ZPEC 2026

The 2nd International Zhejiang Power Electronics Conference

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Technical Sponsors: IEEE Power Electronics Society (PELS)

IEEE PELS Zhejiang/Jiangsu/Anhui Chapter

China Power Supply Society (CPSS)

August 14-16, 2026
Hangzhou, China

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CONTENT

Welcome Message

On behalf of the Organizing Committee, it is my great pleasure to extend a warm welcome to all of you to the 2nd International Zhejiang Power Electronics Conference (ZPEC2026), which will be hosted by Zhejiang University in the historic and vibrant city of Hangzhou, China, from August 14 to 16, 2026. This conference is organized in partnership with IEEE Power Electronics Society (PELS), China Power Supply Society (CPSS), and IEEE PELS Zhejiang/Jiangsu/Anhui Chapter.

ZPEC2026 will serve as a premier platform for power electronics engineers, researchers, and students to share cutting-edge advancements in power electronics, energy conversion, and emerging technologies, as well as their transformative applications. The conference will be held in Hangzhou, a dynamic city in China's eastern coastal region, bridging the Yangtze River Delta and Pearl River Delta – a hub for renewable energy, electric vehicles, power supplies, and power semiconductor manufacturing. The program will feature keynote speeches, technical presentations, tutorials, panel discussions, exhibitions, and networking events, bringing together renowned scholars, engineers, and industry leaders. This gathering promises an excellent opportunity for knowledge exchange, collaboration, and inspiration, highlighting both pioneering research and real-world technological impact.

Hangzhou, a city where ancient heritage meets modern innovation, offers the perfect backdrop for ZPEC2026. Renowned for its UNESCO-listed West Lake, adorned with willow-fringed shores and historic pagodas, Hangzhou is also a thriving tech hub, often called "China's Silicon Valley". Additionally, it is celebrated for its rich tea culture, being the birthplace of the famous Longjing green tea.

On behalf of the Organizing Committee, we look forward to welcoming you in Hangzhou. Your participation will be instrumental in making ZPEC2026 a resounding success. We are confident that this conference will be both intellectually rewarding and personally enriching for all attendees.

With best regards,

Dehong Xu
General Chair, ZPEC2026
IEEE Fellow, Professor of Zhejiang University

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Dehong Xu, IEEE Fellow, Zhejiang University

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Binxin Zhu
Rongwu Zhu
Yinxiao Zhu
Haoxiang Zong

Agenda Overview

August 14, Friday

08:15–21:00	**Registration** Hotel Lobby
09:00–12:30	**Tutorial 1** Wideband Oscillation Analysis and Robust Stabilization Control for Grid-Tied Converter Systems 3F Harvest Room **Tutorial 2** Powering Next Generation AI Infrastructure: Ultra-Efficient/Compact Three-Phase Isolated Rectifier and Solid-State Transformer Concepts 3F Grand Ballroom B **Tutorial 3** Advanced Inductive Power Transfer: From Fundamentals to Magnetics, Control, and System Topologies 4F Diplomat Boardroom
12:30–13:30	**Lunch Break** 2F Window Pavilion Cafe
13:30–17:00	**Tutorial 4** Integrated Digital Signal Processing and Machine Learning Frameworks for Real-Time Power Quality Disturbance Recognition and Embedded Implementation 3F Harvest Room **Tutorial 5** Inside the Solid-State Transformers 3F Grand Ballroom B

Agenda Overview

August 14, Friday

13:30–17:00	Tutorial 6 Recent Advancements on Active Flux Control and DC Bias Prevention of Transformer Magnetic Core in AC–DC and DC–DC Applications 4F Diplomat Boardroom
18:00–20:00	Welcome Reception 2F Window Pavilion Cafe
19:00–21:00	IEEE PELS Young Professionals & Women in Engineering Events 17F Narada Tea House

Agenda Overview

August 15, Saturday

08:15–21:00	Registration Hotel Lobby
08:30–08:50	Opening Ceremony 3F Grand Ballroom
08:50–09:30	Keynote Speeches 3F Grand Ballroom Next-Generation GaN/SiC Monolithic Bidirectional Switch-Based Power Electronics Johann W. Kolar ETH Zurich, Switzerland
09:30–10:10	Full-Range Zero-Voltage-Switching Non-Resonant PWM Converters Xinbo Ruan Nanjing University of Aeronautics and Astronautics, China
10:10–10:50	Powering AI Energy Transition: How SiC Technologies Enable Efficient HVDC, SST, and Solid-State Circuit Breakers Xing Huang PNJ Semiconductor LLC, China
10:50–11:20	Coffee Break 3F Foyer
11:20–12:20	Panel Discussion 1 Is Solid-State Transformer Necessary for GW AI Data Centers? 3F Grand Ballroom
12:20–13:30	Lunch Break 2F Window Pavilion Cafe

Agenda Overview

August 15, Saturday

13:30–15:10	**Technical Sessions** T01 Grid-Forming Technologies & Stability 3F Harvest Room T02 Solid-State Transformers & Multiport Converters 3F Grand Ballroom A
13:30–15:10	**Industry Session** I01 Power Electronics for AI Data Center 3F Grand Ballroom B
15:10–15:30	**Coffee Break** 3F Foyer
15:30–18:00	**Poster Sessions** 3F Grand Ballroom A
18:30–21:30	**Rtunit Night: Banquet & Awards Ceremony** 3F Grand Ballroom

Keynote Speeches Livestream: Scan the QR codes below or search “中国电源学会” on WeChat Channels, Douyin, or Bilibili.
大会报告将在视频号、抖音、B 站同步直播，扫描下方二维码或在上述平台搜索“中国电源学会”观看直播。

WeChat Channels | Douyin | Bilibili

Agenda Overview

August 16, Sunday

08:30–12:00	**Registration** Hotel Lobby
09:00–09:40	**Keynote Speeches** 3F Grand Ballroom Model Predictive Control: Basic Concepts, Applications, Advances and Challenges Jose Rodriguez Universidad San Sebastian, Chile
09:40–10:20	High Voltage Transformerless Grid-Tied Battery Energy Storage System Rui Li Shanghai Jiao Tong University, China
10:20–11:00	Embedded Packaging Technology for SiC Power Modules Min Chen Zhejiang University, China
11:00–11:20	**Coffee Break** 3F Foyer
11:20–12:20	**Panel Discussion 2** AI for Power 3F Grand Ballroom
12:20–13:30	**Lunch Break** 2F Window Pavilion Cafe
13:30–15:10	**Technical Sessions** T03 AI for Power Electronics 3F Harvest Room T04 Data Center Power Systems 3F Grand Ballroom A

Agenda Overview

August 16, Sunday

13:30–15:10	**Industry Session** I02 Power Devices and High-Efficiency Power Supply Technology 3F Grand Ballroom B
15:10–15:30	**Coffee Break** 3F Foyer
15:30–17:10	**Technical Sessions** T05 Invited Session: DC Grids 3F Harvest Room T06 Invited Session: Microgrid Control and Applications 3F Grand Ballroom A
15:30–17:10	**Industry Session** I03 Power Electronics for Renewable Energy 3F Grand Ballroom B
17:30–19:30	**Dinner** 2F Window Pavilion Cafe

General Information

To fully understand the agenda and related matters of this conference, and ensure the smooth progress of the meeting, please pay attention to the following:

Conference Venue

Zhejiang Narada Grand Hotel
Address: 122 Shuguang Road, Xihu District, Hangzhou, Zhejiang Province, China
Tel.: 0571 8799 0888

Registration

08:15–21:00, August 14, 2026
08:15–21:00, August 15, 2026
08:30–12:00, August 16, 2026

Catering

August 14, 2026	
12:30–13:30	**Lunch** 2F Window Pavilion Cafe
18:00–20:00	**Welcome Reception** 2F Window Pavilion Cafe
August 15, 2026	
12:20–13:30	**Lunch** 2F Window Pavilion Cafe
18:30–21:30	**Banquet** 3F Grand Ballroom
August 16, 2026	
12:20–13:30	**Lunch** 2F Window Pavilion Cafe
17:30–19:30	**Dinner** 2F Window Pavilion Cafe

Transportation Information

1. Hangzhou Xiaoshan International Airport

Plan 1: The distance is 35 kilometers, about 50 minutes by taxi, and the fare is about 120 yuan.

