Program

Keynote

K01 **»AI between Hype and Industrial-Grade«**
Rolf Hellinger, Siemens, DE

K02 **»Infrastructure Requirements for Electrified Heavy Goods Transport in Germany and the EU«**
Martin Wietschel, Daniel Speth, Steffen Link, Fraunhofer Institute ISI, DE

K03 **»Challenges and Solutions to Power Latest Processor Generations for Hyper Scale Datacenters«**
Gerald Deboy, Matthias Kasper, Martin Wattenberg, Roberto Rizzolatti, Infineon Technologies, AT

GaN Ruggedness

OP001 **An Improved Ultrafast Desaturation-Based Protection Scheme for GaN HEMT**
Juncheng Lu, Hossein Khoun Jahan, Hamidreza Esmaeilian, Lei Kou, Roy Hou, Infineon Technologeis, CA;
Xiaoyu Wang, Carleton University, CA

OP002 **The Performance of a GaN eMode HEMT in Surge Current Scenarios such as the Active Short Circuit**
Dominik Nehmer, Mark-M. Bakran, University of Bayreuth, DE
Maximilian Hepp, Wolfgang Wondrak, Mercedes-Benz, DE

OP003 **Gate Resistance Effect on Short-Circuit Robustness of p-GaN HEMTs**
Mohamed Lemine Dedew, Valeria Rustichelli, Joao Oliveira, Maroun Alam, Fabio Coccetti, IRT Saint Exupery, FR
Stéphane Lefebvre, Tien Anh Nguyen, Matthieu Landel, SATIE, FR
Le Thanh Long, Safran, FR

Advanced Packaging Technologies

OP004 **Neural Network Assisted Numerical Simulation Benchmarking for Electric Vehicle Thermal Management System**
Ekin Alp Bicer, Pascal Schirmer, Peter Schreivogel BMW, DE
Gabriele Schrag, Technical University of Munich, DE

OP005 **Relationship Between Porosity in Cu Sintered Bonding and Bonding Reliability**
Hideo Nakako, Michiko Natori, Dai Ishikawa, Kazuhiko Minami, Seiji Matsushima, Resonac, JP

OP006 **High Thermal Durability of Thin Copper Die-attach Layers and Finite Element Model Simulation**
Takaaki Eyama, Shuichi Inaya, Ukyo Suzuki, Taiki Fukuda, Takumi Miyamoto,Masafumi Takesue, Kao, JP

Thermal Cycling Reliability

OP007 **Thermal Shock Test Lifetime Improvement with Optimized Adhesive Strength between Epoxy Resin and Copper**
He Kangjia, Seiichi Hayakawa, Yukihiro Kumagai, Kan Yasui, Takayuki Kushima, Mineba Power Semiconductor Device, JP
Kisho Ashida, Osamu Ikeda, Hitachi, JP

OP008 **Power Cycling Reliability and Failure Mode Analysis of POL**
Kenichi Koi, Jumpei Tokutake, Koji Bando, Shinko Electric Industries, JP

OP009 **Accelerated Power Cycling of GaN HEMTs using Switching Loss and Fast Temperature Measurement**
Wing Tai Leung, Mehdi Niroomand, Saeed Jahdi, Bernard Stark, University of Bristol, UK

High Power Converters

OP010 **Control of an MMC-Based Hybrid Transformer with Star-Point Voltage Injection**
Rui Wang, Henk Huisman, C.G.E. (Korneel) Wijnards, Eindhoven University of Technology, NL

OP011 **Protection and Control of a Dual MMC Medium Voltage Supply**
Max Dupont, Drazen Dujic, EPFL, CH

OP012 **Station Power Electronics Converter with High Thermal Endurance to Pole-To-Pole Short Circuits for LVDC Distribution Grid**
Frédéric Reymond-Laruina, Djamel Hadbi, Philippe Egrot, EDF R&D, FR
Loïc Quéval, Damien Huchet, Marc Petit, GeePs, FR
Stéphane Mercier, Socomec, FR
Gustavo Alves de Lima Henn, IEDS-UNILAB, BR

Gate Drivers

OP013 **Suppression of Oscillations in a SiC Bridge-Leg using a Custom Single-Chip Digital Active Gate Driver with 2×255 Strength Levels**
Qilei Wang, Harry Dymond, University of Bristol, UK
Dawei Liu, Guangdong Academy of Sciences, CN
Yushi Wang, Saeed Jahdi, Bernard Stark, University of Bristol, UK

OP014 **SiC MOSFET Short-Circuit Protection: A Faster Soft Shut Down Method for Gate Drivers**
Julien Weckbrodt, Le Thanh Long, Safran, FR
Nicolas Ginot, Christophe Batard, Louison Gouy, University of Nantes, FR

OP015 **Parameter Identification: Gate Sensor for Power Transistor Tolerance Compensation in Advanced Gate Driver Ics**
Christopher Wille, Andreas Menzel, Thoralf Rosahl, Rakshith Satheesh, Pushkar Kulkarni, Robert Bosch, DE

Advanced Control Techniques on Electrical Drives I

OP016 **An Innovative High-Speed Track Range Restart Strategy for Permanent Magnet Synchronous Motor**
Anna Corbitt, Weiping Fu, Hao Chen, Cheng Tang, Yuyang Wang, H. Alan Mantooth, University of Arkansas, US

OP017 **Steady-State Error Reduction of Reinforcement Learning Based Indirect Current Control of Permanent Magnet Synchronous Machines**
Tobias Schindler, Lara Broghammer, Nina Diringer, Benedikt Hofmann, Dennis Hufnagel, Armin Dietz, Nuremberg Institute of Technology, DE
Ralph Kennel, Technical University of Munich, DE
Petros Karamanakos, Tampere University, FI

OP018 **Performance Comparison of Using Shunt-based and Integrated Current Sensing for Sensorless Field-Oriented Control**
John Emmanuel Tan, Juan Paolo Quismundo, Jhaebhee Mark Calderon, Power Integrations, PH

