### Organized by

The conference is organized by ETG, the Power Engineering Society within VDE, and by ECPE European Center for Power Electronics.

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VDE is the Association for Electrical, Electronic & Information Technologies is one of the largest technical and scientific associations in Europe with more than 32,000 members. [www.vde.com](http://www.vde.com)

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ECPE is the Industrial and Research Network for Power Electronics in Europe was founded in 2003 by leading power electronics industries in order to promote research, education and public relations in this field.

### Technical Co-Sponsors

**IEEE** Power Electronics Society (PELS) and

**ZVEI** – the German Electrical and Electronic Manufacturers’ Association.
Chairmen's Welcome Message

We are really pleased to welcome you to the 8th International Conference on Integrated Power Electronics Systems (CIPS). This important event is held to be a technical and scientific forum for engineers and researchers engaged in all the aspects of hybrid integration and reliability of power electronics systems. We are truly delighted that you are a part of this event.

CIPS 2014 is organized by ETG, the Power Engineering Society within VDE and co-organized by ECPE, the European Center for Power Electronics.

The program for this year's conference includes 14 sessions (13 oral and one dialog session) with the presentation of 80 technical papers: Three Keynote papers, 9 Invited papers, and 68 regular papers (29 of which are presented in the dialogue/poster session).

21 of the papers come from industry, 20 are authored by industry and academia, and 39 come from research institutes.

The three keynote and 9 invited papers, authored by qualified experts coming from worldwide important industrial and academic organizations, are presenting the latest developments in various aspects of Integrated Power Electronics Systems and their reliability with particular attention to the latest results achieved in the main research centers in America, Asia, and Europe.

The Technical Programme Committee considers the dialogue Session as a very important part of the conference and a Best Poster Award will be presented in the closing session on Thursday, February 27, 2014. In addition ECPE is sponsoring the Young Engineer Award for the Best Paper which will be granted for.

It is important to mention that in contrast to the other mainstream power electronics conferences, reliability, wide band gap devices and packaging (including requirements concerning parasitics), interfaces, substrates, and interconnects are in the focus of CIPS 2014.

All papers in these proceedings have been reviewed in a two-stage review process:

› Based on the abstract, the Technical Program Committee decided upon the acceptance of the contributions for the preliminary conference program

› The full papers were reviewed by at least three peers who made suggestions for improving the final papers.

In addition to be printed in the CIPS proceedings by the VDE Verlag, the papers will be uploaded to the IEEE Xplore digital library and the VDE Verlag library. The papers can be applied to the IEEE Transactions on Power Electronics as well.

We hope that you are able to use this conference to advance your professional career technically, socially, and culturally. This is truly a unique opportunity and on behalf of everyone, we express our thanks to all the members of CIPS 2014 organizing committee, especially including Mr. T. Raphael and Ms. H. Altintas, all VDE, and Mr. T. Harder, Ms. I. Bollens, and Ms. S. Haberl from ECPE, for all that they have done to make this conference such a great opportunity.

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10:30 Welcome and Opening

Eckhard Wolfgang (ECPE e.V., Germany),
Dieter Silber (Bremen University, Germany)

Session 1: Reliability (1)

Chairs: Eckhard Wolfgang (ECPE e.V., Germany),
Martin März (Fraunhofer IISB, Germany)

10:50 Keynote: What are the big challenges in PE
Johann. W. Kolar (ETH Zurich, Switzerland)

11:30 Packaging and Reliability of Power Modules
(Invited)
Josef Lutz (Chemnitz University of Technology, Germany)

12:00 High-throughput DBC-assembled IGBT screening for power module
Masanori Tsukuda (The International Centre for the Study of East Asian Development & Kyushu Institute of Technology, Japan); Seiichi Okoda (Coper Electronics co. Ltd, Japan); Noda Ryuzo (C. D. N. Corporation, Japan); Katsuji Tashiro (HOH KOH SYA Co., Ltd., Japan); Ichiro Omura (Kyushu Institute of Technology, Japan)

12:20 Simultaneous Testing of Wirebond and Solder Fatigue in IGBT Modules
Gernot J Riedel, Maria Valov (ABB Corporate Research, Switzerland)

