IEEE Workshop on Wide Bandgap Power Devices and Applications in Asia (WiPDA Asia 2021)

Aug 25-27, 2021 Wuhan · China

PROGRAM

HUAZHONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

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IEEE

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Welcome Message

Dear Colleagues and Friends,

On behalf of the Organizing Committee, we warmly welcome you to the IEEE Workshop on Wide Bandgap Power Devices and Applications in Asia (WiPDA Asia 2021) to be held at Hilton Wuhan Optics Valley, Wuhan, China, during Aug. 25-27, 2021.

It is our great pleasure to hold this exciting event at Wuhan, the capital of Hubei Province, with a history of over 3,500 years. The goal of WiPDA Asia 2021 is to provide a forum for device scientists, circuit designers, and application engineers to share technology updates, research findings, development experience, and application knowledge. This workshop comprises various invited speeches and technical sessions of oral and poster presentations.

As the host and conference organizer, we would like to express our heartfelt thanks to the sponsorship of Huazhong University of Science and Technology (HUST) and IEEE Power Electronics Society (PELS). We thank all the sponsors, exhibitors, session chairs, volunteers, and conference staff for your great dedication to make this event a success. We are very grateful for the hard work of the experts on various committees. Your continuous efforts made it possible for WiPDA Asia 2021 to proceed smoothly. Taking this opportunity, we would like to express our deepest gratitude to all reviewers who have reviewed all technical papers professionally to ensure the high-quality publication of the conference proceedings.

We sincerely hope that all participants will have in-depth discussions with each other and build lasting friendships during this conference, and have a pleasant and fruitful stay in Wuhan. Last but not least, we look forward to seeing you all at the next conference.

Yours sincerely,

General Chair

Prof. Shijie Cheng
HUST, China

General Co-Chair

Prof. Yong Kang
HUST, China

General Co-Chair

Prof. Xiaoming Zha
WHU, China

History of WiPDA Asia

WiPDA Asia 2018, May 17-19, 2018, Xi'an, China

WiPDA Asia 2019, May 23-25, 2019, Taipei, China

WiPDA-Asia 2020, Sep 24-25, 2020, virtual, Japan

WiPDA-Asia 2021, Aug 25-27, 2021, Wuhan, China

Conference Committee

✧ Conference General Chair

Shijie Cheng	Huazhong University of Science and Technology, China

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Xiaoming Zha	Wuhan University, China

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Bangyin Liu	Huazhong University of Science and Technology, China

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Ming Yang	Harbin Institute of Technology
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Xiong Du	Chongqing University
Mingyao Ma	Hefei University of Technology
Hanyu Wang	Hefei University of Technology
Lijun Hang	Hangzhou Dianzi University
Sheng Zheng	Huawei Technologies

✧ Local Arrangement

Xudong Zou (Chair)	Huazhong University of Science and Technology, China
Lei Lin (Co-chair)	Huazhong University of Science and Technology, China
Guorong Zhu (Co-chair)	Wuhan University of Technology, China

✧ Sponsor & Exhibition

Xuejun Pei (Chair)	Huazhong University of Science and Technology, China
Xuehua Wang (Co-chair)	Huazhong University of Science and Technology, China
Shangzhi Pan (Co-chair)	Wuhan University, China

✧ Publicity Chair

Han Peng (Chair)	Huazhong University of Science and Technology, China
Jun Wang (Co-chair)	Hunan University, China
Puqi Ning (Co-chair)	Chinese Academy of Science, China
Shu Yang (Co-chair)	Zhejiang University, China

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Meng Huang (Co-chair)	Wuhan University, China

✧ Financial Chair

Hua Lin (Chair)	Huazhong University of Science and Technology, China
Donghai Zhu (Co-chair)	Huazhong University of Science and Technology, China
Lin Liang (Co-chair)	Huazhong University of Science and Technology, China

✧ Publication Chair

Li Peng (Chair)	Huazhong University of Science and Technology, China
Wei Sun (Co-chair)	Huazhong University of Science and Technology, China
Zhiliang Zhang (Co-chair)	Nanjing University of Aeronautics and Astronautics, China

✧ Keynote Chair

Fang Luo (Chair)	Stony Brook University, USA
Zheyu Zhang (Co-chair)	Clemson University, USA

✧ Tutorial Chair

Dong Jiang (Chair)	Huazhong University of Science and Technology, China
Laili Wang (Co-chair)	Xi'an Jiaotong University, China
Xu She (Co-chair)	United Technologies Corporation, USA

✧ Student Volunteer Chair

An Li (Chair)	Huazhong University of Science and Technology, China
Yiyang Yan(Co-chair)	Huazhong University of Science and Technology, China
Xiangwen Sun (Co-chair)	Huazhong University of Science and Technology, China
Xuan Zhao(Co-chair)	Huazhong University of Science and Technology, China
Pengye Wang(Co-chair)	Huazhong University of Science and Technology, China
Feng Hu (Co-chair)	Huazhong University of Science and Technology, China

About the Conference

✧ Time Arrangements

Aug 25th 14:00-21:00 (Virtual Conference)
Aug 26th full day, Aug 27th full day (Virtual Conference)

✧ Conference Venue

Full Virtual Conference

✧ Conference Hosts

IEEE Power Electronic Society, Huazhong University of Science and Technology (HUST)

✧ Conference Organizers

Organizer:
School of Electrical & Electronic Engineering, Huazhong University of Science and Technology

Co-organizer:
Hubei Jiufengshan Laboratory
IEEE Power Electronic Society Student Branch Chapter, Huazhong University of Science and Technology (HUST)

✧ Topics

- ✓ Heteroepitaxial & Bulk Materials Growth
- ✓ Gate Dielectrics & Surface Passivation
- ✓ Device Structures & Fabrication Techniques
- ✓ Device Characterization & Modeling
- ✓ Very-High Efficiency or Compact Converters
- ✓ Safe Operating Areas of Wide Bandgap Devices, Including Short Circuit, Spike, &Transient Tolerance
- ✓ Harsh Environment (High Temperature) Operation & Reliability
- ✓ Packaging, Power Modules, & ICs
- ✓ Hard-Switched & Soft-Switched Application
- ✓ Gate Drive & Other Auxiliary Circuits
- ✓ High-Performance Passive Components
- ✓ Applications in Renewable Energy & Energy Storage, Transportation, Industrial Drives, & Grid Power Systems

✧ Contact

- ✓ wipda-asia-2021@hust.edu.cn

Agenda

Time	Activity		
25-Aug			
	13:30-14:30	Tutorial 1	Tutorial 5
	14:30-15:30	Tutorial 2	Tutorial 6
		Break	
	16:00-17:00	Tutorial 3	Tutorial 7
	17:00~18:00	Tutorial 4	Tutorial 8
	14:00~18:00	Vendor Online Exhibition	

Time	Activity
26-Aug	
8:45~9:00	Welcome Speech
9:00~9:40	Keynote 1
9:40~10:20	Keynote 2
10:20~10:30	Break
10:30~11:10	Keynote 3
11:10~11:50	Keynote 4
12:00~14:30	Vendor Online Exhibition
14:30~15:10	Keynote 5
15:10~15:50	Keynote 6
15:50~16:00	Break
16:00~16:40	Keynote 7

Time	Activity		
27-Aug			
8:30~10:00	Oral Session 1	Oral Session 5	Industry Session -1
10:15~12:00	Oral Session 2	Oral Session 6	Industry Session -2
12:00~13:30	Poster Session		
14:00~15:30	Oral Session 3	Oral Session 7	
15:30~17:00	Oral Session 4	Oral Session 8	

Keynote Speakers

✧ Fred C. Lee

University Distinguished Professor Emeritus, Virginia Tech, USA

Member of National Academy of Engineering

IEEE Fellow

Topic: Next Generation of Power Supplies: EV On-Board Charger

Dr. Lee is a University Distinguished Professor Emeritus at Virginia Tech. He is a member of the *U.S. National Academy of Engineering*, an academician of Taiwan's *Academia Sinica*, and a foreign member of the *Chinese Academy of Engineering*, China. Dr. Lee founded the Center for power electronics and led a program that encompasses research, technology development, educational outreach, industry collaboration, and technology transfer. To date, more than 230 companies worldwide have benefited from this industry partnership program.