GaN Converters

OP019 **Design of High-Power Inverter with 12 Parallel GaN Devices**

Takashi Sawada, Hiroshi Tadano, Koji Shiozaki, Nagoya University, JP
Shunsuke Takuma, Yoshiya Ohnura, Nagaoka Power Electronics, JP

OP020 **Over 99.7% Efficient GaN-Based 6-Level Capacitive-Load Power Converter**
Stefan Mönch, Richard Reiner, Patrick Waltereit, Rüdiger Quay, Michael Basler, Fraunhofer Institute IAF, DE
Kilian Bartholomé, Fraunhofer Institute IPM, DE

OP021 **Cascaded Primary-Side-Only Control of a Compact 2 MHz 500 W Wireless Power Transfer System**
Tim Krigar, Martin Pfost, Tim Egener, TU Dortmund University, DE

Advanced Materials and Technologies

OP022 **Power Module Evaluation Using Ultra High Heat Dissipation and High Heat Resistance Resin Sheet Containing Card House Type Boron Nitride Filler**
Ayano Imai, Katsuhiko Hidaka, Shuji Suzuki, Jun Matsui, Toshiyuki Sawamura, Yuya Koga, Mitsubishi Chemical, JP
Yasushi Yamada, Daido University, JP
Shinichi Yasaka, Kanagawa Institute of Industrial Science and Technology, JP
Hitoshi Habuka, Yokohama Jisso Consotium, JP

OP023 **Investigating Temperature Dependent Warpage in Metal Ceramic Substrates for Power Electronics Devices**
Benjamin Fabian, Daniel Schnee, Sebastian Fritzsche, Peter Prenosil, Marco Müller, Heraeus Electronics, DE
Felix Koser, University of Applied Sciences Aschaffenburg, DE

OP024 **Degradation Mode Analysis of Different Bonding Technologies of SiC Power Semiconductors Stressed by Active Power Cycling**
Rasched Sankari, Ulrich Kessler, Martin Rittner, Thomas Kaden, Manfred Reinold, Robert Bosch, DE
Martin Schneider-Ramelow, Fraunhofer Institute IZM, D

Charging Station Technology

OP025 **Implementation and Verification of a 50kW Opportunity Wireless Charger Design**
Carlos Costas Sos, Juan Manuel Pere Buil, Irene Maria Torres Alfonso, Antonio Miguel Munoz Gomez, CIRCE Foundation, ES

OP026 **Performance Evaluation of Silicon-Based 3-Level Vienna Rectifier in ISOPLUS SMPD Package**
Karsten Haehre, Muhammad Yassof, Littelfuse, DE

OP027 **Performance Analysis of a 25-kW SiC-Based Dual Active Bridge Converter Based on Parallel-Connected Devices**
Francesco Porpora, Mauro Di Monaco, Giuseppe Tomasso, Vito Nardi, University of Cassino and Southern Lazio, IT
Daniele Marciano, Emanuele Di Fazio, E-Lectra, IT
Maurizio Granato, Analog Devices, IT
Eric Benedict, Ryan Schnell, Analog Devices, US

Modelling and Monitoring

OP028 **Semiconductor Chip Models are the Key for Enabling Virtual Design and Optimization Workflows of Power Electronic Systems**
Stefan Haensel, Sebastian Nielebock, Christian Raduege, Rolf Hellinger, Markus Pfeifer, Siemens, DE
Abby Shih, Keysight Technologies, DE

OP029 **Improved Resonant Frequency-Based Parasitic Inductance Estimation Method for SiC MOSFET Half-Bridge Circuit**
Hongpeng Zhang, Felix Steiner, Horst Demattio, Thomas Blank, Karlsruhe Institute of Technology, DE

OP030 **Fast Simulator with Inverter Temperature Estimation for Traction eDrives in Vehicles Subjected to Driving Cycles**
Simone Giuffrida, Iustin Radu Bojoi, Luisa Tolosano, Fabio Mandrile, Polytechnical University of Turin, IT
Claudio Romano, Maurizio Tranchero, Ideas&Motion, IT

Solid State Transformers

OP031 **A New Family of Three-Phase-Unfolder-Based MVAC-LVDC Solid-State Transformers**
Jonas Huber, Johann Kolar, ETH Zurich, CH
Uwe Drofenik, Francisco Canales, ABB, CH

OP032 **Voltage Balancing of a Split-Capacitor IGCT 3L-NPC Leg for the Resonant DC Transformer**
Renan Pillon Barcelos, Drazen Dujic, EPFL, CH

OP033 **Comparative Analysis of Unidirectional High Step-Up Converters for Medium Voltage Applications**
Stefan Subotic, Drazen Dujic EPFL, CH
Ralph Burkart, Thomas Gradinger, Hitachi Energy, CH

Advanced Control Techniques on Electrical Drives II

OP034 **Startup Behavior of Harmonic Suppression in Electrical Machines Using Iterative Learning Control and Neural Networks**
Annette Mai, Maximilian Hofmann, Fraunhofer Institute IISB, DE
Bernhard Wagner, Nuremberg Institute of Technology, DE

OP035 **Analytical Approach of the Vector Current Control Flux-Weakening Strategy for Permanent Magnet Synchronous Machines**
Oriol Subirats Rillo, Daniel Montesinos i Miracle, Samuel Galceran Arellano, Carlos Miguel Espinar, UPC, ES

OP123 **Statistical Variations in the Parasitic Capacitance of a Coil**
Kevin Talits, Claas Tebrügge, HELLA, DE
Martin Pfost, TU Dortmund University, DE

Power Electronics for E-Mobility

OP036 **Investigation on Direct Liquid Cooling Design of Power Modules with Flat Baseplate for Automotive Application**
Nobuhide Arai, Shinichiro Adachi, Kensuke Matsuzawa, Takahiro Koyama, Takanori Shintani, Fuji Electric, JP
Steffen Ewald, Fuji Electric, DE

