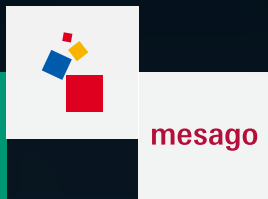


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**28 – 30 August 2024**

Hall 11, Shenzhen World Exhibition &  
Convention Center, Shenzhen, China

# Conference Program

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# Advisory Board

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## Conference Agenda

Wednesday, August 28, 2024				
MORNING	09:10-10:00	Conference Opening & Award Ceremony Conference Director: Leo Lorenz, ECPE, DE Meeting Room 9B		
	10:00 - 10:40	Keynote 1: Power semiconductors for an energy-wise society - A brief review of IEC whitepaper Speaker: Gourab Majumdar, Mitsubishi Electric Corporation, JP Chair: Leo Lorenz, ECPE, DE Meeting Room 9B		
	10:40 - 10:55	Tea Break ☕		
	10:55 - 12:45	Oral Session 1: Si Devices Chair: Haihui Luo, Zhuzhou CRRC Times Semiconductor, CN Meeting Room 9B	Oral Session 2: Power Conversion I Chair: Yongdong Li, Tsinghua University, CN Meeting Room 9C	
AFTERNOON	12:45 – 13:30	Lunch Break 🍽️		
	13:30 - 14:30	Power MOSFET and IGBT Chair: Jinsong Kang, Tongji University, CN Poster Dialogue Session 1	Advanced Power Module Chair: Yi Tang, Starpower Semiconductor, CN Poster Dialogue Session 2	Advanced Power Converter Chair: Lie Xu, Tsinghua University, CN Poster Dialogue Session 3
	14:30 - 16:20	Oral Session 3: High Voltage WBG Chair: Gourab Majumdar, Mitsubishi Electric Corporation, JP Meeting Room 9B	Oral Session 4: Power Conversion II Chair: Jinjun Liu, Xi'an Jiaotong University, CN Meeting Room 9C	
Thursday, August 29, 2024				
MORNING	09:30-10:10	Keynote 2: Solid state transformer in modern power system Speaker: Dianguo Xu, Harbin Institute of Technology, CN Chair: Yongdong Li, Tsinghua University, CN Meeting Room 9B		
	10:10 - 10:25	Tea Break ☕		
	10:25 - 12:15	Oral Session 5: WBG I Chair: Naoto Fujishima, Fuji Electric, JP Meeting Room 9B	Oral Session 6: E-mobility Chair: Tianhao Tang, Shanghai Maritime University, CN Meeting Room 9C	
AFTERNOON	12:15 – 13:30	Lunch Break 🍽️		
	13:30 - 14:30	Integrated Power Module Chair: Xuhui Wen, Institute of Electrical Engineering, Chinese Academy of Sciences, CN Poster Dialogue Session 4	Future Control Concept Chair: Meiqin Mao, Hefei University of Technology, CN Poster Dialogue Session 5	SiC Devices Chair: Min Chen, Zhejiang University, CN Poster Dialogue Session 6
	14:30 - 16:20	Oral Session 7: Packaging Technologies I Chair: Norbert Pluschke, Semikron Danfoss, HKSAR, CN Meeting Room 9B	Oral Session 8: Power Conversion III Chair: Dehong Xu, Zhejiang University, CN Meeting Room 9C	
Friday, August 30, 2024				
MORNING	09:30-10:10	Keynote 3: Power semiconductors applications within future renewable energy and electrification industry Speaker: Rainer Kaesmaier, Hitachi Energy, Switzerland Chair: Dapeng Zheng, Shenzhen Hopewind Electric, CN Meeting Room 9B		
	10:10 - 10:25	Tea Break ☕		
	10:25 - 12:15	Oral Session 9: Packaging Technologies II Chair: Shunli Wang, Inner Mongolia University of Technology, CN Meeting Room 9B	Oral Session 10: Smart Grid Chair: Teng Liu, China Southern Power Grid Electric Power Research Institute, CN Meeting Room 9C	
AFTERNOON	12:15 – 13:30	Lunch Break 🍽️		
	13:30 - 14:30	Exhibition Visiting		
	14:30 - 16:20	Oral Session 11: Peripheral Components and Circuitry Chair: Gang Yao, Shanghai Maritime University, CN Meeting Room 9B	Oral Session 12: WBG II Chair: Ziyang Chen, Infineon Technologies, CN Meeting Room 9C	