12:40 - 14:00 Lunch Break

Session 2: Reliability (2)

Chairs: Christian Conrath (Schneider-Electric, STIE & Schneider Electric, France), Josef Lutz (Chemnitz University of Technology, Germany)

14:00 Power cycling capability of Modules with SiC-Diodes
Christian Herold (Chemnitz University of Technology, Germany); Marc Schäfer, Frank Sauerland (Infineon AG, Germany); Tilo Poller, Josef Lutz (Chemnitz University of Technology, Germany); Oliver Schilling (Infineon AG, Germany)

14:20 A real time measurement of junction temperature variation in high power IGBT modules for wind power converter application
Pramod Ghimire, Angel Ruiz de Vega, Kristian Bonderup Pedersen (Aalborg University, Denmark); Bjørn Rannestad (kk-electronics a/s, Denmark); Stig Munk-Nielsen (Aalborg University, Denmark); Paul Bach Thøgersen (kk-elektronics a/s, Denmark)

14:40 Thermal path integrity monitoring for IGBT Power Electronics Modules
Amir Eleffendi, C. Mark Johnson (University of Nottingham, United Kingdom)

15:00 Reliability assessment of molded Smart Power Modules
Tina Thomas (TU Berlin, Germany); Karl-Friedrich Becker, Tanja Braun, Joerg Bauer (Fraunhofer IZM, Germany); Klaus-Dieter Lang (TU Berlin, Germany); Olaf Wittler, Rolf Aschenbrenner (Fraunhofer IZM, Germany)

15:20 Microstructural study of the fatigue mechanism of aluminum cladded copper wires
Falk Naumann, Benjamin Maerz, Jan Schischka, Matthias Petzold (Fraunhofer IWM, Germany)

15:40 - 16:10 Coffee Break
Session 3: Reliability (3)
Chairs: Stefan Linder (ABB, Switzerland), Norbert Seliger (FH Rosenheim, Germany)

16:10 Aging of new Interconnect-Technologies of Power Modules during Power-Cycling
Nicolas Heuck, Karsten Guth, Alexander Ciliox, Markus Thoben, Niels Oeschler, Sandra Krasel, Roland Speckels, Lars Böwer (Infineon Technologies AG, Germany)

16:30 High resolution failure analysis of silver-sintered contact interfaces for power electronics
Bianca Böttge, Sandy Klengel, Matthias Petzold (Fraunhofer IWM, Germany)

16:50 An x-ray computed tomography study of crack development during thermal cycling of Al wire bonds
Pearl A. Agyakwa, Li Yang, Martin Corfield, C. Mark Johnson (University of Nottingham, United Kingdom)

17:10 Probabilistic model based analysis of electrolytic capacitor ageing and failures in a single-phase power factor correction circuit
Norbert Seliger (University of Applied Sciences Rosenheim, Germany)

Session 4: Reliability (4)
Chairs: Dushan Boroyevich (Virginia Tech, USA), Uwe Scheuermann (Semikron, Germany)

17:40 Transient hygro-thermal-response of power modules in inverters-mission profiling for climate and power loading (Invited)
Reinhold Bayerer, Matthias Lassmann, Sebastian Kremp (Infineon Technologies AG, Germany)

18:10 Temperature Humidity Bias (THB) Testing on IGBT Modules at High Bias Levels
Christian Zorn (University of Bremen & IALB, Germany); Nando Kaminski (University of Bremen, Germany)

18:30 Keynote: Simulation and Test Vibration – Nonlinear Dynamic Effects in Vibration Durability of Electronic Systems
Abhijit Dasgupta, Cholmin Choi (University of Maryland, USA); Ed Habtour (US Army Research Lab, USA)
Exhibition Area

Dialog Session: Inverters, Converters, Drivers
Chairs: Andreas Lindemann (University of Magdeburg, Germany), C. Mark Johnson (University of Nottingham, United Kingdom)

P01 Development of a New 1000V/1MVA IGBT 3L-NPC-VSC PEBB Type 2 with Independent Modulation, DC-Link Balancing and Short-Circuit Protection
Ingo Staudt (SEMIKRON Elektronik GmbH & Co. KG, Germany); Michael Sprenger (Technische Universität Dresden, Germany)