OP037 **A Novel Approach for Affordable Electric Vehicles Based on Dual 48V Battery System with Multi-functional 3-Level Converter**
Radovan Vuletic, Dušan Graovac, Infineon Technologies, DE
Tatsuya Arai, Infineon Technologies, JP; Akihiro Furukawa, Mazda Motor, JP

OP038 **An Innovative 3-level Solution for Automotive Applications: eMPack**
Pranav Panchal, Arendt Wintrich, Oliver Tamm, Ole Muehlfeld, Semikron-Danfoss, DE

OP039 **Gated Recurrent Units-Assisted State-Space Modeling for Electric Vehicle Temperature Prediction**
Xinyuan Liao, Shaowei Chen, Northwestern Polytechnical University, CN;

Shuai Zhao, Aalborg University, DK

OP040 **Novel Bidirectional Single-Stage Isolated 600-V GaN M-BDSBased Single/Three-Phase-Operable EV On-Board Charger**
Sven Weihe, Johann Kolar, David Menzi, Jerome Kaufmann, Jonas Huber, Daifei Zhang, ETH Zurich, CH
Matthias Kasper, Kennith Kin Leong, Gerald Deboy, Infineon Technologies, AT

Encapsulation Materials

OP041 **Application-Specific Investigation of Inorganic Potting Material in Drive Trains**
Soenke Fleck, Ulf Schuemann, University of Applied Sciences Kiel, DE

OP042 **The Influence of the Glass Transition Temperature of Epoxy Mold Compounds on the Reliability of a Semiconductor Device**
Stefan Schwab, Christoph Liebl, Alexander Roth, Infineon Technologies, DE
Timo Mueller, Infineon Technologies, SGP

pcim Europe
Best Paper Award

OP043 **Corrosion Resistant Packaging for Power Semiconductor Modules - Modified Insulation Materials for Contaminated Environments**
Michael Hanf, Nando Kaminski, University of Bremen, DE
Andreas Brinkmann, Andrea Deißenberger, Volkmar Stenzel, Fraunhofer Institute IFAM, DE

OP044 **Investigation of Inorganic Encapsulation Materials in Power Electronic Systems for High Power Density Applications**
Stefan Behrendt, Semikron Danfoss, DE
Christophe Fery, Tamara Albert, Heraeus Electronics, DE
Christiane Plikat, Volkswagen, DE
Rüdiger Knofe, Siemens, DE
Soenke Fleck, Ulf Schuemann, University of Applied Sciences Kiel, DE

OP045 **Characterization of Thermally Aged Silicone Gels for Power Semiconductor Modules**
Sonja Madloch, Thomas Spann, Littelfuse, DE
Elaheh Arjmand, Littelfuse, Meghna De, UK
Philip Fletcher, University of Bath, UK

Power Quality

OP046 **A Coordinated Control of Hybrid Single-Phase AC/DC Microgrids Based on the Natural Harmonic Injection Concept**
Mehdi Baharizadeh, Mohammad Sadegh Golsorkhi Esfahani, Thomas Ebel, University of Southern Denmark, DK

OP047 **A High-Power Density SiC Based TP PFC with High-Frequency Ripple Cancellation Leg**
Serkan Dusmez, Huawei Technologies DE
Ali Tausif, Ahmet Faruk Bakan, Yildiz Technical University, TR

OP048 **High Frequency Active Filter for AC-DC High Power Converters**
Sarah Sifoune, Denis Labrousse, Pierre-Etienne Lévy, Cyrille Gautier, Bertrand Revol, Safran, F

OP049 **Laboratory Setup for Accuracy Investigation of Electricity Meters and Monitors under Industry-Typical Operating Conditions**
Matthias Schmidt, Xiaofei Guo, Robin Abraham, Physikalisch-Technische Bundesanstalt (PTB), DE
Michael Freiburg, Felix Hackeloeer, Lukas Christ, Technical University Cologne, DE
Christian Brenncke, ZERA, DE

Sascha Bierbach, Fischer & Kaufmann, DE
Ralf Schellenberg, Alfred H. Schütte, DE

Grid Connected Converters

OP050 **Real-Time Evaluation of Weighting Factorless Predictive Control of LCL Filter Equipped Grid-Side Converters using Sorting Networks**
Kristóf Bándy, Péter Stumpf, Zoltán Sütő, Budapest University of Technology and Economics, HU

OP051 **Relaxed Robust Control with Pragmatic Shortage of Passivity for Wind, Storage and PV Power Converters**
Sergio de Lopez Diz, Pablo Moreno, Andres Agudo, Ana Rodríguez, Luis Diez, Mario Rizo, Gamesa Electric, ES

OP052 **An Effective DC Voltage Regulation of Active Front-End Rectifier through Model Predictive Control**
Mobina Pouresmaeil, Edris Pouresmaeil, Jorma Kyyrä, Aalto University, FI

OP053 **Bi-directional 11kW Multi-Level Active-Neutral-Point-Clamped AC-DC Converter Using 600V/750V Si Super-Junction and SiC MOSFETs for High-Efficiency and High-Density Applications**
Mengxing Chen, Manuel Escudero Rodriguez, Matteo-Alessandro Kutschak, Alex Rossi, Infineon Technologies, AT
David Meneses Herrera, Infineon Technologies, FI

OP054 **A Study of Grid-Forming Inverter Control Strategy for Fault-Ride-Through Capability**
Hirofumi Uemura, Sachio Takano, Fuji Electric, JP

Passive Components

OP055 **Film Capacitors for High Temperature AC-DC Inverter Applications**
Adel Bastawros, Fumio Yu, Sabic, JP
Takashi Mori, Kenichi Oshita, Nichicon, JP

OP056 **Loss Reduction in HF-Transformers using Laminated Ferrite E-Cores**
Lukas Reißenweber, Julia Rogner, Alexander Stadler, Coburg University of Applied Sciences and Arts, DE

OP057 **Multigap Toroidal Transformer and Inductors for Overcoming Fringing Losses in High Frequency Converters**
Pau Colomer, Marc Maneja, David Prados, Prax, ES