研讨会日程

2024年8月28日，星期三				
上午	09:10-10:00	开幕致辞暨颁奖典礼 研讨会主席：Leo Lorenz，欧洲电力电子中心，德国 会议室9B		
	10:00 - 10:40	主题演讲 1：节能社会的功率半导体- IEC白皮书概述 演讲人：Gourab Majumdar，三菱电机，日本 主持人：Leo Lorenz，欧洲电力电子中心，德国 会议室9B		
	10:40 - 10:55	茶歇 ☕		
	10:55 - 12:45	口述专场 1：Si器件 主持人：罗海辉，株洲中车时代半导体，中国 会议室9B	口述专场 2：电能变换I 主持人：李永东，清华大学，中国 会议室9C	
下午	12:45 – 13:30	午餐 🍽		
	13:30 - 14:30	功率MOSFET和IGBT 主持人：康劲松，同济大学，中国 墙报交流专场 1	先进功率模块 主持人：汤艺，斯达半导体，中国 墙报交流专场 2	先进电能变换器 主持人：许烈，清华大学，中国 墙报交流专场 3
	14:30 - 16:20	口述专场 3：高压宽禁带功率器件 主持人：Gourab Majumdar，三菱电机，日本 会议室9B	口述专场 4：电能变换II 主持人：刘进军，西安交通大学，中国 会议室9C	
2024年8月29日，星期四				
上午	09:30-10:10	主题演讲 2：电力电子变压器在现代电力系统中的研究现状与问题 演讲人：徐殿国，哈尔滨工业大学，中国 主持人：李永东，清华大学，中国 会议室9B		
	10:10 - 10:25	茶歇 ☕		
	10:25 - 12:15	口述专场 5：宽禁带功率器件I 主持人：Naoto Fujishima，富士电机，日本 会议室9B	口述专场 6：电动汽车 主持人：汤天浩，上海海事大学，中国 会议室9C	
下午	12:15 – 13:30	午餐 🍽		
	13:30 - 14:30	集成功率模块 主持人：温旭辉，中国科学院电工研究所，中国 墙报交流专场 4	未来控制概念 主持人：茆美琴，合肥工业大学，中国 墙报交流专场 5	SiC器件 主持人：陈敏，浙江大学，中国 墙报交流专场 6
	14:30 - 16:20	口述专场 7：封装技术I 主持人：Norbert Pluschke，赛米控丹佛斯，中国香港 会议室9B	口述专场 8：电能变换III 主持人：徐德鸿，浙江大学，中国 会议室9C	
2024年8月30日，星期五				
上午	09:30-10:10	主题演讲 3：功率半导体在未来可再生能源和电气化中的应用 演讲人：Rainer Kaesmaier，日立能源，瑞士 主持人：郑大鹏，深圳禾望电气，中国 会议室9B		
	10:10 - 10:25	茶歇 ☕		
	10:25 - 12:15	口述专场 9：封装技术II 主持人：王顺利，内蒙古工业大学，中国 会议室9B	口述专场 10：智能电网 主持人：刘腾，中国南方电网科学研究院，中国 会议室9C	
下午	12:15 – 13:30	午餐 🍽		
	13:30 - 14:30	展览会参观		
	14:30 - 16:20	口述专场 11：器件与电路 主持人：姚刚，上海海事大学，中国 会议室9B	口述专场 12：宽禁带功率器件 II 主持人：陈子颖，英飞凌科技，中国 会议室9C	



# Oral Session

Wednesday, 28 August 2024 Morning, 09:10-12:45

09:10-10:00

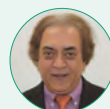


**Meeting Room 9B**  
**Conference Opening & Award Ceremony**  
Conference Director: Leo Lorenz, ECPE, DE

10:00 - 10:40

**Room M2**

## **Keynote 1: Power semiconductors for an energy-wise society - A brief review of IEC whitepaper**



**Speaker:**  
Gourab Majumdar,  
Mitsubishi Electric Corporation, JP



**Chairperson:**  
Leo Lorenz,  
ECPE, DE

10:40 - 10:55

Coffee break and room change ☕

## **Meeting Room 9B** **Oral Session 1: Si Devices**



**Chairperson:** Haihui Luo,  
Zhuzhou CRRC Times Semiconductor, CN

10:55

**Chair's opening speech**



11:05

### **PowerBrain: An automatic data extraction tool for semiconductor Datasheets**

**Fanghao Tian**, Qingcheng Sui, Jiaze Kong,  
Wilmar Martinez, EnergyVille - KU Leuven,  
Belgium



11:30

### **Next generation 4.5 kV IGBT StakPak module and FRD for 8GW HVDC application**

**Jeremy Jones**, David Guillon, Gaurav Gupta,  
Evgeny Tsyplakov, Makan Chen, Hitachi Energy,  
Switzerland  
Jan Vobecky, Hitachi Energy Czech Republic,  
Czech Republic



11:55

### **New Power MOSFET Technology for High Efficient Motor Drives**

**Waikeung Lun**, Infineon Technologies Hong Kong  
Limited, HKSAR, China  
Ralf Siemieniec, Elvir Kahrmanovic,  
Infineon Technologies Austria AG, Austria



12:20

### **Scalable and Reliable IGCT Power Semiconductor Platform for Offshore Wind Turbines**

**Christian Winter**, Thomas Stiasny, Olivier Quittard,  
Tobias Wikström, Makan Chen, Hitachi Energy Ltd,  
Switzerland

## **Meeting Room 9C** **Oral Session 2: Power Conversion I**



**Chairperson:** Yongdong Li,  
Tsinghua University, CN

10:55

**Chair's opening speech**



11:05

### **Adaptive Active Damping-Based Grid-side Current Harmonic Suppression Method for Totem-pole Bridgeless PFC Converter**

**Binxing Li**, Gaolin Wang, Yujia Zhu, Guoqiang  
Zhang, Dianguo Xu, Harbin Institute of Technology,  
China



11:30

### **A Simplified-ISOP-CLLLC Converter with Wide Voltage Gain for Auxiliary Power Supply Systems of Urban Rail Vehicles**

**Fangyi Wei**, Yan Li, Yi Tian, Ye Tian, Yanxuan Zheng,  
Beijing Jiaotong University, China



11:55

### **Research on Switch-Linear Hybrid Power Supply Based on Energy Feedback Scheme**

**Congrui Liu**, Yan Li, Junyi Mao, Yi Tian, Beijing  
Jiaotong University, China



12:20

### **Analysis and Design of Asymmetrical Half-bridge (AHB) Flyback Converter**

**Guoxing Zhang**, Junyang Luo, Infineon  
Technologies, Singapore  
Pengcheng Bai, Zan Wang, Infineon Technologies,  
China

# Poster Dialogue Session

Wednesday, 28 August 2024

13:30-14:30

## Power Mosfet and IGBT



**Chairperson:** Jinsong Kang,  
Tongji University, CN



**PP001**  
**Performance Evaluation of IGBT4 and IGBT7 in Servo Drive Design**

**Jia Zhao**, Infineon Integrated Circuit (Beijing) Co., Ltd., China  
Jianzhong Su, Beijing Jingchuan Electronic Technology Development Co., Ltd., China  
Zuange Liu, Wuhan Maxsine Electric Technology Co., Ltd., China



