mesago

pcim
EUROPE

9 – 11.5.2023
NUREMBERG, GERMANY

CONFERENCE PROGRAM

Messe Frankfurt Group

Table of Content

PLEASE NOTE

that the program is subject to changes. The program will be updated daily. Please refer to **pcim-europe.com/program** for possible changes.

All at a glance in the **PCIM Europe App**

Board of Directors & Advisory Board

Board of Directors

General Conference Director PCIM Europe
Leo Lorenz
ECPE, Germany

Silvio Colombi
ABB, Switzerland

Drazen Dujic
Power Electronics Laboratory, EPFL, Switzerland

Eric Favre
IMI Precision Engineering, Switzerland

Marc Hiller
Karlsruhe Institute of Technology, Germany

Johann Walter Kolar
ETH Zürich, Switzerland

Philippe Ladoux
University of Toulouse, France

Josef Lutz
Chemnitz University of Technology, Germany

Frank Osterwald
Gesellschaft für Energie und Klimaschutz Schleswig-Holstein, Germany

Uwe Scheuermann
Semikron Danfoss, Germany

Honorary Board

Jean-Paul Beaudet, Schneider Electric, France

Helmut Knöll, University for Applied Sciences Würzburg-Schweinfurt, Germany

Jose Mario Pacas, University of Siegen, Germany

Jean-Marie Peter, France

Gerhard Pfaff, University of Erlangen, Germany

Alfred Rufer, EPFL, Switzerland

Advisory Board

Francisco Javier Azcondo, University of Cantabria, Spain

Mark M. Bakran, University of Bayreuth, Germany

Thomas Basler, Chemnitz University of Technology, Germany

Pavol Bauer, Delft University of Technology, Netherlands

Aylin Bicakci, University of Applied Sciences Kiel, Germany

Frede Blaabjerg, Aalborg University, Denmark

Serge Bontemps, Microchip Technology, France

Bruce Carsten, Bruce Carsten Associates, USA

Daniel Chatroux, CEA-LITEN, France

Ilknur Colak, Schneider Electric, France

Hilmar Darrelmann, Darrelmann + Partner Ingenieure, Germany

Enrique J. Dede, University of Valencia, Spain

Christina DiMarino, Virginia Tech, USA

Martin Doppelbauer, Karlsruhe Institute of Technology, Germany

Bernd Eckardt, Fraunhofer IISB, Germany

Hans-Günter Eckel, University of Rostock, Germany

Hans Ertl, Vienna University of Technology, Austria

Ole Gerkensmeyer, Wolfspeed, Germany

Petar J. Grbovic, University of Innsbruck, Austria

Ulrike Grossner, ETH Zurich, Switzerland

Steffan Hansen, SMA Solar Technology, Germany

Marcelo Lobo Heldwein, TU München, Germany

Klaus F. Hoffmann, Helmut-Schmidt-University, Germany

Nando Kaminski, University of Bremen, Germany

Peter Kanschat, Infineon Technologies, Germany

Ulrich Kirchenberger, STMicroelectronics, Germany

Philip C. Kjaer, Vestas Wind Systems, Denmark

Christopher Kocon, iDEAL Semiconductor Devices, USA

Jacques Laeuffer, Dtalents, France

Stéphane Lefebvre, CNAM - SATIE, France

Andreas Lindemann, Otto-von-Guericke-University Magdeburg, Germany

Stefan Linder, Alpiq, Switzerland

Marco Liserre, Christian-Albrechts-University of Kiel, Germany

Martin März, Fraunhofer IISB, Germany

Gourab Majumdar, Mitsubishi Electric, Japan

Klaus Marahrens, SEW-EURODRIVE, Germany

Elison Matioli, POWERlab, EPFL, Switzerland

Anton Z. Miric, Heraeus, Germany

Thomas Neyer, Infineon Technologies, Germany

Yasuyuki Nishida, Chiba Institute of Technology, Japan

Geraldo Nojima, Eaton Corporation, USA

Yasuhiro Okuma, Fuji Electric, Japan

Masahito Otsuki, Fuji Electric, Japan

Gianmario Pellegrino, Polytechnic University of Turin, Italy

Chris Rexer, onsemi, USA

Klaus Rigbers, SMA Solar Technology, Germany

Katsuaki Saito, Hitachi Power Semiconductor Device, Japan

Achim Scharf, Techmedia International, Germany

Jens Schmenger, Siemens, Germany

Manfred Schrödl, Vienna University of Technology, Austria

Jürgen Schuderer, Hitachi Energy Switzerland, Switzerland

Elmar Stachorra, KoCoS Engineering, Germany

Peter Steimer, Hitachi Energy Switzerland, Switzerland

Bernhard Strzalkowski, Analog Devices, Germany

Wolfram Teppan, LEM INTERNATIONAL, Switzerland

Giuseppe Tomasso, University of Cassino and South Lazio, Italy

Peter Wallmeier, AEG Power Solutions, Germany

Peter Zacharias, University of Kassel, Germany

Conference Program at a Glance

Tuesday, 9 May 2023

8:30 a.m.	Foyer Stage Brüssel **Community Coffee**				
9 a.m.	Stage Brüssel 1 **Conference Opening and Award Ceremony**				
9:45 a.m.	Stage Brüssel 1 **Keynote** **How Life Cycle Analyses are Influencing Power Electronics Converter Design** Franz Musil, Fronius International, A				
10:30 a.m.	Foyer Stage Brüssel **Coffee Break**				
11 a.m.	Stage Brüssel 1 **GaN Devices**	Stage Brüssel 2 **Package Reliability I**	Stage München 1 **Converter Design and Optimization**	Stage München 2 **Power IC**	Stage Mailand **Passive Components I**
12:20 p.m.	Hall 10.1 NCC Mitte **Lunch Break**				
2 p.m.	Stage Brüssel 1 **SiC Device Technology**	Stage Brüssel 2 **Package Reliability II**	Stage München 1 **WBG Devices and Applications**	Stage München 2 **System Reliability**	Stage Mailand **Power Electronics For Railway Traction**
3:05 – 5 p.m.	Foyer Entrance NCC Mitte **Poster / Dialogue Sessions & Coffee Time**				
5:15 p.m.	NCC Ost **Welcome Party**				

Wednesday, 10 May 2023

8:30 a.m.	Foyer Stage Brüssel **Community Coffee**				
8:45 a.m.	Stage Brüssel 1 **Keynote** **On the Way to the DC Factory – The Open Industrial DC Grid for Sustainable Production Sites is Entering the Dissemination Phase** Holger Borcherding, University of Applied Sciences and Arts Ostwestfalen-Lippe, D				
9:30 a.m.	Foyer Stage Brüssel **Coffee Break**				
9:50 a.m.	Stage Brüssel 1 Special Session **Solutions for Future Medium Voltage Grids**	Stage Brüssel 2 **Advanced IGBT's and Modules**	Stage München 1 **Thermal Perfomance and Measurement**	Stage München 2 **Energy Storage Systems**	Stage Mailand **Passive Components II**
11:50 a.m.	Hall 10.1 NCC Mitte **Lunch Break**				
2 p.m.	Stage Brüssel Special Session **Power Electronics for E-Mobility**	Stage Brüssel 2 **Power Electronics for Automotive**	Stage München 1 **New and Renewable Energy Systems**	Stage München 2 **Packaging and Integration**	Stage Mailand **Cu-Sintering**
3:05 – 5 p.m.	Foyer Entrance NCC Mitte **Poster / Dialogue Sessions & Coffee Time**				
4 – 6 p.m.	Messepark **After Work Beer**				
6:30 p.m.	Hotel Le Meridien, Nuremberg **Night of Excellence**				

Thursday, 11 May 2023

8:45 a.m.	Stage Brüssel 1 **Keynote** **HV Silicon and SiC Power Semiconductors; Key Components for Sustainable Energy Solutions** Munaf Rahimo, MTAL, CH			
9:30 a.m.	Foyer Stage Brüssel **Coffee Break**			
9:50 a.m.	Stage Brüssel 1 **SiC Device Design**	Stage München 1 Special Session **Understanding Losses in WBG Power Devices**	Stage München 2 **High Power SiC Converters**	Stage Mailand **High Frequency Converters and Applications**
11:10 a.m. – 1 p.m.	Foyer Entrance NCC Mitte **Poster / Dialogue Sessions**			
12 p.m.	Hall 10.1 NCC Mitte **Lunch Break**			
1 – 2 p.m.	Stage Brüssel 2 **Feedback Lunch** (only for members of the Board of Dirctors and the Advisory Board)			
2 p.m.	Stage Brüssel 1 **DC-DC Converters**	Stage München 1 **SiC Device Application**	Stage München 2 **Power Electronics for Charging Station**	Stage Mailand **Sensing and Measurement**

As of April 2023 / subject to change without notice

Keynotes

Speaker:
Franz Musil, Power Electronics Engineer, Fronius International, Austria
Chairperson:
Johann Kolar, ETH Zürich, Switzerland

Tuesday, 9 May 2023, 9:45 a.m., Stage Brüssel 1

How Life Cycle Analyses are Influencing Power Electronics Converter Design

A life cycle analysis (LCA) is one of the most common and internationally standardized scientific methods to analyse the environmental impact of a product over its entire life cycle. The presentation shows how to perform a LCA and gives examples, therefore. By evaluating the results, it becomes clear what contribution power electronics and its components have on the environmental footprint. The goal of the keynote is to initiate a discussion about how to establish LCA analysis as another dimension in a multi-objective-optimisation, of a power converter design.

Speaker:
Holger Borcherding, Scientific Director, University of Applied Sciences and Arts Ostwestfalen-Lippe, Germany
Chairperson:
Leo Lorenz, ECPE, Germany

Wednesday, 10 May 2023, 8:45 a.m., Stage Brüssel 1

On the Way to the DC Factory – The Open Industrial DC Grid for Sustainable Production Sites is Entering the Dissemination Phase

The successful research project DC-INDUSTRIE2 (2016 – 2023) as the direct follower of DC-INDUSTRIE (2013 – 2016) ends short before the PCIM 2023. The Open Direct Current Alliance (ODCA), an association affiliated to the ZVEI, connects seamlessly to the successful DC-INDUSTRIE2 research project. The goal is to build a worldwide direct current ecosystem and establish direct current technology across applications. The proposed keynote reports on the achievements of both projects, reflects on the history, explains the structure of the ODCA and looks to the future of low voltage DC.

Speaker:
Munaf T. A. Rahimo, President and Founder, Consultant Power Devices, MTAL, Switzerland
Co-Author :
Eric Carroll, EIC Consultancy, F
Chairperson:
Drazen Dujic, EPFL, Switzerland

Thursday, 11 May 2023, 8:45 a.m., Stage Brüssel 1

HV Silicon and SiC Power Semiconductors; Key Components for Sustainable Energy Solutions

The keynote will focus on the recent advancements in high voltage Silicon and SiC power semiconductor devices for targeting very high-power applications in the MW - GW range. The »Si versus SiC« competitive journey in the coming years will be covered by highlighting the critical technology and performance challenges defining the time-lines for both the Si and SiC HV technology roadmaps while taking different application reequipments into account. An outlook into the future is also provided with respect to ultra-high voltage SiC devices targeting for example Grid Systems.

All keynotes will be streamed live from Nuremberg at the **PCIM Europe digital.**

Conference Tuesday, 9 May 2023

Morning Oral Sessions

8:30 a.m.	Foyer Stage Brüssel	**Community Coffee**
9 a.m.	Stage Brüssel 1	**Opening / Award Ceremony**
9:45 a.m.	Stage Brüssel 1	**Keynote** How Life Cycle Analyses are Influencing Power Electronics Converter Design Franz Musil, Power Electronics Engineer, Fronius International, A | Chairperson: Johann Kolar, ETH Zurüch, CH
10:30 a.m.	Foyer Stage Brüssel	**Coffee Break**

Find the matching manuscript in your proceedings via the presentation numbers listed here.

