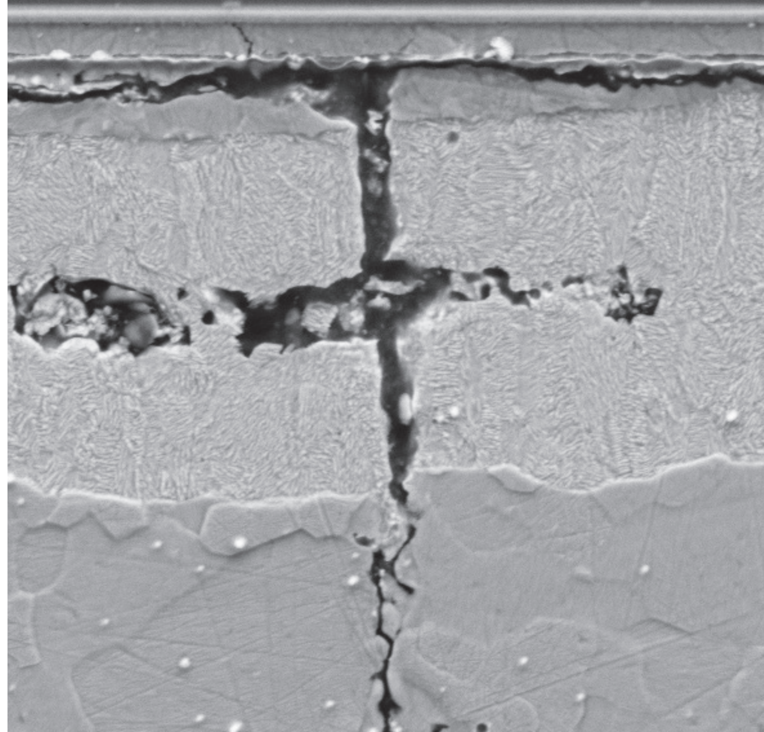
Anna-Louisa-Karsch-Str. 2, 10178 Berlin, Germany

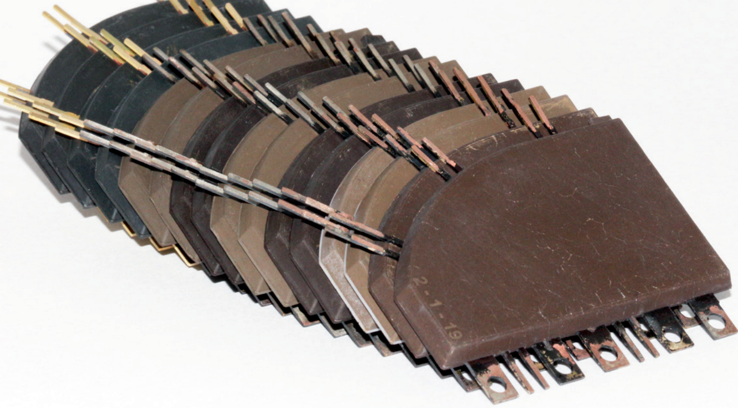
WHO SHOULD ATTEND?

This workshop is aimed preferably at design engineers, electronic packaging specialists, manufacturing engineers, quality and production personnel, project engineers, supervisors, and anyone concerned with the reliability of power electronics.

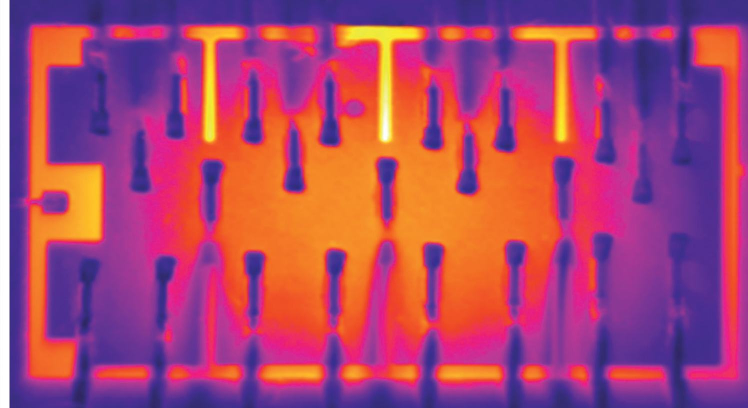
WORKSHOP: BERLIN, SEPTEMBER 17TH, 2015

RELIABILITY IN POWER ELECTRONIC PACKAGING

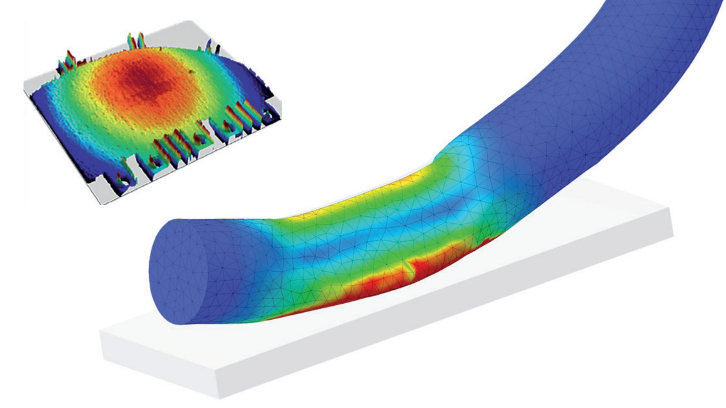




Transfer molded power modules after thermal ageing



IR-Thermography image of power chip during active thermal cycling



Visualisation of deformations in wire bond and module

AGENDA

September 16th, 2015

19.00 **Evening-before event**

September 17th, 2015

08.30 **Registration**

09.00 **Welcome**
Prof. Klaus-Dieter Lang, Head of Fraunhofer IZM

09.10 **IZM Trends in Power Electroncis**
Prof. Eckart Hoene, Fraunhofer IZM

09.50 **Wire Bonding in Power Electronics**
Materials, Processes and Reliability
Christian Erhardt, Fraunhofer IZM

10.30 **Coffee break**

10.50 **Die Attach Technologies**
Soldering, TLPS/TPLB, Ag Sintering, Reliability
Dr. Matthias Hutter, Fraunhofer IZM

11.30 **Accelerated Life Testing**
Mission Profiles, Test Planning, Lifetime Models
Felix Wüst, Fraunhofer IZM

12.10 **Lunch**

13.10 **Design for Reliability**
Material Properties and Characterization, FE Simulation, Physics of Failure
Arian Grams, Fraunhofer IZM

13.50 **Power Electronics Encapsulation**
Issues in Potting, Molding, Embedding
Tina Thomas, Fraunhofer IZM

14.30 **Corrosion as failure mechanism**
Basics, Electrochemical reactions and Failures issues
Dr. Stefan Wagner, Fraunhofer IZM

15.10 **Coffee break**

15.30 **Polymer Aging**
Shrinking, Moisture Sorption and Chemical Effects
Marius van Dijk, Fraunhofer IZM

16.10 **Thermal Interface Reliability**
Material Selection, Failure Mechanisms, Test Methods
Torsten Nowak, Fraunhofer IZM

16.50 **Summary and Questions**
Dr. Olaf Wittler, Fraunhofer IZM

17.00 **End of workshop**

Cover: SEM of a crack formation in a power module (using TLPB)