

pcim
ASIA



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26 – 27 October 2022

2F, Chuangjing Technology Center, No. 1539,
Haigang Road, Lin-gang Special Area of
China (Shanghai) Pilot Free Trade Zone

International Exhibition and Conference for
Power Electronics, Intelligent Motion, Renewable
Energy and Energy Management

**Power electronics
towards a sustainable
new era**

Conference Program

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PCIM Asia 上海国际电力元件、可再生能源管理研讨会

PCIM Asia- International Conference on Power Electronics,
Intelligent Motion, Renewable Energy and Energy Management

主办单位 Organizer

广州光亚法兰克福展览有限公司
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上海临港电力电子研究院
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IEEE PELS-CPSS上海联合分会
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时间 Date

2022年10月26至27日
26 – 27 October 2022

地点 Venue

中国自由贸易区（上海）临港新片区海港大道1539号, 创晶科技中心, 2楼
2F, Chuangjing Technology Center, No. 1539, Haigang Road, Lin-gang Special Area of China (Shanghai) Pilot Free Trade Zone

会议形式 Format

线下+线上
hybrid (offline+ online)

联系方式 Contact

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www.pcimasia-expo.com

Contents

Welcome Address	01
Advisory Board and Technical Committee	03
Agenda	05
PCIM Asia 2022 Award Winners	07
Wednesday Morning Oral Sessions	09
Wednesday Poster Sessions	10
Wednesday Afternoon Oral Sessions	11
Thursday Morning Oral Sessions	12
Thursday Poster Sessions	14
Thursday Afternoon Oral Sessions	15
Registration Information	17
Call for Papers	18

Welcome Address

Dear PCIM Asia participants,

I am very pleased and honored to welcome all of you to the PCIM Asia Conference 2022 in Shanghai.

The PCIM Asia Conference the leading Power Electronics Event worldwide for discussing future technology trends in this technical domain and offering a competent platform for introducing the new generation of components and scalable power electronic building blocks in the market. Researchers from academia and experts from industry will provide presentations and being available for open discussions on new materials for power devices and passive components, advanced packaging technologies with extended lifetime and outstanding reliability, digital controlled energy systems and AI solutions for smart power converters. This year in our technical program we are covering dedicated innovations in the field of power electronics in complimentary to three leading experts for keynote presentations, two special sessions on WBG Devices and AI solutions for intelligent power conversion systems and two Chinese sessions. The PCIM Asia serves as a technical and scientific platform for engineers and researchers in the field of power electronics as well as decision makers from companies to generate new market segments and trigger future research directions.

Pioneering work of new products will be discussed during this year the PCIM Asia Conference

The technical program of this year's PCIM Asia is covering advanced developments of new power semiconductor devices based on Si and WBG (SiC& GaN) technologies with smart gate driver solutions, dedicated packages for ultrafast switching devices with extended lifetime and predictive diagnostic functions as well as smart digital controlled power conversion concepts with the impact of AI solutions.

Conference highlights and important milestones in Power Electronics

The keynote presentations on High Power Semiconductor Circuit breaker development, benefits of DC Grids in renewable energy technologies and power solutions for Server Applications are addressing important development trends in power electronics. A further strong focus is on new materials to achieve a technology breakthrough towards elevated temperature along with an extended lifetime of devices and smart digital controlled power converter concepts. Distinguished speakers will be discussing Challenges in High Power Density Converter design as well as passive components and filter design.

Special attention has been paid to research carried out by young engineers from industries and universities with their presentations and Best Paper Awards during the PCIM Asia conference 2022 – these are certainly further highlights of the conference.

I wish you an enjoyable and successful conference, an open dialog with all the experts and packed with new ideas for your future product innovation and business.

Leo Lorey



欢迎致辞

尊敬的PCIM Asia来宾,

本人非常荣幸地欢迎各位前来参加PCIM Asia 上海国际电力元件、可再生能源管理研讨会。

PCIM Asia 国际研讨会作为全球领先的电力电子研讨会，专注于讨论电力电子领域的未来技术趋势，为向市场推出新一代功率半导体器件与可扩展的电力电子组件提供了一个优秀平台。来自行业及学界的专家将于会上进行演讲，就用于功率器件和被动元件的新材料、可延长使用寿命和具有出色可靠性的先进封装技术、数字化能源系统以及适用于智能功率转换器的AI解决方案等进行交流讨论。今年，PCIM Asia 国际研讨会将专注电力电子领域的创新，带来三场主题演讲，两场分别关于宽禁带器件和人工智能在电力电子中的应用的特邀专题报告，以及两场中文专场。PCIM Asia 作为一个专业科技平台，为电力电子领域的工程师、研究人员以及公司决策者提供了一个新的细分市场和探索未来研究方向的机会。

今年，PCIM Asia 国际研讨会将讨论关于新产品的开创性工作。

PCIM Asia 国际研讨会会议程涵盖了多个议题，包括基于硅和宽禁带（碳化硅和氮化镓）技术的新型功率半导体器件的新发展、智能门级驱动方案、具有延长使用寿命和诊断功能的用于超快开关器件的封装技术，以及基于人工智能的数字功率转换概念。

研讨会将成为电力电子领域的亮点和重要里程碑

研讨会重点关注电力电子领域的重要发展趋势，特设主题演讲：关于高功率半导体断路器的发展、直流电网在可再生能源技术中的优势以及服务器应用的电源解决方案。另一重点是关于利用新材料实现在高温工作环境下延长设备使用寿命的技术突破，和关于智能数字功率转换器的概念。演讲者将围绕高功率密度转换器设计的挑战，以及被动元件和滤波器设计进行演讲及讨论。

我们也特别关注来自企业和高校的年轻工程师们的演讲，以及PCIM Asia 2022 国际研讨会最佳论文奖。毋庸置疑，这些也都是本次会议的亮点所在。

衷心祝愿您在研讨会拥有一个愉快的体验，与专家集思广益，畅所欲言，为将来的产品创新和业务拓展带来新想法。

Leo Lorenz



Advisory Board and Technical Committee

Chairman



Leo Lorenz
ECPE, DE

Board of Directors



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Smart Induction Converter
Technologies, ES



Naoto Fujishima
Fuji Electric, JP



Yongdong Li
Tsinghua University, CN



Jinjun Liu
Xi'an Jiaotong University, CN



Gourab Majumdar
Mitsubishi Electric
Corporation, JP



Norbert Pluschke
Semikron, HKSAR, CN



Xinbo Ruan
Nanjing University
of Aeronautics and
Astronautics, CN



Zhihong Wu
Tongji University, CN



Dehong Xu
Zhejiang University, CN



Dianguo Xu
Harbin Institute of
Technology, CN



Jianping Ying
Delta Electronics, CN



Dapeng Zheng
Shenzhen Hopewind
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Haihui Luo, Zhuzhou CRRC Times Semiconductor, CN