Stage Brüssel 1
GaN Devices

Chairperson:
Thomas Neyer, Infineon Technologies, D

11 a.m. OP001
Integrated Multi-Gate Cascade Structure for Lateral High-Voltage GaN Power Transistors
Richard Reiner, Fraunhofer IAF, D

11:20 a.m. OP002
Towards Vertical GaN Power Transistors on Foreign Substrates - the European YESvGaN Project
Christian Huber, Robert Bosch, D

11:40 a.m. OP003
GaN Power ICs Drive Efficiency and Size Improvements in BLDC Motor Drive Applications
Alfred Hesener, Navitas Semiconductor, D

12 p.m. OP004
Reliability Investigations on 650 V Schottky p-GaN Power Gallium Nitride HEMTs
Maximilian Goller, Chemnitz University of Technology, D

Stage Brüssel 2
Package Reliability I

Chairperson:
Uwe Scheuermann, Semikron Danfoss, D

11 a.m. OP005
Condensation Test: Methodology and Robustness Against it for Power Modules Employed in Railway Applications
Edoardo Ceccarelli, Hitachi Energy, CH

11:20 a.m. OP006
Impact of Current Density on Wire Bond Lifetime – Power Cycle Testing with Clamped VCE for Realistic Current Stress
Ralf Schmidt, Siemens, D

11:40 a.m. OP007
Physics-of-Failure Model to Explain the Heating-Time Effect on IGBT Power Modules Lifetime
Merouane Ouhab, Mitsubishi Electric, F

12 p.m. OP008
A Standard Low Voltage Power Module Platform with High Reliability and Low Cost
Harley Neal, Dynex Seminconductor, GB

Stage München 1
Converter Design and Optimization

Chairperson:
Hans-Günter Eckel, University of Rostock, D

11 a.m. OP009
Towards a Modular Multilevel Flying Capacitor Module Using SiC MOSFET
Omar Sanjakdar, French Alternative Energies and Atomic Energy Commission, F

11:20 a.m. OP010
Parallel Operation of Direct Current Transformers
Renan Barcelos, EPFL, CH

11:40 a.m. OP011
Optimal Design of Multiwinding-Transformer-Based Power Architectures in Data Center Applications
Qian Xun, Fraunhofer Institute for Silicon Technology, D

12 p.m. OP012
An ANN Assisted Reverse Recovery of Diode Model for Switching-on Characteristics of IGBT Devices
Abby Shih, Keysight Technologies, D

Stage München 2
Power IC

Chairperson:
Hans-Günter Eckel, University of Rostock, D

11 a.m. OP013
Optimum Power Architecture for USB-PD EPR
Alfredo Medina-Garcia, Infineon Technologies, D

11:20 a.m. OP014
CT-Drive – A Simple Two Dice Solution Coreless Transformer Driver for Integrated GaN GIT Devices
Kennith Leong, Infineon Technologies, A

11:40 a.m. OP015
GaN Power ICs Enable 300cc 700kHz 300W AC-DC Converter
Tom Ribarich, Navitas Semiconductor, USA

12 p.m. OP016
Safe and Secure SW Controlled Digital LDO
David Zipperstein, Infineon Technologies, D

Stage Mailand
Passive Components I

Chairperson:
Stéphane Lefebvre, CNAM - SATIE, F

11 a.m. OP017
Parasitic Component Reduction of a Two-Winding Transformer
Claus Kjeldsen, University of Southern Denmark, DK

11:20 a.m. OP018
Polymers in Film Capacitors – The Next Generation Material is Available!
Udo Wahner, Borealis Polyolefine, A

11:40 a.m. OP019
FE Modeling and Development of a High-Frequency Coreless Transformer for Impulsive Automotive Applications
Danilo Santoro, University of Parma, I

12 p.m. OP020
Litz Wire Configurations for Charging Applications: A Field Study
Martin Nießen, Cologne University of Applied Sciences, D

12:20 p.m.	Hall 10.1 NCC Mitte	**Lunch Break**

Conference Tuesday, 9 May 2023

Afternoon Oral Sessions

Stage Brüssel 1
SiC Device Technology

Chairperson:
Josef Lutz, Chemnitz University of Technology, D

2 p.m. OP021
Prediction of the Bipolar Degradation in 1200V 4H-SiC MOSFETs by Inspection in Device Fabrication Process
Kazuya Ishibashi, Mitsubishi Electric, J

2:20 p.m. OP022
Improved Short Circuit Ruggedness by Optimization of Sidewall P-type Pillar Ratio for Trench SiC-MOSFET Fabricated by Multiple Tilted Ion Implantation into Trench Sidewalls
Yutaka Fukui, Mitsubishi Electric, J

2:40 p.m. OP023
Research of Characterization for Activation Rate of Ion Implantation in SiC Power Device Manufacturing
Songlin Yang, Dynex Semiconductor, GB

Stage Brüssel 2
Package Reliability II

Chairperson:
Peter Kanschat, Infineon Technologies, D

2 p.m. OP024
Study of Power Cycling Tests Superimposed with Passive Thermal Cycles on IGBT Modules
Alexander Otto, Fraunhofer Institute ENAS, D

2:20 p.m. OP025
Physics-of-Failure Based Lifetime Approach for Silver Sintered Power Modules in Power Cycling
Freerik Forndran, Vitesco Technologies, D

2:40 p.m. OP026
Experimental Investigation of Advanced Cu-Mo-Cu Clips for Enhanced Power Cycling Reliability of Die-top Interconnections
Harley Neal, Dynex Semiconductor, GB

Stage München 1
WBG Devices and Applications

Chairperson:
Ilknur Colak, Schneider Electric, F

2 p.m. OP027
Power Loss Calculation Tool for N-level Half-bridge Sub-module Modular Multilevel Converter used for Offshore Wind Energy
Kesheng Wang, University of Bristol, GB

2:20 p.m. OP028
Simulation Study of the Effect of Threshold Voltage Hysteresis on Switching Characteristics of SiC MOSFETs
Yumeng Cai, KTH, S

2:40 p.m. OP029
Comparison of Simulation Methods to Study the Switching Transients of GaN Transistors
Xiaomeng Geng, Technical University of Berlin, D

Stage München 2
System Reliability

Chairperson:
Silvio Colombi, ABB Industrial Solutions, CH

2 p.m. OP030
Partial Discharge Analyses of DBC Substrates
Johannes Drechsel, Fraunhofer IKTS, D

2:20 p.m. OP031
Development of Ag-Free Active Metal Brazing Filler for Manufacturing Copper-Si3N4 Substrates
Yoichiro Mori, Toshiba Materials, J

2:40 p.m. OP032
Improving High-Power Crowbar Design Using Rupture-Enhanced, Capsule-Style Thyristors in Medium-Voltage Driven Applications
Martin Schulz, Littelfuse Europe, D

Stage Mailand
Power Electronics For Railway Traction

Chairperson:
Philippe Ladoux, University of Toulouse, F

2 p.m. OP033
Coupling Dynamics of Second-Order Harmonic Active Filters in Single-Phase Input-Series/Output-Parallel AC-DC Converters
Andrea Cervone, EPFL, CH

2:20 p.m. OP034
Performance Analysis of a PEBB Demonstrator with High Power 3.3 kV CoolSiC in XHP 2 for Modern Railway Traction Systems
Jens Czichon, Infineon Technologies, D

2:40 p.m. OP035
Experimental Validation of a Semi-Two-Stage Traction System based on the NPC Multi-Source Inverter for Fuel Cell Rail Vehicles
Emanuele Fedele, University of Naples Federico II, I

3:05 – 5 p.m. Foyer Entrance NCC Mitte **Poster/Dialogue Session & Coffee Time**

Detailed program with descriptions and all co-authors can be found online at
pcim-europe.com/program

Conference Wednesday, 10 May 2023

Morning Oral Sessions

8:30 a.m. Foyer Stage Brüssel **Community Coffee**

Stage Brüssel 1

8:45 a.m. **Keynote** **On the Way to the DC Factory – The Open Industrial DC Grid for Sustainable Production Sites is Entering the Dissemination Phase**
Holger Borcherding, Scientific Director, University of Applied Sciences and Arts Ostwestfalen-Lippe, D | Chairperson: Leo Lorenz, ECPE, D

9:30 a.m. Foyer Stage Brüssel **Coffee Break**

Stage Brüssel 1
Special Session: Solutions for Future Medium Voltage Grids

Chairperson:
Thomas Brückner, Universität der Bunderwehr München, D
Christof Sihler, General Electric, F

9:50 a.m. OP036
Multilevel Converter System for Medium Voltage Grids
Nicolas Lapassat, GE Power Conversion, F

10:10 a.m. OP037
Discontinuous Quasi-2-Level Modulation for MV Applications
Anatolii Tcai, Huawei, D

10:30 a.m. OP038
Fault Management in Meshed MVDC Grids Enabling Uninterrupted Operation
Sven Marquardt, Universität der Bundeswehr München, D

11:10 a.m. OP039
Design of Oil Insulated SiC Diode Rectifier for an MVDC SST
Pierre Le Métayer, SuperGrid Institute, F

11:30 a.m. OP040
MVDC Distribution Concept for Green Data Centers: Achieving the Sustainability Roadmap with Highest Efficiency
Daniel Siemaszko, Hitachi Energy, CH

Stage Brüssel 2
Advanced IGBT's and Modules

Chairperson:
Jürgen Schuderer, Hitachi Energy Switzerland, CH

9:50 a.m. OP041
Investigation of Paralleling Topologies for the New 1500 A 1700 V LinPak Power Module
Virgiliu Botan, Hitachi Energy, CH

10:10 a.m. OP042
RC-IGBT Module Suitable for Motion Control
Nobuchika Aoki, Mitsubishi Electric, J

10:30 a.m. OP043
4.5 kV HV100-type HVIGBT Module for Large Industrial Equipment
Kazuto Mikami, Mitsubishi Electric, J

11:10 a.m. OP044
Design Considerations for the EDT3 750V Next Generation IGBT Technology for Automotive Drive Applications
Alexander Beckmann, Infineon Technologies, D

11:30 a.m. OP045
Novel MOS-cell Engineered 4.5 kV Enhanced-Planar IGBT Device for Improved Short-Circuit Capability
Gaurav Gupta, Hitachi Energy, CH

Stage München 1
Thermal Perfomance and Measurement

Chairperson:
Andreas Lindemann, Otto-von-Guericke-University Magdeburg, D

9:50 a.m. OP046
Performance Enhancements and Easy Integration of Double Side Cooled Automotive SiC Power Modules - Enabled by a Sophisticated Cooler System
Christian Schweikert, Infineon Technologies, D

10:10 a.m. OP047
Additively Manufactured Heat Sink with Integrated Pulsating Heat Pipe
Florian Schwarz, Siemens, D

10:30 a.m. OP048
Calorimetric Characterizations of a High Efficiency GaN Based 30 kW–1500 V Solar String Inverter
Van Sang Nguyen, CEA Tech, F

11:10 a.m. OP049
Machine-Learning Approach to Model Junction Temperatures in Automotive Inverters
Leonhard Hertenstein, Mercedes-Benz, D

11:30 a.m. OP050
Inorganic Potting Compound for Electrical Machines to Improve the Thermomechanical Behaviour
Sönke Fleck, University of Applied Sciences Kiel, D

Stage München 2
Energy Storage Systems

Chairperson:
Daniel Chatroux, CEA-LITEN, F

9:50 a.m. OP051
Demand Side Management for Electric Vehicles: A Rural Perspective
Thomas McKinney, University of Sheffield, GB

10:10 a.m. OP052
Methodology for Multiple SoC Estimation in Lithium-Ion Battery Packs Based on an Adaptive Square-Root Unscented Kalman Filter
Davide Fusco, University of Cassino and Southern Lazio, I

10:30 a.m. OP053
Key Points Regarding Electrical Safety in Small Cylindrical Li-ion Cell Assemblies During Overcharge or Partial Short-Circuit
Julien Chauvin, CEA, F

11:10 a.m. OP054
Predictive Control of Supercapacitors for Peak Power Reduction in Stacker Cranes in Intralogistics
Fabian Melkowski, Technical University of Dresden, D

11:30 a.m. OP055
Real-Time AC Impedance Measurement Using Limited Energy Onboard Excitation for Battery Management System
Meng Chen, HK Applied Science and Technology Research Institute, HK

Stage Mailand
Passive Components II

Chairperson:
Wolfram Teppan, LEM INTERNATIONAL, CH

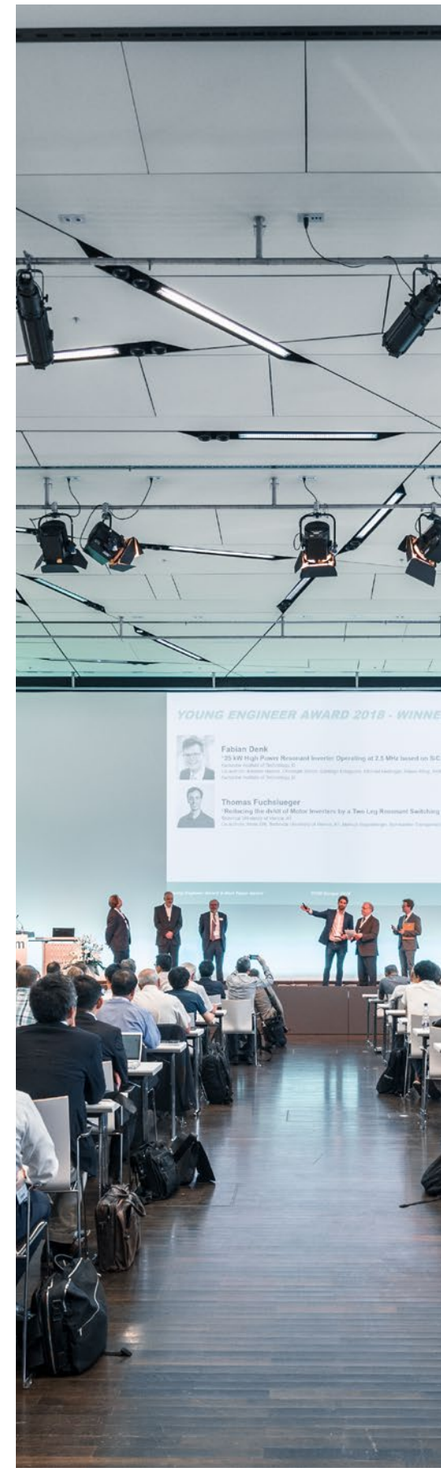
9:50 a.m. OP056
Design and Testing of a Compact Dry Insulated Medium Frequency Transformer Prototype for Medium Voltage Applications
Martin Guillet, SuperGrid Institute, F