P02 Switching-Frequency Limitations of a Three-Phase PWM Inverter using Si-MOSFETs and SiC-SBDs
Keiji Wada, Kent Taguri (Tokyo Metropolitan University, Japan)

P03 A proposal of embedded SoC power supply compatible with a digital block design flow
Thomas Souvignet (STMicroelectronics, France); Bruno Allard (INSA Lyon, France); Severin Trochut, Frederic Hasbani (STMicroelectronics, France)

P04 Ultra-low Power Autonomous Power Management System with Effective Impedance Matching for RF Energy Harvesting
Salah-Eddine Adami, Christian Vollaire, Bruno Allard (Ampere Lab, France); Francois Costa (SATIE, France); Walid Haboubi, Laurent Cirio (Marne-la-Vallée University, France)

P05 GaN Power Semiconductors for PV Inverter Applications – Opportunities and Risks
Thorsten Stubbe (SMA Solar Technology AG, Germany); Regine Mallwitz (Fulda University of Applied Sciences, Germany); Mike Kunze (MicroGaN GmbH, Germany); Wolfgang Bergner, Oliver Häberlen, Gianmauro Pozzovivo (Infineon Technology AG, Austria); Roland Rupp (Infineon Technology AG, Germany)

Tuesday, February 25, 2014 19:30 - 22:00

P06 Design of Photovoltaic Microinverter for Off-Grid and Grid-Parallel Applications
Christian Felgemacher, Philipp Jäger, Ali Kobeissi, Jonas Pfeiffer, Dennis Wiegand, Wolfram Kruschel, Benjamin Dombert, Samuel Araújo, Peter Zacharias (University of Kassel, Germany)

P07 An Improved Method of Controlling IGBT Modules Using an Optimized Gate Current Waveform
Marius Cenusa, Gabriel Cretu, Martin Pfost (Reutlingen University, Germany)

P08 Impact of the control on the size of the output capacitor in the integration of Buck converters
Jorge Cortés, Vladimir Svikovic, Pedro Alou, Jesús A. Oliver, José A. Cobos (Universidad Politécnica de Madrid, Spain)

Dialog Session: Packaging
Chairs: Jelena Popovic-Gerber (Delft University of Technology, The Netherlands), Jürgen Wilde (University of Freiburg, Germany)

P09 Improving the bond strength of sinter joints by modifying the DBC without noble finishes and modified silver sinter pastes
Alexander Roth (KCC Corporation, Germany); Wolfgang Schmitt (Heraeus Materials Technology GmbH & Co. KG, Germany)

P10 Power Semiconductors Packaging in PV Inverters up to 30 kW power, a difficult choice
Juliane Hinze (University of Kassel, Germany); Jens Friebe (SMA Solar Technology AG, Germany); Peter Zacharias, Samuel Araújo (Universität Kassel, Germany); Torsten Leifert (SMA Solar Technology AG, Germany)

P11 Data-driven Modeling of the Ultrasonic Softening Effect for Robust Copper Wire Bonding
Andreas Unger, Walter Sextro, Simon Althoff, Tobias Meyer (University of Paderborn, Germany); Michael Brökelmann (Hesse GmbH, Germany); Felix Reinhart, Klaus Neumann (Bielefeld University, Germany); Karsten Guth, Daniel Bolowski (Infineon Technologies AG, Germany)
P12 Influence of nickel-phosphorus surface roughness on both wettability and pores formation in solder joints for high power electronic applications
Laurent Vivet, Ky Lim Tan (Valeo, France); Jean Michel Morelle (VALEO & GEEDS, France); A.-L. Joudrier, A. Etcheberry (Institut Lavoisier de Versailles, France); L. Chalumeau (Egide, France)

P13 Challenges on Diagnostics of Power Electronics Modules and Assemblies
Hans-Jürgen Albrecht, N. Busche, J. Strogies, K. Wilke, M. Schuster, C. Cassigniol (Siemens AG, Germany)

P14 Surface Profiles of Printed Ag Nanoparticle Paste and Their Implication on the Quality of Sintered Joints
Yun Wang, Jianfeng Li, Pearl Agyakwa, C Mark Johnson, Shuguang Li (University of Nottingham, United Kingdom)