Dr. Lee has supervised to completion 89 Ph.D. and 93 M.S. students. He holds over 100 US patents, and has published over 330 journal articles and more than 760 refereed technical papers. His research interests include high-frequency power conversion, magnetics and EMI, distributed power systems, renewable energy, power quality, high-density electronics packaging and integration, and modeling and control.

Dr. Lee is a fellow of the US National Academy of Inventor, and the recipient of the 2015 IEEE Medal in Power Engineering "for contributions to power electronics, especially high-frequency power conversion."

✧ Alan Mantooth

University Distinguished Professor, University of Arkansas, USA

Past-President of IEEE Power Electronics Society

IEEE Fellow

Topic: Designing Wide Bandgap Power Electronic Systems

H. Alan Mantooth received the B.S.E.E. and M.S.E.E. degrees from the University of Arkansas in 1985 and 1986, and the Ph.D. degree from Georgia Tech in 1990. He then joined Analogy, a startup company in Oregon, where he focused on semiconductor device modeling and the research and development of modeling tools and techniques. In 1998, he joined the faculty of the Department of Electrical Engineering at the University of Arkansas, Fayetteville, where he currently holds the rank of Distinguished Professor. His research interests now include analog and mixed-signal IC design & CAD, semiconductor device modeling, power electronics, power electronics packaging, and cybersecurity. Dr. Mantooth helped establish the National Center for Reliable Electric Power Transmission (NCREPT) at the UA in 2005.

Professor Mantooth serves as the Executive Director for NCREPT as well as two of its centers of excellence: the NSF Industry/University Cooperative Research Center on GRid-connected Advanced Power Electronic Systems (GRAPES) and the Cybersecurity Center on Secure, Evolvable Energy Delivery Systems (SEEDS) funded by the U.S. Department of Energy. In 2015, he also helped to establish the UA's first NSF Engineering Research Center entitled Power Optimization for Electro-Thermal Systems (POETS) that focuses on high power density systems for electrified transportation applications. Dr. Mantooth has co-founded three companies in design automation (Lynguent), IC design (Ozark Integrated Circuits), and cybersecurity (Bastazo) as well as advising a fourth in power electronics packaging (Arkansas Power Electronics International) to maturity and acquisition as a board member. Dr. Mantooth holds the 21st Century Research Leadership Chair in Engineering.

✧ Yong Kang

Professor,

Huazhong University of Science and Technology, China

Topic: The Research of High Frequency, High Efficiency and High Power Density (3H) Application for GaN Devices

Professor Yong Kang received the B.E., M.E., and Ph.D. degrees from the Huazhong University of Science and Technology (HUST), Wuhan, China, in 1988, 1991, and 1994, respectively. He joined the School of Electrical and Electronic Engineering, HUST in 1994, where he became a professor in 1998. He is the Vice Chairman of the Power Electronics Society of China Electrotechnical Society, the Vice Chairman with the China UPS Standard Committee, and the Associate Editor of the Journal of Power Electronics.

Professor Yong Kang has authored or coauthored more than 200 technical articles published in journals and conferences and holds more than 30 Chinese patents. His research interests include power electronic converter, wide bandgap semiconductor device packaging, integration and its application, renewable energy generation systems, ac and dc drivers and electromagnetic compatibility. Yong Kang has presided over or participated in 8 National Natural Science Foundation of China projects, and won national, provincial and ministerial and international awards 8 times. In 2001, Yong Kang was awarded the special government allowance of the State Council, and was awarded the honorary title of "Zhongda Scholar" in 2005.

✧ Mingxiang Chen

Professor,

Huazhong University of Science and Technology, China

Topic: Development and Applications of Packaging Materials for Power Semiconductor Devices

Mingxiang Chen, Professor of Huazhong University of Science and Technology (HUST). He received his B. S. and M. S. in Material Engineering from Wuhan University of Science and Technology, and his Ph. D. in Physical Electronics from HUST. After his doctoral study, he was awarded the postdoctoral fellowship with Professor C. P. Wong at Georgia Institute of Technology, where he conducted studies on nano packaging. Now his research focuses on electronic packaging materials & micro/nano fabrication. He has published over 50 peer-reviewed papers and holds over 10 patents (some have been licenced to the industry).

✧ Harufusa Kondo

Senior Technical Advisor

Mitsubishi Electric, Power Device Works, Japan

Topic: Technology Trends of SiC Chips and Modules

Harufusa Kondo received the B.S., M.S., and Ph.D. degrees from Osaka University, JAPAN. In 1985, he joined the LSI R&D Laboratory, Mitsubishi Electric Corporation, where he had been engaged in the design of system VLSI's for digital communication. In 2003, he moved to the Optical and High-frequency Device Works as a manager of Optical Transceiver. Since 2009, he has been working at Power Device Works for the development of DIPIPM, Industrial IGBT modules, and high-voltage modules including SiC. He is currently the senior technical advisor at Power Device Works, Mitsubishi Electric, Japan.

✧ Song Bai

Director

State Key Laboratory of Wide Bandgap Semiconductor

Power Electronic Devices, China

Topic: Development of High Voltage SiC Power MOSFETs

Song Bai received the B. S. degree in physics from Peking University, in 1997 and the Ph. D degree in physics from University of Pittsburgh, in 2003. In 2004, he joined Nanjing Electronic Devices Institute where he currently heads research on SiC power device development at State Key Laboratory of Wide-Bandgap Semiconductor Power Electronic Devices. He is the author or coauthor of over 30 publications and holds more than 20 patents. His present research interests are in developing high-voltage power devices of wide-bandgap semiconductors.

✧ Stig Munk-Nielsen

Professor,

Aalborg University, Denmark

Topic: WBG Power Devices and Digital Design Framework: Challenges, Possibilities, Opportunities

Stig Munk-Nielsen is currently Professor at the Department of Energy Technology, Aalborg University, Denmark. Since 2008 Stig worked with circuits for monitoring of high power IGBTs voltage drop for failure analysis purpose and the team managed to install monitoring systems in off-shore wind turbine in 2018. Since 2013, Stig has secured funding for a die packaging team and laboratory facilities for 10 kV SiC devices and later on the team did numerous application designs with GaN, Si and other SiC devices. Since 2013, where the team initially simulated and included the R,L,C parasitics of power module layouts we are building a second version of the packaging facilities. We expect the new laboratory facilities is a key enabler to the goal of extending the experience with digital design framework. In the newly funded project CoDE we hire 5 PhDs and want to use the digital framework in more applications but also to include mechanical wear out in simulations. The application examples include megawatt PtX converters and pump drive systems technology. A number of industrial related projects is conducted in parallel.

Program

August 25, Wednesday		
Tutorial		
Time	**Zoom meeting ID:** 842 0481 1080	**Zoom meeting ID:** 873 1966 9550
Chairs	*Dong Jiang, Huazhong University of Science and Technology*	*Han Peng, Huazhong University of Science and Technology*
13:30-14:30	**Tutorial 1:** Multi-MHz Power Conversion Technology Based on GaN Devices Yueshi Guan, Yijie Wang, Dianguo Xu, Harbin Institute of Technology	**Tutorial 5:** Resonant Gate Drivers For SiC Devices In High Frequency, High Power Density Applications Han Peng, Huazhong University of Science and Technology
14:30-15:30	**Tutorial 2:** High Frequency Power Conversion with SiC Power Devices for The High Voltage Power Supply with Fast Transient Response Saijun Mao, Fudan University	**Tutorial 6:** Thermal Design and Optimization of SiC Power Module Zhiqiang (Jack) Wang, Huazhong University of Science and Technology / Tong Wu, ON Semiconductor
15:30-16:00	**Break**	
16:00-17:00	**Tutorial 3:** Sintered-Silver Bonding (SSB) for Power Packaging: Its Science and Practice Yunhui Mei, Tiangong University	**Tutorial 7:** Design Advances in High Frequency Power Converters with Wide Bandgap Devices --- Part1: Power Loop Impedance Control Zhe Zhang, Technical University of Denmark / Bainan Sun, Infineon Technologies / Hongbo Zhao, Aalborg University / Zhan Shen, Aalborg University
17:00-18:00	**Tutorial 4:** Advanced Packaging Technologies for Silicon Carbide Devices and Their Reliability Issues Nan Jiang, Hefei Comprehensive National Science Center	**Tutorial 8:** Design Advances in High Frequency Power Converters with Wide Bandgap Devices ---Part 2: Magnetics Zhe Zhang, Technical University of Denmark / Bainan Sun, Infineon Technologies / Hongbo Zhao, Aalborg University / Zhan Shen, Aalborg University
14:00-18:00	**Vendor Online Exhibition**	