10:10 a.m. OP057
Evaluation of the Impact of Switching Speed on Inductors in SiC Converters
Binyu Cui, University of Bristol, GB

10:30 a.m. OP058
Comparison of High Frequency Three Phase Transformer Technologies for High Power Density On Board Chargers
Wendell da Cunha Alves, Valeo Siemens eAutomotive, F

11:10 a.m. OP059
Towards a Multiphysics FEM Simulation Model of an Arbitrary Inductive Component for Power Electronic Applications
Christoph Drexler, SUMIDA Components & Modules, D

11:30 a.m. OP060
Considering 2D Magnetic Fields and Air Gap Geometry in the Estimation of AC Losses in Round Wire Windings
Andre Furlan, Federal University of Santa Caterina, BR



Conference Wednesday, 10 May 2023

Afternoon Oral Sessions

11:50 a.m. Hall 10.1 NCC Mitte **Lunch Break**

Stage Brüssel 1

Special Session: Power Electronics for E-Mobility

Chairperson:
Uwe Schäfer, Technical University of Berlin, D

2 p.m. OP061
The Impact of SiC Traction Converter Switching on EV DC Bus and Battery
Sibylle Dieckerhoff, Technical University of Berlin, D

2:20 p.m. OP062
Loss Distribution in an Electric Vehicle Traction Chain using a Cascaded H-Bridge Inverter with Integrated Battery
Gaël Pongnot, SATIE Laboratory, F

2:40 p.m. OP063
Design Aspects in SiC MOSFET based High Performance Automotive and Commercial Vehicle Inverters
Matthias Bösing, Robert Bosch, D

Stage Brüssel 2

Power Electronics for Automotive

Chairperson:
Jose Mario Pacas, University of Siegen, D

2 p.m. OP064
Performance and Feature Benchmarking of SiC Trench Technologies and Cooling Systems for DSC Modules in Traction Inverters
Dustin Meichsner, Infineon Technologies, D

2:20 p.m. OP065
Current Harmonics in a Complex Automotive DC Bus of an Electric Vehicle compared to a Standard Laboratory Setup
Michael Schlüter, Technical University of Berlin, D

2:40 p.m. OP066
800-V SiC Traction Inverter Key Design Considerations for Improved Efficiency and Power Density
Xung Gong, Texas Instruments, D

Stage München 1

New and Renewable Energy Systems

Chairperson:
Jens Schmenger, Siemens, D

2 p.m. OP067
A High-Current 1.7 kV SiC Module Enabling High Efficiency, High Power Density Renewable Energy Applications
Ahmed Ismail, University of Arkansas, USA

2:20 p.m. OP068
Trends and Influencing Factors in Power-Converter Reliability of Wind Turbines
Katharina Fischer, Fraunhofer IWES, D

2:40 p.m. OP069
Bidirectional Multi-Port Partial Power Converter for Solar PV Application
YongDae Kwon, Huawei Technologies, D

Stage München 2

Packaging and Integration

Chairperson:
Aylin Bicakci, University of Applied Sciences Kiel, D

2 p.m. OP070
Reliability of Molded POL Tile as Simple Module
Kei Murayama, Shinko Electric Industries, J

2:20 p.m. OP071
3.3 kV 800 A IGBT Module with High Power Cycle Durability Fulfilling Roll2Rail Target
Kanta Makabe, Hitachi Power Semiconductor Device, J

2:40 p.m. OP072
Fabrication Refinements and Evaluation of a Wirebond-less Multi-chip Power Module with 13 kV SiC Devices
Danielle Lester, Viginia Tech, USA

Stage Mailand

Cu-Sintering

Chairperson:
Frank Osterwald, Gesellschaft für Energie und Klimaschutz Schleswig-Holstein, D

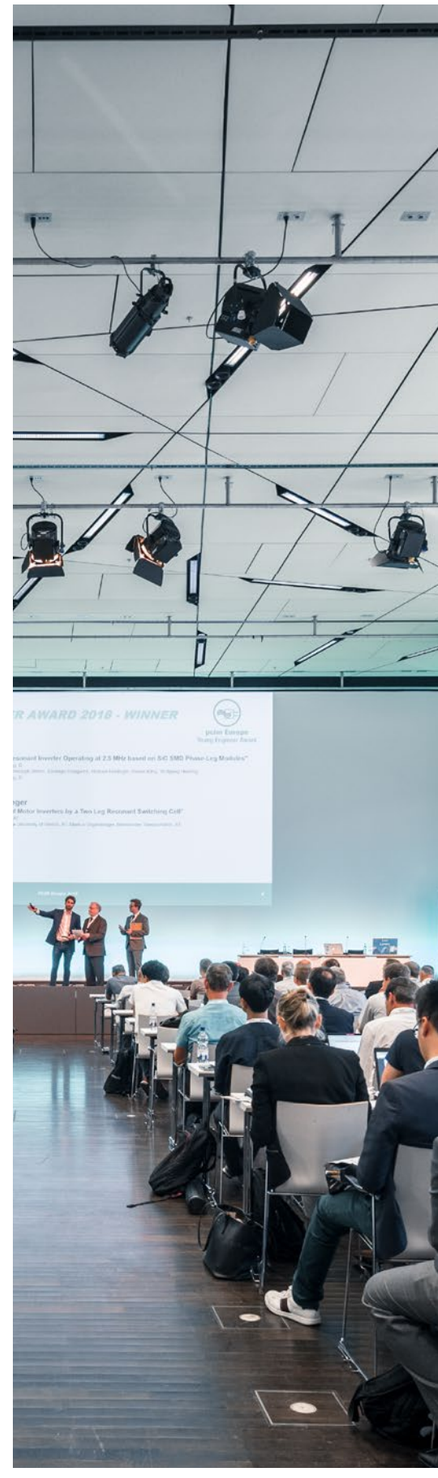
2 p.m. OP073
Copper Sintering Pastes for Die-Bonding and Large Area Bonding
Hideo Nakako, Resonac Corporation, J

2:20 p.m. OP074
Bonding Properties and Reliability Evaluation of Cu Sinter Paste for Pressure Sintering
Takashi Hattori, Mitsui Mining & Smelting, J

2:40 p.m. OP075
Crystallographic Examination of High Thermal Stability of Dense Sintered Copper Layer
Takaaki Eyama, Kao, J

3:05 – 5 p.m. Foyer Entrance NCC Mitte **Poster/Dialogue Session & Coffee Time**

Detailed program with descriptions and all co-authors can be found online at **pcim-europe.com/program**



Conference Thursday, 11 May 2023

Morning Oral Sessions

8:45 a.m. Stage Brüssel 1
Keynote HV Silicon and SiC Power Semiconductors; Key Components for Sustainable Energy Solutions
Munaf Rahimo, MTAL, CH | Chairperson: Drazen Dujic, EPFL, CH

9:30 a.m. Foyer Stage Brüssel **Coffee Break**

Stage Brüssel 1
SiC Device Design

Chairperson:
Ulrike Grossner, ETH Zurich, CH

9:50 a.m. OP076
Impact of Operating a SiC-MOSFETs Body Diode Beyond its SOA
Michael Rauh, University of Bayreuth, D

10:10 a.m. OP077
Avalanche Robustness of SiC MOSFETs in Parallel Connections
Clemens Herrmann, Chemnitz University of Technology, D

10:30 a.m. OP078
A novel 2200 V Schottky Barrier Diode-Embedded SiC MOSFET Module
Takahiro Ogata, Toshiba Electronic Devices & Storage, J

10:50 a.m. OP079
CoolSiCTM Trench MOSFET Chip Design for the 3.3 kV Class
Caspar Leendertz, Infineon Technologies, D

Stage München 1
Special Session: Understanding Losses in WBG Power Devices

Chairperson:
Elison Matioli, POWERlab, EPFL, CH

9:50 a.m. OP080
Switching Loss and Coss Hysteresis Loss in Power Devices
Jaume Roig, onsemi, B

10:10 a.m. OP081
Characterization of COSS Losses in Power Semiconductor at High Frequencies
Juan Rivas-Davila, University of Stanford, GB

10:30 a.m. OP082
Switching Losses in Power Devices: From Dynamic on Resistance to Output Capacitance Hysteresis
Elison Matioli, POWERlab, EPFL, CH

10:50 a.m. OP083
Dynamic Rdson in GaN HEMTs: Physical Origins and System Design Considerations
Nicholas Dellas, Infineon Technologies, A

Stage München 2
High Power SiC Converters

Chairperson:
Marc Hiller, Karlsruhe Institute of Technology, D

9:50 a.m. OP084
Open Loop Approach to Balance Cross Currents in Time Staggered Switching SiC-Converters
Simon Johannliemke-Appelbaum, Ruhr-University of Bochum, D

10:10 a.m. OP085
Switching Behaviour of a SiC-MOSFET 3-Level ANPC Inverter with Different Modulation Schemes
Johannes Häring, University of Bayreuth, D

10:30 a.m. OP086
Experimental 500kW Hybrid Si/SiC ANPC Inverter
To Pham Ha Trieu, University of Rostock, D

10:50 a.m. OP087
Investigation of SC Faults in 3300 V SiC MOSFET Based Half Bridge Submodules for HVDC Converters
Lukas Bergmann, University of Bayreuth, D

Stage Mailand
High Frequency Converters and Applications

Chairperson:
Francisco Javier Azcondo, University of Cantabria, E

9:50 a.m. OP088
Converters with Multiphase Magnetics: TLVR vs CL and the Novel Optimized Structure
Alexandr Ikriannikov, Analog Devices, USA

10:10 a.m. OP089
A High Gain Passive/Active Switched-LC DC-DC Converter
Ahmed Allehyani, University of Jeddah, USA

10:30 a.m. OP090
A Differential Relaxation Half-Bridge Oscillator for Inductive Power Transfer
Norbert Seliger, University of Applied Sciences Rosenheim, D

10:50 a.m. OP091
High Efficiency and High Power Density Totem-Pole PFC with SiC MOSFETs
Bhaskar Pariti, Wolfspeed, D

11:10 a.m. – 1 p.m. Foyer Entrance NCC Mitte **Poster/Dialogue Session**

Conference Thursday, 11 May 2023

Afternoon Oral Sessions

12 p.m. Hall 10.1 NCC Mitte **Lunch Break**

Stage Brüssel 1
DC-DC Converters

Chairperson:
Ole Gerkensmeyer, Wolfspeed, D

2 p.m. OP092
Implementation and Characterization of a 200 kW Full-SiC Isolated DC-DC Converter for Future Medium Voltage PV Plants
Minh Nhut Ngo, CEA, F

2:20 p.m. OP093
High-Frequency High-Efficiency LLC Module with Planar Matrix Transformer for CRPS Application Using GaN Power IC
Bin Li, Navitas Semiconductor, USA

2:40 p.m. OP094
DC-Ready Photovoltaic Solar Converter
Oleksandr Matiushkin, Tallinn University of Technology, EST

3 p.m. OP095
High Power-Density, Bi-Directional, 48 V to 12 V Converter using eGaN FETs for next generation BEV's
Michael de Rooij, EPC, USA

Stage München 1
SiC Device Application

Chairperson:
Nando Kaminski, University of Bremen, D

2 p.m. OP096
Advanced SiC Trench-MOS Technology for Automotive Application
Stephan Schwaiger, Robert Bosch, D

2:20 p.m. OP097
Application of Newly-Developed 2.3 kV Si and SiC Devices to Renewable Energy System
Shuangching Chen, Fuji Electric, J

2:40 p.m. OP098
Application-close Study of a SiC JFET Cascode Switching Characteristic under dV/dt-Limitations
Josefine Dukar, SEW-EURODRIVE, D