**PP002**  
**New 15 V silicon trench MOSFET technology optimized for high frequency switching buck converters at low input voltages**

**Jasmine Huang**, Infineon Semiconductors Company Ltd., China  
Seung Hwan Lee, Maximilian Roesch, Thomas Gebhard, Alexander Josef Glantschnig, Infineon Technologies Austria AG, Austria



**PP003**  
**Optimizing Turn-off Controllability of Micropattern Trench IGBTs for 900 A ED Type Modules**

**Nick Schneider**, Paula Diaz Reigosa, Roger Stark, Raffael Schnell, Sven Matthias, Lars Knoll, SwissSEM Technologies AG, Switzerland  
Coris Li, Leon Liang, Sun.King Pacific Semiconductor Technology, China



**PP004**  
**The Carriers-Redistribution Phenomenon on Short-Circuit Oscillations of IGBTs**

**Rui Li**, Keqiang Ma, Siliang Wang, Min Hu, Chengdu Semi-Future Technology Co., Ltd., China



**PP005**  
**Evaluation and Efficiency study of high current class discrete IGBTs-based converter systems**

**Sanbao Shi**, Yi Zhang, Infineon Semiconductors (Shenzhen) Company Limited, China  
Sekar Ajith Kumar, Infineon Technologies Austria AG, Austria



**PP006**  
**Novel 1300V Trench IGBT optimized for Automotive Applications with Bus Voltage above 900V**

**Lixiao Liang**, Zhenhua Tan, Wei Hu, Di Li, Pengfei Liu, Rongzhen Qin, Qiang Xiao, Haihui Luo, State Key Laboratory of Power Semiconductor and Integration Technology, China  
Lixiao Liang, Zhenhua Tan, Wei Hu, Di Li, Pengfei Liu, Rongzhen Qin, Qiang Xiao, Haihui Luo, Zhuzhou CRRC Times Semiconductor Co. Ltd, China



**PP007**  
**Comparison of Junction Temperature Measurement Methods for Power Module**

**Andrew Yang**, Juyoung Kim, Robbie Park, onsemi, Korea  
Yusi Liu, onsemi, USA



**PP008**  
**SPICE Modeling and Experimental Validation of the Active Short Circuit (ASC) Test with Silicon Carbide Power MOSFETs**

**Paolo Messina**, Alessandra Raffa, Pier Paolo Veneziano, Benedetto Amata, Carlo Brugaletta, Marco Papasero, Antonia Lanzafame, STMicroelectronics, Italy



**PP009**  
**Applying of RC-IGBT using 300mm wafer to consumer use**

**Toma Takao**, Hisashi Oda, Masaki Ueno, Kazuki Takakura, Akki Goto, Koichiro Noguchi, Power Device Works, Mitsubishi Electric Corporation, Japan  
Jian Chen, Mitsubishi Electric GEM Power Device (Hefei) Co., Ltd., China



**PP010**  
**Dynamic Current Balancing Optimization of Cu Clip-Bonded SiC power module Based on Layout-Dominated Parasitic Inductance**

**Xin Zhang**, Yongmei Gan, Tongyu Zhang, Xiaodong Hou, Guolian Guan, Wenbo Fan, Laili Wang, Xi'an Jiaotong University, China  
Kai Gao, State Grid Shanghai Electric Power Research Institute, China

## Advanced Power Module



**Chairperson:** Yi Tang,  
Starpower Semiconductor, CN



**PP011**  
**125KW PCS solution in high power density GWQ package**

**Shuai Cao**, Jun Zheng, Shuo Miao, Tao Zhang, Rui Rong, Guokang Chen, MACMIC SCIENCE&TECHNOLOGY CO., LTD, China



**PP012**  
**Compact 2kV IGBT Modules for Cascaded Static Var Generator**

**Bo Hu**, Jian Sun, Gaosheng Song, Mitsubishi Electric & Electronics (Shanghai) Co., Ltd, China



**PP013**  
**New Developed 4.5KV/1.5KA IGBT Module based on TMS IGBT and PIC FRD Technology**

**Bin Wang**, Liheng Zhu, Jiacheng Xu, Xing Chen, Mengjie Wang, Pengfei Liu, Rongzhen Qin, Qiang Xiao, Haihui Luo, State Key Laboratory of Advanced Power Semiconductor Devices, China  
Bin Wang, Liheng Zhu, Jiacheng Xu, Xing Chen, Mengjie Wang, Pengfei Liu, Rongzhen Qin, Qiang Xiao, Haihui Luo, Zhuzhou CRRC Times Semiconductor Co. Ltd, China



**PP014**  
**Introduction of New 650V Automotive Power Module with Latest Field Stop IGBT for an Excited Synchronous Motor Application**

**Jinwoo Park**, Yeriel Bai, Duwon Lee, KyuHyun Lee, onsemi, Republic of Korea  
BumSeung Jin, onsemi, USA

# Poster Dialogue Session

Wednesday, 28 August 2024

13:30-14:30



PP015

## Introduction of Power Module for Brushed and Brushless Exciter System of Electrically Excited Synchronous Motor

**Sangjun Koo**, Yeri Bai, Kangyoon Lee, onsemi, South Korea  
BumSeung Jin, onsemi, USA



PP016

## Switching Behavior of a 5 kA Press-Pack IGBT for HVDC Applications

**Niklas John**, Karsten Fink, Power Integrations GmbH, Germany



PP017

## Study on Microstructure and Mechanical Properties of IGBT Module Bonding Interface after Multiple Reflowing

**Xiankun Zhang**, Xiaofei Pan, Xiaodong Zhang, Yuancheng Liu, Bin Chen, Aoao Ren, China Resources Runan Chongqing Co., Ltd., China



PP018

## Research on Reliability of Heavy Copper Wire Bonding for IGBT Module

**Yankai Chen**, Jie Fang, Hongtao Zhao, Zhuzhou CRRR Times Semiconductor Co., Ltd., China.  
Yankai Chen, Jie Fang, Hongtao Zhao, Skate Key Laboratory of Power Semiconductor and Integration Technology, China.