Yu-Kang Lo, Lite-ON Technology, TW, CN

Meiqin Mao, Hefei University of Technology, CN

Abhijit D. Pathak, ADP-Power LLC, USA

Gaosheng Song, Great China Mitsubishi Electric Semiconductor, CN

Tianhao Tang, Shanghai Maritime University, CN

Yi Tang, Starpower Semiconductor, CN

Shunli Wang, Southwest University of Science and Technology, CN

Xuhui Wen, Institute of Electrical Engineering, Chinese Academy of Sciences, CN

James Yin-Chin Wu, Hosonic Electronic, TW, CN

Lie Xu, Tsinghua University, CN

Xing Zhang, Hefei University of Technology, CN

Guoqiang Zhang, Harbin Institute of Technology, CN

Conference Agenda

The agenda is scheduled in Beijing time (UTC+8)

Wednesday, October 26, 2022				
MORNING	09:30-10:00	2F201 Conference Opening Conference Director: Leo Lorenz, ECPE, DE		
	10:00 - 10:40	2F201 Keynote: Development and Application of Novel Power Semiconductor Devices and DC Equipment Speaker: Zhanqing Yu, Tsinghua University, CN Chairperson: Yongdong Li, Tsinghua University, CN		
	10:40 - 10:55	Tea Break ☕		
	10:55 - 12:45	<table border="0"> <tr> <td>2F201 Oral Session: Packaging and Reliability Chairperson: Gourab Majumdar, Mitsubishi Electric Corporation, JP; Yi Tang, Starpower Semiconductor, CN</td> <td>2F203 Oral Session: Motion Control Chairperson: Zhihong Wu, Tongji University, CN; Tianhao Tang, Shanghai Maritime University, CN</td> </tr> </table>	2F201 Oral Session: Packaging and Reliability Chairperson: Gourab Majumdar, Mitsubishi Electric Corporation, JP; Yi Tang, Starpower Semiconductor, CN	2F203 Oral Session: Motion Control Chairperson: Zhihong Wu, Tongji University, CN; Tianhao Tang, Shanghai Maritime University, CN
2F201 Oral Session: Packaging and Reliability Chairperson: Gourab Majumdar, Mitsubishi Electric Corporation, JP; Yi Tang, Starpower Semiconductor, CN	2F203 Oral Session: Motion Control Chairperson: Zhihong Wu, Tongji University, CN; Tianhao Tang, Shanghai Maritime University, CN			
AFTERNOON	12:45 - 14:00	<table border="0"> <tr> <td>Poster Gallery Poster Session Advanced Power Semiconductor Devices Chairperson: Yong Kang, Huazhong University of Science and Technology, CN</td> <td>Poster Gallery Poster Session Packaging Technologies and Reliability Chairperson: Gaosheng Song, Great China Mitsubishi Electric Semiconductor, CN</td> </tr> </table>	Poster Gallery Poster Session Advanced Power Semiconductor Devices Chairperson: Yong Kang, Huazhong University of Science and Technology, CN	Poster Gallery Poster Session Packaging Technologies and Reliability Chairperson: Gaosheng Song, Great China Mitsubishi Electric Semiconductor, CN
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14:00 - 16:15	<table border="0"> <tr> <td>2F201 Oral Session: Power Conversion Technology for Renewable Energies Chairperson: Jinjun Liu, Xi'an Jiaotong University, CN; Dapeng Zheng, Shenzhen Hopewind Electric, CN</td> <td>2F203 Special Session: WBG Devices Chairperson: Naoto Fujishima, Fuji Electric, JP; Norbert Pluschke, Semikron, HKSAR, CN</td> </tr> </table>	2F201 Oral Session: Power Conversion Technology for Renewable Energies Chairperson: Jinjun Liu, Xi'an Jiaotong University, CN; Dapeng Zheng, Shenzhen Hopewind Electric, CN	2F203 Special Session: WBG Devices Chairperson: Naoto Fujishima, Fuji Electric, JP; Norbert Pluschke, Semikron, HKSAR, CN	
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Thursday, October 27, 2022					
MORNING	09:30 - 10:10	2F201 Keynote: Near-Zero Carbon Park of Antoshan Speaker: Yanzhong Zhang, Huawei Digital Energy, CN Chairperson: Jinjun Liu, Xi'an Jiaotong University, CN			
	10:10 - 10:20	Tea Break ☕			
	10:20 - 12:25	<table border="0"> <tr> <td>2F201 Oral Session: Power Devices Chairperson: Haihui Luo, Zhuzhou CRRC Times Semiconductor, CN; Ziyang Chen, Infineon Technologies, CN</td> <td>2F203 Special Session: AI for Power Electronics Chairperson: Meiqin Mao, Hefei University of Technology, CN</td> <td>2F202 Chinese Session: Challenges in High Power Density Converter Design Chairperson: Xuhui Wen, Institute of Electrical Engineering, Chinese Academy of Sciences, CN</td> </tr> </table>	2F201 Oral Session: Power Devices Chairperson: Haihui Luo, Zhuzhou CRRC Times Semiconductor, CN; Ziyang Chen, Infineon Technologies, CN	2F203 Special Session: AI for Power Electronics Chairperson: Meiqin Mao, Hefei University of Technology, CN	2F202 Chinese Session: Challenges in High Power Density Converter Design Chairperson: Xuhui Wen, Institute of Electrical Engineering, Chinese Academy of Sciences, CN
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AFTERNOON	12:25 - 14:00	<table border="0"> <tr> <td>Poster Gallery Poster Session Future Power Converter System Solution Chairperson: Min Chen, Zhejiang University, CN</td> <td>Poster Gallery Poster Session Power Converter Control and Protection Chairperson: Jianping Ying, Delta Electronics, CN</td> </tr> </table>		Poster Gallery Poster Session Future Power Converter System Solution Chairperson: Min Chen, Zhejiang University, CN	Poster Gallery Poster Session Power Converter Control and Protection Chairperson: Jianping Ying, Delta Electronics, CN
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	14:00 - 16:15	<table border="0"> <tr> <td>2F201 Oral Session: Power Conversion and Gate Driver Solution Chairperson: Abhijit D. Pathak, ADP-Power LLC, USA; Dehong Xu, Zhejiang University, CN</td> <td>2F203 Chinese Session: Passive Components and Filter Design Chairperson: Dianguo Xu, Harbin Institute of Technology, CN</td> <td>2F202 Tutorial: SiC& GaN Speaker: Weiwei He, Shenzhen BASiC Semiconductor LTD., CN; Huaifeng Wang, Innoscience, CN Chairperson: Yongdong Li, Tsinghua University, CN</td> </tr> </table>	2F201 Oral Session: Power Conversion and Gate Driver Solution Chairperson: Abhijit D. Pathak, ADP-Power LLC, USA; Dehong Xu, Zhejiang University, CN	2F203 Chinese Session: Passive Components and Filter Design Chairperson: Dianguo Xu, Harbin Institute of Technology, CN	2F202 Tutorial: SiC& GaN Speaker: Weiwei He, Shenzhen BASiC Semiconductor LTD., CN; Huaifeng Wang, Innoscience, CN Chairperson: Yongdong Li, Tsinghua University, CN
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16:15 - 16:25	Tea Break ☕				
16:25 - 17:05	2F201 Keynote: Power Solution for Server Applications Speaker: Lisong Hu, Infineon Semiconductors (Shenzhen) Company Limited, CN Chairperson: Abhijit D. Pathak, ADP-Power LLC, USA				