August 26, Thursday Zoom meeting ID: 881 8063 8333	
Chair: *Prof. Yong Kang, Huazhong University of Science and Technology, China*	
08:45-08:50	**Welcome Speech 1** **Prof. Shijie Cheng** *General Chair, WiPDA-Asia 2021* *Member of the Chinese Academy of Sciences* *Huazhong University of Science and Technology*
08:50-09:00	**Welcome Speech 2** **Prof. Jinyu Wen** *Changjiang Distinguished Professor* *Dean of School of Electrical and Electronic Engineering* *Huazhong University of Science and Technology*
Keynote Speech	
09:00-9:40	**Next Generation of Power Supplies: EV On-Board Charger** **Prof. Fred C. Lee** *University Distinguished Professor Emeritus, Virginia Tech, USA* *Member of National Academy of Engineering* *IEEE Fellow*
9:40-10:20	**Designing Wide Bandgap Power Electronic Systems** **Prof. Alan Mantooth** *University Distinguished Professor, University of Arkansas, USA* *Past-President of IEEE Power Electronics Society* *IEEE Fellow*
10:20-10:30	**Break**
Chair: *Prof. Xiaoming Zha, Wuhan University, China*	
10:30-11:10	**The Research of High Frequency, High Efficiency and High Power Density (3H) Application for GaN Devices** **Prof. Yong Kang** *Huazhong University of Science and Technology, China*
11:10-11:50	**Development and Applications of Packaging Materials for Power Semiconductor Devices** **Prof. Mingxiang Chen** *Huazhong University of Science and Technology, China*
12:00-13:30	**Vendor Online Exhibition**
Chair: *Prof. Xuejun Pei, Huazhong University of Science and Technology, China*	
14:30-15:10	**Technology Trends of SiC Chips and Modules** **Dr. Harufusa Kondo** *Senior Technical Advisor, Mitsubishi Electric, Power Device Works, Japan*
15:10-15:50	**Development of High Voltage SiC Power MOSFETs** **Dr. Song Bai** *Director, State Key Laboratory of Wide Bandgap Semiconductor Power Electronic Devices, China*
15:50-16:00	**Break**
Chair: *Prof. Zhiqiang Wang, Huazhong University of Science and Technology, China*	

16:00-16:40	**WBG Power Devices and Digital Design Framework: Challenges, Possibilities, Opportunities** **Prof. Stig Munk-Nielsen** *Aalborg University, Denmark*

August 27, Friday			
Time	**Zoom meeting ID**: **842 0481 1080**	**Zoom meeting ID**: **873 1966 9550**	**Zoom meeting ID**: **881 8063 8333**
08:30-09:45	**Oral Session 1:** WBG Device Modeling and Simulation	**Oral Session 5:** WBG Device Design	**Industry Session 1**
09:45-10:00	**Break**		
10:00-11:30	**Oral Session 2:** WBG Device Reliability	**Oral Session 6:** WBG Device Gate Drivers	**Industry Session 2**
12:00-13:30	**Poster Session**		
14:00-15:15	**Oral Session 3:** WBG Device Applications	**Oral Session 7:** WBG Power Converters	
15:15-15:30	**Break**		
15:30-17:00	**Oral Session 4:** WBG Device Package Design & Analysis	**Oral Session 8:** WBG Device Characteristic and Converter Modeling	

Oral Presentations

Aug 27, 2021 08:30~11:15 Zoom meeting ID：842 0481 1080

S1: Device Modeling and Simulation			
Chairs: Xiaochuan Deng, University of Electronic Science and Technology of China Yu Chen, Huazhong University of Science and Technology			
Start	**Duration**	**ID**	**Title**
08:30	15	157	Datasheet Driven Turn Off Overvoltage Prediction for Silicon Carbide Power MOSFETs Based on Theoretical Analysis Cheng Qian, Yuxin Ge, Zhiqiang (Jack) Wang, Yong Kang
08:45	15	1	Identification Method for the HF-Osc of SiC MOSFET Based on Instantaneous Frequency Xin Li, Ruitian Wang, Fei Xiao, Yifei Luo, Zenan Shi, Feng Xie
09:00	15	150	An Automated Electro-Thermal-Mechanical Co-Simulation Methodology Based on PSpice-MATLAB-COMSOL for SiC Power Module Design Yayong Yang, Yuxin Ge, Zhiqiang (Jack) Wang, Yong Kang
09:15	15	55	Comprehensive Investigations on Paralleling Operation of SiC MOSFETs based on Subcircuit Model in MATLAB/SIMULINK Yuqi Wei, Dereje Woldegiorgis, Xia Du, Venkata Samhitha Machireddy, Alan Mantooth
09:30	15	91	A Physics-Based Unified Compact Model for Si/SiC IGBT in LTspice with Experimental Validation Md Maksudul Hossain, Arman Ur Rashid, Yuqi Wei, H. Alan Mantooth
09:45	15	**Break**	
S2: WBG Device Reliability			
Chairs: Qing Guo, Zhejiang University Meng Huang, Wuhan University			
10:00	15	13	Analysis of GaN HEMT Degradation under RF Overdrive Stress Yuhan Xie, Yan Ren, Chang Liu, Yiqiang Chen, Rongsheng Chen
10:15	15	11	Analysis of the Influence of Vibration and Thermal Vibration Coupling on The Power Module Jiajia Guan, Chi Zhang, Cai Chen, Yong Kang
10:30	15	104	Investigation of the Insulation Failure of Power Modules by Observation of Electrical Trees Kaixuan Li, Boya Zhang, Xingwen Li, Haotao Ke
10:45	15	100	Failure Analysis of 200V p-GaN HEMT under Unclamped Inductive Switching Conditions Junjie Ye, Li Xuan, Yangyang Wu, Xiaochuan Deng, Zhiqiang Li, Bo Zhang
11:00	15	26	Characteristics of SiC MOSFET in a Wide Temperature Range Mengyu Zhu, Laili Wang, Huaqing Li, Chengzi Yang, Dingkun Ma, Fengtao Yang

Aug 27, 2021 14:00~17:00 Zoom meeting ID：842 0481 1080

S3: WBG Device Applications			
Chairs: Haoze Luo, Zhejiang University Xuehua Wang, Huazhong University of Science and Technology			
Start	**Duration**	**ID**	**Title**
14:00	15	109	A Predictive Method for Switching Time of Nanosecond Pulsed Power System of Ohmic Loads Using SiC MOSFETs Yifei Luo, Xin Li, Fei Xiao, Zenan Shi, Ruitian Wang, Feng Xie
14:15	15	89	Analysis of an Output Series High Voltage Gain Impedance Source Circuit Based on SiC Switch Qing Cheng, Wei Wang, Yueshi Guan, Tingting Yao, Dianguo Xu
14:30	15	118	Homogeneous-Flux Transmitter Coil Design with Improved Position Tolerance Yunfeng Liu, Yi Dou, Ziwei Ouyang, Michael A. E. Andersen
14:45	15	152	An Accurate Analytical Model for Motor Terminal Overvoltage Prediction and Mitigation in SiC Motor Drives Neng Wang, Cheng Qian, Zhiqiang (Jack) Wang, Yong kang
15:00	15	96	Adaptive Digital Technique Assisted Hard Switching Fault Detection for SiC MOSFETs Saravanan DhanaseKaran, Vamshi Krishma Miryala, Kamalesh Hatua
15:15	15	**Break**	
S4: WBG Device Package Design & Analysis			
Chairs: Jianing Wang, Hefei University of Technology Cai Chen, Huazhong University of Science and Technology			
15:30	15	29	Comparison Study of Parasitic Inductance, Capacitance and Thermal Resistance for Various SiC Packaging Structures Yue Xie, Yifan Zhang, Cai Chen, Yong Kang
15:45	15	74	A Layout Optimization Method to Reduce Commutation Inductance of Multi-Chip Power Module Based on Genetic Algorithm Yu Zhou, Yu Chen, Hongyi Gao, Chengmin Li, Haoze Luo, Wuhua Li, Xiangning He
16:00	15	126	A High Power Density Chip-on-Chip Gan-based Module with Ultra-Low Parasitic Inductance Yi Zhang, Zongheng Wu, Cai Chen, Yong Kang, Han Peng
16:15	15	50	15kV Press Pack SiC IGBT Yujie Du, Xinling Tang, Liang Wang, Zhibin Zhao, Xiaolei Yang, Fei Yang, Junmin Wu
16:30	15	154	Analysis of Dynamic Current Balancing in Multichip SiC Power Modules Based on Coupled Parasitic Network Model Yuxin Ge, Yayong Yang, Cheng Qian, Zhiqiang (Jack) Wang, Yong Kang
16:45	15	62	Power Loop Inductance Extraction with High Order Polynomial Fitting Algorithm for SiC MOSFET Power Module Characterization Zhikun Wang, Saijun Mao, Shuhao Yang, Wenyu Li, Yujie Ding, Keqiu Zeng