PP019

## An Automatic Optimization Algorithm of SiC MOSFET Power Cycling Test Parameters Based on the Device Thermal Networks

**Hao Jin**, Jin Zhang, Xinyu Zou, Yao Yan, Institute of Electrical Engineering of the Chinese Academy of Sciences, China  
Hao Jin, Xinyu Zou, Yao Yan, University of Chinese Academy of Sciences, China



PP020

## Influence of surface morphology of press-pack IGBT on temperature and thermal resistance

**Yunzhi Qi**, Tong An, Fei Qin, Institute of Electronics Packaging Technology and Reliability, School of Mathematics, Statistics and Mechanics, Beijing University of Technology, China  
Yunzhi Qi, Tong An, Fei Qin, Beijing Key Laboratory of Advanced Manufacturing Technology, School of Mathematics, Statistics and Mechanics, Beijing University of Technology, China



PP021

## The effect of the bonded interface damage on mechanical and electro-thermal characteristic of the IGBT Modules

**Shengjun Zhao**, Tong An, Fei Qin, Institute of Electronics Packaging Technology and Reliability, School of Mathematics, Statistics and Mechanics, Beijing University of Technology, China  
Shengjun Zhao, Tong An, Fei Qin, Beijing Key Laboratory of Advanced Manufacturing Technology, Beijing University of Technology, China

## Advanced Power Converter



**Chairperson:** Lie Xu,  
Tsinghua University, CN



PP022

## Optimized Switching Behavior in a 3L-ANPC-Topology with paralleled IGBTs for Renewable Energy Applications

**Hao Wang**, Yi Xu, Yuejuan Bian, Power Integrations, China  
Karsten Fink, Power Integrations GmbH, Germany



PP023

## Design of a High Efficiency Single-Stage Series Resonant Micro-Inverter

**Wenzhe Xu**, Hao Chu, Cai Chen, Yong Kang, Huazhong University of Science and Technology, China



PP024

## A Virtual Impedance-Based Control Bandwidth Enhancement Method for Three-Level Flying Capacitor Boost Converter

**Kaidi Wang**, Qiyu Li, Shaanxi University of Science and Technology, China  
Hongwei Zhou, Dapeng Lu, Cheng Luo, TBEA Xi'an Electric Technology Co., Ltd, China



PP025

## Adaptive Efficiency Optimization for the High-Step-Up Boost Converter Based on the Loss Analysis Model

**Yuxiao Qin**, Lei Zhao, Department of Electronic and Information Engineering, Shantou University, China



PP026

## Analysis of Coupling Mechanism and Decoupling between Inductor and Active Filter in Hybrid EMI Filter

**Han Bu**, Fanghua Zhang, Chuang Zhou, Department of Electrical Engineering, Nanjing University of Aeronautics and Astronautics, China



PP027

## The Charging Station for Fast-Charging Batteries of Two Electric Vehicles

**Nikolay Volskiy**, Mikhail Krapivnoi, Charge Evolution Ltd, Russian Federation  
Dmitry Sukhov, Korsi Ltd, Russian Federation



PP028

## Design and optimization of a resonant converter for wireless power transfer

**Nikolay Kalugin**, Valentin Gura, Alexey Suvorin, Andrey Kostin, EnerGET LLC, Russia



PP029

## An Improved PSO-Based Maximum Power Point Tracking Algorithm for Distributed Photovoltaic System Under Partial Shading

**Yanxuan Zheng**, Yan Li, Yangpeng Guo, Ye Tian, Fangyi Wei, Yi Tian, Electrical Engineering School of Beijing Jiaotong University, China



# Oral Session

Wednesday, 28 August 2024 Afternoon, 14:30-16:20

## Meeting Room 9B

### Oral Session 3: High Voltage WBG



**Chairperson:** Gourab Majumdar,  
Mitsubishi Electric Corporation, JP

14:30  
**Chair's opening speech**



14:40  
**Intelligent SiC Power Module for 2- and 3-level high voltage applications**  
**Norbert Pluschke**, Semikron Danfoss (Hong Kong) Company Limited, HKSAR, China



15:05  
**3.3kV SBD-Embedded SiC-MOSFET module for railway applications**  
**Daichi Yoshio**, Yoichi Hironaka, Shigeru Okimoto, Kenji Hatori, Mitsubishi Electric Corporation, Japan  
Jian Sun, Mitsubishi Electric & Electronics (Shanghai) Co., Ltd., China



15:30  
**Accurate Characterization of the Gate Charge for SiC MOSFETs based on Double Pulse Test Scheme**  
**Chenghui Qian**, Hongyao Liu, Saijun Mao, UniSiC Technology (Shanghai) Co., Ltd., China



15:55  
**CoolSiC™ 2000 V SiC Trench MOSFET defines an enhanced benchmark for increased power density in new energy applications**  
**Ming Zhou**, Infineon Semiconductor (Shenzhen) Co. Ltd, China  
Xin Hao, Infineon Technologies Center of Competence (Shanghai) Co. Ltd., China

## Meeting Room 9C

### Oral Session 4: Power Conversion II



**Chairperson:** Jinjun Liu, Xian  
Jiaotong University, China

14:30  
**Chair's opening speech**



14:40  
**Quantitative Calculation of Motor End Overvoltage and Analysis of Over Double Overvoltage Under High Frequency**  
**Ying Yang**, Pengcheng Ma, Pang Shuo, School of Electrical and Mechanical Engineering and Automation, Shanghai University, China