研讨会日程

2022年10月26日, 星期三

上午	09:30-10:00	2F201 开幕致辞 研讨会主席: Leo Lorenz, 欧洲电力电子中心, 德国	
	10:00-10:40	2F201 主题演讲: 新型功率半导体器件与直流装备的研发与应用 演讲人: 余占清, 清华大学, 中国 主持人: 李永东, 清华大学, 中国	
	10:40-10:55	茶歇 ☕	
	10:55-12:45	2F201 口述演讲: 器件封装与可靠性 主持人: Gourab Majumdar, 三菱电机, 日本; 汤艺, 嘉兴斯达半导体, 中国	2F203 口述演讲: 运动控制 主持人: 吴志红, 同济大学, 中国; 汤天浩, 上海海事大学, 中国
下午	12:45-14:00	墙报展示廊 先进功率半导体器件 主持人: 康勇, 华中科技大学, 中国	墙报展示廊 器件封装技术与可靠性 主持人: 宋高升, 三菱电机半导体大中国区, 中国
	14:00-16:15	2F201 口述演讲: 可再生能源电能变换技术 主持人: 刘进军, 西安交通大学, 中国; 郑大鹏, 深圳禾望电气, 中国	2F203 特邀专题报告: 宽禁带器件 主持人: Naoto Fujishima, 富士电机, 日本; Norbert Pluschke, 赛米控, 中国香港

2022年10月27日, 星期四

上午	09:30-10:10	2F201 主题演讲: 安托山近零碳园区 演讲人: 张彦忠, 华为数字能源, 中国 主持人: 刘进军, 西安交通大学, 中国			
	10:10-10:20	茶歇 ☕			
	10:20-12:25	2F201 口述演讲: 功率器件 主持人: 罗海辉, 株洲中车时代 半导体, 中国; 陈子颖, 英飞凌科技, 中国	2F203 特邀专题报告: 人工智能在电力电子中的应用 主持人: 茆美琴, 合肥工业大学, 中国	2F202 中文专场: 高功率密度变换器设计中的挑战 主持人: 温旭辉, 中国科学院电工研究所, 中国	
下午	12:25-14:00	墙报展示廊 未来电能变换系统解决方案 主持人: 陈敏, 浙江大学, 中国	墙报展示廊 电能变换器控制与保护 主持人: 应建平, 台达电子, 中国		
	14:00-16:15	2F201 口述演讲: 电能变换和门级驱动方案 主持人: Abhijit D. Pathak, ADP-Power LLC, 美国; 徐德鸿, 浙江大学, 中国	2F203 中文专场: 被动元件及滤波器设计 主持人: 徐殿国, 哈尔滨工业大学, 中国	2F202 技术讲座: SiC & GaN 演讲人: 和巍巍, 深圳基本半导体有限公司, 中国; 王怀锋, 英诺赛科科技有限公司, 中国 主持人: 李永东, 清华大学, 中国	
	16:15-16:25	茶歇 ☕			
	16:25-17:05	2F201 主题演讲: 服务器电源解决方案 演讲人: 胡立松, 英飞凌半导体 (深圳) 有限公司, 中国 主持人: Abhijit D. Pathak, ADP-Power LLC, 美国			

PCIM Asia Award Winners 2022

Winner of the Best Paper Award



Rotor Eccentricity Vibration Suppression Strategy for Multi-module Synchronous Motors
Pengye Wang, Zicheng Liu, Haiyang Fang, Jiang Dong, Ronghai Qu, Huazhong University of Science and Technology, China
Oral Session, 26 October 2022, Wednesday Morning, 11:55hrs



pcim Asia
Best Paper Award
WINNER

Short description of presentation:

This paper proposes an eccentricity vibration suppression strategy for multi-module synchronous motors by compensating the eccentricity unbalanced magnetic pull (UMP). The analytical expressions of the UMP and the optimal compensation currents under eccentricity conditions are deducted. Simulation verification is implemented on a low electromagnetic coupling four-module three-phase motor, and the results indicate that with the injection of the compensation currents, the eccentricity UMP can almost be suppressed to zero.



This award is sponsored by:

Changes for the Better

Winner of Young Engineer Award



Short Circuit Protection of SiC MOSFET Module with Extended Short Circuit Withstanding Time
Chengmin Li, Jing Sheng, Drazen Dujic, EPFL, Switzerland
Oral Session, 27 October 2022, Thursday Afternoon, 15:25hrs



pcim Asia
Young Engineer Award
WINNER

Short description of presentation:

We propose a two-step protection method to achieve fast and noise-immune protection during the short-circuit (SC) of SiC Module. Firstly, the high current at the loop stray inductor introduced by short-circuit is detected and the gate driving voltage is clamped to a lower value to increase the short-circuit withstanding time; secondly, the phase leg output voltage is sensed and compared with a pre-set reference value to further verify the short-circuit event. If it is confirmed, an error signal is generated to turn off the power devices. Experimental results confirm excellent performances of the proposed protection scheme.