Plan 2: Take Metro Line 19 at Xiaoshan International Airport Station, get off at West Lake Cultural Square Station after 6 stops, transfer to Metro Line 3 in the station, get off at Huanglongdong Station after 3 stops, exit the metro station through Exit A1, and walk 550 meters to the hotel, which takes about 60 minutes.

2. Hangzhou East Railway Station

Plan 1: The distance is 10 kilometers, about 20 minutes by taxi, and the fare is about 30 yuan.

Plan 2: Get on Metro Line 1 at East Railway Station, get off at Wulin Square Station after 4 stops, transfer to Metro Line 3 in the station, get off at Exit A1 of Huanglongdong Station after 2 stops, and walk 550 meters to the hotel, which takes about 30 minutes.

3. Hangzhou Railway Station

Plan 1: The distance is 8 kilometers away, about 25 minutes by taxi, and the fare is about 25 yuan.

Plan 2: Take Metro Line 1 at Chengzhan Station, get off at Wulin Square Station after 4 stops, transfer to Metro Line 3 in the station, get off at Huanglongdong Station after taking 2 stops, exit the metro station through Exit A1, and walk 550 meters to the hotel, which takes about 30 minutes.

4. Hangzhou West Railway Station

Plan 1: The distance is 20 kilometers away, about 35 minutes by taxi, and the fare is about 70 yuan.

Plan 2: Take Metro Line 3 at Hangzhou West Railway Station, get off at Huanglongdong Station after taking 15 stops, exit the metro station through Exit A1, and walk 550 meters to the hotel, which takes about 45 minutes.

Information for Presenters

Technical Session Presenters

- The duration of an oral presentation slot is 20 minutes (15 minutes for presentation + 5 minutes for Q&A).
- Speakers in Technical Sessions T01 – T06 must attend a mandatory orientation with Session Chairs during the Speakers' Breakfast on August 15–16, 2026, from 7:15 AM to 8:15 AM.
- The Technical Program Chair will host the breakfast/lunch at which you will be provided instructions.
- Please get your presentation PPT or PDF files prepared and backed up.
- Laptops, projector & screen, and laser sticks will be provided by the conference organizer.

Poster Session Presenters

- Poster Session will be held on Saturday afternoon in the 3F Grand Ballroom A.
- Poster presenters should be available for questions at their display boards during their scheduled poster presentation time. Your poster will be assigned a specific poster board number and section referenced in the Poster Session section of the program. Thumbtacks and stands will be provided on-site.

Badges Required for Admission

Badges are required for admission to all ZPEC events and activities. Those who have registered for the conference can collect their badges at the registration desk. ZPEC reserves the right to deny admission to any ZPEC event or activity to any person not showing an appropriate badge for that activity or event.

ZPEC2026 Conference Awards

Best Paper Award

- The total number of best paper candidates is set at 10% of all accepted papers. ZPEC2026 accepted 147 papers, resulting in 14.7 candidate slots, which is rounded up to 15 candidates.
- The shortlist of candidates is determined from the top 15 accepted papers ranked by review scores, according to the following criteria:
  a. The confidence-weighted average total score
  b. In the event of a tie, the unweighted average total score will be used as the tiebreaker.
- The final Best Paper Award recipients are selected by the Awards Committee based on the following four dimensions:
  a. Originality and Innovation (30%) — Does the paper propose new theories, topologies, algorithms, or application scenarios?
  b. Technical Depth and Rigor (30%) — Are the theoretical derivations and experimental designs rigorous? Is the conclusion well supported by the presented results?
  c. Practical Value and Impact (20%) — Does it demonstrate clear application potential? Does it address a critical real-world problem?
  d. Presentation Quality (20%) — Is the paper well organized? Are the figures and tables clear and informative? Is the manuscript written in clear, professional English consistent with IEEE standards?

Best Oral / Poster Presentation Award

The Best Oral Presentation Award and Best Poster Presentation Award recognize outstanding presentations delivered during ZPEC2026.

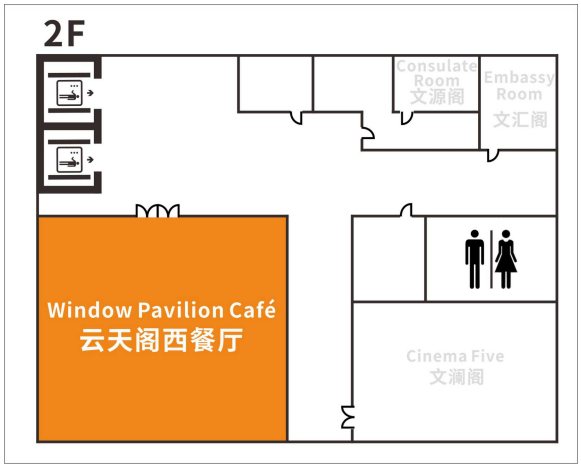
- Awards are open to all registered presenters who deliver their presentations in person.
- Oral presentations are evaluated by the Session Chairs based on scientific quality, presentation organization, delivery, and Q&A performance.
- Poster presentations are evaluated by the Poster Session Chairs based on scientific merit, poster design, presentation effectiveness, and interaction with attendees.
- Award recipients will be selected based on the judges' evaluation scores and will be announced on the ZPEC2026 conference website.
- Award certificates will be sent to the recipients by email after the conference.

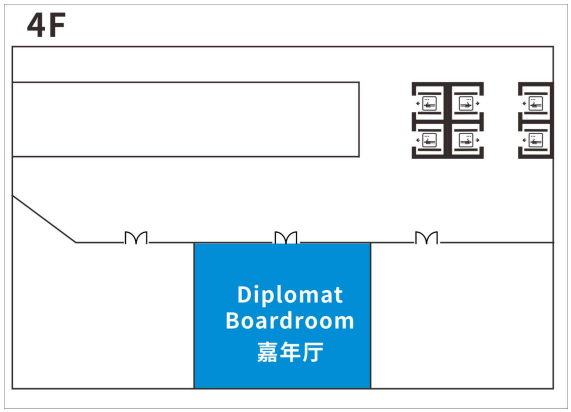
Student Travel Support

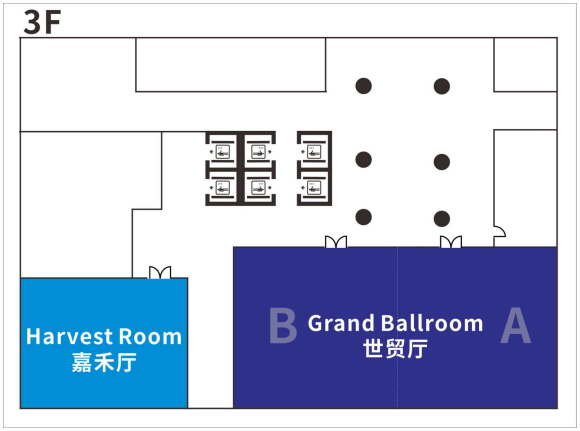
ZPEC2026 provides a Student Travel Support Program to assist eligible student presenters in attending the conference.