15:05  
**A Model Predictive Method for Specific Harmonic Reduction at Low Switching Frequency in Permanent Magnet Synchronous Motor**  
**Tianyu Yuan**, Xiaoguang Zhang, Yuanhang Cao, North China University of Technology, China



15:30  
**Research of Three-Level ANPC Converter Based on Si/SiC Hybrid Switches**  
**Dichao Jin**, Hangzhi Liu, Aoying Hu, Yuming Zhou, Qicheng Guo, Anhui University of Technology, China



15:55  
**Parameter Estimation of Dual Three-Phase PMSM based on the Recursive Least Square Method**  
**Weidong He**, Lie Xu, Longbing Song, Yanjie Han, Lei Xia, Department of Electrical Engineering, Tsinghua University, China

## PCIM Asia 国际研讨会

PCIM Asia Conference



# Oral Session

Thursday, 29 August 2024 Morning, 09:30-12:15

9:30 - 10:10

## Meeting Room 9B

### Keynote 2: Solid state transformer in modern power system



#### Speaker:

Dianguo Xu,  
Harbin Institute of Technology, CN



#### Chairperson:

Yongdong Li,  
Tsinghua University, CN

10:10 - 10:25

Coffee break and room change

## Meeting Room 9B

### Oral Session 5: WBG I



**Chairperson:** Naoto Fujishima,  
Fuji Electric, JP

10:25

**Chair's opening speech**



10:35

**A 150 & 200mm engineered substrate increasing SiC power device current density up to 30%**

**Gonzalo Picun**, Eric Guiot, Frédéric Allibert, Alexis Drouin, Walter Schwarzenbach, Soitec, France  
Jürgen Leib, Tom Becker, Oleg Rusch, Fraunhofer IISB, Germany



11:00

**Tuning the parasitic JFET resistance for low on-state 1.2kV SiC power MOSFETs**

**Lars Knoll**, Nick Schneider, Paula Diaz Reigosa, Roger Stark, Raffael Schnell, SwissSEM Technologies AG, Switzerland  
Coris Li, Leon Liang, Sun.King Pacific Semiconductor Technology, China



11:25

**Analysis of the effect of system parasitic parameters on the switching of SiC devices**

**Qibin Wu**, Lifeng Chen, Infineon Technologies Center of Competence (Shanghai) Co. Ltd., China  
Yeon Jaeul, Infineon Technologies Austria AG, Austria



11:50

**Current Sharing Issues of Paralleled SiC MOSFET**

**Jie Dong**, Wenmin Hua, Lifeng Chen, Infineon Technologies China Co. Ltd., China

## Meeting Room 9C

### Oral Session 6: E-mobility



**Chairperson:** Tianhao Tang,  
Shanghai Maritime University, CN

10:25

**Chair's opening speech**



10:35

**Failure Diagnosis and Reconfiguration Scheme for Distributed Photovoltaic Converter Array in Solar Unmanned Aerial Vehicles**

**Xionsen Zhang**, Fuxin Liu, College of Automation Engineering, Nanjing University of Aeronautics and Astronautics, China  
Zhengxiao Zong, Shanghai Institute of Space Power-Sources, China  
Xuling Chen, College of Mechanical & Electrical Engineering, Nanjing University of Aeronautics and Astronautics, China



11:00

**Fusion switch concept addresses the cost-performance dilemma in EV powertrains**

**Tomas Reiter**, Waldemar Jakobi, Michael Niendorf, Matthias Ippisch, Mark Münzer, Infineon Technologies AG, Germany



11:25

**High integration of SiC power modules using the multi-functional Si chip technology**

**Yukimasa Higashi**, Noboru Morimoto, Rei Yoneyama, Mitsubishi Electric Corporation, Japan  
Makoto Ueno, Kazuhiro Nishimura, Melco Semiconductor Engineering Corporation, Japan



11:50

**A SiC-Based 60kW LLC Converter with Novel Transformer Design for Improving Voltage Balance and Wide Output Voltage Range**

**Chen Wei**, Jianlong Chen, Zongzeng Hu, Fulin Zhang, Wolfspeed, China

# Poster Dialogue Session Thursday, 29 August 2024

13:30-14:30

## Integrated Power Module



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



**PP030**  
**Optimization of External Components for Automotive Smart Power Module to Mitigate Specified HVIC Malfunction**

**Jinwoo Park**, Kangyoon Lee, Wonhi Oh, onsemi,  
Republic of Korea  
BumSeung Jin, onsemi, USA



**PP031**  
**Estimating the junction temperature of CIPOS™ IPMs using their case temperature and thermistor's resistance**

**Bokkeun Song**, Kihyun Lee, Taejin Lee, David Jo,  
Infineon Technologies Korea, South Korea



**PP032**  
**Comparison of PIM modules with separate inverter and rectifier schemes in inverter applications**

**Tao Zhang**, Guokang Chen, Rui Rong, Shuai Cao, Shuo Miao,  
Macmic science & technology Co., Ltd., China



**PP033**  
**Comprehensive Board Level Temperature Cycling Lifetime Projection of WLCSP GaN Power Devices**

**Shengke Zhang**, Siddhesh Gajare, Duanhui Li,  
Efficient Power Conversion, United States

## Future Control Concept



**Chairperson:** Meiqin Mao,  
Hefei University of Technology, CN



**PP034**  
**Enhanced Robust Model Predictive Control for Permanent Magnet Synchronous Motor Drives**

**Ruifang Chen**, Xiaoguang Zhang, North China University of Technology, China



**PP035**  
**Simplified Model Predictive Current Control for PMSM Drives Based on Bayesian Inference**

**Xiang Yu**, Xiaoguang Zhang, Guofu Zhang, North China University of Technology, China



**PP036**  
**Model Predictive Current Control for PMSM Drives with Low Parameter-dependent Model**  
**Xiang Yu**, Xiaoguang Zhang, Guofu Zhang, North China University of Technology, China