This award is sponsored by:

Winners of University Scientist Award



Degradation Mechanism of SiC MOSFET Module with Double Side Cooling for Electric Vehicle in Accelerated Aging Test

Lubin Han, Lin Liang, Yong Kang, Huazhong University of Science and Technology, China
Xudan Liu, Maojun He, Bosch (China) Investment Ltd., China

Oral Session, 26 October 2022, Wednesday Morning, 11:30hrs



pcim Asia
University Scientist Award

WINNER



Improving speed and power density of electrical machines through regional changes in properties of electrical steels

Jing Ou, Feng Chai, Jingbo Lin, Dianguo Xu, Harbin Institute of Technology, China
Martin Doppelbauer, Karlsruhe Institute of Technology, Germany

Oral Session, 26 October 2022, Wednesday Morning, 12:20hrs



High Ratio DC/DC Converter for Offshore Wind Farms with MVDC Collection System

Lei Li, Hao Tian, Binbin Li, Ming Yang, Dianguo Xu, Harbin Institute of Technology, China
Tianliu Wei, Weiwei Li, CSG, China

Oral Session, 26 October 2022, Wednesday Afternoon, 14:10hrs



Short-circuit and overcurrent protection scheme of SiC MOSFET based on combined protection method

Zhijing Ye, Chi Li, Zedong Zheng, Tsinghua University, China
Tao Li, Xiangfei Zhang, Xueqing Qi, Beijing Smartchip Microelectronics Technology Company Limited, China

Poster Session, 27 October 2022, Thursday Afternoon, 12:25hrs-14:00hrs



Enhanced Master-Slave Windings Motor System with Extended Range of Applications

Mustafa Tahir, Sideng Hu, Zhao Li, Zhejiang University, China

Poster Session, 27 October 2022, Thursday Afternoon, 12:25hrs-14:00hrs



This award is sponsored by:

Conference Wednesday, 26 October, 2022 Morning, Oral Session

09:30-10:00



2F201 Conference Opening

Conference Director: Leo Lorenz, ECPE, DE

10:00 - 10:40

2F201

Keynote: Development and Application of Novel Power Semiconductor Devices and DC Equipment



Speaker:

Zhanqing Yu,
Tsinghua University, CN



Chairperson:

Yongdong Li,
Tsinghua University, CN

10:40 - 10:55

Coffee break and room change ☕

2F201

Packaging and Reliability



Chairperson: Gourab Majumdar,
Mitsubishi Electric Corporation, JP



Chairperson: Yi Tang,
Starpower Semiconductor, CN

10:55

Chairs' opening speech



11:05

Pin electrical resistance welding capability and verification of new TO-247 PLUS discrete package

Zhenbo Zhao, Laser Jiang, Infineon Technologies Center of Competence (Shanghai) Co., Ltd., China
Omar Harmon, Infineon Technologies Austria AG, Austria



11:30

Degradation Mechanism of SiC MOSFET Module with Double Side Cooling for Electric Vehicle in Accelerated Aging Test

Lubin Han, Lin Liang, Yong Kang, State Key Laboratory of Advanced Electromagnetic Engineering and Technology, School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, China
Xudan Liu, Maojun He, Bosch (China) Investment Ltd., China



11:55

Cable Stray Parameters Impact Exploration on Stability of DC Distributed Power System

Sideng Hu, Mustafa Tahir, Zhengbin Zhu, College of Electrical Engineering, Zhejiang University, China



12:20

Reliability Evaluation of New Generation High Temperature Capacitor Films for Inverter Applications

Yuan Zhou, SABIC, China
Adel Bastawros, Andrew Pingitore, SABIC, USA
Fumio Yu, Koichi Nakashima, Hisao Katsuta, SABIC, Japan

2F203

Motion Control



Chairperson: Zhihong Wu,
Tongji University, CN



Chairperson: Tianhao Tang,
Shanghai Maritime University, CN

10:55

Chairs' opening speech



11:05

Model Predictive Current Control of Open-Winding PMSM Based on Zero Sequence Current Suppression

Han Zhang, Xiaoguang Zhang, North China University of Technology, China



11:30

Model Predictive Control for Open Winding PMSM Based on Optimizing Dead-Zone Effect

Chenguang Zhang, Xiaoguang Zhang, North China University of Technology, China



11:55

Rotor Eccentricity Vibration Suppression Strategy for Multi-module Synchronous Motors

Pengye Wang, Zicheng Liu, Haiyang Fang, Jiang Dong, Ronghai Qu, School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, China



12:20

Improving speed and power density of electrical machines through regional changes in properties of electrical steels

Jing Ou, Feng Chai, Jingbo Lin, Dianguo Xu, Harbin Institute of Technology, China
Martin Doppelbauer, Karlsruhe Institute of Technology, Germany



Conference Wednesday, 26 October, 2022 Afternoon, Poster Session

12:45-14:00 Poster Gallery Poster Session

Advanced Power Semiconductor Devices



Chairperson: Yong Kang, Huazhong University of Science and Technology, CN



PP001
A new voltage class 2.3 kV IGBT enables new solutions for 1500 VDC system

Xin Hao, Infineon Technology Competency Center (Shanghai) Co., Ltd, China
Jia Zhao, Infineon Integrated Circuit Beijing Co., Ltd, China



PP002
Research on layout of paralleling LV100-type IGBT modules in three-level NPC converters

Bo Hu, Jian Sun, Gaosheng Song, Mitsubishi Electric & Electronics (Shanghai) Co., Ltd, China
Shota Saito, Mitsubishi Electric Power Device Works, Japan



PP003
Hardware Optimization of Current Distribution for Parallel-Connected, High-Power, Press-Pack IGBTs

Hao Wang, Power Integrations, China
Ahmed Majed Saif, Karsten Fink, Power Integrations GmbH, Germany



PP004
20A/600V RC-IGBT Based Transfer Molded IPM for Home Appliance Application

Hongguang Huang, Xiaoling Wang, Mitsubishi Electric & Electronics (Shanghai) Co., Ltd, China
Motonobu Joko, Mitsubishi Electric Corporation, Japan



PP005
Infineon's IGBT package evolution with regard to the development of 1500 V solar string inverters

Xin Hao, Dunhu Sun, Infineon Technology Competency Center (Shanghai) Co., Ltd, China
Sichao Ma, Infineon, Germany



PP006
The 7th Generation "X Series" Intelligent Power Module and Its Feature

Song Chen, Fuji Electric (China) Co., Ltd., China
Kei Minagawa, Takahiro Mori, Kaname Mitsuzuka, Yuki Kumazawa, Kiyoshi Sekigawa, Yasuyuki Kobayashi, Fuji Electric Co., Ltd., Japan



PP007
A New Generation of 600V CIPOS™ Tiny IM323 Intelligent Power Module for Home Appliance Motor Drive Application

Bryan Tian, Infineon, China
Kihyun Lee, Bokkeun Song, Jaewook Lee, Taesung Kwon, Infineon Technologies Korea, South Korea



PP008
Introduction of Large DIIPM+™ application on air-conditioner inverters

Jiasheng Bao, Jian Chen, Mitsubishi Electric GEM Power Device (Hefei) Co., Ltd, China
Hongguang Huang, Mitsubishi Electric & Electronics (Shanghai) Co., Ltd, China
Hongbo Zhang, Power Device Works, Mitsubishi Electric Corporation, Japan

Packaging Technologies and Reliability



Chairperson: Gaosheng Song, Great China Mitsubishi Electric Semiconductor, CN



PP009
Si₃N₄ Substrate Metallization

Xiaosi Wang, TEDA Tian&Di IT Co. Ltd., China



PP010
Thermal Evaluation of SiC MOSFET Power Modules with HPD Package and Double-sided Cooling Package