Stage München 2
Power Electronics for Charging Station

Chairperson:
Enrique J. Dede, University of Valencia, E

2 p.m. OP099
Evaluation of Silicon-Based 3-Level T-Type Neutral Boost Rectifier Integrated into SMPD Package for EV Charger Applications
Karsten Haehre, Littelfuse, D

2:20 p.m. OP100
Characterization of Si IGBTs in ZCS for EV Charger Applications
Salvatore Race, ETH Zurich, CH

2:40 p.m. OP101
Resonant, Bidirectional 22 kW DC-Stage for Chargers using Quantum Control Featuring Load Independent ZVS Achieving 99,2 % eff.@ 5,7 kW/L
Martin Nießen, Cologne University of Applied Sciences, D

3 p.m. OP102
An Interoperable 50kW Inductive Power Transfer Design for Opportunity Wireless Vehicle Charging
Irene Torres-Alfonso, Fundación CIRCE, E

Stage Mailand
Sensing and Measurement

Chairperson:
Eric Favre, IMI Precision Engineering, CH

2 p.m. OP103
Development of Method for Thermal Diffusivity Measurement of Thin and High Conductive Ceramics
Martina Schmirler, ROGERS, D

2:20 p.m. OP104
Acquisition of the DC-Link Voltage only by Measuring the Gate-Source-Voltage of a SiC MOSFET
Zheming Li, University of Bayreuth, D

2:40 p.m. OP105
High Current Converter for a Space Application: Pros and Cons of several current sensors
Thomas Harmand, 3D PLUS, F

3 p.m. OP106
Design of a Low Cost Over Temperature Detector using the Internal Gate Resistance as TSEP
Vincent Quemener, Mitsubishi Electric, F

Detailed program with descriptions and all co-authors can be found online at
pcim-europe.com/program

Conference Tuesday, 9 May 2023 Poster / Dialogue Sessions

3:05 p.m. – 5 p.m., Foyer Entrance | NCC Mitte

SiC Devices I

Chairperson:
Mark-M. Bakran, University of Bayreuth, D

PP001 **Active Clamping for SiC MOSFET's Body Diode During Reverse-Recovery**
To Pham Ha Trieu, University of Rostock, D

PP002 **Reverse Recovery Behavior in SiC-MOSFETs: Characterization and Modelling**
Andreas Hürner, Infineon Technologies, D

PP003 **Threshold Voltage Hysteresis in Compact Models of SiC-MOSFETs**
Qing Sun, Infineon Technologies, D

PP004 **Towards a Common Mode Free Packaging Solution for High Voltage Series Connected SiC MOSFET Switches**
Cédric Mathieu de Vienne, SuperGrid Institute, F

PP005 **Degradation Pattern of Parallel Symmetrical and Asymmetrical Double-Trench SiC MOSFETs under Repetitive Short Circuits**
Renze Yu, University of Bristol, GB

PP006 **SiC Power Device Competitive Landscape: A Patent Perspective**
Remi Comyn, KNOWMADE, D

PP007 **Characterization of the Static and Dynamic Behavior of a 1.2kV SiC JFET in Reverse Conduction**
Tim Ringelmann, University of Bayreuth, D

PP008 **Aging of SiC MOSFETS Through Multistep Voltage Gate Switching Stress**
Jorge Mari, Semikron Danfoss, D

Packaging for SiC Devices

Chairperson:
Christina DiMarino, Virgina Tech, USA

PP009 **New XHP 2 Module using 3.3kV CoolSiC MOSFET and .XT Technology**
Matthias Buerger, Infineon Technologies, D

PP010 **Evaluation of Next Generation MV SiC Power Modules**
Calvin Flack, University of Alabama, USA

PP011 **ISOPLUS - SMPD: An Advanced Isolated Packaging to Fully Exploit the Advantages of SiC MOSFETs**
Aalok Bhatt, Littelfuse Europe, D

PP012 **Characterization of 6.5 kV SiC MOSFETs with and without an Integrated On-Chip Schottky Diode**
Nicholas Baker, University of Alabama, USA

PP013 **Efficient and Optimized Traction Converter System Enabled by the New 3.3kV CoolSiC .XT Mosfet in XHP 2 Package**
Vishal Jadhav, Infineon Technologies, D

PP014 **Advanced PKG Technology for SiC in the NX Package**
Ryo Goto, Mitsubishi Electric, J

PP015 **Analysis of Moisture-Induced Void Formations within Silicon Carbide Power Modules**
Felix Fraas, Wolfspeed, D

PP016 **Investigation to Improve Reliability of Substrates having Low Thermal Resistance using thicker Cu Circuit Layer**
Fumiaki Ishikawa, Mitsubishi Materials, J

Reliability I

Chairperson:
Steffan Hansen, SMA Solar Technology, D

PP017 **Manufacturing Method of Copper Nanowired Interconnections for Embedding Power Dies in PCB**
Caio Cesar De Oliveira Mendes, Mitsubishi Electric, F

PP018 **Power Cycling test of PCB-Embedded Power Packaging**
Mounira Bouarroudj, SATIE, F

PP019 **Analysis of Tandem Diodes Solutions for Power Modules in Motor Drives Applications**
Tiago Jappe, Vincotech, D

PP020 **Influence of Humidity on Thermal Resistance of Power Devices**
Erping Deng, Hefei University of Technology, RC

PP021 **Switch Mode Power Cycling Test of Silicon Carbide MOSFETs using Repetitive Avalanche for Heat Generation**
James Abuogo, Chemnitz University of Technology, D

PP022 **In-Situ Wire Bond Lift-Off Detection in Three-Phase Inverters based on Magnetic Field Profiling**
Haosu Huai, University of Freiburg, D

PP023 **Influence of Testing Parameters On the Failure Mechanism of Power Modules During Active Power Cycling Test**
David Strahringer, University of Freiburg, D

PP024 **Potentials of Condition Monitoring for Automotive SiC Traction Inverters**
Nikolay Korshunov, IAV, D

E-Mobility in Transportation

Chairperson:
Pavol Bauer, Delft University of Technology, NL

PP025 **Optimization of Sets of Semiconductor Power Modules for Paralleling in High Power Converters**
Stefan Schönewolf, Siemens Mobility, D

PP027 **Magnetic Optimization for Three-Phase LLC Converters**
Daniel Ríos Linares, Polytechnic University of Madrid, E

PP028 **Co-Design and Prototyping of a Wide Bandgap-based Two-Level Inverter for Variable Speed Electrical Propulsion Drives**
Svetomir Stevic, RWTH Aachen University, D

PP029 **Design of a Fast Switching 200 kVA SiC Drive Inverter for Aviation Application**
Dennis Wöhrle, Fraunhofer ISE, D

PP030 **Characterization of a High Voltage Power Net in a Heavy Duty Fuel Cell Truck with Focus on Current Ripples**
Yavuz Gürlek, Daimler Truck, D

PP031 **Modeling of the Drive Train and Energy Management Strategy for a Hybrid Midsize Multifunctional Vehicle**
Vasken Ketchedjian, University of Stuttgart, D

PP032 **Quasi-Static Approach for Mass Estimation of Electric Propelled Vehicles**
Marius Miller, Ravensburg-Weingarten University of Applied Sciences, D

PP033 **A Comparison of GaN HEMT and SiC MOSFET Power Inverter Modules for Electric Vehicles (EV)**
Dominik Nehmer, University of Bayreuth, D

Power Electronics for Electric Cars I

Chairperson:
Ulrich Kirchenberger, STMicroelectronics, D

PP034 **Mitigation of PWM-Induced Losses in Electric Machines Using Multi-Level Converters**
Anand Krishnamurthy Iyer, Lightyear, NL

PP035 **Microcontroller Based Closed Control Loop Asynchronous Boost Converter Exploiting Sti2GaN IC**
Federica Cammarata, STMicroelectronics, I

PP036 **Performance Enhancement of a SiC Power Semiconductor Module**
Steffen Beushausen, Robert Bosch, D

PP037 **Reducing the Battery Current Ripple in EVs with Discontinuous Pulse Patterns**
Marius Gentejohann, Technical University of Berlin, D

PP038 **GaN-Based Multiphasic Drive for Electric Vehicles**
Ander Avila del Pozo, Ikerlan, E

PP039 **High Performance GaN Inverter for High-Speed Application**
Jordan Sorge, Fraunhofer IISB, D

PP040 **A Novel Approach to Suppress Self-Excited Oscillations in SiC-Based Power Modules**
Muhammad Muneeb Alam, Robert Bosch, D

PP042 **GaN-based High Frequency High Power Density 2-in-1 Bidirectional OBCM Design for EV Application**
Minli Jia, Navitas, CHN

Gate Drivers

Chairperson:
Bernhard Strzalkowski, Analog Devices, D

PP043 **An Active Gate Driver for Simultaneous Transient and Steady-State Currents Balancing for Silicon Carbide Power Modules in Parallel**
Ahmed Ismail, University of Arkansas, USA

PP044 **A New Resistive Adaptive Gate-Driving Concept with Automated Identification of Operational Parameters**
Philipp Swoboda, Karlsruhe Institute of Technology, D

PP045 **Current Adjustable Gate Drive IC with Propagation Delay Reduction Technique for High-Speed Power Transistors**
Hideaki Majima, Toshiba Electronic Devices & Storage, J

PP046 **Universal Isolated Gate Driving Platform for 650 V GaN HEMTs Half-Bridge with Dead-Time Control and Integrated Bias Supply**
Diogo Varajao, Infineon Technologies, A

PP047 **A Variable Gate Resistance SiC MOSFET Driver Network to Mitigate Overshoot and Parasitic Ringing**
Vin Loong Choo, TU Dortmund University, D

PP048 **Advantages of Synchronous Bootstrap Methods Over Conventional Methods to Prevent Bootstrap Overcharge in GaN Drivers**
Alexander Mazany, Texas Instruments, USA

PP049 **Design and Analysis of a Voltage Controlled Current Source Gate Driver for IGBT**
Alexander Leandro Quispe Parillo, University of Sheffield, GB

PP050 **Gate-Driver Design and Optimization in Power Converters**
Jan Hammer, University of British Columbia, CDN

Power Converters I

Chairperson:
Klaus F. Hoffmann, Helmut-Schmidt-University, D

PP051 **Resonant Multiport Converter with High Interconnection Capability and Lower Parameter Deviations**
Fabian Groon, University of Applied Sciences Kiel, D

PP052 **Thermal Management of a Compact High Power Factor Air Cooled Isolated 12kW 9 Litre SiC Three-Phase AC-DC Converter**
Jean Carlo Da Cunha, Traco Power, IRL

PP053 **A General Analytical Approach for the Analysis of Filter Circuits Regarding Conducted Voltage and Current Emissions**
Marcel Gladen, WILO, D

PP054 **32-Stage Semiconductor-Based Marx Modulator with Resonant Charging**
Martin Sack, Karlsruhe Institute of Technology, D

PP055 **A Dual Output Discontinuous Conduction Mode SEPIC with Integrated Boost DC-DC Converter**
Ben Stainthorpe, Newcastle University, GB

PP056 **Considerations for Mitigating False Triggering of a Truly Differential Input Gate Driver for 1.2kV SiC MOSFETs**
Jesi Miranda, CPES, USA

PP057 **Rotor Position Extraction of Dual Induction Motors at High Loads using Intermodulation Saliency**
Markus Vogelsberger, Alstom Austria, A

Measurement Methods

Chairperson:
Geraldo Nojima, Eaton Corporation, USA

PP058 **Layout Considerations for a New Current Sensing Circuit for Online Lifetime Prediction of SiC MOSFETs**
Yusuke Kubo, ROHM Semiconductor, J

PP059 **Reconfigurable Double Pulse Test Setup for Si and Wide Bandgap Power FETs**
Madhat Alimawi, University of Twente, NL

PP060 **Conceptual Design of a Portable Measuring Box for Monitoring Ripple Currents Affecting the Lifetime of Electrolytic Capacitors in Industrial Open DC Grids**
Jan-Niklas Koch, University of Applied Sciences and Arts Ostwestfalen-Lippe, D

PP061 **Current Measurement Comparison for SiC MOSFET Modules**
Yusi Liu, onsemi, USA

PP062 **Impedance Analysis in Power Electronic Systems with Spectral Estimation**
Tobias Haas, University of Applied Sciences Würzburg-Schweinfurt, D

PP063 **A Fully Integrated LEM Nano Current Sensor for DCM Platform for High Power Density EV-Applications**
Fabio Carastro, Semikron Danfoss, D

PP064 **Inverter-Integrated Acquisition of the Current Through the DC-Link Based on the Measured DC-Link Voltage**
Joschka Randerath, Cologne University of Applied Sciences, D