- Priority will be given to first-author presenters.
- Priority will be given to applicants from different institutions. If multiple applicants are from the same institution, priority will be given to papers with higher review scores.
- Applicants must present their accepted paper in person, be an IEEE PELS or IEEE CPSS Student Member, and agree to serve as a volunteer for at least one conference session.
- Travel support is available at three funding levels (RMB 500, RMB 1,000, and RMB 2,500), determined according to the estimated travel cost from the applicant's institution to Hangzhou.
- Applications must be submitted before the announced deadline on the conference website.

Floor Plan


2F
Consulate Room
文源阁
Embassy Room
文汇阁
Window Pavilion Café
云天阁西餐厅
Cinema Five
文澜阁


4F
Diplomat Boardroom
嘉年厅


3F
Harvest Room
嘉禾厅
B
Grand Ballroom
世贸厅
A

Social Events

IEEE PELS YP & WIE Events

Time: 19:00–21:00 August 14, 2026

Venue: 17F Narada Tea House

ZPEC gives you this opportunity to mingle with peers and to engage with leading experts in power electronics and its applications.

Time	Activity
18:45–19:00	**Check-in**
19:00–19:05	**Welcome Remarks** – by PELS leaders & ZPEC2026 chairs
19:05–19:15	**Fireside Chat with ZPEC2026 Keynote Speakers and TPC Co-chairs** – light conversation to set the tone
19:15–20:45	**Social Networking** – mingle, connect, and share ideas with fellow professionals
20:45–20:55	**Lucky Draw** – surprise prizes for a few lucky participants
20:55–21:00	**Closing Remarks & Group Photo**

Rtunit Night: Banquet & Awards Ceremony

Time: 18:30–21:30 August 15, 2026

Venue: 3F Grand Ballroom

This unique evening brings together attendees and sponsors for a night of networking featuring local Hangzhou delicacies. Join us as we celebrate the recipients of the Best Paper Awards and honor our sponsors for their invaluable support.

Keynote Speakers

Time: 08:50–09:30 August 15, Saturday

Venue: 3F Grand Ballroom

Prof. Johann W. Kolar

ETH Zurich, Switzerland
IEEE Life Fellow, Foreign Member of the US National Academy of Engineering

Next-Generation GaN/SiC Monolithic Bidirectional Switch-Based Power Electronics

Abstract

Monolithic bidirectional switches (MBDSs) provide bidirectional current control and bipolar voltage blocking, enabling true AC-switch operation and driving the next generation of power electronic converters. They unlock substantially higher performance in applications ranging from grid interfaces for photovoltaic systems to EV chargers, datacenter power supplies, and AC/AC current-source motor drives with inherently sinusoidal output voltages.

The talk presents novel converter topologies exploiting the unique capabilities of MBDSs and discusses the resulting significant advances over conventional approaches. Starting from diode-bridge rectification, non-isolated PFC rectifier topologies are systematically derived, highlighting their modulation, control, and semiconductor blocking-voltage requirements. The presentation then introduces quasi-single-stage isolated and single-stage matrix-type converters, building on the dual active bridge concept, and discusses the associated multi-step commutation strategies. Particular emphasis is placed on next-generation bidirectional EV on-board chargers, supporting

both three-phase and single-phase AC operation, and future 99%-efficient datacenter AC/DC power-supply modules, demonstrating the substantial performance gains achievable with MBDSs.

The keynote concludes with an outlook on higher levels of monolithic integration and future matrix-type AC/AC converter architectures, aimed at reducing commutation complexity and simplifying gate-drive implementation.

Biography

Johann W. Kolar is Professor Emeritus at ETH Zurich and former Head of its Power Electronic Systems Laboratory. He received his M.Sc. (1997) and Ph.D. (1999, summa cum laude) from the Vienna University of Technology (TU Wien). He introduced several breakthrough converter topologies, including the VIENNA Rectifier, Sparse Matrix Converter, and SWISS Rectifier, and made fundamental contributions to ultra-high-speed motor systems and automated multi-objective converter design. Since 2023, he has been a Specially Appointed Professor at the Nagasaki Institute of Applied Science, Japan, and since 2024 a Guest Professor at TU Wien, contributing to research and academic exchange in advanced power electronic systems. He has personally supervised 94 Ph.D. students to completion, authored more than 1,000 publications, and holds over 200 patents. His honors include the IEEE William E. Newell Power Electronics Award, the IEEE PELS R. David Middlebrook Achievement Award, the EPE Outstanding Achievement Award, and the 2025 IEEE Medal in Power Engineering. He is an IEEE Life Fellow, an International Member of the National Academy of Engineering, and a Fellow of the National Academy of Inventors. He has co-founded four ETH Zurich spin-offs and continues research in wide-bandgap power converters, artificial intelligence in power electronics, solid-state transformers, and life-cycle assessment of power electronics systems.

Keynote Speakers

Time: 09:30-10:10 August 15, Saturday

Venue: 3F Grand Ballroom

Prof. Xinbo Ruan

Nanjing University of Aeronautics and Astronautics, China
IEEE Fellow

Full-Range Zero-Voltage-Switching Non-Resonant PWM Converters

Abstract

Soft-switching techniques can greatly reduce the switching loss, thus improving the efficiency, power density, and reliability of power converters. Motivated by this, a family of full-range non-resonant PWM ZVS converters, including dc-dc, dc-ac, and ac-dc converters, is derived. The four-switch buck-boost (FSBB) converter is employed as an example to illustrate the proposed combined PWM and phase-shift control, by which zero-voltage-switching (ZVS) is realized with constant frequency in the full operation range while minimizing inductor current ripple. Inspired by this control scheme, the optimal operating modes for other full-range ZVS non-resonant PWM converters are also analyzed. Finally, the experimental results of the dc-dc converter, the dc-ac inverter, and the simulation results of ac-dc rectifier as an extension, are provided to verify the effectiveness of the non-resonant ZVS approach and generated converters.

Biography

Xinbo Ruan received the B.S. and Ph.D. degrees in electrical engineering from Nanjing University of Aeronautics and Astronautics (NUAA), Nanjing, China, in 1991 and 1996, respectively. In 1996, he joined the Faculty of Electrical Engineering Teaching and Research Division,

NUAA, where he became a Professor in the College of Automation Engineering in 2002. From August to October 2007, he was a Research Fellow in the Department of Electronic and Information Engineering, Hong Kong Polytechnic University, Hong Kong, China. From March 2008 to August 2011, he was also with the School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, Wuhan, China. He is the author or co-author of 15 books and more than 300 technical papers published in journals and conferences. His main research interests include resonant and soft-switching power converters, power converter topologies and control, grid-connected converters and system for renewable energy, modeling and stability of power converters, and envelop tracking power supply. Prof. Ruan was a recipient of the Sustainable Energy Systems Technical Achievement Award from IEEE Power Electronics Society in 2022, the Delta Scholarship by the Delta Environment and Education Fund in 2003, and the Special Appointed Professor of the Chang Jiang Scholars Program by the Ministry of Education, China, in 2007. From 2005 to 2013, and from 2017 to 2025, he served as a Vice President of the China Power Supply Society. From 2014 to 2016, he served as a Vice Chair of the Technical Committee on Renewable Energy Systems within the IEEE Industrial Electronics Society. Currently, he serves as a Co-EIC for IEEE Transactions on Power Electronics, an Editor for IEEE Journal of Emerging and Selected Topics on Power Electronics, and an Associate for IEEE Open Journal of Industrial Electronics Society. He served as an Associate Editor for IEEE Transactions on Industrial Electronics (2011-2021) and IEEE Transactions on Circuits and Systems – II: Express Briefs (2016-2023). He was the General Chair of IPEMC-ECCE Asia 2020 and the General Secretary of IPEMC-ECCE Asia 2009, a Technical Program Committee Chair of the IEEE 7th Annual Energy Conversion Congress and Exposition (ECCE 2015), and a Tutorial Committee Chair of the IEEE 12th Annual Energy Conversion Congress and Exposition (ECCE 2020). He is an IEEE Fellow.