Huakang Li, Puqi Ning, University of Chinese Academy of Sciences, China
Huakang Li, Yuhui Kang, Puqi Ning, Institute of Electrical Engineering Chinese Academy of Sciences, China



PP011
Effect of Fatigue Crack Network in Die-attach Joints on Thermal Resistance

Koki Ochi, Ryuichiro Hanada, Power Device Works, Mitsubishi Electric Corporation, Japan
Yoshinori Yokoyama, Shinichi Izuo, Kazuyasu Nishikawa, Advanced Technology R&D Center, Mitsubishi Electric Corporation, Japan
Hiroki Kanai, Yoshiki Abe, Graduate School of Shibaura Institute of Technology, Japan
Yoshiharu Kariya, Department of Materials Science and Engineering, Shibaura Institute of Technology, Japan



PP012
The effect of quasi-DC power cycling on insulated gate bipolar transistor dual-in-line package intelligent power module

Jaewook Oh, Inhyeok Hwang, Namsu Kim, Konkuk University, Republic of Korea



PP013
New Transfer Molded Power Integrated Module (TMPIM) for Industrial Drive

Jinchang Zhou, onsemi, USA
Chee Hiong Chew, onsemi, Malaysia
Silnore Sabando, Joji Corbillon, onsemi, Vietnam



PP014
Transient optimal control algorithm for DC-DC converter based on time-series neural network

Junzi Zhang, Ye Liu, Yuanyuan Yan, Xiaoqi Zhang, Fuhua Huang, School of Electrical Engineering, Xi'an Jiaotong University, China



PP015
High-Performance Double Side Cooled Power Module for Automotive Traction Inverter Applications

Maryam Kahali Moghaddam, Ajay Poonjal Pai, Infineon Technologies AG, Germany

Conference Wednesday, 26 October, 2022 Afternoon, Oral Session

2F201

Power Conversion Technology for Renewable Energies



Chairperson: Jinjun Liu,
Xi'an Jiaotong University, CN



Chairperson: Dapeng Zheng,
Shenzhen Hopewind Electric, CN

14:00

Chairs' opening speech



14:10
High Ratio DC/DC Converter for Offshore Wind Farms with MVDC Collection System

Lei Li, Hao Tian, Binbin Li, Ming Yang, Dianguo Xu,
School of Electrical Engineering, Harbin Institute of Technology, China
Tianliu Wei, Weiwei Li, State Key Laboratory of HVDC, Electric Power Research Institute, CSG, China



14:35
An ANPC converter design using ST20 for high-power offshore wind application

Fengjie Zhu, SEMIKRON Electronics (Zhuhai) Co., Ltd., Beijing, China
Wei Jing, SEMIKRON Electronics (Zhuhai) Co., Ltd., Shenzhen, China



15:00
A Hybrid Isolated DC-DC Converter With Wide Input Voltage Regulation Range

Ning Wang, Xiaodong Zhao, Binbin Li, Dianguo Xu,
School of Electrical Engineering, Harbin Institute of Technology, China



15:25
A benchmark study on the AC voltage in the 3L converter for high power offshore wind turbines

Heng Wang, Xin Ma, Yong Yang, Infineon Integrated Circuit (Beijing) Co., Ltd., China



15:50
Efficiency Improvement of a Nearly Zero Energy Building through the Optimal Control of the Domestic Wind Turbine

Christos Mademlis, School of Electrical and Computer Engineering, Aristotle University of Thessaloniki, Greece

2F203

Special Session: WBG Devices



Chairperson: Naoto Fujishima,
Fuji Electric, JP



Chairperson: Norbert Pluschke,
Semikron, HKSAR, CN

14:00

Chairs' opening speech



14:10
A SiC Based High Efficiency High Power Three Phases Interleaved LLC Resonant Converter

Chen Wei, Zongzeng Hu, Fulin Zhang, Wolfspeed, China
Jianwen Shao, Anuj Narain, Wolfspeed, United States



14:35
How Silicon Carbide is Changing the Future of Electric Vehicles

Tong Wu, onsemi, China



15:00
An indispensable role of SiC on the EV field

Jun Li, ROHM Semiconductor (shanghai) Co., Ltd., China



15:25
Technology Developments, Limits and Challenges of SiC Power Devices

Haihui Luo, Zhuzhou CRRC Times Semiconductor Co., Ltd., China



15:50
SiC Power Devices and Application to Power Electronics

Jun Li, Fuji Electric (China) Co. Ltd, China
Seiki Igarashi, Naoto Fujishima, Fuji Electric Co., Ltd., Japan

PCIM Asia 国际研讨会
PCIM Asia Conference



Conference Thursday, 27 October, 2022 Morning, Oral Session

9:30 - 10:10

2F201

Keynote: Near-Zero Carbon Park of Antoshan



Speaker:

Yanzhong Zhang,
Huawei Digital Energy, CN



Chairperson:

Jinjun Liu,
Xi'an Jiaotong University, CN

10:10 - 10:20

Coffee break and room change ☕

2F201

Power Devices



Chairperson: Haihui Luo,
Zhuzhou CRRC Times Semiconductor, CN



Chairperson: Ziyang Chen,
Infineon Technologies, CN

10:20

Chairs' opening speech



10:30

Trench IGBT with FS2 Technology Platform for Low Loss and High Robustness Applications

Ken Zhang, Charlie Zhu, Ke Jiang, Bo Xu, Jinshan Shi, Randy Yin, Huiling Zuo, Jimmy Fang, Junli Xiang, Boger Cai, Katherine Huang, Jason Duan, Nexperia (China) Ltd., China



10:55

Novel 2000V IGBT with LV100 package for Renewable Energy Application

Satoshi Miyahara, Nobuya Nishida, Ikumi Fukuda, Mitsubishi Electric Corporation, Japan
Yuanchen Zhang, Mitsubishi Electric & Electronics (Shanghai) Co., Ltd., China

11:20 Coffee break ☕



11:35

Application Benefits of 3.3 kV/185 A, 375 A Full SiC Power Modules

Mamoru Matsuo, Shota Saito, Kenta Nakahara, Ryo Tsuda, Kenji Hatori, Keiichi Nakamura, Mitsubishi Electric Corporation, Japan
Jian Sun, Gaosheng Song, Mitsubishi Electric & Electronics (Shanghai) Co., Ltd., China



12:00

3.3kV All SiC Module for Traction Inverters with 2nd Generation Trench gate SiC MOSFETs

Song Chen, Fuji Electric (China) Co., Ltd., China
Yusuke Sekino, Sayaka Yamamoto, Takafumi Uchida, Keiji Okumura, Yoshiyuki Kusunoki, Yuichi Onozawa, Hiroshi Kimura, Yasuyuki Kobayashi, Takashi Shiigi, Fuji Electric Co., Ltd., Japan