OP058 **Study on Sample Geometries for Ferrite Characterisation in the MHz Range**
Till Piepenbrock, Joachim Böcker, Sebastian Schachten, Frank Schafmeister, Paderborn University, DE
Lukas Keuck, HELLA, DE

OP059 **FEM-Supported and Non-Destructive Magnetic Characterization Method for Non-Laminated Steel**
Stefan Tobler, Simon Nigsch, Eastern Switzerland University, CH

Drives for High Demanding Applications

OP060 pcim Europe Young Researcher Award **Highly-Compact Bearingless Axial-Flux Motor for a Pediatric Implantable Fontan Blood Pump**
Andreas Horat, Rosario Vincenzo Giuffrida, Jonas Huber, Johann Kolar, ETH Zurich, CH
Spasoje Miric, University of Innsbruck, AT
Marcus Granegger, Medical University of Vienna, AT

OP061 **A Novel Permanent Magnet Synchronous Motor Drive for Reaction Wheels in Satellites**
Baris Colak, Suleyman Cetinkaya, TUBITAK UZAY Space Technologies Research Institute, TR

OP062 **Exploring High Frequency Operation of Motor Drives: Practical Insights on Efficiency and Loss**
Asantha Kempitiya, Hrach Amirkhanian, Steve Oknaian, Infineon Technologies, US
Jannik Gade, Infineon Technologies, AT

OP063 **High Power Density System Design for GaN-based LV Motor Drives**
Marco Cannone, Edward Jones, Martin Wattenberg, Infineon Technologies, AT

OP064 **Design of GaN Transistor based Variable Speed Drive Inverter with Output Voltage Filtering**
Kaspars Kroics, Valerijs Maricevs, Riga Technical University, LV
Ugis Sirmelis, Energotronix, LV

IGBT

OP065 **The 8TH Generation LV100 IGBT Module with Higher Current Rating**
Daichi Otori, Masaomi Miyazawa, Mitsubishi Electric, JP
Koichi Masuda, Eugen Stumpf, Mitsubishi Electric, DE

OP066 **New Planar 4.5 kV Split-gate (SG) Si-IGBT Device for Improved Switching Characteristics and High Frequency Operation**
Gaurav Gupta, Jeremy Jones, Boni Boksteen, Babak Nikberg, Luca De Michielis, Hitachi Energy, CH; Gontran Pâques, Hitachi Energy Research, CH

OP067 **4.5 kV Double-Gate Reverse-Conducting Press-Pack IEGT**
Satoshi Yoshida, Tatsunori Sakano, Atsushi Yamaoka, Tomoaki Inokuchi, Kazuto Takao, Toshiba, JP
Ryohei Gejo, Takahiro Kato, Toshiba Electronic Devices & Storage, JP

Device Concepts

OP068 **Evaluation of a 3 kV Polarization Superjunction GaN HEMT**
Alireza Sheikhan, Sankara Narayanan Ekkanath Madathil, University of Sheffield, UK
Hiroji Kawai, Shuichi Yagi, Hironobu Narui, Powdec, JP

OP069 **More than 1200 V Breakdown and Low Area-Specific On State Resistances by Progress in Lateral GaN-on-Si and GaN-on-Insulator Technologies**
Richard Reiner, Stefan Müller, Patrick Waltereit, Fouad Benkhelifa, Stefan Mönch, Michael Basler, Michael Mikulla, Rüdiger Quay, Fraunhofer Institute IAF, DE

OP070 **Novel 200 V MOSFET Technology Pushes Motor Drive Inverter Efficiency to an Unprecedented Level**
Mark Thomas, Ralf Siemieniec, Elvir Kahrimanovic, Laszlo Juhasz, Michael Hutzler, Infineon Technologies, AT
Kapil Kelkar, Infineon Technologies, US

Degradation Mechanisms

OP071 **Moisture Robust Chip Design - Improved Edge-Terminations for High Lifetime under High Humid Conditions**
Michael Hanf, Nando Kaminski, University of Bremen, DE
Arnost Kopta, Power Device Technology, CH
Yanrui Ju, Raffael Schnell, SwissSEM Technologies, CH

OP072 **Method for Measuring the Initial State of a Solder Joint Delamination in a 3D PCB Integration Assembly of SiC MOSFETs**
Souhila Bouzerd, Laurent Dupont, University Gustave Eiffel, FR
Mickael Petit, SATIE, FR
Vincent Bley, Céline Combettes, University of Toulouse, FR

OP073 **Generic Lifetime Model for Wire Bonds Degradation in IGBT Modules Based on a Fracture Mechanics Parameter**
Merouane Ouhab, Nicolas Degrenne, Mitsubishi Electric, FR
Yusaku Ito, Masaki Taya, Mitsubishi Electric, JP

Advanced Conversion Concepts

OP074 **Modular Coaxial Power Converter for High-Density Integration into Medium-Voltage Cables**
Mark Cairnie, Aakash Kamalapur, Jack Knoll, Qingrui Yuchi, Rajaie Nassar, Christina DiMarino, Khai Ngo, Guo-Quan Lu, Qiang Li, Jung-Soo Bae, Dushan Boroyevich, Viriginia Polytechnic and State University, US
Jierui Zhou, Yang Cao, University of Connecticut, US
Doug DeVoto, Bidzina Kekelia, National Renewable Energy Lab, US

OP075 **Controlled Inductor Based BCM Buck Converters**
Ziv Gellman, Sam Ben-Yaakov, Iris Eting, Yivgeni Semidotskih, Ben Gurion University, IL

OP076 **Influence of Varying Common Mode Choke Sizes on the Performance and Stability of an Active EMI Filter**
Patrick Körner, Philip Brockerhoff, Felix Müller, Vitesco Technologies, DE
Marco Jung, Bonn-Rhein-Sieg University of Applied Sciences, DE

Photovoltaic Systems

OP077 **A High Efficiency Battery Charger with Maximum Power Point Tracking for Magnetic Energy Harvesters**
Antonio Miguel Munoz Gomez, Javier Ballestin Fuertes, CIRCE Foundation, ES
Jose Francisco Sanz Osorio, Zaragoza University, ES