PP065 **Design of a 2 kA Pulsed Current Source for Characterization of Current Sensors**
Philipp Ziegler, University of Stuttgart, D

Power Converters and Measurement Methods

Chairperson:
Marcelo Lobo Heldwein, Technical University of Munich, D

PP066 **MMC Thermal Measurements on Floating Potential using an Arduino-Based Distributed and Wireless IoT Sensor System**
Julian Lange, Siemens Energy Global, D

PP067 **Design of an Easy-to-Use Standalone PD Measurement System for Pulsed Voltage and High dV/dt Setups**
Markus Fürst, University of Bayreuth, D

PP068 **High-Frequency Voltage and Current Probes for Measurement at Distance with an Oscilloscope**
Julien Chauvin, CEA, F

PP069 **Utterly Simple and Economical Bus Capacitors Pre-Charger Based on a Unique 'Floating Integrator'**
Sam Ben-Yaakov, Ben-Gurion University, IL

PP070 **A Novel Application in Overhead Power Lines of Wireless Self-Powered Monitoring System for Detection of Forest Fires**
Antonio-Miguel Muñoz-Gómez, CIRCE, E

PP071 **Embedded Current Sensor for SiC Die Current Measurement**
Janus Meinert, University of Aalborg, DK

PP072 **Mixed Critical Resolver to Digital Conversion for Safety-Related Servo Drive Applications**
Tobias Schmidt, Cologne University of Applied Sciences, D

Conference Tuesday, 9 May 2023 Poster / Dialogue Sessions

3:05 p.m. – 5 p.m., Foyer Entrance | NCC Mitte

PP073 **Improving a Machine Set Based Controller for Grid Side Power Converter Applications**
Steffen Menzel, University of Bremen, D

PP074 **Optimized Tuning of Controllers Considering Different VSI Four-Wire Converters in Autonomous Microgrids**
Sergio Augusto Oliveira da Silva, Federal University of Technology – Paraná, BR

Passive Components

Chairperson:
Mario Pacas, University of Siegen, D

PP075 **High Temperature Capacitor Films with Reduced Dissipation Losses for High Voltage AC-DC Inverters**
Adel Bastawros, SABIC, USA

PP076 **Improved Magnetic Devices for Battery Inverter Systems with a High Power-to-Weight Ratio**
Manfred Wohlstreicher, SUMIDA Components and Modules, D

PP077 **A Novel Test Setup for Arbitrary PWM Converter Excitations of Nonlinear Inductors**
Jeremias Kaiser, Friedrich-Alexander-University Erlangen-Nuremberg, D

PP078 **Experimental Analysis of the Temperature Dependency of an Orthogonal Field-Coupled Current Controlled Adjustable Inductance**
Guido Schierle, Helmut Schmidt University, D

PP079 **High Frequency Model with Ohmic Behave of a Three-Phase Coil**
Andreas Wist, University of Applied Sciences Wuerzburg-Schweinfurt, D

PP080 **Stress Testbench for Two-Phase Interleaved Coupled Inductors in Three-Level Inverters using Cascaded Control**
Valentin Wagner, Cologne University of Applied Sciences, D

PP081 **Analytical Model for Considering the Magnetic Anisotropy of the Inductance and Core Losses of Passive Magnetic Components**
Michael Owzareck, BLOCK Transformatoren-Elektronik, D

PP082 **Integration of High Leakage Inductance to HFHP Transformer in High Power Converters Vs the Use of a Discrete Inductor**
Kapila Warnakulasuriya, Infineon Technologies Reigate, GB

Packaging and Integration

Chairperson:
Thomas Basler, Chemnitz University of Technology, D

PP083 **Top Side Cooling Packages: Disrupting Technology to Boost Power Density and Performances in High-End Power Conversion Systems**
Daniela Cavallaro, STMicroelectronics, D

PP084 **Reliability and Thermal Analysis of ACEPACK SMIT Power Module**
Davide Maria Amoroso, University of Catania, I

PP085 **Epoxy Molding Compound Adhesion Analysis on Copper and Nickel Surfaces Using In-Situ Button Shear Method**
Andris Avots, Hitachi Energy, CH

PP086 **High Temperature Lead Free Solder for High Power Semiconductor Device Packaging Applications**
Muhammad Morshed, Dynex Semiconductor, GB

PP087 **Material Innovation, Process Development, Reliability & Challenges with Copper Sintered Interconnects for High Power & Optoelectronics Packaging**
Sri Krishna Bhogaraju, University of Applied Sciences Ingolstadt, D

PP088 **Thermal Evaluation of Substrate Technologies Used for Power Peak Management in SSPC Modules**
Guy Scoggin, SAFRAN, F

PP089 **Active Metal Brazed Cu-Si3N4 Composites for Power Electronics**
Axel Rost, Fraunhofer IKTS, D

PP090 **Development of Cu-Cu Joining Technology by Laser Welding for Terminal Attach within Power Semiconductor Package**
Elaheh Arjmand, Littelfuse, GB

MOSFETS and Integrated Power Modules

Chairperson:
Peter Kanschat, Infineon Technologies, D

PP091 **Assessment of MOSFET Switching Losses Based on Junction Temperature. Comparison in an LLC Converter between TO-247 and ACEPACK SMIT Using MDmesh DM6 Technology.**
Alfio Scuto, STMicroelectronics, I

PP092 **The Next Step in Power MOSFET Technology Enables Further Increase in Power Supply Efficiencies**
Simone Mazzer, Infineon Technologies, A

PP093 **A Heterogeneously Integrated Double-Sided Cooled Power Module for Electric Vehicles**
Ahmed Ismail, University of Arkansas, USA

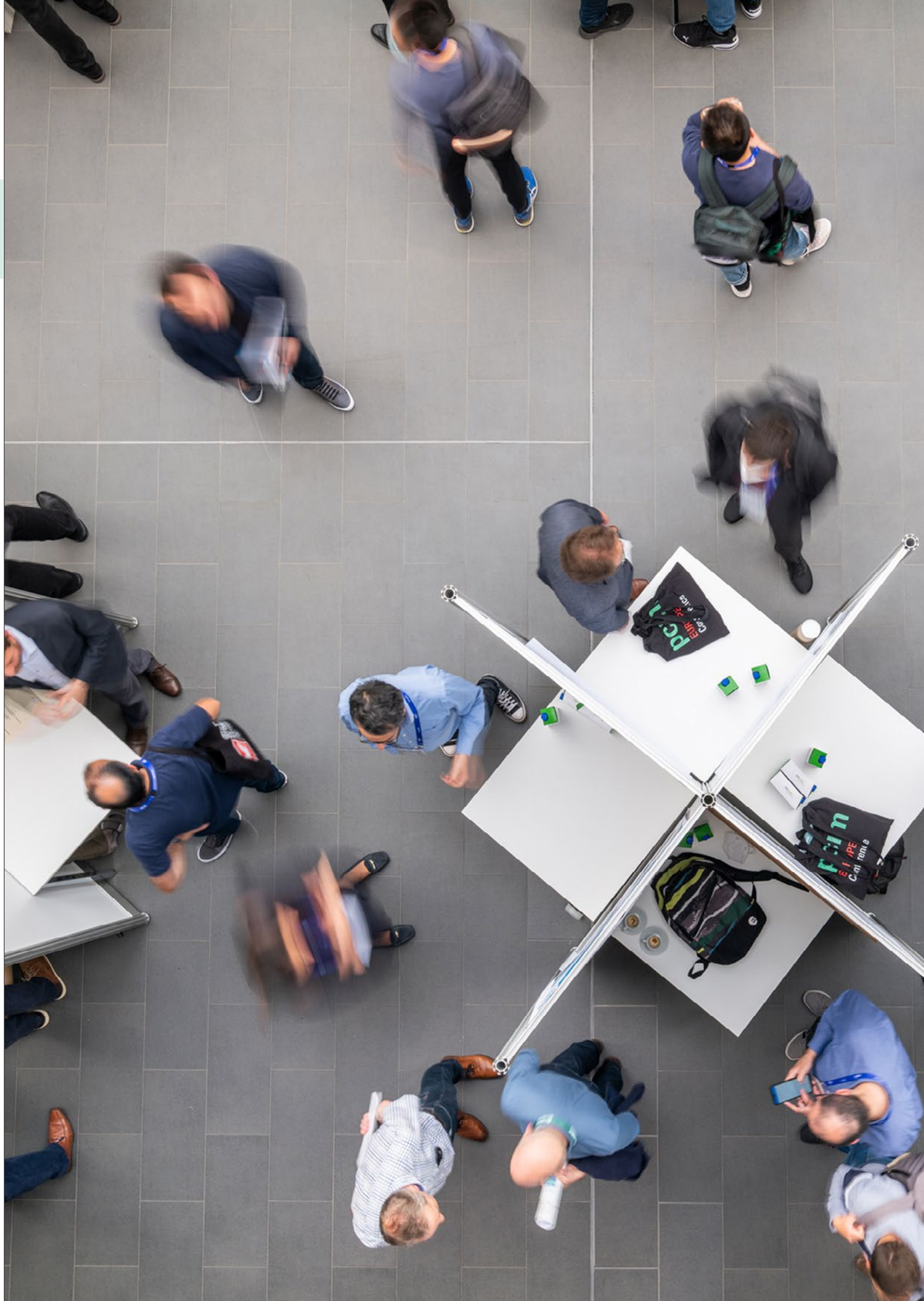
PP094 **Introducing the New 600 V CIPOSTM Tiny IM323 Intelligent Power Module for Motor Drive Applications**
Kihyun Lee, Infineon Technologies, ROK

PP095 **New SMD-IPM: Explore How to Make Low-Power Inverter Design More Compact and Cost-Efficient**
Jong-Mu Lee, Alpha and Omega Semiconductor, ROK

PP096 **Utilization of SiC Integrated Power Device Towards Enhanced Power Density and Energy Efficient Low Power Drives Applications**
Konstantinos Patmanidis, Infineon Technologies, A

PP097 **Development of Enhanced RC-IGBT Based Intelligent Power Module for Home Appliance Application**
Taesung Kwon, Infineon Technologies, ROK

PP098 **Online Monitoring Approach of a SiC Power Semiconductor using Turn-Off Delay during Operation**
Victor Golev, University of Applied Sciences Kiel, D



Conference Wednesday, 10 May 2023 Poster / Dialogue Sessions

3:05 p.m. – 5 p.m., Foyer Entrance | NCC Mitte

SiC Devices II

Chairperson:
Katsuaki Saito, Hitachi Power Semiconductor Device, J

PP099 **Characterizing the Stability Limits of 1.2 kV SiC MOSFET Body Diodes Under Hard Switching**
Mohammed Amer Karout, University of Warwick, GB

PP100 **Impact of Temperature and Base Bias Stress on the Static Characteristics of Silicon and 4H-SiC NPN Vertical Power BJTs**
Mana Hosseinzadehlish, University of Bristol, GB

PP101 **The Evolution of Commercial SiC FETs, from Planar Gates to Reliable Trench Technology and Towards Superjunction Devices**
Stephen Russell, TechInsights, CDN

PP102 **Characterization of Constant-Gate-Charge Scaled 4H-SiC Power Mosfets**
Ben Ngu, CPES, USA

PP103 **The Impact of Different Test Methodologies for Short-Circuit Ruggedness of SiC MOSFETs**
Sara Kochoska, onsemi, D

PP104 **Improved Power Cycling Reliability through the use of SmartSiC Engineered Substrate for Power Devices**
Eric Guiot, SOITEC, F

PP105 **Inter-Chip Oscillation of Paralleled SiC MOSFETs**
Florian Sawallich, University of Rostock, D

Reliability II

Chairperson:
Christina DiMarino, Virgina Tech, USA

PP106 **Compensation of Long-Term Drift Effects of SiC MOSFETs under Power Cycling Like Gate Conditions**
Carsten Kempiak, Otto-von-Guericke-University Magdeburg, D

PP107 **Reliability Assessment of Latest SiC Chip and Packaging Technology**
Sven Thomas, Heraeus Germany, D

PP108 **Power Cycling SiC MOSFETs: Study of Reliability in Multi-chip Power Modules**
Andrew Lemmon, University of Alabama, USA

PP109 **A Condition Monitoring Method for Solder Layer Degradation of Liquid-Cooled Power Semiconductors**
Timm Felix Baumann, CERN, CH

PP110 **Power Cycling of Discrete Devices with Very High Power Density**
Patrick Heimler, Chemnitz University of Technology, D

PP111 **Measurment Methods for Water-Uptake of Encapsulation Materials in Power Electronics**
Paul Gierth, Fraunhofer IKTS, D

PP112 **Identifying Superimposed Degradation Effects in Power Electronic Modules**
Isabel Austrup, ISEA, D