2F203

Special Session: AI for Power Electronics



Chairperson: Meiqin Mao,
Hefei University of Technology, CN

10:20

Chairs' opening speech



10:30

Preliminary study on multi-objective design of converters/power modules based on machine learning algorithm

Jianing Wang, Hefei University of Technology, China



10:55

Emerging Applications of AI in Magnetics for Power Electronics

Li Wang, Nanjing University of Aeronautics and Astronautics, China

11:20 Coffee break ☕



11:35

Artificial Intelligence Applications for Power Electronics Reliability

Chunlin Lv, Xi'an Jiaotong University, China



12:00

AI Applications for Power Electronics - Challenges and Opportunities

Huai Wang, Aalborg University, Denmark



Conference Thursday, 27 October, 2022 Morning, Oral Session

2F202

Chinese Session: Challenges in High Power Density Converter Design



Chairperson: Xuhui Wen,
Institute of Electrical Engineering, Chinese Academy of Sciences, CN

10:20
Chairs' opening speech



10:30
Integrated Motor Drives with Novel Topologies
Dong Jiang, Huazhong University of Science and Technology, China



10:55
Technology & Industrialization Development of eDrive System for New Energy Vehicles
Zhouyun Zhang, Shanghai Edrive Co., Ltd, China

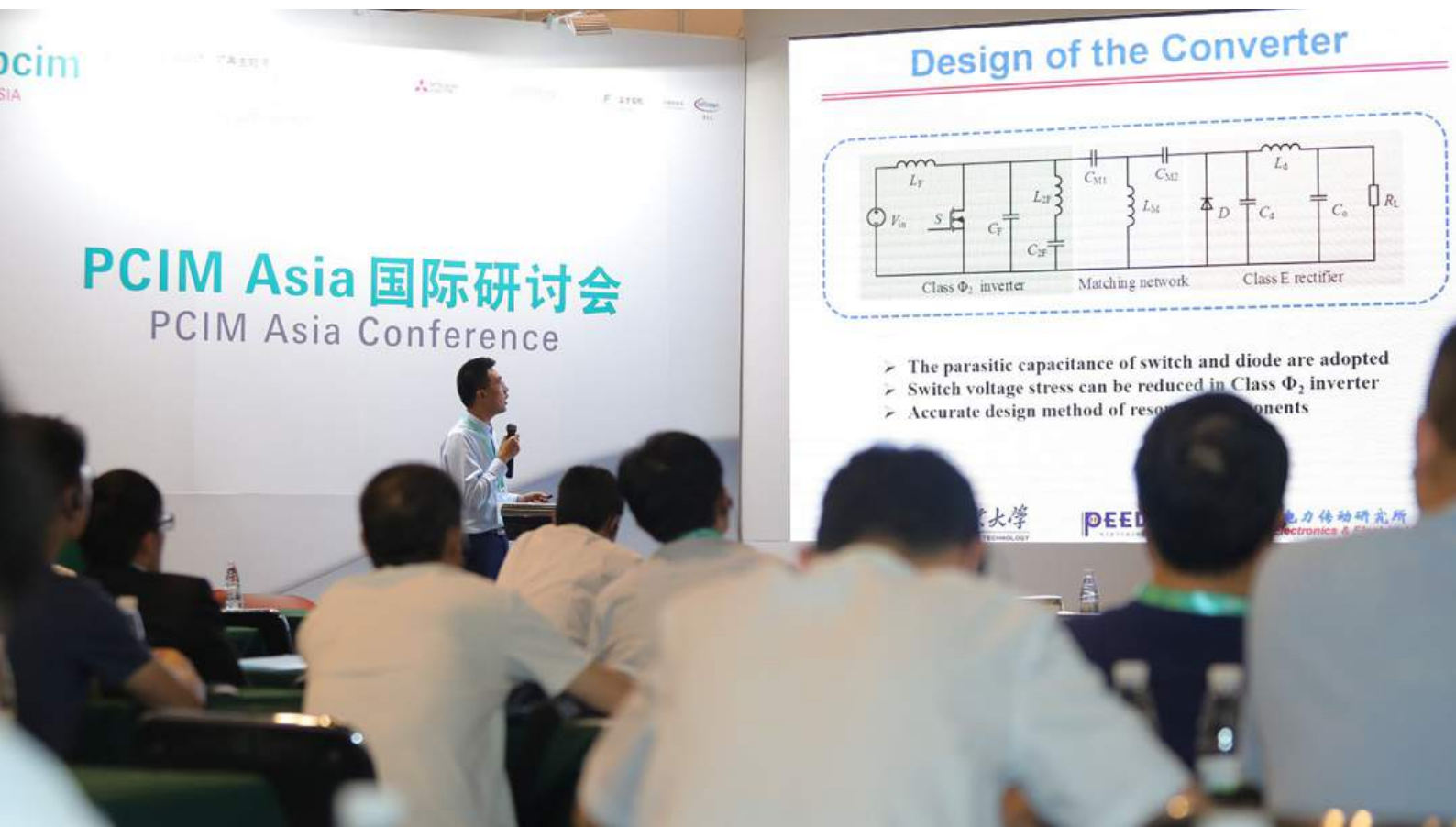
11:20 Coffee break ☕



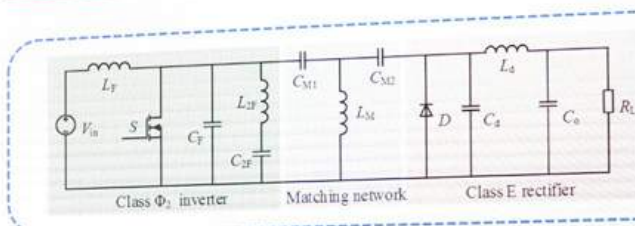
11:35
Research and prospect of high density power electronics technology for rail transit applications
Zechun Dou, CRRC Zhuzhou Institute Co.,LTD, China



12:00
Application of High Voltage and High Power Electric Energy Conversion Devices in Large Civil Aircraft
Zhaomin He, COMAC Beijing Aircraft Technology Research Institute, China



Design of the Converter



- The parasitic capacitance of switch and diode are adopted
- Switch voltage stress can be reduced in Class Φ_2 inverter
- Accurate design method of resonant components

Conference Thursday, 27 October, 2022 Afternoon, Poster Session

12:25-14:00 Poster Gallery Poster Session

Future Power Converter System Solution



Chairperson: Min Chen,
Zhejiang University, CN



PP016
Automatic optimization of motor controller with component arrangement, disassembly and thermal management