OP078 **Symmetric Flying-capacitor Boost Converter for Medium-voltage Photovoltaic Applications**
Luis Alves Rodrigues, Guillaume Piquet-Boisson, Arnaud Revel, Anthony Bier, Stéphane Catellani, CEA, FR

OP079 **Comparison of Si IGBT, SiC MOSFET and Adjustable Hybrid Switch PV Inverters for Different Geographical Locations**
Tanya Thekemuriyil, Dario Schneider, Jaspera Dominique Rohner, Silvia Mastellone, Renato Amaral Minamisawa, University of Applied Sciences and Arts Northwestern Switzerland, CH
Munaf T.A. Rahimo, MTAL, CH
Vipluv Aga, Solextron, CH

Model Based System Analysis

OP080 **Optimising a Power Module for Electrical and Thermal Performance and Symmetry Using EDA Tools**
Wilfried Wessel, Andreas Schwarzbacher, Technical University of Dublin, IE
Florian Bauer, Siemens EDA, DE
Christian Jakob, University of Applied Sciences Darmstadt, DE
Roland Bátai, Gergö Juhasz, Vincotech, HU

OP081 **Conductor-Based Modeling of Voltage Distribution along a Single-Tooth Winding of Electrical Machines**
Hujun Peng, Yue Yu, Svetomir Stevic, Niklas Driendl, Kay Hameyer, RWTH Aachen University, DE

OP082 **Reduction of PWM Harmonics with Carrier Phase Shifting in a Dual-Stator PMSM with Magnetic Coupled Windings**
Bünyamin Tekir, Robert Zipprich, Jan Winter, Marcus Ziegler, University of Kassel, DE

SiC Devices

OP083 **The New CoolSiC MOSFET 1200 V G2: Electrical Performance and Compact Modelling**
Andreas Huerner, Qing Sun, Rudolf Elpelt, Infineon Technologies, DE

OP084 **Paralleling SiC-Power-MOSFET Body Diodes under Harsh Switching Conditions**
Michael Rauh, Mark-M. Bakran, University of Bayreuth, DE
Matthias Bürger, Infineon Technologies, DE

OP085 **3.3kV SBD-Embedded SiC-MOSFET Module for Traction Use**
Yoichi Hironaka, Shigeru Okimoto, Mamoru Matsuo, Shota Saito, Kenji Hatori, Mitsubishi Electric, JP
Nils Soltau, Mitsubishi Electric, DE

OP086 **Dead Time Optimization for High Power SiC MOSFET Module in Consideration of Parasitic Components**
Pham Ha Trieu To, Hao Wang, Florian Sawallich, Felix Kayser, Hans-Günter Eckel, University of Rostock, DE

WBG Reliability

OP087 **Performance Instability of 650 V p-GaN Gate HEMT Device under Temperature-related Positive Gate Bias Stresses**
Renze Yu, Saeed Jahdi, Phil Mellor, University of Bristol, UK
Jose Ortiz Gonzalez, Olayiwola Alatise, University of Warwick, UK

OP088 **Gate Oxide Reliability of Current Generation 1.2 kV SiC MOSFETs under Step-Wise Increased Gate Voltage**
Roman Boldyrjew-Mast, Sven Thiele, Thomas Basler, Chemnitz University of Technology, DE

OP089 **An Accelerated Dynamic Gate Switching Stress Test Concept of SiC MOSFETs at High Drain-Source Voltage (HV-GSS)**
Clemens Herrmann, Sven Thiele, Dezhi Yang, Thomas Basler, Chemnitz University of Technology, DE
Matthias Neumeister, Markus Pfeifer, Siemens, DE

OP090 **Silicon Carbide Power Device Use in Spacecraft and Aircraft**
Akin Akturk, Ethan Mountfort, Christopher Darmody, Mitchell Gross, Bryce Galey, Usama Khalid, Neil Goldsman, CoolCAD Electronics, US

Power Electronics for E-Mobility/ Control

OP091 **Current Ripple Reduction by Combination of Si IGBT and SiC MOSFETs in Heavy Duty Fuel Cell Trucks**
Yavuz Gürlek, Firat Yüce, Martin Ackerl, Roland Dold, Daimler Truck, DE
Thomas Basler, Chemnitz University of Technology, DE
Martin Neuburger, Esslingen University, DE

OP092 **Evaluation of Active Gate Drivers with Switchable Gate Resistors and Intermediate Voltage Levels for SiC MOSFETs in WLTC**
Michael Frank, Mark-M. Bakran, University of Bayreuth, DE

OP093 **Performance Evaluation of TCM-based, Zero-Voltage Switching (ZVS) Three-Phase Inverter for Electric Vehicle Drive Systems**
Khizra Abbas, Hans-Peter Nee, KTH Royal Institute of Technology, SW

OP094 pcim Europe Best Paper Award **A Partial Load Three-Phase Triangular Current Mode Modulation Concept with an Optimized Filter Inductor for High Efficiency Traction Drives**
Bhaskar Chatterjee, Jan Allgeier, Thomas Plum, Robert Bosch, DE
Marc Hiller, Karlsruhe Institute of Technology, DE

DC-DC Converters I

OP095 **GaN vs Si Synchronous Rectifier for LLC Converter**
Gokhan Sen, Milko Paolucci, Sriram Jagannath, Infineon Technologies, AT
Ahmet Cem Gungor, RWTH University Aachen, DE
Serkan Dusmez, Huawei Technologies, DE

OP096 **Co-Simulation Design of a GaN-Based Three-Phase LLC Converter with Integrated Three-Phase Magnetics**
Jhih-Cheng Hu, Ming-Shi Huang, Shih-Cyuan, Kuo, Hong-Xuan Liao, National Taipei University of Technology, TW