P15 Developments for Copper-Graphite Composite Thermal Cores for PCBs for High-Reliability RF Systems
David L. Saums (DS&A LLC, USA); Robert A. Hay (MMCC LLC, USA)

P16 Robustness study of solder joints of different compositions by using Stochastic Finite Element Modeling
Younes Aoues, Abderahman Makhoulfi (INSA Rouen-LOFIMS, France); Philippe Pougnet (Reliability Expert Valeo, France); Abdelkhalak El-Hami (INSA Rouen-LOFIMS, France)

Dialog Session: Reliability, Design Tools
Chairs: Giovanni Breglio (Università di Napoli Federico II, Italy), Nando Kaminski (University of Bremen, Germany)

P17 Internal degradation monitoring of power devices during power cycling test
Akihiko Watanabe (Kyushu Institute of Technology, Japan); Masanori Tsukuda (The International Centre for the Study of East Asian Development & Kyushu Institute of Technology, Japan); Ichiro Omura (Kyushu Institute of Technology, Japan)

P18 Characterization of different wire bonding materials during passive thermal test
Fernando Cosiansi (Politecnico di Turin, Italy); Marcello Turnaturi, Emilio Mattuzzo (Vishay Semiconductor Italiana, Italy); Steffen Koetter, Sven Thomas ( Heraeus, Germany)

P19 Manufacturability and Reliability Assessment of Power Sandwich Technology
Ivan Josifovic (Delft University of Technology, The Netherlands); Till Huesgen, Elena Mengotti (ABB Corporate Research, Switzerland); Jelena Popovic-Gerber, Braham Ferreira (Delft University of Technology, The Netherlands); Uwe Drofenik (ABB Corporate Research, Switzerland)

P20 Reliability Prediction Approach of DC-DC Converter with Electrical Stress Analysis
Jemin Kim, Sungsoon Choi (Korea Electronics Technology Institute, South Korea); Kwanhun Lee (Kwangwoon University, South Korea)

P21 A Multi-Disciplinary Virtual Prototyping Design Tool for Power Electronics
Paul L Evans, Alberto Castellazzi, C. Mark Johnson (University of Nottingham, United Kingdom)

Dialog Session: Wide Band Gap and Passives Packaging
Chairs: Martin Schneider-Ramelow (Fraunhofer IZM, Germany), Thomas Harder (ECPE e.V., Germany)

P22 Evolution of Electrical Performance in New Generation of SiC MOSFET for High Temperature Applications
Remy Ouaida (Université Lyon1 & Thales TMI, France); Cyril Calvez, Anne-Sophie Podlejski, Pierre Brosselard (Laboratoire Ampére UMR CNRS 5005, France)

P23 Technology, industry and market trends in WBG power module packaging
Philippe Roussel, Jérôme Azemar (Yole Développement, France)
P24 Novel Layout and Packaging for Lateral, Low-Resistance GaN-on-Si Power Transistors
Richard Reiner, Patrick Waltereit, Fouad Benkhelifa, Herbert Walcher, Rüdiger Quay, Michael Schlechtweg, Oliver Ambacher (Fraunhofer IAF, Germany)

P25 High Temperature Discrete Integrated Coreless Signal Insulator
Dominique Bergogne (Ampere Lab, France); Khalil El Falahi (X-Rel Semiconductors, France); Hilal Ezzeddine (ST-Microelectronics, France); Christian Martin, Bruno Allard (University of Lyon, France); Gonzalo Picun (X-Rel Semiconductors, France); Cédric Pintout (ST-Microelectronics, France)

P26 Investigation on AlCu-clad base plates and a new by-pass cooler concept for pin fin power modules
Andre Uhlemann, Erwin Hymon, Thorsten Fath (Infineon Technologies AG, Germany)

P27 Laminate with Thermal-Power Insert for Efficient Front-Side Heat Removal and Power Delivery
Dominic Gschwend, Timo Tick (IBM Research Zurich, Switzerland); Stefano Oggioni (IBM ISC Eng., Italy); Stephan Paredes (IBM Research Zurich, Switzerland); Keiji Matsumoto (IBM-Japan, Japan); Manish K. Tiwari (ETH Zurich, Switzerland); Dimos Poulikakos (ETH Zurich, Switzerland); Thomas Brunschwiler (IBM Research Zurich, Switzerland)