Jian Cui, Puqi Ning, Yunhao Huang, Tao Fan, Key Laboratory of Power Electronics and Electric Drive, Institute of Electrical Engineering, Chinese Academy of Sciences, China
Jian Cui, Puqi Ning, Yunhao Huang, Tao Fan, Collaborative Innovation Center of Electric Vehicles in Beijing, China



PP017
DIPIPM Suitable for Middle Power Servo Drive
Siqing Lu, Rui Zhao, Mitsubishi Electric & Electronics (Shanghai) Co., Ltd, China
Rongning Tao, THINKVO Automation Eqpt. Co., Ltd, China



PP018
Four-stage Deadbeat Control with Dead-time Compensation Based on PMSM
Guofu Zhang, Xiaoguang Zhang, North China University of Technology, China



PP019
Robust Model Predictive Current Control Based on Inductance Sliding Mode Observer
Zhen Wu, Xiaoguang Zhang, Hailong Bai, North China University of Technology, China



PP020
Suppression of vibration and common-mode voltage of dual three-phase motor under improved PWM methods
Dailin Ou, Zicheng Liu, Xiangwen Sun, Dong Jiang, Ronghai Qu, Huazhong University of Science and Technology, China



PP021
Enhanced Master-Slave Windings Motor System with Extended Range of Applications
Mustafa Tahir, Sideng Hu, Zhao Li, College of Electrical Engineering, Zhejiang University, China



PP022
Microgrid Reliability Assessment Based on Historical Weather Conditions
Xiaoguang Chai, Wuxi Power Supply Company of State Grid, China
Fancheng Guo, Nantong Power Supply Company of State Grid, China



PP023
Resonance analysis and detection of the clustered grid-connected PV system
Jing Gao, Yi Lu, Yuan Zhao, State Grid Jibei Electric Power Co. Ltd. Research Institute (North China Electric Power Research Institute Co., Ltd.), China



PP024
Design of Portable Power Quality Detection Device Based on DSP+ARM
Pengsheng Bu, Gaohui Feng, Yuan Tian, Shanxi Tiandi Coal Mining Machinery Co., Ltd., China
Pengsheng Bu, Gaohui Feng, Yuan Tian, China Coal Technology & Engineering Group Taiyuan Research Institute Co., Ltd., China
Pengsheng Bu, Gaohui Feng, Yuan Tian, China National Engineering Laboratory for Coal Mining Machinery, China

Power Converter Control and Protection



Chairperson: Jianping Ying,
Delta Electronics, CN



PP025
Short-circuit and overcurrent protection scheme of SiC MOSFET based on combined protection method
Zhijing Ye, Chi Li, Zedong Zheng, Tsinghua University, China
Tao Li, Xiangfei Zhang, Xueqing Qi, Beijing Smartchip Microelectronics Technology Company Limited, China



PP026
Comparison of CCM and CRM Totem-Pole PFC based on Silicon Carbide Device
Hua Wang, Jianhua Wang, Yang Xu, Yang Lei, Xing Huang, PN Junction Semiconductor (Hangzhou) Co.,Ltd, China



PP027
Suppressing Switching Noise Three-phase Inverter Enabling Output Voltage Control in Extended Output Range
Atsushi Hirota, National Institute of Technology, Akashi College, Japan



PP028
The new CIPOS™ Micro intelligent power module with reverse conducting IGBT technology for home appliances
Bryan Tian, Infineon, China
Syed Shamsul Arefin, Infineon Technologies AG, Germany
Claudio Villani, Stefano Ruzza, Infineon Technologies Italia S.r.l., Italy



PP029
Analysis and Simulation Validation of Boost Inverter Switching Losses
Deliang Wu, Hang Li, Xiaosa Sui, Shanghai University, China



PP030
Research on Source Network Load Storage Collaborative control Based on multi port power electronic transformer in Coal Mine
Gaohui Feng, Yuan Tian, China Coal Technology & Engineering Group Taiyuan Research Institute Co., Ltd., China
Gaohui Feng, Pengsheng Bu, Yuan Tian, China National Engineering Laboratory for Coal Mining Machinery, China
Pengsheng Bu, Shanxi Tiandi Coal Mining Machinery Co., Ltd., China
Kainan Chen, Department of Electrical Engineering, Tsinghua University, China

Conference Thursday, 27 October, 2022 Afternoon, Oral Session

2F201

Power Conversion and Gate Driver Solution



Chairperson: Abhijit D. Pathak,
ADP-Power LLC, USA



Chairperson: Dehong Xu,
Zhejiang University, CN

14:00
Chairs' opening speech



14:10
Programmable Gate Driver Solution with Optimized Two-Level Turn-Off for Paralleled IGBTs in Renewable Energy Application

Hao Wang, Yuejuan Bian, Power Integrations, China
Karsten Fink, Power Integrations, Germany



14:35
A novel low-cost, high efficiency, low-ripple high PF LED driver with ripple cancellation

Jie Fu, Zhiquan Chen, Gang Wang, Signify
(China) investment Co. LTD Research Center, China



15:00
Equalizing the voltage of ANPC topology switches
Jianwen Qiu, Chaoqun Zhang, SEMIKRON Electronics
(Zhuhai) Co., Ltd., China



15:25
Short Circuit Protection of SiC MOSFET Module with Extended Short Circuit Withstanding Time

Chengmin Li, Jing Sheng, Drazen Dujic, Power
Electronics Laboratory, EPFL, Switzerland



15:50
Optimized design of unified platform for light industrial applications using SiC MOSFETs and mixed DC-link capacitors

Xin Hao, Infineon Technology Competency Center
(Shanghai) Co., Ltd, China
Simon Kim, Infineon Technologies, Korea
Dinesh Palaniappan, Kwok Wai Ma, Infineon
Technologies Asia Pacific, Singapore

2F203

Chinese Session: Passive Components and Filter Design



Chairperson: : Dianguo Xu,
Harbin Institute of Technology, CN

14:00
Chairs' opening speech



14:10
Second Harmonic Current Reduction Techniques for Two-Stage Single-Phase Converters

Xinbo Ruan, Nanjing University of Aeronautics and
Astronautics, China



14:35
The analysis, modeling and test of Common-mode EMI Inductors

Wei Chen, Fuzhou University, China



15:00
Interleaving magnetic integration technology for bi-directional DC/DC converter

Yugang Yang, Shixian Wang, Haichao Li, Runbo
Chen, College of Electrical and Power Engineering,
Taiyuan University of Technology, China
Yanqiu Wu, State Grid Liaoning Electric Power
Company Anshan Power Supply Company, China



15:25
Researches on Passive Integration of High Frequency High density Power Converters

Laili Wang, Xi'an Jiaotong University, China



15:50
Research on High Distance Diameter Ratio IPT System based on Series Multi-segment Compensation