Keynote Speakers

Time: 10:10-10:50 August 15, Saturday

Venue: 3F Grand Ballroom

Dr. Xing Huang

PNJ Semiconductor LLC, China

Powering AI Energy Transition: How SiC Technologies Enable Efficient HVDC, SST, and Solid-State Circuit Breakers

Abstract

The exponential growth of AI is driving unprecedented power demands on modern energy infrastructure. To meet these high-density load requirements efficiently, reliably and sustainably, the global grid is undergoing a rapid transition toward advanced power electronics and devices. Silicon Carbide (SiC) devices play pivotal role in accelerating this transformation. By enabling higher switching speed, superior thermal behavior, and significantly reduced power losses, SiC devices serve as the core foundation for next-generation power infrastructure. This presentation highlights how SiC technologies empower AI power architecture:

- HVDC: 650V-1200V SiC MOSFETs optimize 800Vdc power racks efficiency to support AI rack up to 1MW with maximized power density.
- Solid-State Transformers (SST): 1200V – 3300V SiC MOSFETs based ISOP power electronics topologies directly convert MV to 800Vdc, eliminating bulky line frequency power transformers and achieving 98.5% efficiency.

• Solid-State Circuit Breakers (SSCB): Super-low Rdson SiC JFETs provide ultra-fast, reliable and robust protection against grid and load anomalies.

Driven by continuous cell pitch and Rsp optimization, SiC innovations are building a resilient, high-efficiency energy ecosystem for the AI era.

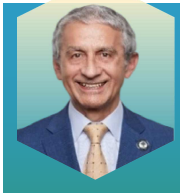
Biography

Dr. Xing Huang is the Founder and Chairman of PNJ Semiconductor LLC, a leading Chinese wide-bandgap semiconductor company specializing in SiC power devices. He received his Ph.D. from North Carolina State University, where he was advised by Prof. B. Jayant Baliga (Inventor of the IGBT, IEEE Life Fellow) and Prof. Alex Q. Huang (Pioneer of Solid-State Transformer). With near two-decade experience in SiC/GaN R&D, Dr. Huang has been instrumental in advancing power devices for critical renewable applications. His research contributions include the invention of 10 kV+ bidirectional blocking SiC devices for AC smart grid fault protection and studies on SiC devices under extreme operation conditions. Under his leadership, PNJ Semiconductor has developed over 200 SiC products spanning 100 V to 6500 V, including MOSFETs, diodes, and JFETs. These products are now powering the global energy transition and have been deployed in over 5 million electric vehicles with zero field failures. The company's planar-gate SiC MOSFETs, featuring a 3.2 um cell pitch, SiC JFETs, and proprietary embedded PCB packaging technology (parasitic inductance < 3 nH) enable superior efficiency and reliability in applications including AI centers' HVDC power distribution, Solid-State Transformers (SST), and Solid-State Circuit Breakers (SSCB) for HVDC grid protection. PNJ manufactures in both Lubbock, TX, USA and Ningbo, Zhejiang, China, providing flexibility to serve global customers. Dr. Huang has published over 10 peer-reviewed papers (350+ citations) and holds 120+ patents.

Keynote Speakers

Time: 09:00-09:40 August 16, Sunday

Venue: 3F Grand Ballroom



Prof. Jose Rodriguez

Universidad San Sebastian, Chile
IEEE Life Fellow, Member of the Chilean Academy of Engineering

Model Predictive Control: Basic Concepts, Applications, Advances and Challenges

Abstract

Model Predictive Control (MPC) emerged years ago as an attractive control strategy for power electronics systems. Main advantages of MPC are the simple concept, the capability to include easily different control objectives and the high dynamic performance. On the contrary, like any new strategy, it also has disadvantages such as dependence on the mathematical model, dependence on the parameters and a variable frequency spectrum. However, thanks to the work carried out by the scientific community, most of these disadvantages have been resolved. This talk aims to introduce the audience to MPC and show them its evolution and applications. Special attention will be given to use of MPC in multilevel inverters using few calculations and how to avoid the use of weighting factors. The presentation will also present the evaluation to be used in electric vehicles. Finally, this talk will discuss the challenges that MPC must overcome to be adopted by the industry.

Biography

Jose Rodriguez received the Engineer degree in electrical engineering from the Universidad Tecnica Federico Santa

Maria, in Valparaiso, Chile and the Dr.-Ing. degree in electrical engineering from the University of Erlangen, Erlangen, Germany. He has been professor and President of Universidad Tecnica Federico Santa Maria, Universidad Andres Bello and Universidad San Sebastian, all in Chile. Now, he is Director of the Center for Energy Transition at the University of San Sebastian in Santiago de Chile. He has coauthored two books, several book chapters and more than 1000 journal and conference papers. His main research interests include multilevel inverters, new converter topologies, control of power converters, and adjustable-speed drives. He has received a number of best paper awards from journals of the IEEE. Dr. Rodriguez is member of the Chilean Academy of Engineering. In 2014 he received the National Award of Applied Sciences and Technology from the government of Chile. In 2015 he received the Eugene Mittelmann Award from the Industrial Electronics Society of the IEEE. In years 2014 to 2025 he has been included in the list of Highly Cited Researchers published by Web of Science.

Keynote Speakers

Time: 09:40-10:20 August 16, Sunday

Venue: 3F Grand Ballroom

Prof. Rui Li

Shanghai Jiao Tong University, China

High Voltage Transformerless Grid-Tied Battery Energy Storage System

Abstract

As battery energy storage systems move toward higher voltage, larger capacity, and longer duration, transformerless grid connection must address system efficiency, SOC consistency, converter utilization, and reliable battery-state awareness. To meet these interrelated requirements, three connected technologies are discussed: system architecture and balancing control, low-loss inter-cluster coordination, and online impedance-based state estimation.

A cascaded H-bridge architecture enables modular conversion and direct medium/high-voltage grid connection. Within this architecture, adaptive SOC balancing is introduced to coordinate energy among cascaded units under battery-current and converter-modulation constraints.

For long-duration storage, the mismatch between H-bridge converter capacity and battery-cluster output capability, together with variations in capacity, resistance, and aging, may cause unequal current sharing and reduced capacity utilization. A low-loss inter-cluster balancing scheme based on small-capacity series voltage compensation reshapes branch currents according to cluster conditions, improving SOC consistency and converter utilization with limited auxiliary power.

These balancing functions require accurate battery-state references. By exploiting converter modularity and redundancy, electrochemical impedance spectroscopy can be measured online through modulation during normal operation. Selected impedance features are further used to estimate SOC and SOH, including in voltage-plateau regions. Together, these technologies provide an integrated approach to efficient and reliable operation of scalable battery energy storage systems.