P28 A Simple Method to Evaluate Substrate Layout for Power Modules
Nan Zhu, Min Chen, Dehong Xu (Zhejiang University, P.R. China)

P29 Planar, double-layer magnetic inductors for low power, high frequency DC-DC converters
Elias Haddad, Christian Martin, Charles Joubert (University Lyon 1, France); Bruno Allard, Cyril Buttay, Tony Abi Tannous, Pascal Bevilacqua (INSA Lyon, France)
Hall Kaiser Maximilian

Session 6: Interfaces and Substrates

Chairs: Martin Rittner (Robert Bosch GmbH, Germany), Olaf Wittler (Fraunhofer IZM, Germany)

David Saums (DS&A LLC, USA)

09:20 High Temperature Compatibility of Interface between Al Ribbon and Au finished DBC Substrate
Semin Park, Shijo Nagao, Katsuaki Suganuma (Osaka University, Japan)

09:40 Improved thermal cycling reliability of ZTA DBC substrates by manipulating metallization properties
Junhee Park (KCC Corp., Korea); Alexander Roth (KCC Europe Gmbh, Germany)

10:00 3D Packaging for vertical power devices
Nicolas Rouger (Univ. Grenoble Alpes, G2Elab CNRS & Grenoble electrical engineering lab, France);
Julie Widiez, Lamine Benaisa, Bruno Imbert, Paul Gondcharton (CEA Leti, France);
Jean-Christophe Crebier (Grenoble Université, France)

10:20 - 10:50 Coffee Break

Hall Kaiser Karl IV.

Session 7: Inverters, Converters, Drivers

Chair: Rainer Marquardt (Universität der Bundeswehr München, Germany), Kai Kriegel (Siemens AG, Germany)

10:50 Scalable high frequency converters for drives based on switching cells
Martin Schulz (Universität der Bundeswehr & ITIS GmbH - Marquardt, Germany); Florian Kapaun, Rainer Marquardt (Universität der Bundeswehr München, Germany)

11:10 Gate driver with adjustable gate current for flexible switching speed control to improve switching losses and EMI
Julia Bauch, Andreas Lindemann (Otto-von-Guericke-University Magdeburg, Germany);
Andre Arens, Peter Kanschat (Infineon Technologies AG, Germany)

11:30 Integrated gate driver circuits with an ultra-compact design and high level of galvanic isolation for power transistors
Duc To (Grenoble Electrical Engineering Laboratory, France);
Nicolas Rouger (N/A & Grenoble electrical engineering lab, France);
Jean-Daniel Arnould (IMEP-LAHC Laboratory, France);
Yves Lembeye (Grenoble Electrical Engineering Laboratory, France)

11:50 Controlling of Power Electronic Modules by a 2-Wire-Connection with Combined Signal and Power Transfer
Stefan Endres (LEB Uni Erlangen, Germany);
Stefan Zeltner (Fraunhofer IISB, Germany)

12:30 - 14:00 Lunch Break
Hall Kaiser Maximilian

**Session 8: Interconnects**

*Chairs: Bruno Allard (INSA Lyon, France), Jürgen Schuderer (ABB, Switzerland)*

10:50  **Foil based transient liquid phase bonding as a die-attachment method for high temperature devices**

Adeel Ahmad Bajwa, Yangyang Qin, Jürgen Wilde (University of Freiburg, Germany)

11:10  **Partial transient liquid phase bonding for high-temperature power electronics using Sn/Zn/Sn sandwich structure solder**

Sungwon Park, Shijo Nagao, Tohru Sugahara (Osaka University, Japan); Yoshitaka Katoh, Hiroshi Ishino, Kazuhiko Sugiura (Denso Corporation, Japan); Katsuaki Suganuma (Osaka University, Japan)

11:30  **Application of Silver Nano Particle to Pressureless Bonding onto a Copper Surface- Consideration of Substitute Material for Lead Solder**

Satoru Kurita, Hiromasa Miyoshi, Satoru Kurita (DOWA Electronics Materials, Japan)

11:50  **Reliability of Sn based LT-TLPS Joints for High Temperature Electronic Systems**

Hannes Greve (University of Maryland & CALCE - Center for Advanced Life Cycle Engineering, USA); Patrick McCluskey (University of Maryland, USA)

12:10  **Is Conductive Adhesive Bonding Suited for the Die-Attachment of Power Devices?**

Jürgen Wilde, Johanna Ocklenburg (University of Freiburg, Germany); Eugen Rastjagaev (Infineon Technologies AG, Austria)

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Hall Kaiser Karl IV.