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S5: WBG Device Design			
Chairs: Yanqing Wu, Peking University Lin Liang, Huazhong University of Science and Technology			
Start	**Duration**	**ID**	**Title**
08:30	15	48	Comparing Hexagonal and Circular Cell Designs for SiC MPS Diode: The Curvature Effect on Avalanche Capability Li Liu, Na Ren, Jiupeng Wu, Zhengyun Zhu, Hongyi Xu, Qing Guo, Kuang Sheng
08:45	15	12	Improved Breakdown Characteristics for AlN/GaN/InGaN Coupling Channel HEMTs with SiNx Removal and Backfill Technique Hao Lu, Xiaohua Ma, Bin Hou, Ling Yang, Yue Hao
09:00	15	69	Multiple UIS Ruggedness of 1200V Asymmetric Trench SiC MOSFETs Jiayue Liu, Xiaochuan Deng, Xu Li, Xuan Li, Zhiqiang Li, Hongling Lu
09:15	15	105	A Novel GaN MIS-HEMT with a Source-connected Clamp Electrode for Suppressing Short-channel effect Yijun Shi, Shan Wu, Hongyue Wang, Zhiwei Fu, Si Chen, Bin Zhou
09:30	15	107	Resonant Gate Driver with Wide Range Adjustment of Driving Speed Hao Peng, Han Peng, Qiaozhi Yue
9:45	15	**Break**	

S6: Device Gate Drivers			
Chairs: Zicheng Liu, Huazhong University of Science and Technology Hanyu Wang, Hefei University of Technology			
Start	**Duration**	**ID**	**Title**
10:00	15	84	Optimized Parameter Selection Method of Driving Circuit for SiC MOSFET Haihong Qin, Sixuan Xie, Feifei Bu, Shishan Wang, Wenming Chen, Dafeng Fu
10:15	15	46	Analysis of Crosstalk and Suppression Methods for Enhancement-Mode GaN HEMTs in A Phase-Leg Topology Haihong Qin, Wenlu Wang, Feifei Bu, Zihe Peng, Ao Liu, Song Bai
10:30	15	156	An Optimized Parameter Design Method for Desaturation Protection Circuit towards Fast Response Speed and Strong Noise Immunity Cheng Qian, Zhiqiang (Jack) Wang, Yong Kang
10:45	15	64	A Review of the Crosstalk Suppression Methods for SiC MOSFETs in the Phase-leg Circuit Configuration Yujie Ding, Saijun Mao, Zhikun Wang, Shuhao Yang, Wenyu Li, Keqiu Zeng
11:00	15	136	A Synchronous Boot-strapping Technique with Increased On-time and Improved Efficiency for High-side Gate-drive Power Delivery Nathan M. Ellis, Rahul Iyer, Robert C. N. Pilawa-Podgurski

Aug 27, 2021 14:00~17:00 Zoom meeting ID：873 1966 9550

S7: WBG Power Converters			
Chairs: Hongfei Wu, Nanjing University of Aeronautics and Astronautics Dong Jiang, Huazhong University of Science and Technology			
Start	**Duration**	**ID**	**Title**
14:00	15	20	Soft-Switching Resonant Active Clamp Flyback based-on GaN HEMTs for MHz High Step-Up Applications Wuji Meng, Lin Li, Fanghua Zhang, Jianjun Shu
14:15	15	122	Design of a 10kW, High-Frequency Dual Active Bridge Converter Using SiC Devices Haoyuan Jin, Huaqing Li, Junduo Wen, Chengzi Yang, Hang Kong, Laili Wang
14:30	15	42	A Single-Stage Modular DCX with High Voltage Conversion Ratio Based on High Frequency LLC Resonant Converter Yueshi Guan, Zhaoliang Wen, Yijie Wang, Dianguo Xu
14:45	15	111	Comparison of Two Types of Single Gate Drivers for SiC MOSFET Stacks in Flyback Converters Rui Wang, Hongbo Zhao, Stig Munk-Nielsen
15:00	15	119	Review of soft-switching high-frequency GaN-based single-phase Bridgeless Rectifier Yunfeng Liu, Ziwei Ouyang, Michael A.E. Andersen
15:15	15	78	An Efficient Voltage Step-up/down Partial Power Processing Converter (SUD-PPC) using Wide Bandgap devices Chao Liu, Zhe Zhang, Michael A. E. Andersen
15:30	15	**Break**	

S8: WBG Device Characteristic and Converter Modeling			
Chairs: Yu Zhang, Huazhong University of Science and Technology Han Peng, Huazhong University of Science and Technology			
15:45	15	148	Modeling and Design of A 10MHz Class Φ2 Inverter Yongzhi Liu, Yiyang Yan, JiaJia Guan, Cai Chen, Yu Chen, Yong Kang
16:00	15	49	A Real-Time Self-Learning High Performance Control for Megahertz GaN-based DC-DC Converter Jing Chen, Yu Chen, Yong Kang
16:15	15	45	Comparison Study on Short Circuit Capability of 1.2 kV Split-Gate MOSFET and Split-Source MOSFET with Integrated JBS Diode Hongyi Xu, Chaobiao Lin, Na Ren, Xinhui Gan, Liping Liu, Zhengyun Zhu, Li Liu, Qing Guo, Jianxin Ji, Kuang Sheng
16:30	15	67	Single Pulse Short-Circuit Failure Mechanism of 1200V Asymmetric Trench SiC MOSFETs Zhaoxiang Wei, Jiaxing Wei, Xiaowen Yan, Hua Zhou, Hao Fu, Siyang Liu, Weifeng Sun
16:45	15	141	The Influence of Dynamic Threshold Voltage Drift on Third Quadrant Characteristics of SiC MOSFET Lei Tang, Huaping Jiang, Hua Mao, Zebing Wu, Xiaohan Zhong, Xiaowei, Qi, Li Ran

Industry Session

Aug 27, 2021 08:30~11:40 Zoom meeting ID：881 8063 8333

IS1-Industry Session 1		
Chairs: Feng Zhang, Xiamen University | Sheng Zheng, Huawei Technologies		
Start	**Duration**	**Title**
08:30	25	SiC Power Modules for Rail Traction & SST Applications Siqing Lu, Mitsubishi Electric
08:55	25	TMR-Based Current Sensor with Core-less Design for High-frequency Current Detection Xiaopeng Xu, Ningbo Sinomags Technology Co., Ltd.
09:20	25	New Powder Core Material and Its New Applications Yunfan Zhang, POCO Holding Co., Ltd.
9:45	15	**Break**
IS2-Industry Session 2		
Chairs: Chengzhan Li, CRRC | Tong Wu, On Semiconductor		
10:00	25	Evaluation of Dynamic On-Resistance of InnoGaN and its Application for High-Density Power Converters Shan Yin, Innoscience (Zhuhai) Technology Co.,Ltd.
10:25	25	Power Devices and Power Supply Test Solution Yucai Liu, Guangzhou ZHIYUAN Electronics Co., Ltd.
10:50	25	The Latest Testing Methods and Solutions in Wide BandGap Wanner Huang, Tektronix (China) Co., Ltd.