Biography

Rui Li received his M.S. and Ph.D. degrees from Nanjing University of Aeronautics and Astronautics (Nanjing, China) and Zhejiang University (Hangzhou, China), in 2005 and 2010, respectively. From 2008 to 2009, he was an Academic Guest at the Power Electronic Systems Laboratory, Swiss Federal Institute of Technology, Zurich, Switzerland. Between 2010 and 2012, he worked as a postdoctoral researcher in the Department of Electrical Engineering, Shanghai Jiao Tong University, Shanghai, China. From 2014 to 2015, he served as a postdoctoral researcher at the Center for Advanced Power Systems, Department of Electrical and Computer Engineering, College of Engineering, Florida State University, Tallahassee, FL, USA. Since 2012, he has been affiliated with the School of Electronics, Information and Electrical Engineering, Shanghai Jiao Tong University, Shanghai, China, where he was promoted to Professor in 2019. He has co-authored 3 books and over 100 technical papers in journals and conferences. His research interests mainly focus on power electronics applications in battery energy storage and renewable energy conversion. Dr. Li has received some academic honors, including the 2015 IEEE Power Electronics Society Transactions Second Prize Paper Award, the 2022 First Prize of Technological Invention from the China Power Supply Society, the 2023 Distinguished Young Scholar Award of the China Power Supply Society, and the 2024 Chang Jiang Scholars Distinguished Professor title awarded by the Ministry of Education of China.

Keynote Speakers

Time: 10:20-11:00 August 16, Sunday

Venue: 3F Grand Ballroom

Prof. Min Chen

Zhejiang University, China

Embedded Packaging Technology for SiC Power Modules

Abstract

Silicon carbide (SiC) wide-bandgap semiconductor devices exhibit tremendous potential in high-performance, high-power-density applications such as electric vehicles and data centers. However, conventional packaging structures widely used for Si devices fail to fully exploit the superior performance of SiC devices due to high parasitic parameters and a single heat-dissipation path. These limitations have severely restricted the further development and application of SiC devices. Embedded packaging technology has attracted increasing research attention in recent years as a promising solution. This presentation focuses on the current development status and key challenges of embedded packaging technology, introducing its structural design, key manufacturing processes, and integrated thermal management methods. In addition, the presentation further discusses the application prospects of embedded packaging in areas such as electric vehicle drive systems, and provides an outlook on future development trends and research directions.

Biography

Min Chen received the B.S. degree in applied electronics and the Ph.D. degree in electrical engineering from Zhejiang

University, Hangzhou, China, in 2000 and 2006, respectively. From 2007 to 2009, he was a Postdoctoral Researcher with the College of Electrical Engineering, Zhejiang University. He served as a Lecturer from 2010 to 2014, and was promoted to Associate Professor in 2014. During 2014 to 2015, he was a Visiting Researcher with the Department of Energy Technology, Aalborg University, Denmark. Since 2020, he has been a Full Professor with Zhejiang University. He currently serves as the Deputy Director of the National Key Laboratory of Power Electronics. His research interests include the packaging of wide-bandgap power devices, renewable generation & grid integration, and bidirectional charging/discharging for EVs & energy storage. He has published over 100 SCI/EI indexed papers, including one ESI Highly Cited Paper, and holds 55 Chinese invention patents and 5 overseas patents. He has led multiple research projects funded by the National Natural Science Foundation of China (NSFC) and participated in several National Key R&D Programs.

Panel Speakers

Panel Discussion 1: Is Solid-State Transformer Necessary for GW AI Data Centers?

Moderator: Yenan Chen, Zhejiang University

Time: 11:20-12:20, August 15, Saturday
Venue: 3F Grand Ballroom

Abstract

The rapid escalation of AI workloads is giving rise to gigawatt-scale data centers, pushing conventional power delivery architectures to their physical and economic limits. Solid-state transformers (SSTs) have emerged as a compelling contender, promising unprecedented power density, native multi-port DC integration for renewables and storage, and dynamic grid support. Yet, formidable challenges in cost, reliability, and system-level maturity persist. This panel convenes world-renowned academic pioneers and industry leaders to engage in a critical, unvarnished discussion. We will rigorously examine whether SSTs are truly destined to be the unique backbone of future AI power systems, or if they will coexist within a diverse ecosystem of evolving architectures. The discussion will dive deep into the technical bottlenecks, reliability requirements, and realistic deployment timelines that will ultimately determine the fate of SSTs in this critical application.

Prof. Johann W. Kolar

ETH Zurich, Switzerland
IEEE Life Fellow, Foreign Member of the US National Academy of Engineering

Biography

Please refer to the keynote speaker biography on page 23 for details.

Prof. Xinbo Ruan

Nanjing University of Aeronautics and Astronautics, China
IEEE Fellow

Biography

Please refer to the keynote speaker biography on page 24 for details.

Dr. Alpha J. Zhang

Delta Electronics Design Center, China
IEEE Fellow

Biography

Dr. Alpha J. Zhang was an associate professor in the Electrical Engineering Department at Zhejiang University from 1991 to 1998. He served as a visiting professor at the Center for Power Electronics Systems (CPES), Virginia Tech, USA, in 1995 and 1998.

In 1999, he joined Delta Electronics (Shanghai) Co., Ltd. He is the founder and Director of the Delta Electronics (Shanghai) Design Center (SDC), established in 2002, and the Delta Electronics (Hangzhou) Design Center (HDC), founded in 2007. Under his leadership, multi-disciplinary R&D teams of over 1,000 engineers have supported 15 Delta business units in serving customers worldwide. His expertise spans AC/DC adapters and chargers, High-efficiency DC/DC and AC/DC power converters for servers and networking systems, HVDC power solutions for data center systems, On-board chargers and traction inverters for electric vehicles, PV inverters and energy storage solutions for renewable energy systems, among others. He holds 108 U.S. patents and 133 Chinese patents.

Currently, he serves as Vice President of the China Power Supply Society (CPSS) and is a Fellow of both CPSS and IEEE (since 2025).

Ms. Yanhua Lin

Alibaba Cloud Infrastructure
Senior Power Architect

Biography

Yanhua Lin is a Senior Power Architect at Alibaba Cloud Infrastructure, based in Hangzhou, China. With over 7 years of industry experience, she leads the full lifecycle development of power systems for hyperscale AI data centers, covering architecture planning, product R&D, large-scale deployment and operation optimization.

Her core expertise lies in high-efficiency power conversion and distribution technologies, including DC UPS platforms, high-voltage DC systems and solid-state transformer (SST).

She spearheaded the development of the 2.5 MW DC UPS 2.0 platform, which achieves ⩾ 97.5% end-to-end efficiency, cuts equipment cost and electrical room footprint by 50% compared with traditional AC/UPS architectures, and supports seamless voltage evolution from DC240V up to DC800V. For AI data center scenarios, she designed the BR power architecture that lifts facility utilization to over 85% while meeting GB50174 Class A availability standards, enabling rapid construction of 100,000-GPU scale clusters. She also leads frontier R&D on SiC/GaN-based SST and high-efficiency DC STS technology for next-generation power distribution.

Ms. Lin holds an M.S. in Electrical Engineering from Beijing Jiaotong University and a B.Eng. in Electrical Engineering and Automation from Beijing University of Civil Engineering and Architecture.