**Session 9: Overview: EMI: Renewables, Sensors**

*Chairs: Andreas Lindemann (University of Magdeburg, Germany), Jean-Luc Schanen (Grenoble Electrical Engineering Laboratory, France)*

14:00  **Conducted EMI and Systems Integration (Invited)**

Dushan Boroyevich, Xuning Zhang (CPES, USA); Hemant Bishinoi (ABB, Switzerland); Rolando Burgos (CPES, USA); Paolo Mattavelli (DTG, Italy); Fred Wang (CURENT, USA)


Frede Blaabjerg, Ke Ma, Yongheng Yang (Aalborg University, Denmark)

15:00  **New applications in power electronics for highly integrated high-speed magneto-resistive current sensors (Invited)**

Simon Scherner, Rolf Slatter (Sensitec GmbH, Germany)

15:30  **System Integration of GaN Converters – Paradigm Shift, Challenges and Opportunities**

Jelena Popovic, Braham Ferreira (Delft University of Technology, The Netherlands); Jacobus Daan van Wyk (University of Johannesburg, South Africa)
### Hall Kaiser Karl IV.

#### Session 10: Lifetime and Robustness

**Chairs:** Frede Blaabjerg (Aalborg University, Denmark), Giovanni Busatto (University of Cassino, Italy)

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tr>
<td>16:20</td>
<td>Efficient online-algorithm for the temperature-cycle recording of an IGBT power module in a hybrid car during inverter operation</td>
<td>Marco Denk, Mark Bakran (University of Bayreuth, Germany)</td>
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<tr>
<td>16:40</td>
<td>Analyzing the state of health of diode layers by using structure functions</td>
<td>Martin Richter (Chemnitz University of Technology &amp; Robert Bosch GmbH, Germany); Michael Kopp, Rüdiger Schroth (Robert Bosch GmbH, Germany); Josef Lutz (Chemnitz University of Technology, Germany)</td>
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<tr>
<td>17:00</td>
<td>Numerical Simulation and Experimental Results on the Surge Current Capability of 1200 V SiC MPS Diodes</td>
<td>Susanne Fichtner, Josef Lutz, Thomas Basler (Chemnitz University of Technology, Germany); Roland Rupp, Rolf Gerlach (Infineon Technologies AG, Germany)</td>
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<tr>
<td>17:20</td>
<td>A New Rainflow – free Method to Transfer Irregular Load Mission Profile Data Into appropriate Lab Test Conditions for Design Optimization</td>
<td>Andreas Aal (Volkswagen AG, Germany)</td>
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### Hall Kaiser Karl IV.

#### Session 11: Power Modules

**Chairs:** Thomas Licht (FH Düsseldorf, Germany), Jean Michel Morelle (VALEO & GEEDS, France)

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>09:00</td>
<td>Power Modules with increased power density and reliability using Cu wire bonds on sintered metal buffer layers</td>
<td>Jacek Rudzki (Danfoss Silicon Power GmbH, Germany); Martin Becker, Ronald Eisele (FH Kiel, Germany); Max Poech (Fraunhofer ISIT, Germany); Frank Osterwald (Danfoss Silicon Power GmbH, Germany)</td>
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<td>09:20</td>
<td>New power-module structures consisting of both copper and aluminium bonded on aluminium nitride substrates with an aluminium base plate</td>
<td>Nobuyuki Terasaki, Yoshiyuki Nagatomo, Toshiyuki Nagase, Yoshirou Kuromitsu (Mitsubishi Materials Corporation, Japan)</td>
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<td>09:40</td>
<td>Breakthrough into the third dimension – Sintered multi layer flex for ultra low inductance power modules</td>
<td>Peter Beckedahl, Matthias Spang, Oliver Tamm (Semikron Elektronik GmbH &amp; Co. KG, Germany)</td>
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</tbody>
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19:15 - 23:00  Conference Dinner

10:00 - 10:30  Coffee Break
Thursday, February 27, 2014 10:30 - 12:10

Hall Kaiser Karl IV.