Poster Presentations

P1-WBG Devices

Chairs: Guorong Zhu, Wuhan University of Technology & Zhen Tian, Wuhan University

Start	Duration	ID	Title
12:00	5	115	High Breakdown Voltage AlGaN/GaN HEMT with Graded Fluorine Ion Implantation Terminal in Thick Passivation Layer Siyu Deng, Xiaorong Luo, Jie Wei, Yanjiang Jia, Tao Sun, Lufan Xi, Zhuolin Jiang, Kemeng Yang, Qinfeng Jiang, Bo Zhang
12:05	5	101	Low Roughness SiC Trench Formed by ICP Etching with Sacrificial Oxidation and Ar Annealing Treatment Changwei Zheng, Zhicheng Wang, Shasha Jiao, Qijun Liu, Yehui Luo, Jieqin Ding, Chengzhan Li
12:10	5	85	The Influence of Hydrogen Annealing on Minority Carrier Lifetimes in 4H-SiC Ruijun Zhang, Rongdun Hong, Jiafa Cai, Xiaping Chen, Dingqu Ling, Mingkun Zhang, Shaoxiong Wu, Yuning Zhang, Jingrui Han, Zhengyun Wu, Feng Zhang
12:15	5	33	Deep Energy Levels Investigation on High Resistivity Bulk Monocrystalline Diamond Yutian Wang, Qian Sun, Fangzhou Zhao, Hui Guo
12:20	5	158	650V 4H-SiC VDMOS with Additional N Region_A Simulation Study Xiuxiu Gao, Chengzhan Li, Xiaoping Dai
12:25	5	127	A Novel SiC Trench MOSFET Structure with Enhanced Short Circuit Robustness Chongyu Jiang, Hongyi Xu, Na Ren, Qing Guo, Kuang Sheng
12:30	5	92	Temperature-Dependent Current Collapse and Gate Leakage in AlGaN/GaN HEMTs with Si-rich SiN Interlayer Jielong Liu, Yuwei Zhou, Minhan Mi, Jiejie Zhu, Siyu Liu, Qing zhu, Pengfei Wang, Hong Wang, Xiaohua Ma, Yue Hao
12:35	5	32	Off-State Negative Differential Capacitance in Low-Temperature AlGaN/GaN HFETs Siyu Liu, Jiejie Zhu, Jingshu Guo, Minhan Mi, Xiaohua Ma, Yue Hao, Jielong Liu, Yilin Chen
12:40	5	114	Influence of the Interface Traps Distribution on I-V and C-V Characteristics of SiC MOSFET Evaluated by TCAD Simulations Yumeng Cai, Hao Xu, Peng Sun, Zhibin Zhao, Zhong Chen
12:45	5	102	Research on Threshold Voltage Hysteresis of D-mode and Fully recessed E-mode AlGaN/GaN MIS-HEMTs with HfO_2 Dielectric Zicheng Yu, Chi Sun, Xiaoyu Ding, Xing Wei, Weining Liu, Li Zhang, Zhang Chen, Guohao Yu, Baoshun Zhang
12:50	5	24	Effects of p-type Islands Configuration on the Electrical Characteristics of the 4H-SiC Trench MOSFETs with Integrated Schottky Barrier Diode Fei Yang, Lixin Tian, Zhanwei Shen, Guoguo Yan, Xingrang Liu, Wanshun Zhao, Lei Wang, Guosheng Sun, Junmin Wu, Feng Zhang, Yiping Zeng

P2-WBG Device Packaging

Chairs: Yi Liu, Huazhong University of Science and Technology & Qingqing He, Wuhan University of Technology

Start	Duration	ID	Title
12:00	5	103	Electrical Insulation Packaging for High Voltage High Power IGBT Modules Using Nonlinear Conductivity Composites Kaixuan Li, Xingwen Li, Boya Zhang, Haotao Ke
12:05	5	97	Design and Research on Package Insulation of Highvoltage Silicon Carbide Module Yang Zhou, Ling Sang, Xinling Tang, Hao Shi
12:10	5	35	Power Semiconductor IGBT Packaging Technology and Reliability Yameng Sun, Shizhao Wang, Lianghao Xue, Zheng Feng, Rui Li, Sheng Liu
12:15	5	124	Evaluating Switching Performance of GaN HEMT Using Analytical Modeling Yingzhe Wu, Shan Yin, Hui Li, Minghai Dong, Xi Liu, Yuhua Cheng
12:20	5	83	Comparative Study of Thermal Performance of a SiC MOSFET Power Module Integrated with Vapor Chamber for Traction Inverter Applications Wei Mu, Binyu Wang, Shenghe Wang, Haoyuan Jin, Huaqing Li, Laili Wang
12:25	5	79	The Method for Decoupling the Parasitic Inductance of the Laminated Busbar with SiC MOSFETs in Parallel Shaolin Yu, Jianing Wang, Xing Zhang, Yuanjian Liu, Zhaoyang Wei
12:30	5	120	A Low Winding Loss Magnetic Circuit Structure Design of Planar Inductance for GaN-based Totem-Pole PFC Pengyuan Ren, Wenjie Chen, Xingwei Huang, Yue Cao, Yuxuan Chen, Xu Yang
12:35	5	28	GaN HEMT with Current-driven Gate and Its Driving Circuit Design Owen Song, Rafael Garcia
12:40	5	44	Ultra-thin Coupled Inductor for a GaN-Based CRM Buck Converter Ming Hua, Junyu Chen, Guolin Xu, Hongfei Wu
12:45	5	155	A Compact 175°C High Temperature Gate Driver with Isolated Power Supply and Advanced Protection for HybridPACK Drive SiC Power Module Cheng Qian, Neng Wang, Yayong Yang, Zhiqiang(Jack)Wang, Yong Kang
12:50	5	145	An Optimal Design Scheme of Intermediate Bus Voltage for two-stage LLC Resonant Converter Based on SiC MOSFET Feng Wang, Xuehua Wang, Xinbo Ruan

P3-WBG Device Modeling

Chairs: Zhijian Fang, China University of Geosciences & Hao Feng, Chongqing University

Start	Duration	ID	Title
12:00	5	71	Dynamic Gate Leakage Current of p-GaN Gate AlGaN/GaN HEMT under Positive Bias Conditions Yu Sun, Maojun Wang, Wen Lei, Chun Han
12:05	5	70	Design, Fabrication and Characterization of 6.5 kV/100A 4H-SiC PiN Rectifier Mengling Tao, Xiaochuan Deng, Rui Hu, Xuan Li, Zhiqiang Li, Hongling Lu
12:10	5	129	Analytical Averaged Loss Model of a Three-level NPC-type Converter with SiC Devices Xinyue Guo, Yue Xie, Cai Chen, Yong Kang
12:15	5	10	An Accurate Crosstalk Evaluation and Prediction Method for SiC MOSFET Considering Nonlinear Capacitance and Stray Parameters Huaqing Li, Chengzi Yang, Longyang Yu, Haoyuan Jin, Xingshuo Liu, Laili Wang
12:20	5	140	The Influence of Gate Resistances on the Turn-on Behaviors of Si/SiC Hybrid Switch Xiaofeng Jiang, Huaping Jiang, Hongyu Yu, Jinhong Jiang, Hao Feng, Hua Mao, Lei Tang, Xiaohan Zhong, Li Ran
12:25	5	3	Modeling and Comparison of Switching Loss Between SiC MOSFETs with Current Source and Voltage Source Gate Driver Quan Zheng, Cai Chen, Yong Kang
12:30	5	68	Modeling and Analysis of the Switching Characteristics Difference for Paralleling SiC MOSFETs in Multichip Power Modules Wenyu Li, Saijun Mao, Zhikun Wang, Shuhao Yang, Yujie Ding, Keqiu Zeng
12:35	5	135	Power Loss Characterictics Comparsion of the Modular Multilevel Multilevel Converter Based on Based on Si IGBT and SiC MOSFET Tianxiang Yin, Lei Lin, Yihong Huang, Zuochen Liu, Kaiyuan Jing
12:40	5	73	A Survey on Modeling of SiC IGBT Yuwei Wu, Laili Wang, Jianpeng Wang, Feng Zhang
12:45	5	61	Automated SiC MOSFET Power Module Switching Characterization Test Platform Shuhao Yang, Saijun Mao, Zhikun Wang, Xi Lu, Hansen Chen, Keqiu Zeng
12:50	5	6	Modeling and Suppression of Crosstalk of SiC MOSFET in Bidirectional Buck/Boost Converter Hao Zhang, Runquan Meng, Dingbang Zhang, Yingying Ding, Ziniu Wu
12:55	5	22	A Lossless and Passive Voltage Spikes Clamping Circuit for SiC HERIC Inverter Yong Li, Shanxu Duan, Qiqi Li
13:00	5	18	Investigation on Parameter Extraction for An Improved Fourier-Series-Based NPT IGBT Model Yifei Ding, Xin Yang, Jun Wang, Chunming Tu, Guoyou Liu