Yijie Wang, Harbin Institute of Technology, China



Conference Thursday, 27 October, 2022 Afternoon, Oral Session

2F202

Tutorial: SiC & GaN



Chairperson: Yongdong Li, Tsinghua University, CN

14:00

Chairs' opening speech



14:10

SiC Power Device Industry Outlook

Weiwei He, Shenzhen BASIC Semiconductor LTD., China



15:10

Unique advantages and applications of gallium nitride power devices

Huaifeng Wang, Innoscience, China

16:15-16:25

Coffee break and room change ☕

16:25-17:05

2F201

Keynote: Power Solution for Server Applications



Speaker:

Lisong Hu, Infineon Semiconductors
(Shenzhen) Company Limited, CN



Chairperson:

Abhijit D. Pathak,
ADP-Power LLC, USA



Registration Information 2022

Registration

These are per named delegate as follows:	fee
2-Day Full Conference Ticket (onsite & online, proceeding inclusive)	3,000 CNY
One Day Ticket (onsite, proceeding inclusive)	1,600 CNY
Online Only* (proceeding inclusive)	2,000 CNY

*For audience participate through virtual platform only

Online participation please directly contact Zoey.Lin@china.messefrankfurt.com

Conference Proceedings

E-Proceedings of PCIM Asia 2022 (USB)	RMB 2,000
E-Proceedings of PCIM Asia 2021 (USB)	RMB 800
E-Proceedings of PCIM Asia 2015-2020 (USB)	RMB 750

Payment of fees entitles you to following services:

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Important Dates

Submission of abstracts	March 2023
Notification of acceptance	May 2023
Submission of full paper	June 2023

Submission

Please find detailed information instructions on submitting your synopsis/abstract online at

www.pcimasia-expo.com

Selection Process

All submitted abstracts will be reviewed to ensure a highquality conference. Submitted abstracts maybe selected for oral or poster presentation. Notification of acceptance will be announced in May 2023.

Conference language

- Abstract and paper written in English only.
- Oral presentations conducted in English.
- Presenter's PowerPoint presentation can be compiled in English or bilingual (English and Chinese).

Topics of Interest

Highlighted Topic: Electrification of Transportation Systems

1. Advanced Power Semiconductors

- 1.1 High Power Semiconductors
- 1.2 MOSFETs, IGBTs, FREDs & Schottkys
- 1.3 Power Modules and Power Hybrids
- 1.4 SiC, GaN and other Wide Bandgap Devices and their Applications
- 1.5 Power Supply Control IC and Power Management ICs
- 1.6 Gate Driver and Device Protection
- 1.7 IPM and Power Electronic Building Blocks

2. Packaging and Reliability

- 2.1 Packaging and Interface Technologies
- 2.2 Advanced Cooling Systems
- 2.3 Thermal Modelling and Simulations
- 2.4 Power Electronic Components Reliability
- 2.5 Power Embedding
- 2.6 High Power Density Designs

3. Passive Components and Integration

- 3.1 Higher Frequency and Low Loss Materials & Techniques for Inductors and Capacitors
- 3.2 Planar Inductors and Transformers and Thin Film Magnetic Component
- 3.3 Filters and Passive Integration

4. AC/DC Converter

- 4.1 High Efficiency/High Density Power Converters/Inverters
- 4.2 Resonant and Quasi Resonant Topologies for Power Supplies
- 4.3 Stand-alone Power Supplies (Adapters) and on Board Supplies
- 4.4 New Topologies (Single Switch, Phase Shift, ZVS, ZCS, ZVZCS)

5. DC/DC Converter

- 5.1 DC/DC Converter Topologies for Enhanced Efficiency and Control
- 5.2 Synchronous Rectification
- 5.3 Smart Battery Management Concepts
- 5.4 Point of Load Converters
- 5.5 New Topologies for Distributed Power Supply Systems (Single or Multi-Stage Architecture, ZVS, ZCS, ZVZCS)

6. Digital Power Conversion

- 6.1 PMBus and other Digital Power Control Protocols
- 6.2 Digital Control for Power Converters
- 6.3 Advantages of Digital Power Conversion and Associated Challenges
- 6.4 System on a Chip (SOC)
- 6.5 Energy Harvesting

7. Motor Drive & Motion Control

- 7.1 Home Appliances
- 7.2 Small Power Motor "General Purpose Drive" with Highly Sophisticated Control Strategies and Low Cost Solutions
- 7.3 New Converter/Inverter Types for Single- and Three Phase Systems
- 7.4 Advanced Motor Concepts for Industrial Application and Traction Drives
- 7.5 New Control Architectures DSP, Microcontroller or FPGA
- 7.6 Advanced Sensor Concepts for Motor Drives
- 7.7 Intelligent Motion Control and Architecture

8. High Frequency Power Electronic Converters and Inverters

- 8.1 Thermal Design, Packaging and EMI Issues
- 8.2 Sensors Specific to Power Electronics (e.g. voltage, current, power, frequency, phase, temperature)
- 8.3 Techniques to Reduce Switching Losses to Improve Efficiency and Reduce Size and Weight
- 8.4 Wireless Power Transfer

9. Automotive Power Electronics

- 9.1 Hybrid-/ Electric Vehicle
- 9.2 MOSFET and IGBT Modules in Motor Traction Applications
- 9.3 DC/DC Conversion in Automobiles
- 9.4 Bidirectional DC/DC Converters
- 9.5 Electronics for Powertrain and Power Management
- 9.6 Energy Storage and Management, including Battery Types, Super Capacitors and Fly Wheels
- 9.7 DC Circuit Breaker

10. System Reliability

- 10.1 Reliability and Health Management of Power Electronic Components and Systems
- 10.2 Fail-safe and Fault-tolerant Applications
- 10.3 Redundancy Concepts in Power Electronics
- 10.4 Life Cycle Cost Analysis

11. Power Quality Solutions

- 11.1 UPS Systems and Inverters
- 11.2 Active Power Filter (APF), DVR, SVG
- 11.3 Energy Storage System (Battery Technologies, Flywheel, Super (ultra) Capacitors)
- 11.4 Harmonics and Power Factor Correction

12. Smart Grid Power Electronics

- 12.1 Grid Inverter Control
- 12.2 Battery Charging and V2G
- 12.3 Energy Storage System and Control
- 12.4 Micro-Grid
- 12.5 Solid State Transformers
- 12.6 Medium Voltage Multilevel Converters
- 12.7 Modular Multilevel Converters
- 12.8 Novel Converter Topologies
- 12.9 Wind Energy Systems
- 12.10 Solar and Photovoltaic Energy Systems

13. Power Electronics in Transmission Systems

- 13.1 FACTS
- 13.2 Converters for Offshore/Onshore HVDC Links
- 13.3 Power Generation, Transmission and Distribution
- 13.4 DC Grids
- 13.5 HVDC Systems

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