Session 12: Wide Band Gap (1)

Chairs: Kimimori Hamada (Toyota Motor Corporation, Japan), Nando Kaminski (University of Bremen, Germany)

10:30 Influence of Cu/Ni(P) Metallized Si3N4 Ceramic Substrate in Bond Reliability of Power Components at 250 °C
Fengqun Lang, Hiroshi Yamaguchi, Hiroshi Nakagawa, Hiroshi Sato (R & D Partnership for Future Power Electronics Technology, Japan)

10:50 DCB-based low-inductive SiC modules for high frequency operation
Michael Meisser (Karlsruhe Institute of Technology & Institute for Data Processing and Electronics, Germany); Dean Hamilton, Philip Mawby (University of Warwick, United Kingdom)

11:10 1200 V-360 A SiC Power Module with Phase Leg Clustering Concept for Low Parasitic Inductance and High Speed Switching
Kazuto Takao, Takashi Shinohe, Takashi Yamamoto, Kohei Hasegawa, Masaaki Ishida (Toshiba Corporation, Japan)

11:30 Comparison of thermo-mechanical reliability of high-temperature bonding materials for attachment of SiC devices
Jianfeng Li, Imran Yaqub, Martin Corfield, Pearl A Agyakwa, C Mark Johnson (University of Nottingham, United Kingdom)

11:50 Robust Top Side Contact Technology on Power Semiconductors – Results from the Public Funded Project ´Pro Power´
Martin Rittner, David Gross, Michael Guyenot, Michael Günther, Sabine Haag, Thomas Kaden, Manfred Reinhold (Robert Bosch GmbH, Germany); Markus Thoben (Infineon Technologies AG, Germany); Stefan Stegmeier, Karl Weidner (Siemens AG, Germany); Mathias Kock (Danfoss Silicon Power GmbH, Germany)

Thursday, February 27, 2014 13:30 - 15:10

Hall Kaiser Karl IV.

Session 13: Wide Band Gap (2)

Chairs: Gerhard Miller (Infineon Technologies AG, Germany), Dieter Silber (Bremen University, Germany)

13:30 Invited: Packaging Very Fast Switching Semiconductors (Invited)
Eckart Hoene, Andreas Ostmann, Christoph Marczok (Fraunhofer IZM, Germany)

14:00 Multi-chip circuit design for silicon carbide power electronics (Invited)
Hans-Peter Nee (KTH Royal Institute of Technology, Sweden); Jacek Rabkowski (Warsaw University of Technology, Poland); Dimosthenis Peftitsis (KTH Royal Institute of Technology, Sweden)

14:30 Keynote: Present and Future of GaN Power Devices
Daisuke Ueda, Takeshi Fukuda, Shuichi Nagai, Hiroyuki Sakai, Nobuyuki Otsuka, Tatsuo Morita, Noboru Negoro, Tetsuzo Ueda, Tsuyoshi Tanaka (Panasonic, Japan)

Thursday, February 27, 2014 15:10 - 15:30

Hall Kaiser Karl IV.

Awards and Closing Ceremony
Chair: Dieter Silber (Bremen University, Germany), Eckhard Wolfgang (ECPE e.V., Germany),
Registration fees

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<th>From January 24, 2014</th>
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<tr>
<td>Presenting Author</td>
<td>€ 610,--</td>
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<tr>
<td>Member (VDE/IEEE/ECPE)*</td>
<td>€ 610,--</td>
</tr>
<tr>
<td>Non-member</td>
<td>€ 675,--</td>
</tr>
<tr>
<td>Student*</td>
<td>€ 520,--</td>
</tr>
<tr>
<td>Additional tickets for conference dinner</td>
<td>€ 60,--</td>
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<tr>
<td>Additional proceedings</td>
<td>€ 40,--</td>
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* Participants applying for the membership fee must include a copy of their membership card to the registration form. A photocopy of the student card must be included.