Panel Discussion 2: AI for Power

Moderator: Yongheng Yang, Zhejiang University

Time: 11:20-12:20, August 16, Sunday
Venue: 3F Grand Ballroom

Abstract

Artificial intelligence (AI) and machine learning are rapidly transforming energy systems as well as modern power electronics, opening new frontiers in control, diagnostics, and system optimization. However, bridging the gap between theoretical AI models and real-world grid reliability, and also power electronics dynamics, presents fundamental engineering challenges. This panel session brings together leading international experts to critically examine where AI delivers actionable value in power electronics — and where traditional physics-based engineering remains irreplaceable.

The session opens with three complementary perspectives:
- Power Electronics with Edge Intelligence — Prof. Feng Gao (Shandong University, China) explores embedded AI, local processing, and real-time smart control directly at the converter and device level.

- Three Things AI Still Can't Do in Power Electronics (and Why They Matter Most) — Prof. Huai Wang (Aalborg University, Denmark) offers a candid evaluation of AI's current limitations, highlighting critical bottlenecks in domain knowledge integration, explainability, and physical safety guarantees.

- AI for Power: Go Big, Go Small or Go Home? — Prof. Georgios Konstantinou (University of New South Wales, Australia) evaluates the strategic scale of AI deployment, contrasting massive cloud-level system analytics against lightweight, localized models.

It is expected that this interactive panel will engage the audience in a forward-looking dialogue on the realistic role of artificial intelligence in shaping the next generation of resilient, intelligent power systems.

Prof. Feng Gao

Shandong University

Biography

Prof. Gao received the B.Eng. and M.Eng. degrees in electrical engineering from Shandong University, Jinan, China, in 2002 and 2005, respectively, and the Ph.D. degree from the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, in 2009. Since 2010, he has been with Shandong University, where he is currently a Professor with the School of Control Science and Engineering.

Prof. Huai Wang

Aalborg University

Biography

Huai Wang is a Professor at the Department of Energy (AAU Energy), Aalborg University, Denmark. He leads the Reliability of Power Electronic Converters (ReliaPEC) group and chairs the Mission of Digital Transformation and AI at AAU Energy. His research focuses on efficient, reliable, and cognitive power electronic components and converter systems. He has initiated five industrial/PhD courses, attended by over 1,000 PhD students and industry engineers, and delivered more than 30 international conference tutorials. He received his PhD from the City University of Hong Kong in 2012 and a B.E. degree from Huazhong University of Science and Technology in 2007. He was elected to the Danish Academy of Technical Sciences in 2023.

Prof. Georgios Konstantinou

The University of New South Wales

Biography

Georgios Konstantinou is an Associate Professor and an ARC Future Fellow with the School of Electrical Engineering and Telecommunications at UNSW Sydney, where he leads the real-time simulations laboratory (RTS@UNSW).

Tutorial Speakers

Tutorial 1: Wideband Oscillation Analysis and Robust Stabilization Control for Grid-Tied Converter Systems

Time: 09:00-12:30, August 14, Friday
Venue: 3F Harvest Room

Tutorial Abstract:
The large-scale integration of renewable energy through power electronic converters has introduced wideband oscillation phenomena across sub-synchronous to super-synchronous frequencies, posing critical challenges to modern power grid stability. This tutorial presents a systematic framework for analyzing and mitigating wideband oscillations in grid-tied converter systems, structured into four interconnected parts.

Part I establishes fundamental modeling and stability analysis of single grid-tied converters using state-space eigenvalue analysis and impedance-based methods with Nyquist stability criteria.

Part II introduces a frequency-domain adaptive parametric model order reduction method for multi-converter-fed systems, overcoming traditional Krylov subspace limitations through three indicators — convergence error, cumulative error, and projection matrix rank — enabling accurate and efficient oscillatory stability analysis across varying system scales.

Part III presents robust stabilization control strategies including margin balancing control via phase correction, virtual damping and virtual element control for wideband dissipativity shaping, voltage feedforward-based coordinated damping, and gap metric-based robust stability assessment for ultra-weak grid support.

Part IV introduces a Physics-Guided Deep Reinforcement Learning-based Multi-Objective Controller for online broadband oscillation prevention in power electronic-dominated regional power systems, combining an impedance network perception module with a TD3 reinforcement learning engine to achieve rapid optimal control decisions.

By integrating analytical methods, model reduction, robust control theory, and AI-driven adaptive control, this tutorial equips attendees with a holistic toolkit for tackling wideband oscillation challenges in modern renewable-rich power systems.

Bao Xie
Hefei University of Technology

Biography

Bao Xie (Member, IEEE) received his B.S. degree and Ph.D. degree in Electrical Engineering from Chongqing University, Chongqing, China, in 2014 and 2020, respectively. He is now a Lecturer in Hefei University of Technology, China. And his research interests include renewable energy generation technology, control and stability of power converters.

Meiqin Mao
Hefei University of Technology

Biography

Meiqin Mao received the B.Sc., M.Sc. and Ph.D. degrees in electrical engineering from Hefei University of Technology (HFUT), Hefei, China, in 1983, 1988, and 2004, respectively. She is now a Professor with HFUT. She serves as an Associate Editor for IEEE Journal of Emerging and Selected Topics in Power Electronics. Her research interests include distributed power generation, microgrid, and power electronics applied in power system.

Zhiqing Yang
Hefei University of Technology

Biography

Zhiqing Yang (Member, IEEE) received the B.S. degree in electrical engineering from Southwest Jiaotong University, Chengdu, China, in 2013, and the M.S. and Dr.-Ing. degrees in electrical engineering from RWTH Aachen University, Aachen, Germany, in 2017 and 2021, respectively. From April 2016 to September 2016, he was a Research Intern with the Advanced Technology Research and Development Center, Mitsubishi Electric, Amagasaki, Japan. From October 2017 to September 2021, he was a Research Associate with the Institute for Power Generation and Storage Systems, RWTH Aachen University. Since January 2022, he has been with the School of Electrical Engineering and Automation, Hefei University of Technology, Hefei, as an Associate Professor. His research interests include power electronics in renewable generations and electric vehicles and power systems. Dr. Yang serves as the Guest Associate Editor for CPSS Transactions on Power Electronics and Applications.

Xun Jiang
Sungrow Power Supply Co., Ltd.

Biography

Xun Jiang received his Ph.D. degree from Hefei University of Technology (HFUT) in 2025. He is currently a control software engineer at SUNGROW and a joint postdoctoral fellow of SUNGROW-HFUT. His research interests include stability analysis of power electronic integrated power systems and harmonic suppression technology in renewable energy stations. He serves as the post chair of the IEEE Power Electronics Society Student Branch Chapter at HFUT.

Tutorial 2: Powering Next Generation AI Infrastructure: Ultra-Efficient/Compact Three-Phase Isolated Rectifier and Solid-State Transformer Concepts

Time: 09:00-12:30, August 14, Friday
Venue: 3F Grand Ballroom B

Tutorial Abstract:

The explosive trajectory of artificial intelligence (AI) compute is catalyzing an era of Gigawatt-scale datacenter campuses, driving unprecedented global power demands. As IT rack densities aggressively scale toward the 1 MW threshold, legacy 54Vdc global power architectures face absolute physical and thermal limits. While migrating to 800Vdc (±400Vdc) addresses immediate bottlenecks, the unrelenting trajectory of AI compute dictates that this is merely transitional — an inevitable leap to ultra-high 1500Vdc (±750Vdc) rack distribution is mandatory to truly future-proof these extreme loads. This high-voltage paradigm shift prevents the conduction loss escalation and yields massive material savings. Consequently, traditional in-rack ac/dc conversion is being rapidly displaced by power sidecars (i.e., power racks) and direct Medium-Voltage (MV) Solid-State Transformers (SSTs), rearchitecting power delivery from the grid to the chip.