**PP037**  
**A Robust Dual-Vector Model Predictive Current Control for PMSM Drives**

**Lu Xu**, Xiaoguang Zhang, North China University of Technology, China



**PP038**  
**A harmonic current suppression method for PMSM based on model predictive current control**

**Lu Xu**, Xiaoguang Zhang, North China University of Technology, China



**PP039**  
**Improved Model Predictive Current Control for Three-Level NPC Inverter-Fed Long-Stator LSM Drives**

**Renjie Han**, Hao Ding, Min Liu, College of Electronics and Information Engineering, Tongji University, China  
Dongxiu Ou, College of Transportation, Tongji University, China  
Jinsong Kang, Institute of Rail Transit, Tongji University, China



**PP040**  
**Improved MRAS-based Speed Sensorless Control of PMSM Considering Inverter Nonlinearity**

**Longbing Song**, Lie Xu, Weidong He, Yanjie Han, Shaoyi Sun, Department of Electrical Engineering, Tsinghua University, China



**PP041**  
**Prediction of Electric Vehicles Schedulable Capacity Based on Graph Convolution Networks**

**Jixun Wu**, Meiqin Mao, Research Center for Photovoltaic System Engineering, Ministry of Education, Hefei University of Technology, China  
Cheng Yang, State Grid Anhui Electric Power Co., Ltd, China  
Yuanyue Wang, Minglei Zhu, State Grid Anhui Electric Vehicle Service Co., Ltd, China  
Nikos Hatzigiorgiour, National Technical University of Athens, Greece



**PP042**  
**Direct Model Predictive Control of a Five-Level ANPC Inverter with an Adaptive Linear Neuron-based Impedance Estimator**

**Arifin Nugroho**, Zhixun Ma, Tongji University, Shanghai, China,  
Mattia Rossi, Politecnico di Milano, Italy

# Poster Dialogue Session

Thursday, 29 August 2024

13:30-14:30

## SiC Devices



**Chairperson:** Min Chen,  
Zhejiang University, CN



**PP043**  
**Experimental Analysis of 2000 V Discrete CoolSiC™ MOSFETs in TO-2474 High Creepage Packages**

**Sanbao Shi**, Infineon Semiconductors (Shenzhen) Company Limited, China  
Sekar Ajith Kumar, Infineon Technologies Austria AG, Austria



**PP044**  
**New 650V SiC MOSFET for System Efficiency, EMI and Reliability**

**Wonsuk Choi**, Dongwook Kim, Sangwoo Pak, Power Master Semiconductor, ROK



**PP045**  
**Optimized Driving Conditions for Enhanced Switching Performance with SiC-MOSFETs**

**Sangjun Koo**, Jinwoo Park, Kangyoon Lee, onsemi, South Korea  
Jun Hur, BumSeung Jin, onsemi, United states



**PP046**  
**Research on Electrical Characteristics of 1200V SiC Trench MOSFET with Periodic Arrangement of 3D P-shield Structure**

**Guan Song**, Yafei Wang, Yao Yao, Qiming He, Qijun Liu, Xin Yuan, Chengzhan Li, Qiang Xiao, Haihui Luo, Zhuzhou CRRC Times Semiconductor Co., LTD, China  
Guan Song, Yafei Wang, Yao Yao, Qiming He, Qijun Liu, Xin Yuan, Chengzhan Li, Qiang Xiao, Haihui Luo, State Key Laboratory of Power Semiconductor and Integration Technology, China



**PP047**  
**The third generation SiC MOSFET with low on-state resistance and ultra high reliability**

**Pengxiang Wang**, Chengzhan Li, Yao Yao, Yafei Wang, Haihui Luo, Zhuzhou CRRC Times Semiconductor Co., LTD, China  
Pengxiang Wang, Chengzhan Li, Yao Yao, Yafei Wang, Shuai Zhang, Jieqin Ding, Haihui Luo, State Key Laboratory of Power Semiconductor and Integration Technology, China



**PP048**  
**Power cycling lifetime model of sliver sintered SiC MOSFET power module based on physics-of-failure approach**

**Jie Chen**, Wangjun Zhou, Zhexiong Luo, Haihui Luo, Qiang Xiao, Yadong Ren, Zhuzhou CRRC Times Semiconductor Co., Ltd., China  
Jie Chen, Wangjun Zhou, Zhexiong Luo, Haihui Luo, Qiang Xiao, Yadong Ren, State Key Laboratory of Power Semiconductor and Integration Technology, China



**PP049**  
**Automated Optimization of Irregular Elliptical PinFin Heatsinks for SiC Power Module**

**Xiaoshuang Hui**, Puqi Ning, Dongrun Li, Yuhui Kang, Fan Tao, Key Laboratory of High Density Electromagnetic Power and Systems (Chinese Academy of Sciences), Institute of Electrical Engineering, Chinese Academy of Sciences, China  
Xiaoshuang Hui, Puqi Ning, Dongrun Li, Yuhui Kang, Fan Tao, University of Chinese Academy of Sciences, China



**PP050**  
**Design and Implementation of 3.3kV Hybrid SiC Three-level AC/DC Converter**

**Xiaonian Wang**, Lanyuan Xin, Yichun Zhang, Jiayi Wang, Hangjie Fu, CRRC Zhuzhou Institute Co., Ltd, China



**PP051**  
**Gen.4 Trench SiC-MOSFET for Automotive Applications**

**Ryunosuke Matsumoto**, Osaga Tsuyoshi, Murakami Haruki, Ata Yasuo, Inokuchi Seiichiro, Power Device Works, Mitsubishi Electric Corp., Japan