P4-WBG Device Reliability			
Chairs: Donghai Zhu, Huazhong University of Science and Technology & Yi Liu, Wuhan University of Technology			
Start	**Duration**	**ID**	**Title**
12:00	5	38	Comparison of the Influence of Reverse Conduction on EMI of WBG and Si Devices Ru Zhang, Wenjie Chen, YuXuan Chen, Yue Cao, Ruitao Yan, Xu Yang
12:05	5	153	An Improved Desaturation Protection Method with Self-Adaptive Blanking-Time for Silicon Carbide (SiC) Power MOSFETs Jiawei Li, Cheng Qian, Zhiqiang (Jack) Wang, Yong Kang
12:10	5	17	Degradation Behavior and Mechanism of SiC Power MOSFET by Total Dose Irradiation under Different Gate Voltages Kexin Gao, Yiqiang Chen, Shuaizhi Zheng, Xinbing Xu, Min Liao, Meng Lu
12:15	5	138	Single-Pulse Avalanche Failure Characterization of Single and Paralleled SiC MOSFETs Hua Mao, Huaping Jiang, Guanqun Qiu, Yifu Zhang, Xiaohan Zhong, Hao Feng, Li Ran
12:20	5	128	Modeling and Experimental Verification of Common Mode Crosstalk with Shield Cables in Power Converter System Ruizhou Xue, Xuejun Pei, Chunyu Yang, Yi Yu
12:25	5	77	Influence of Al/CucorAl Wire Bonding on Reliability of SiC Devices Chao Fang, Xiang Tang, Guangyuan Qin, Haotao Ke, Yibo Wu, Jing Zhang, Guiqin Chang, Haihui Luo
12:30	5	99	Short-circuit Protection Circuit of SiC MOSFET Based on Drain-source Voltage Integral Hong Li, Yuting Wang, Zhidong Qiu, Zuoxing Wang, Xiaofei Hu, Jia Zhao
12:35	5	23	Design of Aging Test System for SiC MOSFET Modules Chaoyue Shen, Fei Wang, Zhenye Wang, Zhong Ye
12:40	5	53	Degradation Mechanism of AlGaN/GaN HEMT Based on High Temperature Reverse Bias Stress Meng Lu, Yiqiang Chen, Min Liao, Chang Liu, Shuaizhi Zheng, Kexin Gao
12:45	5	58	A Dynamic Current Sharing Method in Multi-chip SiC Power Module Using Stacked DBC Bridges and Decoupling Capacitors Based on the Original Simple Module Layout Jianwei Lv, Chi Zhang, Cai Chen, Yong Kang
12:50	5	82	EMI Noise Reduction in GaN-based Full-bridge LLC Converter Yue Cao, Yuxuan Chen, Xingwei Huang, Pengyuan Ren, Wenjie Chen, Xu Yang

P5-WBG Device Applications

Chairs: Song Xiong, Wuhan University of Technology & Deliang Wu, Shanghai University

Start	Duration	ID	Title
12:00	5	112	Design of a High Power Density Bidirectional AC/DC Converter Based on GaN Jiajia Guan, Zhiwei Wang, Ziyan Tang, Jianwei Lv, Cai Chen, Yong Kang
12:05	5	131	Dual-Side Three-stage Asymmetric Phase Shift Strategy for Bidirectional Inductive Power Transfer System with SiC Power Module Haowen Chen, Changsong Chen, Mengjie Jiang, Shuran Jia, Xuezheng Huang
12:10	5	75	A GaN-based High Power-density Power Optimizer for Solar-powered Aircraft Applications Peng Chen, Tao Liu, Yujie Cheng, Hongfei Wu, Jianxin Zhu
12:15	5	15	Over-Voltage and Oscillation Suppression Circuit with Switching Losses Optimization and Clamping Energy Feedback for SiC MOSFET ChengZi Yang, Huaqing Li, Haoyuan Jin, Longyang Yu, Laili Wang, Yunqing Pei
12:20	5	87	Improved One Cycle Control for Three-Phase Three-Wire VIENNA Rectifier Junnan Gu, Xikun Chen, Ruiying Li, Borui Liu, Ni Zheng
12:25	5	121	Design Methodology of SiC MOSFET Based Bidirectional CLLC Resonant Converter for Wide Battery Voltage Range Mingjie Liu, Xuehua Wang, Jiangtao Xu
12:30	5	36	Research on A Novel Parallel Resonant DC Link Soft-switching Inverter Based on SiC MOSFET Si Li, Ming Yang, Yu Ma, Dianguo Xu
12:35	5	88	Research on Strategy of Parallel Wide Range Bidirectional DC-DC Converter Zehui Peng, Xikun Chen, Borui Liu, Yongjian Chen, Junnan Gu, Ruiying Li
12:40	5	93	Soft Precharging Method for Four-Level Hybrid-Clamped Converter Yihui Zhao, Jianyu Pan, Yao Luo, Jian Li
12:45	5	110	Active Magnetic Bearing Amplifier Design Based on SiC Devices Gang Cao, Hongbo Sun, Gao Yang, Dong Jiang
12:50	5	94	Design and Verification of Gate Driver for 6.5 kV SiC MOSFET Module Yijian Wang, Lin Liang, Hai Shang, Lubin Han
12:55	5	41	A Novel AC/DC Single-Phase Bridgeless SEPIC PFC Converter with Reduced Conduction Losses and Simple Structure Xiang Lin, Shumin Ding, Deliang Wu, Jian Luo
13:00	5	4	Power Cycling Capabilities of Bond Buffer Technologies for Wide Bandgap Power Devices Nan Jiang, Haitao Zhang, Jianing Wang, Chengguo Li, Jinhao Cai
13:05	5	139	DC Transform Circuit Design Based on Multiplier Rectification Penghui Yin, Xuehua Wang, Xinbo Ruan

Start	Duration	ID	Title
13:10	5	63	LLC Resonant Converter Based on Trench Gate SiC MOSFET Yuming Zhou, Jinkun Chu, Jiahui Zhou
13:15	5	27	Fractional-Order Model Predictive Control of SiC PFC Converter Qihui Fu, Zishun Peng, Zipeng Ke, Huimin Quan, Zhenxing Zhao, Zeng Liu, Yuxing Dai, Jun Wang
13:20	5	57	Mode Switchover Strategy for Multi-port Energy Router Based on the State Flow Diagram Jingwen Zheng, Zhiguo Wei, Zaixun Ling, Yu Guo, Ping Xiong, Yiqun Kang
13:25	5	72	An Integrated GaN-Based Power Module Based on the Cooling-System-Inductor Structure for Point-of-load Converters Longyang Yu, Wei Mu, Huaqing Li, Yang ChengZi, Chenya Wang, Laili Wang
13:30	5	14	An Intergrated Buck-Boost Converter with SRC for Wide Input Voltage Yanqing Wang, Yutao Lou, Xiang Guo, Changle Xu, Xudong Zou, Yong Kang

Appendices

Requirement for Oral and Poster Presentation

◆ Preparing Your Oral Presentation

Presentation for oral sessions requires a maximum 12 minutes long PPT presentation and 3 minutes Questions & Answers. We recommend 16:9 PPT format for better screen showing.

Each presenter should prepare a short bio (4 lines maximum). The short bio will be used by session chairs to introduce the presenter.

Each speaker is required to meet his/her Session Chair online 10 minutes before the session starts.

The virtual conference rooms will be notified and tested later. Follow-up notice will be published in the group. Please enter the QQ group, the group number is 974909498.

◆ Preparing Your Poster Presentation

Presentation for poster sessions requires one-page-poster and a maximum five-minute Poster video (make a 5-minute explanation video for your poster, which can be explained directly according to the poster).

Please upload the Poster in PDF format here.

Please upload the maximum five-minute Poster Explanation video in MP4 format here.

The author can also log in to his account on the official website to upload his own poster and other materials.

Deadline for uploading of paper presentations: **2021.08.20**

Tips:

a. The name of the poster for uploading MUST be the Paper ID, “xxxxxx.pdf”, The video should also be named as paper ID, “xxxxxx.mp4”, etc.

b. It is possible to upload the improved version with the same name. The old version will be replaced.