OP097 **Switching Assisting Circuit Improving the Efficiency of DC-DC Converters Based on Piezoelectric Resonators**
Ghislain Despesse, Valentin Breton, Emile Bigot, CEA Leti, FR
François Costa, SATIE, FR

OP098 **Transformer-based Fixed-ratio Resonant DC-DC Converters for 48V Data Centers**
Xufu Ren, Teng Long, Jinfeng Zhang, University of Cambridge, UK
Jibin Song, Lei Wang, Pengcheng Xu, EPIC Tech, CN

PFC Converters

OP099 **High-Density 3.3 kW GaN Rectifier for Server Applications Comprising a 130 kHz Totem-Pole PFC and a 500 kHz LLC**
Manuel Escudero Rodriguez, Matteo-Alessandro Kutschak, Antonello Laneve, Infineon Technologies, AT
David Meneses Herrera, Infineon Technologies, FI

OP100 **Addressing Power Switch Technology Selection Si/SiC/GaN in High Efficiency ZVS-PFC Resonant Converters**
Marco Torrisi, Sebastiano Messina, Angelo Giordano, Daniele Giovanni Sfilio, STMicroelectronics, IT
Mario Cacciato, University of Catania, IT

OP101 **Buck-Type Current Unfolding Converter with Discontinuous Conduction Mode in Ultra-Low Power-Factor Operation**
Tomoyuki Mannen, Boseung Seo, Takanori Isobe, University of Tsukuba, JP
Ha Pham, University of Technology Sydney, AU

OP102 **GaN Based Bi-Directional 6.6kW Interleaved Totem-Pole PFC with 13kW/L Power Density and High Efficiency**
Juncheng Lu, Esmaeil Jalalabadi, Infineon Technologies, CA
Yang Jiao, Infineon Technologies, US; Xiaoyu Wang, Carleton University, CA

SiC Modules

OP103 **The Design of a 2kV 1700A SiC MOSFET Dual Module**
Jorge Mari, Tobias Schuetz, Xiaoting Dong, Yanfeng Shen, Michael Kirner, Luigi Findanno, Semikron Danfoss, DE

OP104 **Technological approaches to high-power density SiC power module for automotive**
Takeshi Tokorozuki, Hideo Komo, Rei Yoneyama, Gourab Majumdar, Mitsubishi Electric, JP
Kazuhiro Nishimura, Melco Semiconductor Engineering, JP

OP105 **Extremely Compact SiC Power Module for EV Traction Inverters in the 250 kW Class**
Raffael Schnell, Guillemin Rémi, Roger Stark, Sven Matthias, SwissSEM Technologies, CH
Samuel Hartmann, MFIS, CH
Li Coris, Sunking Pacific Semiconductors Technology, CN

OP106 **Benefits of .XT Interconnection Technology for 3.3 kV XHP 2 Module with 3.3 kV CoolSiC MOSFET**
Matthias Bürger, Tobias N. Wassermann, Infineon Technologies, DE

Advanced Cooling

OP107 **Large-Area Bonding with LMEE: Suppression of the Degradation of the Junction-to-Water Thermal Resistance in Power Modules**
Yo Mochizuki, ROHM Semiconductor, JP
Takukazu Otsuka, Ken Nakahara, ROHM, JP
Navid Kazem, Dylan Shah, Arieca, US

OP108 **Active Thermal Control of SiC MOSFETs Utilizing Transient Thermal Characterization**
Varaha Satya Bharath Kurukuru, Md. Nazmul Hasan, Roberto Petrella, Silicon Austria Labs, AT

OP109 **Thermal Management Solutions by Additive Manufacturing – Powder Bed Fusion and Diffusion Bonding**
Simon Jahn, Felix Gemse, Steffen Dahms, ifw Jena - Günter-Köhler-Institute, DE

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Elizabeth Seber, Michael Ellis, Advanced Cooling Technologies, US

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Oleksandr Husev, Dmitri Vinnikov, Oleksandr Matiushkin, Parham Mohseni, Tallinn University of Technology, EE
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OP112 **DC-Bias Reduction in High-Frequency Dual Active Bridge DC-DC Converters through Slow DC Measurements**
Patrick Lenzen, Martin Pfost, TU Dortmund University, DE

OP113 **Optimized Current Sharing Technique for Interleaved CLLC Converters for Minimal Output Current Distortion**
Martin Gendrin, Akshay Mahajan, Fraunhofer Institute ISE, DE

OP114 **Primary-side Output Regulation Principles in Dynamic Multi-MHz Inductive Power Transfer Systems and Isolated DC/DC Converters**
Ioannis Nikiforidis, Paul Mitcheson, Prateek Wagle, Imperial College London, UK
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Lukas Fräger, Sascha Langfermann, Michael Owzareck, BLOCK Transformatoren-Elektronik, DE
Andreas Schnieder, Herbert Kannegiesser, DE
Dennis Kampen, City University of Applied Sciences Bremen, DE
Jens Friebe, University of Kassel, DE

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Steffen Menzel, René Reimann,Lorenz Grundhoff, Wilfried Holzke, Bernd Orlik, University of Bremen, DE

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Ehab Tarmoom, Steven Chenetz, Dennis Meyer, Jason Chiang, Microchip Technology, US

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Raphael Beyerle, Manfred Schrödl, Technical University of Vienna, AT

OP120 **'Infinity Gate Sensor': a Differential Magnetic Field Sensor for Measuring Gate Current of SiC Power Transistors**
Yushi Wang, Qilei Wang, Matthew Appleby, Jiaqi Yan, Harry Dymond, Saeed Jahdi, Bernard Stark, University of Bristol, UK

OP121 **Characterising Wide Bandgap Power Modules: Validating the M-Shunt Concept for High-Power Applications in the Kiloampere Range**
Hauke Lutzen, Jonas Müller, Lennart Dittmer, Nando Kaminski, Malte Arndt, University of Bremen, DE
Till Huesgen, Vladimir Polezhaev, Kempten University of Applied Sciences, DE
Steffen Chemnitz, SubCtech, DE