The conference fee includes admission to all sessions as well as to the daily coffee-breaks and lunches, one copy of the proceedings including a CD-ROM, the welcome reception on Tuesday, February 25 and the conference dinner on Wednesday, February 26, 2014 and the table top exhibition.

Payment

Payment for registration, including bank charges and processing fees, must be made in Euro.

The conference fee has to be fully paid in advance. **Confirmation of registration will be sent after full payment has been received at the VDE-Conference Services.**

The following methods of payment are accepted:

- By credit card authorisation as per registration form. The 16 digit card number, expiry date, security No. (last 3 digits on rear side of credit card) and holder’s name must be indicated on the registration form. Signature of the card holder is mandatory.
- Cheque in EURO (€) payable to VDE and sent together with the registration form by mail.

Cancellation

In case of cancellation, provided that written notice is received at the VDE-Conference Services **before January 24, 2014,** the registration fee will be fully refunded less a handling fee of EURO 60,00. After January 24, 2014 no refund will be made. Proceedings and CD-ROM will then be sent to the registrant after the conference.
Proceedings

All papers accepted for presentation at the conference will be published in the proceedings and a CD-ROM. The proceedings will be handed on-site to all delegates attending the event.

The proceedings will be published by VDE Verlag and will also be available in IEEE Xplore® and the VDE-Verlag digital Library.

Additional proceedings and CD-ROM are on sale during the conference (upon availability) at Euro 40,-

Table Top Exhibition

Following Companies will present their products during the

Table Top Exhibition:

Boschman Technologies BV, Duiven,NL
www.boschman.nl

Dowa HD Europe GmbH, Nürnberg, DE
www.dowa-europe.com

DuPont (UK) Ltd, Bristol, UK
www.dupont.com

ECPE e.V., Nürnberg, DE
www.ecpe.org

Fraunhofer Institute for Mechanics of Materials IWM, Halle (Saale), DE
www.en.iwm.fraunhofer.de

Gecko-Simulations AG, Zurich, CH
www.gecko-simulations.com

Hoffmann & Co Elektrokohle AG, Bad Goisern, AT
www.hoffmann.at

Ingenieurbüro Billmann, Emskirchen, DE
www.ib-billmann.de

Kyushu Institute of Technology Kitakyushu, Fukuoka, JP
www.kyutech.ac.jp

Plexim GmbH, Zürich, CH
www.plexim.com

Uptime Engineering, Graz, AT
www.uptime-engineering.com

Conference Venue

Nuremberg is a lively city of about half a million inhabitants, with a visible history of almost one thousand years. It is also a city “of wit”, where inventiveness and the researchers’ curiosity have found a home. In the region Nuremberg-Erlangen many power electronics companies, research institutes and universities are located.

The CIPS 2014 will take place in the Maritim Hotel Nürnberg which offers a wide range of well equipped rooms and foyers. It is located 5 min. off the main railway station where there is also a 10 min. connection from the airport by Subway U 2 direction „Röthenbach”.

Maritim Hotel Nürnberg
Frauentorgraben 11
90443 Nürnberg
Phone: +49 (0) 911 2363-0
Fax: +49 (0) 911 2363-823
E-mail: info.nur@maritim.de

Official Language

All sessions will be held in English, only.

Social Program

● The conference dinner will take place on February 26, 2014 in the City Hall Nuremberg

● During the „Dialog Session – Posters” on February 25, 2014 at the Foyer of the Maritim Hotel Nürnberg, typical Franconian snacks and Beverages will be served.

The attendance is included in the full conference fee. Additional tickets may be ordered with the registration form within the given deadline.

Awards

During the Closing Ceremony on February 27, 2014, the Best Poster Award as well as the Young Engineer Award for the Best Paper will be granted.

Insurance

The organisers may not be held responsible for any injury to participants or damage, theft and loss of personal belongings. Participants should therefore make their own insurance arrangements.
Direction to the Conference Dinner

Historical City Hall Nuremberg
(1332 - 1340)
Rathausplatz 2
90403 Nürnberg