This tutorial proposes a next generation of isolated, ultra-compact three-phase ac/dc PFC rectifier topologies. We will deconstruct the fundamental building blocks, achieving a massive groundbreaking 99% overall efficiency at extreme power densities (10 kW/dm^3) while maintaining minimal control complexity. Attendees will explore the operating principles, design optimizations, and stress analysis of novel architectures, including quasi-single-stage Integrated Active Filter (IAF) rectifier designs, isolated ac/dc matrix converters, and high-power i3X-rectifiers scaling from 20-100 kW. Furthermore, we will spotlight the transformative impact of the latest Monolithic Bidirectional GaN Switches (M-BDS) enabling advanced (series-resonant) DAB-type configurations, which are driving the next wave of high-

efficiency, single-stage isolated ac/dc power conversion. Specifically, the session delves into advanced modulation techniques for single- and three-phase (series-resonant) DAB-type converters, utilizing synergetic control and active magnetizing current injection to guarantee seamless Zero Voltage Switching (ZVS) across all operating boundaries.
Finally, the tutorial tackles the ultimate frontier of grid-to-chip power delivery: Novel MVac/LVdc and MVdc/LVdc Solid-State Transformer (SST) concepts for the multi-megawatt range. Positioned to eliminate bulky Line-Frequency Transformers (LFTs), these HF-isolated SSTs can directly interface with 13.2 kVac to 35 kVac grids. The session will discuss the current SST "density/efficiency barriers," demonstrating concrete topological strategies to catapult system performance from current baselines to a groundbreaking 99% efficiency and up to 2MW/m³ power density—a 5 to 20x leap in compactness. By mapping the transition toward central rectification and MVdc distribution architectures, this tutorial reaffirms that continuous, radical innovation in power electronics is the indispensable bedrock of tomorrow's AI supercomputing infrastructure.

Daifei Zhang
University of Toronto

Biography

Dr. Daifei Zhang is currently an Assistant Professor of Electrical and Computer Engineering at the University of Toronto, a position he has held since October 2024. Before joining the University of Toronto, he was a Postdoctoral Researcher at the Power Electronic Systems Laboratory (PES) at ETH Zurich, Switzerland. Dr. Zhang received his B.Sc. degree in Electrical Engineering and Automation from Huazhong University of Science and Technology (HUST), China in 2017, followed by an M.Sc. (2019) and a Ph.D. (2023) in Electrical Engineering and Information Technology from ETH Zurich. Dr. Zhang's research interests include advanced power conversion techniques for grid modernization and transportation electrification, cryogenic power electronics, and design methodologies for sustainable power electronics.

Johann W. Kolar
ETH Zurich

Biography

Please refer to the keynote speaker biography on page 23 for details.

Junzhong Xu
Shanghai Jiao Tong University

Biography

Dr. Junzhong Xu is currently a Tenure-Track Associate Professor for Power Electronics with the School of Electrical Engineering of the Shanghai Jiao Tong University, Shanghai, China. He received the B.S. degree in electrical engineering from the Harbin Institute of Technology, Harbin, China, in 2016, and the Ph.D. degree in electrical engineering from Shanghai Jiao Tong University, Shanghai, China, in 2021. From 2021 to 2024, he worked as a Postdoctoral Research Fellow with the Department of Electrical Engineering, Shanghai Jiao Tong University, and also with the Power Electronic Systems (PES) Laboratory, the Swiss Federal Institute of Technology (ETH), Zurich, Switzerland. Dr. Xu's research interests include advanced control and modulation for power converters. He was the recipient of the Outstanding Ph.D. Thesis Award from Shanghai Jiao Tong University in 2021.

Tutorial 3: Advanced Inductive Power Transfer: From Fundamentals to Magnetics, Control, and System Topologies

Time: 09:00–12:30, August 14, Friday
Venue: 4F Diplomat Boardroom

Tutorial Abstract:
With the development of technology, an enormous number of electronic devices are being put into the market, and these devices have led to an increasing demand for different battery charging methods. Wireless power transfer, especially inductive power transfer (IPT), has been an emerging technology and has shown great potential in lots of applications throughout the decade. IPT systems allow power to be transferred through a magnetic field, which enables wireless charging to replenish electronic devices over a distance and is able to overcome the shortcomings of clumsy wiring and risk of electric shock when using wired charging, it can achieve fully automatic charging.

However, practical implementation faces critical barriers, including coupler misalignment, converter architecture optimization, and control strategy implementation. This tutorial addresses these challenges by exploring key technical issues in wireless charging, elaborating fundamental IPT principles, and proposing innovative ideas for discussion. We will cover the following topics:

1) Fundamentals of inductive power transfer: We will give an overview of inductive power transfer, including some development history, basic magnetic coupler structures, compensation circuits, output characteristics, and theoretical analysis.

2) Control strategies for efficient wireless charging: We will present effective control strategies for wireless charging, focusing on static wireless EV charging with a wide range and optimal efficiency, analyzing how dual-side control strategies between primary inverters and secondary active rectifiers can optimize impedance matching.

3) Misalignment tolerant magnetic coupler: The magnetic coupler is one of the key factors that determine the transmission efficiency of an IPT system. In this section, we will present our research findings regarding the design of magnetic couplers in various application scenarios. Moreover, we will concentrate on analyzing the various unique misalignment problems, along with the specific effects of these misalignments on system performance.

4) Wireless integrated on-board charger (WiOBC) based on partial power conversion (PPC): We will explore advanced architectures for WiOBC that simultaneously handle multiple charging tasks with enhanced efficiency, paired up with effective control strategies for wireless charging by achieving PPC.

5) Wrap up and discussion: Finally, we will summarize key points and provide a glimpse into the future outlook.

Chi-Fong Ieong
University of Macau

Biography

Chi-Fong Ieong (Member, IEEE) received the B.Sc. and Ph.D. degrees in electrical and computer engineering from the University of Macau (UM), Macau, China, in 2021 and 2025, respectively. He is currently a Postdoctoral Fellow with the State Key Laboratory of Analog and Mixed-Signal VLSI and the Institute of Microelectronics, UM. His research focuses on power electronics and wireless power transfer. During his doctoral studies, he conducted in-depth research on the design of high-efficiency inductive wireless battery charging and power transfer systems for a wide range of applications. Over this period, he authored 7 high-quality journal papers (4 of which as first author) and 5 conference papers. In July 2025, he successfully defended his Ph.D. dissertation titled "Inductive Power Transfer

System Designs for Efficient Wireless Battery Charging in Diverse Applications."

Muxing Wu
University of Macau

Biography

Muxing Wu (Student Member, IEEE) received the B.Sc. degree in electrical and intelligent engineering in 2018 from Xiangtan University, Xiangtan, China, the M.Sc. degree in electrical engineering from Yanshan University, Qinhuangdao, China, and the Ph.D. degree in electrical and computer engineering from the University of Macau (UM), Macau, China, in 2026. He is currently a Research Assistant with the State Key Laboratory of Analog and Mixed-Signal VLSI and the Institute of Microelectronics, UM. His current research interests include wireless power transfer and resonant converter.