OP122 pcim Europe Best Paper Award **Characterization of Power-Module Parasitics: Sub-Nanosecond Large Signal Pulsing vs. Double-Pulse Testing**
Gerhard Groos, Dennis Helmut, Felix Gesele, Thomas Brückner, Universität der Bundeswehr München, DE

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Jan Vobecky, Martin Stencel, Josef Hylsky, Ladislav Radvan, Hitachi Energy, CZ
Umamaheswara Reddy Vemulapati, Urban Meier, Chiara Corvasce, Hitachi Energy, CH

PP002 **6.5 kV Innovative Silicon Power Device (i-Si) Module with High Power Density and Low Loss by Stored Carrier Control**
Takashi Hirao, Tomoyuki Miyoshi, Hiroshi Suzuki, Yusuke Takada, Tomoyasu Furukawa, Yusuke Kanno, Yasuhiko Kono, Katsumi Ishikawa, Mutsuhiro Mori, Hitachi, JP
Tsubasa Moritsuka, Masaki Shiraishi, Isamu Yoshida, Takayuki Kushima, Hitachi Power Semiconductor Device, JP

PP003 **High Current Density 4.5kV PressPack IGBTs Push SOA Limits**
Hossein Davoodi, Peter Waind, Paolo Mirone, Littelfuse, DE
Liutauras Storasta, Littelfuse, CH
Geo Joseph, Paul Hailes, Julian Pitman, Littelfuse, UK

PP004 **2.5kV IGBT Module with High Reliability for Renewable Applications**
Akiyoshi Masuda, Masaomi Miyazawa, Tsuyoshi Uraji, Mitsubishi Electric, JP
Koichi Masuda, Narender Lakshmanan, Thomas Radke, Mitsubishi Electric, DE

PP005 **New Generation 4.5kV IGCT and Fast Recovery Diode for Railway Power Supply Applications**
Umamaheswara Reddy Vemulapati, Remo Baumann, Tobias Wikström, Thomas Stiasny, Chiara Corvasce, Christian Winter, Hitachi Energy, CH

PP006 **Next Generation 4.5 kV IGBT-Only StakPak Module with Reduced Losses and High Temperature Capability**
Jeremy Jones, Gaurav Gupta, Boni Boksteen, Evgeny Tsyplakov, Makan Chen, Luca De Michielis, Gontran Pâques, Hitachi Energy, CH

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Vincenzo Vinciguerra, Giuseppe Luigi Malgioglio, Marco Renna, STMicroelectronics, IT

PP009 **Maximum Junction Temperature Simulation and Validation for the Hot Spot in Multi-Chip SiC Power Module**
Wonjin Dylan Cho, Byoungok Lee, Hansol Seo, Udaykumar Vangaveti, onsemi, US

PP010 **Integration of CFD-Simulation Results in PLECS Using Lookup Tables**
Simon Cepin, Holger Borcherding, University of Applied Sciences and Arts Ostwestfalen-Lippe, DE

PP011 **PCB Only Thermal Management Techniques for eGAN FETs in a Half-Bridge Configuration**
Adolfo Herrera, Alejandro Pozo Arribas, Michael de Rooij, Efficient Power Conversion, US

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PP013 **From 4x to 3x STPAK – Optimization for a More Compact EV Traction Inverter Solution**
Vittorio Giuffrida, Simone Buonomo, Massimiliano Chiantello, STMicroelectronics, IT

PP014 **A Multi-objective Structural Optimization Method Based on Multi-Physics Simulations for Power Module**
Baihan Liu, Mengyao Du, Yiyang Yan, Jianwei Lv Huazhong, Cai Chen, Yong Kang, Huazhong University of Science and Technology, CN

PP015 **Holistic Approach to Maximize Lifetime and Power Density in High Power Semiconductor Modules**
Martin Schulz, Lukas Kreiner, Ralf Klemmer, Littelfuse, DE

PP016 **Regulated High Density Switch Capacitor Topology**
Pierrick Ausseresse, Infineon Technologies, DE

PP017 **Silicon Interposer as a Substrate for Power Modules with High Power Density and Superior Thermal Performance**
Ahmed Ammar, Ömer Altan, Shuangyue Yang, Sebastian Tengvall, Junghyun Kang, Yasser Nour, Hoa Le Thanh Lotus Microsystems, DK

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Timothy Hegarty, Ben Chan, Robert Blattner, Texas Instruments, US
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Liang Shi, Kang Li, Tom Tang, Zephyr Zhao, Signify, CN

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Serge Gavin, Simon Kissling, Mauro Carpita, University of Applied Sciences of Western Switzerland, CH
Bertrand Daout, Frédéric Castella, Montena Technology, CH

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Hamzeh Beiranvand, Julius Maximilian Placzek, Marco Liserre, University of Kiel, DE

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Abdennour Merrouche, Thierry Talbert, University of Perpignan, FR
Daniel Matt, Thierry Martiré, Guillaume Pellecuer, University of Montpellier, FR

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PP023 **Fabrication Development for Gate Driver Embedded Double-Sided Cooling SiC Power Module for Electric Vehicle Application**
Anna Corbitt, Hao Chen, Cheng Tang, Weiping Fu, H. Alan Mantooth, University of Arkansas, US
Yuyang Wang, Riya Paul, Wolfspeed, US

PP024 **Printed Circuit Embedding of Prepackaged 150V Power MOSFETs in a Portable Welding Application**
Thomas Gebhard, Infineon Technologies, AT
Franz Musil, FRONIUS INTERNATIONAL, AT
Manuel Schumann, Unimicron, DE

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Indrajit Paul, Inpil Yoo, STMicroelectronics, DE
Sergio Savino, Gaetano Montalto, Ettore Chiacchio, Alessandro Tumminia, Francesco Salamone, STMicroelectronics, IT

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Philipp Czerwenka, Jan Frederik Wagenfeld, Gernot Schullerus, Reutlingen University, DE

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Stefanie Schindler, Tanja Einhellinger-Müller, Linda Schicker, Hans-Ulrich Völler, CeramTec, DE