Control Techniques in Electrical Drives

Chairperson:
Martin Doppelbauer, Karlsruhe Institute of Technology, D

PP113 **A Method of Synchronizing with DUT to Improve the Stability and Accuracy of Power Hardware-In-the-Loop Simulator**
Jangmok Kim, Pusan National University, ROK

PP114 **Advanced Circuital Model for e-Drive Simulation, including Harmonic Effects and Fault Scenarios**
Andrei Bojoi, Polytechnic University of Turin, I

PP115 **Recurrence Plot Analysis Applied To Power Electronics Systems**
Lincoln Oliveira, Federal University of Ceara, BR

PP116 **Utilization of Least Squares Algorithm for Online Identification of Foster Thermal Network Parameters**
Martin Votava, Fraunhofer ISIT, D

PP117 **Parameters Identification for Control Tuning with Offline Methods for Permanent Magnet Synchronous Machines**
Oriol Subirats Rillo, CITCEA-UPC, E

PP118 **Parameter Sensitivity Assessment for Model-Based Sensorless Control of Synchronous Machines in Automotive Applications**
Robert Nelles, Porsche, D

PP119 **DQ-Sensor-Less Control Implementation on a Multi-Phase High- Speed Direct Drive Motor**
Maurizio Incurvati, MCI The Entrepreneurial University, A

PP120 **Position Control of External Rotor Permanent Magnet Synchronous Motor**
Goksel Kizir, Roketsan, TR

Power Electronics for Electric Cars II

Chairperson:
Martin März, Fraunhofer IISB, D

PP121 **Relevance and Range Benefit of Wide Bandgap Power Semiconductors in Autonomous Battery Electric Vehicles**
Marco Denk, University of Applied Sciences Coburg, D

PP122 **Latest Generation of EMI Suppression (Film) Capacitors for xEV Systems**
David Olalla, TDK Electronics, D

PP123 **Automated Design of Traction Inverter to Achieve Optimal Performances Over the Whole Driving Cycle of an Electrical Vehicle**
Timothé Delaforge, Bern University of Applied Sciences, CH

PP124 **SiC-Based Auxiliary E-Fuse Technology Demonstrator for EV Application**
Ehab Tarmoom, Microchip Technology, USA

PP125 **Design of a Four-limb Coupled Inductor for a Three-phase Six-switched Boost PFC Converter for EV Application**
Kelly Ribeiro de Faria, VALEO, F

PP126 **Advantage of Lead-Frame Wiring and High Reliable to Electromigration Package for High Power Density Automotive Power Module**
Yushi Sato, Fuji Electric, J

PP026 **Characterization and System Benefits of Using 3.3 kV All-SiC MOSFET Modules in MV Power Converter Applications**
Ahmed Ismail, University of Arkansas, USA

Charging Technologies I

Chairperson:
Serge Bontemps, Microchip Technology, F

PP127 **Multiport Type-C & PD Charger Topology and Control Methodologies**
Chuan-Yu Lin, Infineon Technologies, USA

PP128 **Tiny Power Box - Mechanical Investigations for Automotive Very High Power Density Onboard Chargers**
Ismail Recepi, Silicon Austria Labs, A

PP129 **Medium Voltage Series Resonant Dual-Active-Bridge DC-DC Converter for EV Charging System with Bipolar DC-link**
Przemyslaw Trochimiuk, Warsaw University of Technology, PL

PP130 **Increasing Power Transfer Capability of Wireless Battery Charger Under Misalignment Conditions**
Nikola Mirkovic, Polytechnic University of Madrid, E

PP131 **Increasing the Power Density of Bidirectional On-Board Chargers with a New Silicon Carbide Power Module**
Marija Jankovic, ROHM Semiconductor, D

PP132 **Investigation of Ripple Minimization in Asymmetric Interleaved Boost Converters for Vehicle-Integrated Photovoltaics (VIPV) Applications**
Ozturk Sahin Alemdar, ODTU-GUNAM, TR

PP133 **Advanced Synchronous Rectification for an IGBT-Based ZCS LLC Converter with High Output Currents for a 2 kW Automotive DC-DC Stage**
Daniel Urbaneck, University of Paderborn, D

PP134 **Design Optimization of Hybrid Technology PFC Stage in Bidirectional On-Board Charger with WBG Power Semiconductors**
Giuseppe Aiello, STMicroelectronics, I

Control Methods I

Chairperson:
Hans-Günter Eckel, University of Rostock, D

PP135 **Adaptive Control Methods for an Auxiliary Resonant Commutated Pole Inverter**
Markus Zocher, Nuremberg Institute of Technology, D

PP136 **Modeling and Control of a Decoupled Hybrid-Fed Multi-Active Bridge (MAB) converter**
Rebecca Tarraf, CEA, F

PP137 **Stability Enhancement and Power Flow Control for Lunar DC Microgrid with WBG based Flexible DC Energy Router**
Nihanth Adina, The Ohio State University, USA

PP138 **Current Limiting Method for Voltage Source Grid-Forming Inverters**
Alvaro Morales-Munoz, Huawei, D

PP139 **Digital Control for Efficient Switching Over a Wide Range of Supply Voltages**
Dominique Bergogne, Wise-Integration, F

PP140 **Optimized Pulse Patterns for Salient Permanent Magnet Synchronous Machines Considering Nonlinear Magnetic Effects**
Maximilian Hepp, Mercedes-Benz, D

PP141 **Sliding Carrier SPWM for Voltage Balancing in Multilevel Inverters**
Mehdi Zarei Tazehkand, University College London, GB

Power Converters II

Chairperson:
Hans Ertl, Vienna University of Technology, A

PP142 **Switching Losses Estimation Considering Device Parasitics in SiC-Based Industrial Induction Heaters**
Fernando González-Hernando, Ikerlan, E

PP143 **Effects of the DC-Link Voltage on the Efficiency of a 3.3kV-Si-SiC-Topology-Hybrid-Switch**
Michael Meissner, Helmut-Schmidt-University, D

PP144 **Experimental Evaluation and Analysis of Switching Losses for an Active Snubber Cell for High-Power Interleaved Boost Converters**
Sebastian Sprunck, Fraunhofer IEE, D

PP145 **Low Drop-out COT Buck Converter with Internal Compensation w/o Maximum Duty Cycle Limitation due to Minimum Off-Time**
Adalberto Mariani, STMicroelectronics, I

PP146 **Analytic Performance Analysis and Efficiency Model for Inverters at Imbalanced Operation**
Lukas Fräger, Block Transformatoren-Elektronik, D

PP147 **Solid-State Transformers for DC-AC Hybrid Grids: a Case Study of TIGON Project**
Jesús Muñoz-Cruzado Alba, CIRCE, E

Multilevel Converter

Chairperson:
Mark-M. Bakran, University of Bayreuth, D

PP148 **Comparison of 3-Level and 2-Level Topologies for Energy Storage Applications with the New Generation IGBT7**
Alexander Philippou, Infineon Technologies, D

PP149 **Derived Electrical Requirements from the Harmonized Standards and Norms for Electric Vehicle Charging Safety**
Tobias Högerl, Universität der Bundeswehr München, D

PP150 **Development and Operation of an MV-MMC with Optimal Use of Semiconductor Devices**
Joao Victor Farias, Fraunhofer ISIT, D

PP151 **Working Principle, Simulation and Measurement Results of a Novel Hybrid Cascaded H-Bridge Inverter for STATCOM and AHF Purposes**
Niklas Krug, Munich University of Applied Sciences, D

PP152 **Utilizing Dual Active Bridges to Integrate Battery Storage Systems into Medium Voltage MMC STATCOMs - A Feasibility Study**
Simon Puteanus, Technical University of Dresden, D

Modelling and Simulation

Chairperson:
Jacques Laeuffer, Dtalents, F

PP153 **Understanding the Impact on Parasitic Probing Effects onto the PCB Power-to-Control Crosstalk in Switch-Mode Power Supplies**
Jay Carpenter, Keysight Technologies, USA

PP154 **Reduction of SiC-MOSFET Switching Oscillations during Double Pulse Measurements**
Simon Podendorf, Helmut-Schmidt-University, D

PP155 **A Modelling Approach Towards High Power Module Design**
Roveendra Paul, onsemi, USA

PP156 **Computational Efficiency Analysis of a Compact Behavioral SiC SPICE Model**
Blake Nelson, Wolfspeed, USA

PP157 **SiC Power Modules for Automotive Traction Inverters: a Fully Integrated Electromagnetic-Thermal Modeling Methodology for the Estimation of Busbar Heating**
Daniela Cavallaro, STMicroelectronics, I

PP158 **Busbar Optimization Design for Low Parasitic Inductance SiC Power Module**
Wenbo Wang, Dynex Semiconductor, GB

PP159 **Fidelity Assessment of Real-Time Simulation for High-Frequency Resonant Converter Applications**
Marija Stevic, OPAL-RT, D

PP161 **Comparison of AC Common-Mode Filter Topologies through SPICE Simulations**
Maurizio Tranchero, Ideas & Motion,I

Conference Wednesday, 10 May 2023 Poster / Dialogue Sessions

3:05 p.m. – 5 p.m., Foyer Entrance | NCC Mitte

Passive Components and Transformers

Chairperson:
Hans Ertl, Vienna University of Technology, A

PP162 **Experimental Verification of Capacitive Power Loss Associated with the Transformer Intrawinding Capacitance**
Claus Kjeldsen, University of Southern Denmark, DK

PP163 **Using Powder Cores to Increase the Power Density of Flyback Storage Transformers**
Paul Winkler, Acal BFi, D

PP164 **Hybrid Magnetic Core to Increase Saturation Limit and Magnetizing Inductance in Integrated High Power Transformers**
Daniel Goldmann, Munich University of Applied Sciences, D

PP165 **Transformation of Transformer Design with Artificial Intelligence**
Vajira Dhanapala Buckingham Magnetics, GB

Energy Storage and Smart Grid

Chairperson:
Klaus Rigbers, SMA Solar Technology, D

PP166 **DC Transformer Impact on Voltage Dynamics in Hybrid AC-DC Power Distribution Networks**
Jules Mace, EPFL, CH

PP167 **Measured advantages of a Production Plant with DC Grid in terms of Energy Efficiency, Peak Power Reduction and Power Quality**
Slavi Warkentin, Technical University of Ostwestfalen-Lippe, D

PP168 **Advanced Solid-State-based Protection Scheme for High-Voltage Li-ionBattery Energy Storage System**
Hamzeh Beiranvand, Christian-Albrechts-University of Kiel, D

PP169 **Modeling the Influences of Cells Characteristics in Energy Storage System for Different Forms of Discharge Current**
Dimitar Arnaudov, Technical University of Sofia, BG

PP170 **The Dependency of 18650 Lithium Ion Batteries Characteristics on Temperature**
Ali Mashayekh, Universität der Bundeswehr München, D

PP171 **Evaluating SiC-MOSFETs and Si-IGBTs as Self-Protected Battery Disconnect switch in MW-Capable Battery Applications**
Martin Schulz, Littelfuse, D

PP172 **Development of an Educational Li-ion Battery Test Bench for Engineering Students**
Simon Ravyts, KU Leuven, B

Modelling and Digital Twining

Chairperson:
Klaus Marahrens, SEW-Eurodrive, D

PP173 **Digital Twin Approach for Accurate System-Level Simulation of Wide-Bandgap Power-Semiconductors using Temperature Dependent Parameters**
Oleksandr Solomakha, University of Stuttgart, D

PP174 **Development and Evaluation of a Model for the Implementation of a Digital Twin for a Wind Turbine**
René Reimann, University of Bremen, D

PP175 **Flexible and Cost Effective HiL System for Module Based VSC Simulation - Part III: Continuous Integration of HiL Based MMC Firmware Tests**
Tobias Barth, Siemens Energy, D

PP176 **Workflow from Psim to Imperix Platform to Implement Digital Control – Method Applied to Prototype an Bidirectional Inverter-Charger for Electrical Vehicle**
Alek Guedegbe, CEA GRENOBLE, F