**PP052**  
**Auto Power-SOI: Shaping the Future of Battery Monitoring Technology**

**Janpang Lim**, Soitec, Singapore



**PP053**  
**The Advantage of SiC MOSFET for three-phase four legs Converter in Off-grid Applications**

**Zuoyu Wei**, Infineon Technologies (Xi'an) Co., Ltd, China  
Heng Wang, Infineon Integrated Circuit (Beijing) Co., Ltd, China  
Lifeng Chen, Infineon Technologies Center of Competence (Shanghai) Co. Ltd., China



# Oral Session

Thursday, 29 August 2024 Afternoon, 14:30-16:20

## Meeting Room 9B

### Oral Session 7: Packaging Technologies I



**Chairperson:** Norbert Pluschke,  
Semikron Danfoss, HKSAR, CN

14:30

**Chair's opening speech**



14:40

**Comprehensive Study on the Characteristics of Large Area Transient liquid phase sintering (TLPS) Joint for SiC module**

**Di An**, Guiqin Chang, Haoliang Zhang, Haihui Luo, Qiang Xiao, Zhuzhou CRRC Times Semiconductor Co., Ltd., China

Di An, Guiqin Chang, Haoliang Zhang, Haihui Luo, Qiang Xiao, State Key Laboratory of Power Semiconductor and Integration Technology, China



15:05

**Comparison of Board-side and Back-side Thermal Management Techniques for eGAN® FETs in a Half-Bridge Configuration**

**Adolfo R. Herrera**, Michael A. de Rooij, Efficient Power Conversion, U.S.A.



15:30

**Reduced total cost of ownership with copper sintering**

**Sri Krishna Bhogaraju**, CuNex GmbH, Germany  
Stephen Shu, Schlenk Metallic Pigments (Shanghai) Co., Ltd, China



15:55

**Investigation on direct liquid cooling design of power modules with flat baseplate for automotive application**

**Masahide Kamiya**, Nobuhide Arai, Shinichiro Adachi, Kensuke Matsuzawa, Takahiro Koyama, Takanori Shintani, Fuji Electric Co., Ltd, Japan

## Meeting Room 9C

### Oral Session 8: Power Conversion III



**Chairperson:** Dehong Xu,  
Zhejiang University, CN

14:30

**Chair's opening speech**



14:40

**High Density USB-PD ZVS Flyback Converter Based on Secondary Side Control**

**Yongshuang Zhu**, Zan Wang, Huaping Cao, Infineon Semiconductors (Shenzhen) Company Limited, China



15:05

**Combined Scheme of Lithium-ion Battery Equalization with Energy Support Capabilities for Electric Vehicle Applications**

**Christos Mademlis**, Evangelos Tsioumas, Nikolaos Jabbour, School of Electrical and Computer Engineering, Aristotle University of Thessaloniki, Greece



15:30

**150°C Capacitors for DC-Link Applications**

**Adel Bastawros**, SABIC, USA  
Yuan Zhou, SABIC, China  
Fumio Yu, SABIC, Japan  
Takeshi Horiguchi, Takashi Mori, Kenichi Oshita, Nichicon, Japan



15:55

**Power converter with a galvanic isolation and an increased efficiency**

**Yury Skorokhod**, Dmitry Sorokin, Transconverter Ltd, Russian Federation  
Sergey Volskiy, Moscow Aviation Institute (Technical University), Russian Federation

# Oral Session

Friday, 30 August 2024 Morning, 09:30-12:15

9:30 - 10:10

## Meeting Room 9B

### Keynote 3: Power semiconductors applications within future renewable energy and electrification industry



**Speaker:**

Rainer Kaesmaier,  
Hitachi Energy, Switzerland



**Chairperson:**

Dapeng Zheng,  
Shenzhen Hopewind Electric, CN

10:10 - 10:25

Coffee break and room change

## Meeting Room 9B

### Oral Session 9: Packaging Technologies II



**Chairperson:** Shunli Wang, Inner Mongolia University of Technology, CN

10:25

**Chair's opening speech**



10:35

**Different Zth model influence on discrete IGBT Tvj calculation in main inverter application**

**Hao Zhang**, Zhenbo Zhao, Infineon Technologies China Co., Ltd., China  
Gerardo Pantoja, Infineon Technologies AG, Germany



11:00

**2.3 kV SiC MOSFET with New High-Power Package HPnC for 1500 VDC Applications**

**Song Chen**, Fuji Electric (China) Co., Ltd, China  
Junya Kawabata, Sousei Chen, Yoshihiro Kodaira, Takafumi Uchida, Taku Takaku, Yusuke Sekino, Yoshiyuki Kusunoki, Fuji Electric Co., Ltd., Japan



11:25

**Advanced cooling of power electronics with copper cold sprayed aluminium heatsinks & busbars.**

**Michael Dasch**, Reeti Singh, Ján Kondás, Max Meinicke, Leonhard Holzgaßner, Markus Brotsack, Impact-Innovations GmbH, Germany



11:50

**A Research on the EconoDUAL™ 3 Wave IGBT module for CAV main inverters**

**Kai Zhao**, Infineon Semiconductors (Shenzhen) Co. Ltd. China.  
Xie Qicai, INVT Electric Vehicle Drive Technology (Shenzhen) Co., Ltd. China.  
Lifeng Chen, Infineon Technologies Center of Competence (Shanghai) Co. Ltd., China

## Meeting Room 9C

### Oral Session 10: Smart Grid



**Chairperson:** Teng Liu, China

Southern Power Grid Electric Power Research Institute, CN

10:25

**Chair's opening speech**



10:35

**Enhanced Efficiency Wind Energy Conversion System for Ship Propulsion Applications**

**Christos Mademlis**, Evangelos Tsioumas, Nikolaos Jabbour, School of Electrical and Computer Engineering, Aristotle University of Thessaloniki, Greece