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Chih Hui Lee, Liu Ta-Chung, Mustec, TW
Shiue Yow-Ling, Pan Cheng-Tang National Sun Yat-Sen University, TW
I Lin Tsung, Lighten, TW
Yen Chung-Kun, I-Shou University, TW
Wang Shao-Yu, NPERC-J, TW

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Tom Petzold, Ronald Eisele, Armin Hindel, Bennet Lorbeer, Markus Bast, Mohamad Abo Ras, University of Applied Sciences Kiel GmbH, DE
Corinna Grosse-Kockert, Daniel May, Sara Panahandeh, Berliner Nanotest und Desgin, DE
Anu Mathew, Rico Eichhorn, Fraunhofer Institute ENAS, DE

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Thomas Anthony Capobianco, Power Integrations, US

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Oleksandr Solomakha, Siddhartha Menon, Manuel Rueß, Swapnil Sunil Roge, Dominik Koch Ingmar Kallfass, University of Stuttgart, DE

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Sean Yu, Texas Instruments, US

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Rami Troudi, Kelly Ribeiro, Valeo, FR

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Marco Denk, Felix Heigel, University of Applied Sciences Coburg, DE
Johannes Schwarzkopf, Roman Filka, Brose Fahrzeugteile, DE

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Niklas Schwarz, Texas Instruments, DE
Feng Ji, Texas Instruments, CN

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Alfredo Medina-Garcia, Pierrick Ausseresse, Martin Krueger, Cristina Martos-Contreras, Josef Daimer, Infineon Technologies, DE
Manfred Schlenk, Dr. Schlenk Consulting, DE

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Sanbao Shi, Cheng Zhang, Yi Zhang, Infineon Seminconductors, CN
Sidorov Vadim, Tomislav Turscak, Infineon Technologies AT

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Giuseppe Aiello, Francesco Gennaro, Dario Patti, STMicroelectronics, IT
Domenico Nardo, STMicroelectronics, DE

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Iris Liu, Frank Wei, Jianlong Chen, Haiming Zhan, Fulin Zhang, ZongZeng Hu, Wolfspeed, CN

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Amir Babaki, Mohammad Sadegh Golsorkhi Esfahani, Thomas Ebel, University of Southern Denmark, DK
Nicklas Christensen, Danfoss Drives, DK

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Markus Zocher, Norbert Graß, Nuremberg Institute of Technology, DE
Ralph Kennel, Technical University of Munich, DE

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Lei Wang, Sinan Li, University of Sydney, AU

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Rosemary O'Keeffe, Michael Dunleavy, Cathal Sheehan, Bourns Electronics, IE

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Tom Ribarich, Xiucheng Huang, Navitas Semiconductor, CN

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Tamanna Bhatia, Jun Zhang, Sumana Ghosh, Wolfspeed, US
Frank Wei, Wolfspeed, CN

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Sebastian Gick, Mark-M. Bakran, University of Bayreuth, DE
Markus Pfeifer, Sebastian Nielebock, Siemens, DE

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Kohei Tanikawa, Oji Sato, Kotaro Shibata, Masashi Hayashiguchi, Hiroto Sakai, Yuta Okawauchi, Kenji Hayashi, ROHM, JP

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Ulrich Burkhard, Reutlingen University, DE

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Andre Uhlemann, Thomas Hunger, Andreas Groove, Nikolaj Gorte, Infineon Technologies, DE

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Federica Cammarata, Filippo Scrimizzi, Claudia, Malannino, Andrea Russo, STMicroelectronics, IT

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Michael Walter, Mark-M. Bakran, University of Bayreuth, DE

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Markus Vogelsberger, ALSTOM, AT
Hans Ertl, Thomas Wolbank, Technical University of Vienna, AT
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Jan Fuhrmann, Hans-Günter Eckel, University of Rostock, DE
Till-Mathis Plötz, Rostocker Kompetenzzentrum für Leistungselektronik, DE

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Maurizio Tranchero, Luca Bongiovanni, Claudio Romano, Paolo Santero, Ideas & Motion, IT

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Andrew Patterson, David Green, Ahmed Nejim, Silvaco, UK

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Martin Ackermann, José-Luis Marqués, Claus Hillermeier, Universität der Bundeswehr, DE

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Adeel Jamal, Gerd Griepentrog, Technical University of Darmstadt, DE

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Travis Lenz, Skyworks Solutions, US

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Paul Kanatzar, Brian DeBoi, Stephanie Vinueza, Austin Curbow, Wolfspeed, US

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Koji Kato, Hisakatsu Igarashi, Akira Sato, GS Yuasa International, JP

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Robert Graham, Macdermid Alpha Electronic Solutions, US

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Mohammadreza Bagheribavaryani, Niklas Langmaack, Technical University of Braunschweig, DE

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Fernando Aunon, TDK Electronics, ES
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Sascha Langfermann, Michael Owzareck, Lukas Fräger, Block Transformatoren-Elektronik, DE
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Tom Becker, Oleg Rusch, Jürgen Leib, Fraunhofer Institute IISB, DE

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Mana Hosseinzadehlish, Saeed Jahdi, Xibo, Yuan, University of Bristol, UK
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Andrea Cusumano, Debora Crimi, Salvatore Oliveri, Alessandra Manzitto, STMicroelectronics, IT

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Lukas Ruppert, Rik W. De Doncker, RWTH Aachen University, DE

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JongMu Lee, Alpha and Omega Semiconductor, KR
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Christoph Blechinger, Martin Schellenberger, Maximilian Hofmann, Fraunhofer Institute IISB, DE
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Kihyun Lee, Jinhyeok Kim, Soohyuk Han, Bokkeun Song, Kyoungpil Kang, Minsub Lee, Infineon Technologies, KR

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Lukas Knappstein, Martin Pfost, TU Dortmund University, DE

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Yannick Dumollard, Emmanuel Batista, Vincent Escrouzailles, Damien Tisne-Grimaud, Alstom, FR

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Hisashi Sugie, ROHM, JP

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