Introduction to SEEE of HUST

Huazhong University of Science and Technology (HUST) is a national key university and directly belongs to the Ministry of Education. It is one of the first universities included in the national "Project 211" key construction and national "Project 985" construction. It is among the first batch of national "Double First-Class" universities in 2017. The school covers more than 7,000 acres and is located on the bank of East Lake in the core area of China's Optics Valley. With beautiful campus environment and a large number of green trees, the university has a greening rate of 72% and is known as a "forest-style university". The adjacent 'East Lake Green Road' has created a world-class leisure and fitness 'backyard garden' for teachers and students.

The School of Electrical and Electronic Engineering (SEEE) of HUST was founded in 1952. In all previous first-level discipline evaluation by the Ministry of Education, the rank of electrical engineering discipline of this school is always among the top three in China. In 2017, it was selected as one of the first batch of "double first-class" construction disciplines by the country.

The school has strong faculty and has formed a high-level academic team with clear research directions and balanced research forces in all research areas. There are 108 professors and 70 associate professors, including 1 academician of the Chinese Academy of Sciences, 2 academicians of the Chinese Academy of Engineering, 2 national-level teaching teams, 2 innovation teams of the Ministry of Education, and 1 innovation team in the key areas of the Ministry of Science and Technology.

The school has established Department of Electrical and Control Engineering, Department of Electrical Power Engineering, Department of High Voltage Engineering, Department of Applied Electronic Engineering, Department of Electrician Theory and Advanced Electromagnetic Technology, Institute of Fusion and Plasma, Institute of Applied Electromagnetic Engineering, National Electrical and Electronic Experimental Teaching Demonstration Center (Electrical), and National Electrical Electronic Engineering Basic Course Teaching Base (Electrical).

The main research directions of the school cover the entire process of production, transmission, application, transformation, detection, control, dispatching and management of electric energy. Moreover, it has also developed numbers of new frontier disciplines, such as electrical energy storage, pulse power, pulsed magnetic fields, magnetic confinement fusion, plasma medicine, accelerators and their applications, advanced electrical materials and devices, which have formed the widest range of electrical engineering disciplines in domestic research.

The college has the most complete scientific research and innovation platform in the domestic electrical disciplines. It has a national major science and technology infrastructure, a national key laboratory, a joint laboratory for international cooperation. Among them, the Pulsed High Magnetic Field Facility (PHMFF) is the only national major science and technology infrastructure in China's electrical engineering disciplines, and it has become one of the best pulsed magnetic field facilities in the world; the Joint Laboratory for International Cooperation in Fusion and Electromagnetic Technology owns the only large and medium-sized Tokamak J-TEXT among domestic universities, which is a training and basic research base for magnetic confinement fusion talents recognized by the Ministry of Education. Moreover, it has the only national new-type motor national specialized laboratory, and several provincial and ministerial key laboratories and engineering research centers with research areas of electric power safety, new-type motors, pulse power, and ship power, etc.

The school puts the quality of talent training first. The school is one of the first batch authorized units of master's programs, doctoral programs, post-doctoral mobile stations, and first-level discipline doctoral programs in China. There are more than 1,700 undergraduate students and more than 1,000 graduate students. The quality of talent training has been highly recognized by the society. Every year, there are over one million social scholarships set up by companies, and hundreds of special job fair for graduates.

The school has undertaken a number of important national research tasks with more than 300 million RMB research funding each year in recent five years, and has been authorized more than 350 national invention patents, 6 European and US patents, published more than 1300 SCI papers, and 36 ESI hot papers. It has also obtained 2 first prize and 6 second prizes of the National Science and Technology Progress Award.

The academic exchanges of school are active. Multi teachers serve in significant science and technology consulting qualification committee such as the National Major Science and Technology Infrastructure Planning Committee, the National Major Special Expert Committee, and the International Strong Magnetic Field Association. The school has established long-term and deep cooperative relations with more than 20 scientific research institutions including Princeton University, National High Magnetic Field Laboratory (USA), the Max Planck institute for plasma physics (Germany), the controlled fusion institute of French Atomic Energy Commission, and was invited to participate in the ITPA international joint experiment. The school has jointly undertaken seven Sino-U.S. fusion cooperation projects jointly organized by the Chinese Ministry of Science and Technology and the U.S. Department of Energy.

All teachers and students of the school aim to build a world-class electrical engineering discipline. With the development of high-tech electrical engineering and electric power technology as the leading factor, they condense the directions of the discipline, gather research teams, build academic bases, alcoholize the academic atmosphere, unite and be pragmatic, seek truth and innovation to create a better future for electrical engineering disciplines.

Zoom Using Guide

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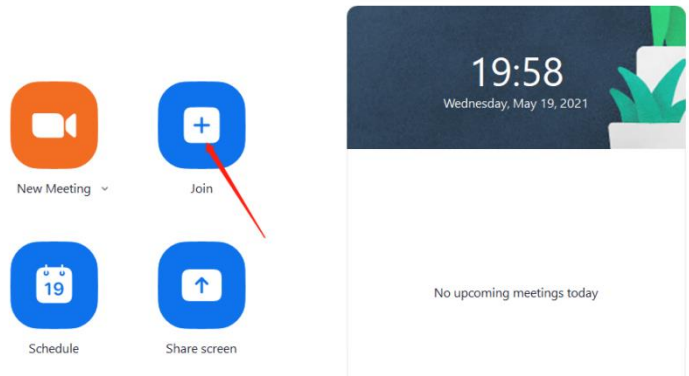

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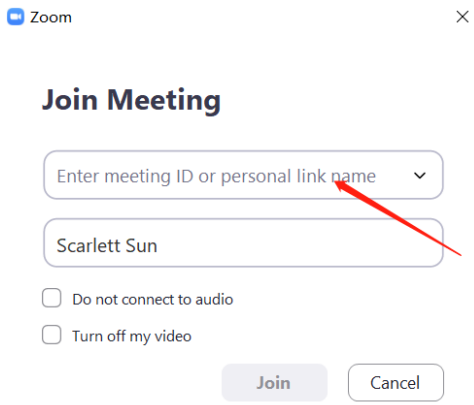

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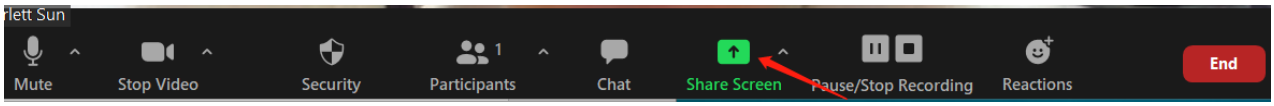

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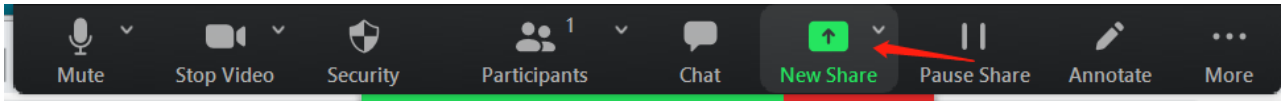

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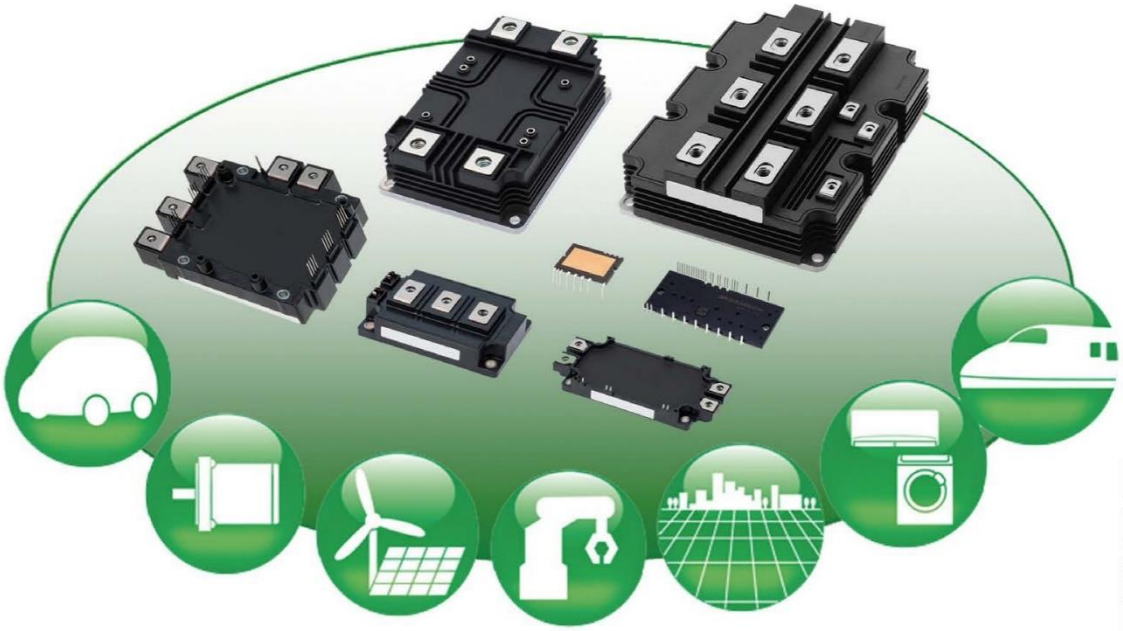
IGBT模块
HVIGBT模块
整流二极管
晶闸管
晶体管阵列
HVIC
传感器