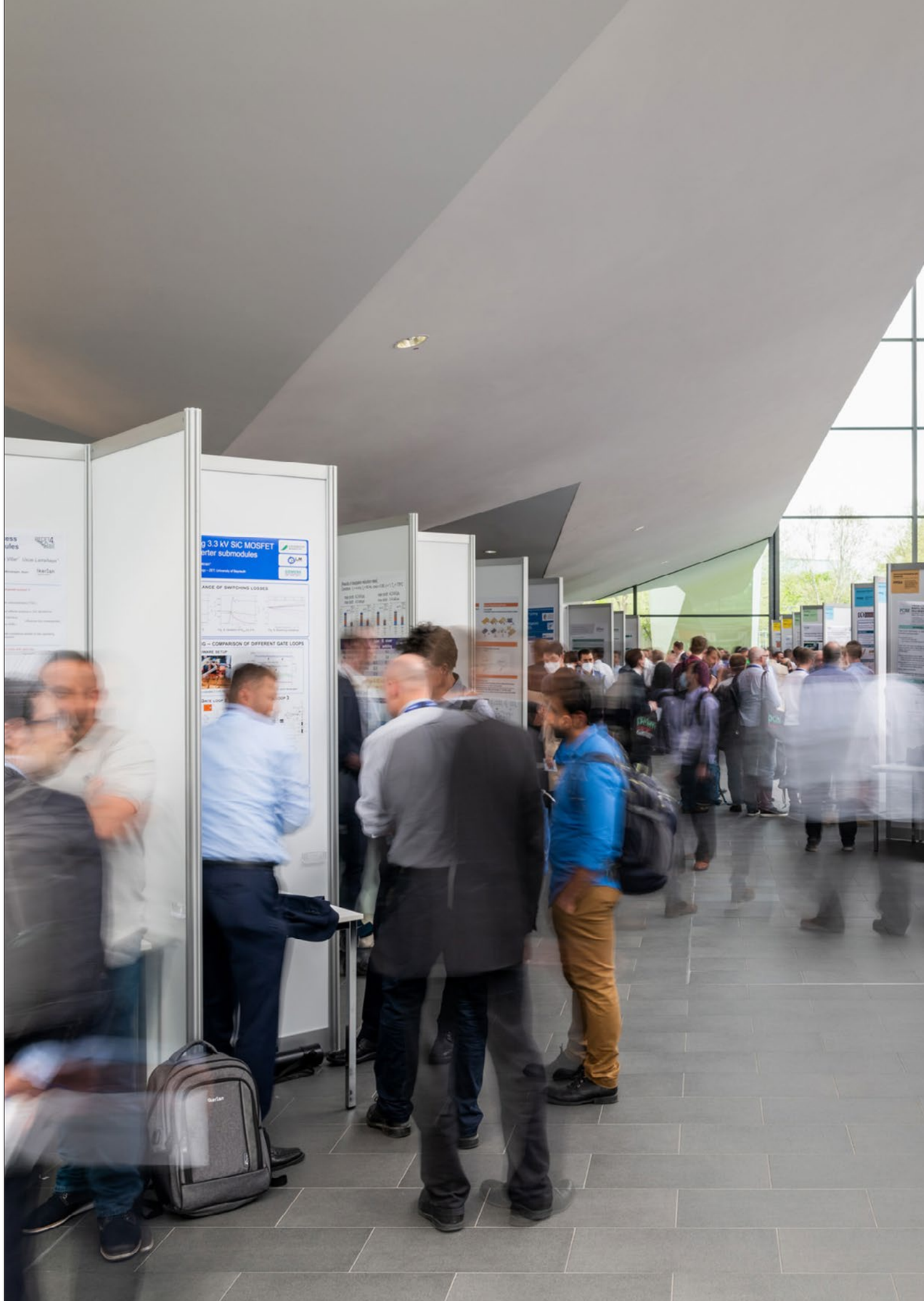
PP177 **Fast and Flexible PCB Parasitic Extraction from Gerber Files for Power Electronics Design Support**
Sven Fießer, Technical University of Ilmenau, D

PP178 **A Novel Approach of Hybrid Behavioral Modelling in Virtual Design Routines and a Survey of Computation Time Reduction**
Markus Mertens, Smart Mechatronics, D

PP179 **Reduction of Parasitic Effects in PCB Connection Paths to Improve the Switching Performance of GaN eHEMT**
Simon Holzmann, Kaiserslautern University of Applied Sciences, D

PP180 **Development of Low-Budget Conductive FDM-Filament for Processing in Commercial Fused-Layer 3D Printers**
Andre Schuhl, Fulda University of Applied Sciences, D

PP181 **Design and Multiphysics Simulation of a PCB-Embedded-Package Enclosing a Gallium Nitride System on Chip Grown on a Novel Substrate**
Abinash Pradhan, Silicon Austria Labs, A



Conference Thursday, 11 May 2023 Poster / Dialogue Sessions

11:10 a.m. – 1 p.m., Foyer Entrance | NCC Mitte

SiC Devices III

Chairperson:
Gourab Majumdar, Mitsubishi Electric, J

PP182 **New 1200V eSiC MOSFET in Kelvin Source Package to Maximize Efficiency in xEV and Solar Applications**
Wonsuk Choi, Power Master Semiconductor, ROK

PP183 **Power Loop Parasitics Impact on Paralleled Silicon Carbide MOSFETs**
Emanuela Alfonzetti, STMicroelectronics, I

PP184 **Dynamic Characterisation of 1200V-SiC-MOSFETs for High Current Applications in TO247-4-Packages**
Sönke Brandt, Helmut-Schmidt-University, D

PP185 **Repetitive Dynamic Voltage Clamp for SiC MOSFETs in Half Bridge Converters**
Luciano Salvo, STMicroelectronics, I

PP186 **Accurate Switching Energy Measurement of Wide Band-Gap Semiconductors at Low Current**
Gustavo Sathler Zappulla, IRT Saint-Exupéry, F

PP187 **Accuracy Improvement to Estimate Power Semiconductor Losses Using Opposition Method**
Tien Anh Nguyen, SATIE, F

PP188 **Evaluation of the Static Voltage Distribution Within Super-Cascode Power Modules**
Sergio Jimenez, The University of Alabama, USA

Motors

Chairperson:
Martin Doppelbauer, Karlsruhe Institute of Technology, D

PP189 **Integration of Power Electronics into the Stator of an Electrical Machine**
Philipp Marx, University of Stuttgart, D

PP190 **Methodology for the Selection of Optimum Switching Frequency and Modulation Technique for System Power Loss Minimization in Inverter-fed Variable Speed Drives**
Steffen Frei, Technical University of Darmstadt, D

PP191 **Optimized Integration of a Modular Motor Driver in a Low Voltage High Power, Open Winding Synchronous Machine**
Alexandre Siccardi, KEEP MOTION, F

PP192 **Verification of Theoretical Models of a Single Air Gap Axial Flux Permanent Magnet Synchronous Machine as a Gearless Drive**
Vanessa Linda Claus, Hamburg University of Applied Sciences, D

PP194 **Investigation of the Influence Caused by Coupling the Winding Systems in a Dual-Stator PMSM Using MATLAB/Maxwell CO-SIM**
Jan Winter, University of Kassel, D

PP195 **Wide Band Gap Inverters and High Frequency Effects on Motor Drives**
Guilherme Bueno Mariani, Infineon Technologies, A

IGBT

Chairperson:
Stefan Linder, Alpiq, CH

PP196 **Desaturation Pulse-Based Turn-Off of Low-Saturation 1.2kV IGBTs for Reduced Turn-Off Energy Losses**
Vishwas Acharya Nayampalli, University of Rostock, D

PP197 **1200 V TRENCHSTOP IGBT7 H7 and Emitter-Controlled EC7 Rapid Diode Technologies Define an Enhanced Benchmark for Improved Energy-Efficient, Fast-Switching Inverter Applications**
Ajith Kumar Sekar, Infineon Technologies, A

PP198 **Evaluation of Silicon Nitride as Moisture Barrier Layer for Enhanced Reliability of IGBT Modules During HV-H3TRB Test**
Shoubhik Gupta, Dynex Semiconductor, GB

PP199 **Investigation of the IGBT's and Diode's Ruggedness Under Short-Circuit Type III Conditions Well Beyond the SOA**
Madhu Lakshman Mysore, Chemnitz University of Technology, D

PP200 **Device Model of CSTBT with Highly Dosed Carrier Density in CS Layer**
Toshiya Tadakuma, Mitsubishi Electric, J

PP201 **Power Semiconductor Module Development for Low Voltage Hybrid Circuit Breaker Used in DC Power Grids**
Kenan Askan, Eaton Industries, A

Charging Technologies II

Chairperson:
Peter Wallmeier, AEG Power Solutions, D

PP202 **Analysis and Experimental Verification of Efficiency Improvement of Automotive Onboard Battery Charger Based on MOSFETs Ideal Rectifier for Active Boost PFC**
Borislav Dimitrov, University of Warwick, GB

PP203 **A SiC Based 60kW Three Phases Interleaved LLC Converter for EV Fast Charger**
Sidhart Gupta, Wolfspeed, D

PP204 **Cost Effective High Power MV Charger Concepts for Highway Charging Stations**
Daniel Neuner, Graz University of Technology, A

PP205 **Charger with Two Balanced Outputs for Li-Ion Battery Packs**
Christian Branas, University of Cantabria, E

PP206 **Achieving fast Electric Vehicle Charging on a Limited Domestic Supply »Power Harvester«**
Vajira Dhanapala, Buckingham Magnetics, GB

Power Supplies

Chairperson:
Daniel Chatroux, CEA-LITEN, F

PP207 **Optimized Power Processing Sharing Between the Converters of a Single-Phase Delta Uninterruptible Power Supply System**
Sergio Augusto Oliveira da Silva, Federal University of Technology –Paraná, BR

PP208 **Effect of the Auxiliary Power Supply of Active Circuits on the Performance of Active EMI Filter**
Xavier Maynard, CEA GRENOBLE, F

PP209 **Quadratic Combined Forward-Flyback Converter**
Helmut Votzi, University of Applied Sciences Technikum Vienna, A

PP210 **Modeling and Analysis of Boost Power Factor Correction Converter Operated in CrCM using Various Software Tools**
Pratiksha Patil, Infineon Technologies, D

PP211 **Extreme Step-Down Ratio Single-Stage Solution for 48V-to-1V Point-of-Load Converter**
Bima Nugraha Sanusi, Technical University of Denmark, DK

PP212 **The Resonant Characteristics Comparison between Primary-Side Resonant and Secondary-Side Resonant Active Clamp Flyback**
Yang-Lin Chen, Texas Instruments, CHN

PP213 **Autonomous Minimization of Power Loss by Switching Frequency Adjusting Function for a DC–DC Converter**
Junichi Kashiwagi, ROHM, J

PP214 **Digital GaN 300W AC/DC Power Supply**
Dominique Bergogne, Wise-Integration, F

PP215 **Gallium Nitride Based High Density Power Factor Corrected AC-DC Converter for Next Generation Power Conversion Solution**
Chun Kit Cheung, ASTRI, HK

Control Methods II

Chairperson:
Gianmario Pellegrino, Polytechnic University of Turin, I

PP216 **Voltage Stress Reduction for New 3L-ANPC Modulation Scheme Using Both Current Paths in Zero State**
Felix Eichler, Dresden University of Technology, D

PP217 **Optimisation of a Model based Controlled Power Converter Test Platform**
Dawid Koczy, University of Bremen, D

PP218 **Hybrid-Switch-Inverter – A New Approach Reducing the System Cost of the Electric Powertrain**
Michael Walter, University of Bayreuth, D

PP219 **Highly Dynamic Voltage Control of a Dual Active Bridge over the Full Voltage Range by Operating Point Dependent Manipulated Variable Limitation**
Georg Zieglmaier, Karlsruhe Institute of Technology, D

PP220 **Analyzing the Influence of Rotating Voltage Vectors in Case of FCS-MPC-Controlled Matrix-Converter for PMSM**
Robert Zipprich, University of Kassel, D

PP221 **Real-time Validation of Quadratic Regression Model Based Predictive Control of Grid-side Converters**
Kristóf Gábor Bándy, Budapest University of Technology and Economics, H

PP222 **Modified Third Harmonic Injection Modulation for Voltage Balancing in Multilevel Inverters**
Mehdi Zarei Tazehkand, University College London, GB

Power Converters III

Chairperson:
Hans Ertl, Vienna University of Technology, A

PP223 **Solid-State Transformers: How Far Have We Come?**
Rafael Medeiros, Schneider Electric, F

PP224 **SiC-MOSFET Assisted, Si-IGBT 1200 V Switch for 3-Phase DC-AC Converters with Overload Condition**
Andrea Piccioni, Infineon Technologies, A

PP225 **High-Density, High-Power Converters Using Paralleled 3.3 kV All-Silicon Carbide Power Modules**
Ahmed Ismail, University of Arkansas, USA

PP226 **A Design Methodology for a CLLLC Bidirectional Resonant Converter with an Integrated Transformer**
Sajad A. Ansari, University of Sheffield, GB

PP249 **New Method for Determining the Peak Ripple Current for Different Modulation Techniques of Hard-Switching Three-Phase VSIs**
Bela Truschenski, Leipzig University of Applied Sciences, D

PP251 **Impacts of Cross-Saturation on Sensorless Control of Synchronous Machines Using Alternating Signal Injection**
André Haspel, University of Stuttgart, D