11:00

**Instability Analysis of Grid-Connected Inverters During Low-voltage-ride Through Process**

**Cheng Luo**, TBEA Xi'an Electric Technology Co., Ltd, China  
Qijin Yang, Yuanda Liu, Yong Han, Chunbao Zou, Yunnan Energy Investment Co., Ltd. of Three Gorges Corporation, China



11:25

**Adaptive Parametric Impedance Model Order Reduction Method for Grid-tied Renewable Energy Dominated Microgrid**

**Xun Jiang**, Meiqin Mao, Bao Xie, Research Center for Photovoltaic System Engineering of Ministry of Education, Hefei University of Technology, China  
Liuchen Chang, University of New Brunswick, Canada  
Haijiao Wang, State Key Laboratory of Operation and Control of Renewable Energy & Storage Systems (China Electric Power Research Institute), China



11:50

**Research on Active Power Reserve Grid Support Control Strategy of Single-stage Grid-connected inverter**

**Yangpeng Guo**, Yan Li, Yanxuan Zheng, Yingdong Fang, Beijing Jiaotong University, China

# Oral Session

Friday, 30 August 2024 Afternoon, 14:30-16:20

## Meeting Room 9B

### Oral Session 11: Peripheral Components and Circuitry



**Chairperson:** Gang Yao,  
Shanghai Maritime University, CN

14:30

**Chair's opening speech**



14:40

**Aging Behavior at 85°C and 85% RH of High Heat Capacitors for DC-Link Applications**

**Yuan Zhou**, SABIC, China  
Adel Bastawros, SABIC, USA  
Tetsuya Motohashi, Koichi Nakashima, Takamune Sugawara, Hisao Katsuta, SABIC, Japan



15:05

**Balancing Switching Transient of Paralleled SiC-MOSFETs by Using Adaptive Gate Current Shaping**

**Christopher Wille**, Tran Hoang Duy Nguyen, Pushkar Kulkarni, Lan Fang, Judith Mireille Nguene Njongue, Robert Bosch GmbH, Mobility Electronics, Germany



15:30

**Switching Loss Reduction for 3.3kV-750A Full-SiC MOSFET Module by Active Gate Driver**

**Sideng Hu**, Xu Wu, Menghao Li, Xiangning He, College of Electrical Engineering, Zhejiang University, China  
Naoto Fujishima, Semiconductors Business Group Fuji Electric Co., Ltd, Japan  
Yun Lei, Technology Strategy & Planning Office, Corporate R&D Headquarters, Fuji Electric Co., Ltd., Japan



15:55

**High voltage gate driver IC technology integrated with DESAT diode**

**Weidong Chu**, Infineon Technologies Americas Corp., USA

## Meeting Room 9C

### Oral Session 12: WBG II



**Chairperson:** Ziyang Chen,  
Infineon Technologies, CN

14:30

**Chair's opening speech**



14:40

**Compensation of Inconsistencies in Junction Temperature Deviation during Power Cycling Tests**

**Yuteng Zhuo**, Qiang Jin, Yuxin Xia, Shanghai Lingang Power Electronics Research Co., Ltd., China  
Jingang Han, Shanghai Maritime University, China



15:05

**New 400 V SiC MOSFET technology delivering highest efficiency in three-level industrial drive applications**

**Owen Song**, Infineon Semiconductors Company Ltd., China  
Ralf Siemienieć, Elvir Kahrmanovic, Ertugrul Kocaaga, Jyotshna Bhandari, Alberto Pignatelli, Wei-Ju Chen, Heejae Shim, Sriram Jagannath, Infineon Technologies Austria AG, Austria



15:30

**Validating Duty Cycle-Based Repetitive Gate and Drain Transient Overvoltage Specifications for GaN HEMTs**

**Shengke Zhang**, Angel Espinoza, Ricardo Garcia, Han Gao, Siddhesh Gajare, Efficient Power Conversion, United States

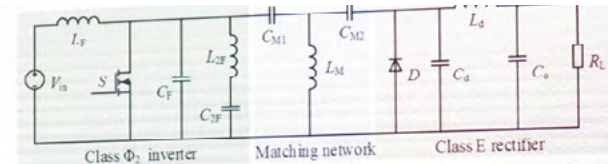


15:55

**Switching speed controllable GaN FET**

**Dajiang Zhang**, Zhan Wang, Luyang Wang, GaNext Ltd, China

PCIM Asia 国际研讨会  
PCIM Asia Conference



- The parasitic capacitance of switch and diode are adopted
- Switch voltage stress can be reduced in Class  $\Phi_2$  inverter
- Accurate design method of resonant components

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Notification of acceptance	May 2025
Deadline of full paper	20 June 2025

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

# Topics of Interest

## 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 Devices
- 1.5 GaN Devices
- 1.6 Other Wide Bandgap Devices
- 1.7 Power Supply Control IC and Power Management ICs
- 1.8 Gate Driver and Device Protection
- 1.9 IPM and Power Electronic Building Blocks

## 2. Packaging and Reliability

- 2.1 Packaging and Interface Technologies
- 2.2 Advanced Cooling Systems
- 2.3 Thermal Management and Simulations
- 2.4 Power Electronic Components Reliability and Life Time Prediction
- 2.5 Power Embedding
- 2.6 High Power Density Designs
- 2.7 Design Automation and Methodology

## 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 and Electrified Transportation

- 9.1 Hybrid / Electric Vehicle
- 9.2 MOSFET, IGBT and SiC Modules in Motor Traction and Propulsion Applications
- 9.3 DC/DC Conversion in Transportation Systems
- 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
- 9.8 Charging Station Technology

## 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 Design and 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
- 11.5 Electromagnetic Compatibility and Immunity

## 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
- 12.11 Communication, Cyber Security and Artificial Intelligence

## 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
- 13.6 Digital Twin for Transmission Equipment

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