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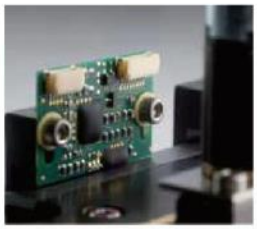
▶▶▶ 探索磁电世界 助力低碳生活 ◀◀◀

宁波希磁电子科技有限公司是一家拥有自主知识产权的高科技企业，致力于磁性传感器的研发和生产。目前，希磁科技拥有无锡乐尔，宁波希磁，蚌埠希磁，德国Sensitec，葡萄牙LERTECH五家子公司。公司拥有以磁学领域的多名专家为核心的超过100人的研发团队，涵盖了从xMR晶圆到传感器模块的全产业链的设计开发和规模生产；现有产品主要为xMR磁性传感器晶圆，磁性传感器芯片，电流传感器，角度传感器，磁性编码器和弱磁信号传感器等。

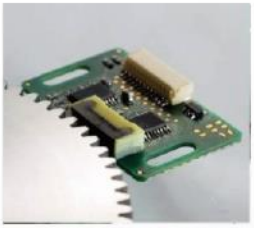
公司拥有严格的质量控制，并通过IATF16949，ISO90001，ISO14000等认证。希磁科技以创新的技术、卓越的产品、优质的服务，立志打造国际知名磁性传感器企业。

Sinomags is a magnetic sensor producer based on TMR (Tunnel Magnetic Resistance) technique. The company owns a group of R&D more than 40 people, with scholars and experts as core members, covering multi areas from MEMS, chip design, circuit design to magnetic circuit design, etc. Sinomags highly respects technique innovation, having 100 percent ownership of its product series, including Current Sensor, Magnetic Detection Sensors, Thickness Detection Sensors, Magnetic Image detection sensor. Today, Sinomags holds over 100 patents at home and abroad. Simomags is also a qualified supplier approved by TS 16949, ISO90001, ISO140000 systems. Armed with the knowing well of TMR core technique consistent spirit of pioneering, Sinomags is providing more competitive solutions for industries of New Energy Generation, Smart Grid , EV, IOT, etc.

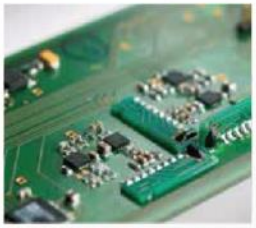
Current Sensors



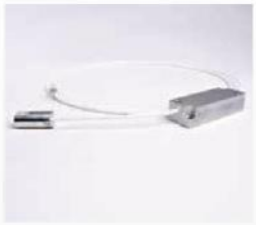
Angle & Length Measurement



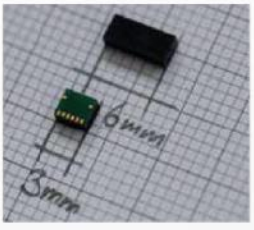
Passive Measurement



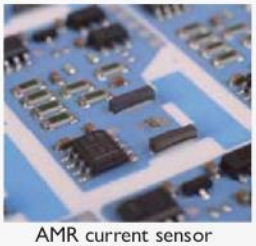
Magnetic Field Measurement



Magnetic Solutions



Customer-specific Development



AMR current sensor
AEC-Q qualified

▶▶▶ 典型应用客户 ◀◀◀

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U.S. Lubbock Wind Farm

风电机组电网适应性测试装置
Wind Turbine Grid Adaptability Test Equipment

SiC 光伏逆变器
SiC-based PV Inverter

SiC EV 电机控制器
SiC-based EV Motor Control Unit

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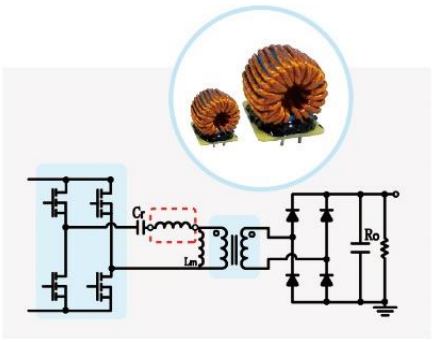

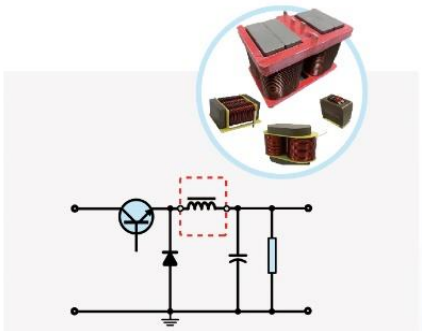

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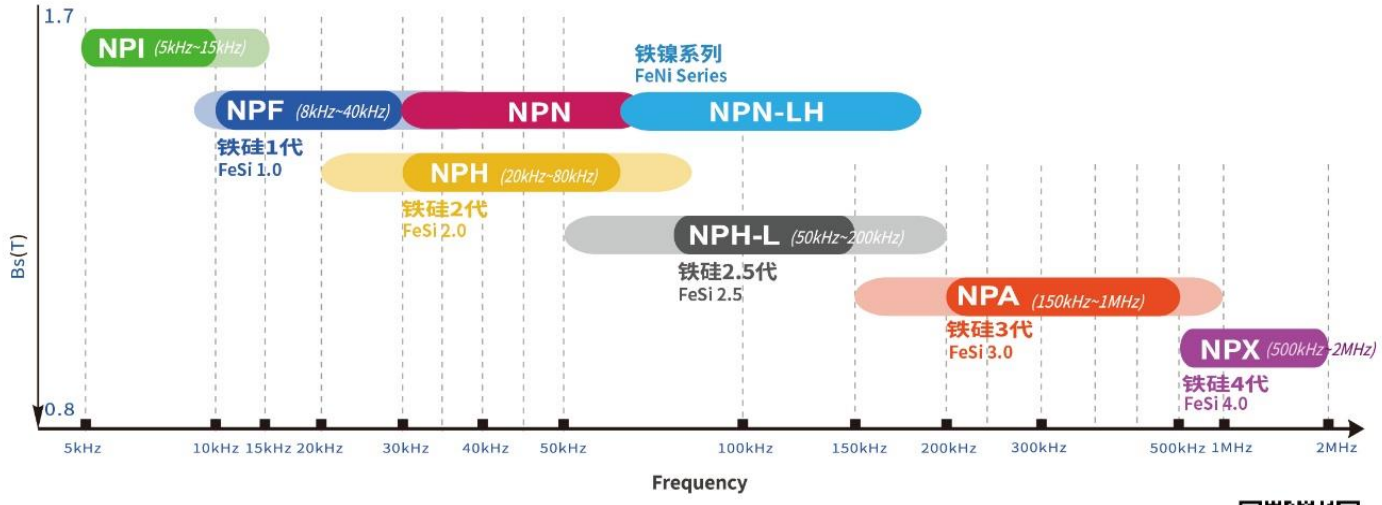

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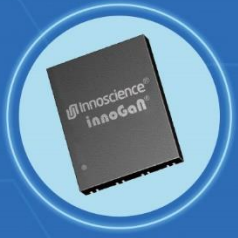
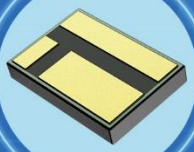


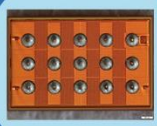
650V DFN5*6

650V DFN8*8

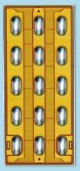


100V/150V
FCLGA 3.2*2.2

100V WLCSP 2x3



100V WLCSP 3x5



100V WLCSP 5x3

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