PP252 **Investigation of the Effects of Block Commutation and Field Oriented Control on PMSMs and Driver Electronics**
Ekrem Uyar, Roketsan, TR

EMC in Power Electronics

Chairperson:
Marco Liserre, Christian-Albrechts-University of Kiel, D

PP227 **Retrofitting Industrial Machinery Driving Large Inertia Loads to Increase the Efficiency and Power Quality in Industrial Grids**
Alberto Pigazo, University of Cantabria, E

PP228 **Efficiency and EMC Comparison of Si MOSFET and GaN HEMT Based Full Bridge DC-DC Converter**
Ekon Ayawo Roger, Synchrotron SOLEIL, F

PP229 **Gain Adjustment Control for an Active EMI Filter**
Stefan Haensel, Siemens, D

PP230 **Design and Simulation of a LISN and an EMC Filter of a Drive Inverter for an Open Industrial DC Grid**
Henriette Reineke, Lenze, D

PP231 **Experimental Validation of Differential and Common Mode Equivalent Circuit of a Three Phase Level Vienna Rectifier**
Gonzalo Moreno Huerta, Indra Sistemas, E

PP232 **Radio Disturbance Evaluation of Si- and GaN-Inverters**
Benedikt Kohlhepp, Friedrich-Alexander-University Erlangen-Nuremberg, D

PP233 **An Active EMI Filter for Common-Mode EMI Mitigation in High-Power AC Systems**
Timothy Hegarty, Texas Instruments, USA

PP234 **Influence of DMC EMI Optimization on CMC EMI for DC-AC Isolated Power Converter Array**
Hugot Pichon, G2elab, F

Thermal Measurements and Cooling

Chairperson:
Anton Miric, Heraeus, D

PP235 **Development of Heat Source for Performance Verification of Thermal Management for Double-Sided Cooled SiC-Power Semiconductors**
Simon Cepin, University of Applied Sciences and Arts Ostwestfalen-Lippe, D

PP236 **Investigation of a Non-Linear Two-Phase Immersion Cooling of Power Semiconductors**
Michael Gleissner, University of Bayreuth, D

PP237 **Polymer-Based Impingement Cooling of Silicon Carbide Power Modules for Traction Applications**
John Mookken, onsemi, USA

PP238 **Subcooled LN2/LN2 at Boiling Point/GN2 for Cryogenic Cooling of Power Electronic Components in Aircrafts**
Timin Jacob, Airbus Upnext, D

PP239 **Super High Heat Dissipation Resin Sheet by Card House Type BN Filler**
Katsuhiko Hidaka, Mitsubishi Chemical, J

PP240 **Electronic and Semiconductor Testing Using Lock-in Thermography with Cameras in HD Resolution for Failure Detection**
André Kipp, InfraTec, D

PP241 **Comparison of Junction Temperature Measurement Using the TSEP Method and Optical Fiber Method in IGBT Power Modules Without Silicon Gel Removal**
Kaichen Zhang, University of Aalborg, DK

PP242 **Measurement and Validation of Junction Temperatures of Chips in Automotive Traction Modules at Inverter Level**
Udaykumar Vangaveti, onsemi, USA

PP243 **Thermal Considerations for Y Capacitors in Wide Band-Gap Based Inverters**
Maurizio Tranchero, Ideas & Motion, I

Conference Thursday, 11 May 2023 Poster / Dialogue Sessions

11:10 a.m. – 1 p.m., Foyer Entrance | NCC Mitte

Renewable Energy Technologies and Grid Stabilisation

Chairperson:
Bernd Eckardt, Fraunhofer IISB, D

PP244 **Fault Ride-Through and Reactive Power Capability Analysis of Grid-Connected Fully Rated Converter Wind Turbines**
Gulasalkhon Musinova, Technical University of Dresden, D

PP245 **System Evaluation and Optimization of Wind Converters Using Dedicated Power Modules for Line-side and Machine-side Converters**
Marcel Morisse, Infineon Technologies, D

PP246 **Field Data based Analysis of Microclimates and Humidity in PV Inverters**
Felix Kulenkampff, Fraunhofer ISE, D

PP247 **Design and Optimization of CLLC Converter Enabling Highly-Efficient Partial Power Processing for Solar PV Applications**
YongDae Kwon, Huawei, D

PP248 **Cost and Energy Efficient Bridgeless Totem-Pole PFC Using CoolSiC(TM) Hybrid Discrete IGBT for High Power SMPS Applications Achieves 80 PLUS Titanium Grade**
Syeda Qurat ul ain Akbar, Infineon Technologies, A

GaN Devices

Chairperson:
Petar J. Grbovic, University of Innsbruck, A

PP253 **Gallium Nitride-Based Inverter for Three-Phase Permanent Magnet Motor Drives**
Gianluigi Forte, STMicroelectronics, I

PP254 **Trading – off GaN FET Performance with Advanced Si MOSFETs**
Giuseppe Longo, STMicroelectronics, I

PP255 **Measurement of GaN HEMTs' Temperature Dependent On-State Resistance in Switching Operation**
Tianyu Li, Otto-von-Guericke-University, D

PP256 **Characterization of Short Circuit Behavior of Parallel Connected GaN HEMT Power Semiconductors**
Jan Schmitz, Technical University of Dresden, D

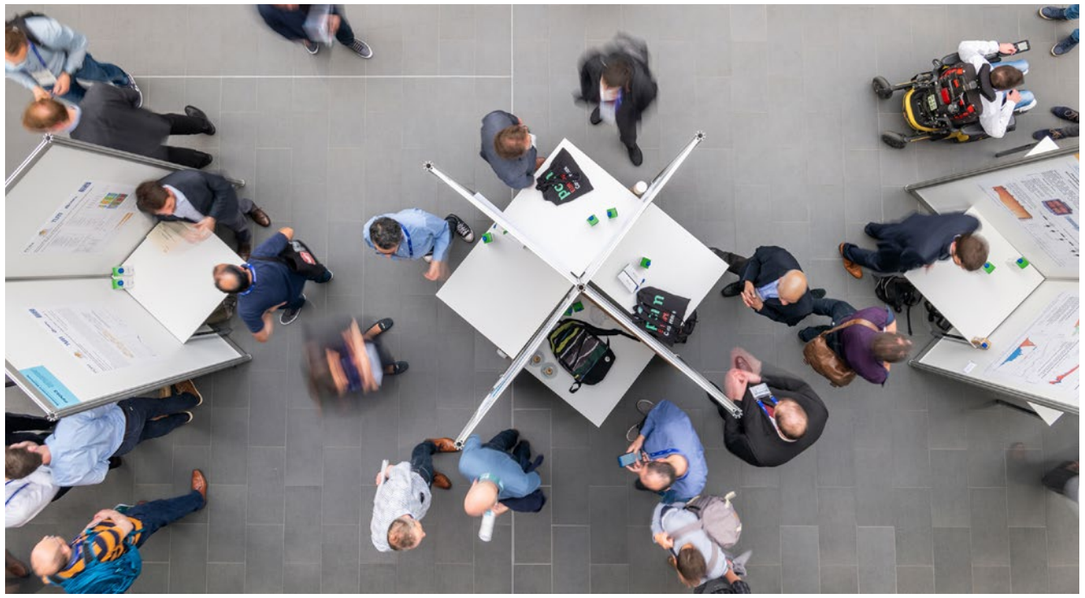
PP257 **Modelling and Experimental Validation of GaN Based Switching Leg in Inverter Topology for Motor Drives Applications**
Marco Palma, EPC, I

PP258 **Using the Influence of Internal Gate Resistance on Gate Current Peak as TSEP for GaN HEMTs**
Kevin Ladentin, Otto-von-Guericke-University, D

PP259 **A GaN-Based 250-kHz LLC Converter with Hybrid Analogue-Digital Control**
Christophe Basso, Future Electronics, F

PP260 **Experimental Analysis of Short Circuit Robustness of GaN and SiC Cascode Devices**
Renze Yu, University of Bristol, GB

PP261 **Fast Switching of High-Power GaN Transistors**
Edward Shelton, University of Oxford, GB



Social Program

Welcome Party

The PCIM Europe invites exhibitors, speakers and conference participants to the Welcome Party. Look forward to an evening full of networking, culinary catering and entertainment. Access is only possible with previous registration while booking your conference ticket. Please note that a registration on-site is not possible. Please come to the Conference Counter in NCC Mitte or to the Service Desk in Foyer Brüssel to pick up your access band for the Welcome Party.

Location NCC Ost
Date Tuesday, 9 May 2023, 5:15 p.m.

Night of Excellence

The evening for advisory board members and speakers offers all participants an unforgettable experience in an extraordinary atmosphere. The evening awaits you with an exclusive dinner and special entertainment program at the Hotel Le Meridien in Nuremberg. As a conference attendee you can join the evening by booking the »Full Conference – Plus« ticket.

Location Hotel Le Meridien, Nuremberg
Date Wednesday, 10 May 2023, 6:30 p.m.

After Work Beer

The After Work Beer offers you a relaxed atmosphere to end the exhibition and conference day with a lot of networking with colleagues, business partners and new contacts. Grab a beer or water before you head home!

Location Messepark
Date Wednesday, 10 May 2023 from 4 – 6 p.m.

Walking towards excellence

Come to the Conference Counter (NCC Mitte) or Service Desk (Foyer Brüssel) and get your own pair of the PCIM Europe community socks, to always have a reminder of this year's PCIM Europe with you.

PCIM Europe digital

The PCIM Europe 2023 will be complemented by a digital platform with live streaming, on demand presentations as well as exhibitor and product profiles.

The digital platform is available via
pcim.digital.mesago.com

Digital Features of the conference

- Live streaming: Experience the varied conference presentations of Stage Brüssel 1 in Nuremberg in a live stream.
- On demand conference presentations: Review all oral presentations of the conference anytime and from anywhere or catch up on missed presentations. Selected poster presentations are also available in pre-recorded videos.
- Digital proceedings: All manuscripts are available on the digital platform in the related presentation profile.

Digital Features of the exhibition

- On demand stage presentations:
  All contents of the Industry, Exhibitor and E-Mobility & Energy Storage Stage will be recorded on-site and will then be available on the Digital Stage
- Exhibitor and product profiles:
  Find relevant exhibitor profiles, products and contacts

General Information

Register online
pcim-europe.com/registration

Conference counter opening hours

Arvena Park Hotel
Sunday, 7 May 2023 from 1 until 5 p.m.
Monday, 8 May 2023 from 8 a.m. until 2 p.m.

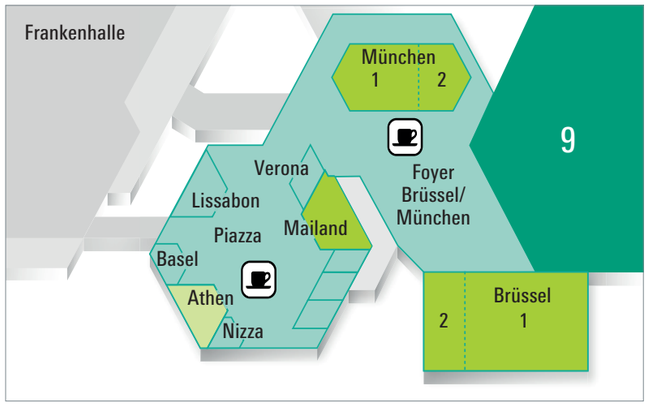
NCC Mitte, NürnbergMesse
Monday, 8 May 2023 from 4 until 6 p.m.
Tuesday, 9 May 2023 – Thursday, 11 May 2023 from 8 a.m. until 5 p.m.

Free Wifi

- Connect to the network »NürnbergMesse_Wi-fi«
- Confirm the terms and conditions
- You are now connected

Exhibition grounds plan

Conference room plan



- PCIM Europe 2023
- SMTconnect 2023
- SENSOR + TEST 2023
- Eingänge und Servicebereiche
  Entrance and Service
- Konferenz
  Conference
- Speakers Lounge Athen

pcim
EUROPE

Save the date
11 – 13 June 2024

Call for Papers

You are an expert in the field of power electronics and would like to present your latest developments and research findings to a highly-qualified audience?

Take the chance and become a speaker at the PCIM Europe 2024!

Why be a speaker?

- Present your solution to an international audience
- Have your paper published in the PCIM Europe proceedings, IET Inspec-Direct, Knovel, Scopus and IEEExplore
- Get the chance to win one of the attractive Awards
- Connect and engage with fellow professionals

Important deadlines for your submission

Submission of your abstract **18 October 2023**
Notification of acceptance **January 2024**
Submission of your full manuscript **9 April 2024**

The Call for Papers for the PCIM Europe 2024 will be online at **pcim-europe.com** from mid June 2023.

#pcimeurope

mesago
Messe Frankfurt Group