Chi-Seng Lam
University of Macau

Biography

Chi-Seng Lam (Senior Member, IEEE) received the Ph.D. degree in electrical and electronics engineering from the University of Cambridge, Cambridge, U.K., in 2019. In 2013, he was a Postdoctoral Fellow with The Hong Kong Polytechnic University, Hong Kong, China. He is currently a Full Professor, UM. He has co-authored or co-edited five books and 220+ technical journals and conference papers. He holds six U.S. and nine Chinese patents. His research interests include power quality compensators, power management ICs, wireless power transfer, and solar energy systems. He has delivered 7 tutorials at IEEE Conferences [IECON2025, IECON2024, IPEMC2024-ECCE Asia, PEDG2023, ISCAS2021, IECON2020, APPEEC2019]. Prof. Lam currently serves as an Associate Editor for TPEL, TIE, JESTPE, TCAS-I, OJES. He was awarded 2024 TIE Outstanding Associate Editor, 2022 and 2024 TIE Distinguished Reviewer, 2024 TPEL Outstanding Reviewer.

Tutorial 4: Integrated Digital Signal Processing and Machine Learning Frameworks for Real-Time Power Quality Disturbance Recognition and Embedded Implementation

Time: 13:30-17:00, August 14, Friday
Venue: 3F Harvest Room

Tutorial Abstract:
Power quality (PQ) analysis is critical for maintaining stability, reliability, and operational efficiency in modern smart-grid infrastructures, where nonlinear loads, power electronic converters, and renewable energy integration introduce complex, non-stationary disturbances. Accurate PQ disturbance identification demands advanced digital signal processing (DSP) techniques, adaptive decomposition algorithms, and intelligent classifiers capable of analyzing rapidly varying, multi-event grid conditions.

The proposed tutorial offers a rigorous deep dive into advanced DSP foundations essential for high-fidelity power quality event (PQE) recognition in modern smart-grid systems. Using representative disturbances such as voltage sags, swells, harmonics, flicker, impulsive transients, and inter-harmonics, the session examines state-of-the-art non-stationary signal analysis techniques including Hilbert Transform-based analytic signal construction, Empirical Mode Decomposition (EMD), and Variational Mode Decomposition (VMD). These techniques enable precise extraction of instantaneous frequency, Hilbert spectral features, energy signatures, and mode-specific characteristics, which are crucial for real-time tracking of single as well as combined PQ disturbances.

Building on the extracted DSP feature space, the tutorial systematically integrates classical machine learning and cutting-edge deep learning models — Decision Trees, Extreme Learning Machines (ELM), Random Vector Functional Link Networks (RVFLN), deep convolutional

neural networks (DCNN), stacked auto-encoders (SAE), and hybrid RDCSAE-RVFLN architectures. Special emphasis is placed on the emerging role of Transformer-based models, which leverage multi-head self-attention mechanisms to capture long-range temporal dependencies inherent in non-stationary grid signals. The tutorial explores how Transformers operate on raw waveform segments or EMD/VMD-derived feature embeddings, achieving enhanced robustness under noisy, dynamic, and multi-event operating conditions.

The final segment transitions from algorithmic design to real-time hardware validation, showcasing implementations on NI-DAQ (USB-6008), dSPACE MicroLabBox II, TI TMS320C6713 DSP, and Xilinx Virtex-5 FPGA platforms. Participants will be guided through the complete workflow of real-time PQE deployment: signal acquisition, fixed-point conversion, deterministic scheduling, FPGA-level Verilog/VHDL mapping of DCNN components, and DSP-based inference execution. The tutorial highlights how optimized DSP kernels, finite state machine (FSM) architectures, and parallel FPGA pipelines enable sub-millisecond PQE detection suitable for industrial grid environments.

Sanjib Kumar Panda
National University of Singapore

Biography

Sanjib Kumar Panda received B. Eng. Degree from the South Gujarat University, India, in 1983, M.Tech. degree from the Indian Institute of Technology, Banaras Hindu University, Varanasi, India, in 1987, and the Ph.D. degree from the University of Cambridge, U.K., in 1991, all in electrical engineering. He was the recipient of the Cambridge-Nehru Scholarship and M. T. Mayer Graduate Scholarship during his PhD study (1987-1991). Since 1992, he has been holding a faculty position in the Department of Electrical and Computer Engineering, National University of Singapore. Dr. Panda has published more than 525 peer-reviewed research papers, co-authored one book and contributed to several book chapters, holds six patents and co-founded three start-up companies. His research interests include high-performance control of motor drives and power electronic converters, condition monitoring and predictive maintenance, building energy efficiency enhancement etc. He has served as Associate Editor of several IEEE Transactions e.g. Power Electronics, Industry Applications, Energy Conversion, Access and IEEE Journal of Emerging and Selected Topics in Power Electronics. He has also served as the Chair of the IEEE PELS Technical Committee, TC-12: Energy Access and Off-grid Systems from 2021-23. He is a member of the Global Committee, IEEE PELS-R10 Membership Chair and a Member of the IEEE PELS Conference Committee. Dr. Panda was awarded the ACE Alumnus Award from SVNIT in Dec. 2025.

Mrutyunjaya Sahani
National University of Singapore

Biography

Mrutyunjaya Sahani received the B.Tech. degree in electrical engineering from the Biju Patnaik University of Technology, Rourkela, India, in 2007, the M. Tech. degree in embedded system technology from the SRM University, Chennai, India, in 2010, and the Ph.D. degree in electronics and communication engineering from Siksha 'O' Anusandhan University, Odisha, India, in 2019. He is currently a Senior Research Fellow with the Department of Electrical and Computer Engineering, National University of Singapore. His current research interests include power quality analysis, power system protection, signal processing, micro and smart grid, renewable energy integration, energy management, artificial intelligence, and embedded system design.

Tutorial 5: Inside the Solid-State Transformers

Time: 13:30-17:00, August 14, Friday
Venue: 3F Grand Ballroom B

Tutorial Abstract:
Solid-State Transformers technology continues to excite researchers in academia and industry. Despite many promises of power-dense high-performance conversion, there are significant challenges encountered in the practical design of these highly modular, galvanically isolated power electronics converters. These stem from high power and high voltage aspects of design, insulation coordination, high voltage magnetic components, thermal aspects, and the complexity of controller hardware and control algorithms. High modularity strongly impacts the reliability and availability of the SST as a whole and has a strong impact on the scalability in terms of voltage, current, and power ratings. Redundancy in design is often adopted, further complicating the realizations of power stages.

The tutorial will systematically address numerous technological aspects inside the MW-level SST design, present commonly used technologies, as well as some first-hand experiences and solutions used or developed at the Power Electronics Laboratory at EPFL, by the instructors. When appropriate, PLECS models and simulations will be used to support the introduced concepts and methods to the audience.

Drazen Dujic
École Polytechnique Fédérale de Lausanne (EPFL)

Biography

Drazen Dujic is an Associate Professor and Director of the Power Electronics Laboratory at the École Polytechnique Fédérale de Lausanne (EPFL) in Lausanne, Switzerland. Upon obtaining his PhD degree in 2008, he spent 5 years in industry (with ABB Switzerland) and joined EPFL in 2014. His research interests are mainly in medium-voltage high-power electronics. He has given numerous keynotes and tutorials on the topics of modular multilevel converters, medium-frequency transformer design and optimization, and solid-state transformers. He is an IEEE Fellow.

Zhenchao Li
École Polytechnique Fédérale de Lausanne (EPFL)

Biography

Zhenchao Li is currently a Ph.D. student at the Power Electronics Laboratory of the École Polytechnique Fédérale de Lausanne (EPFL) in Lausanne, Switzerland. His PhD research projects is directly related to the Solid-State Transformer technologies for data center applications.

Tutorial 6: Recent Advancements on Active Flux Control and DC Bias Prevention of Transformer Magnetic Core in AC-DC and DC-DC Applications

Time: 13:30-17:00, August 14, Friday
Venue: 4F Diplomat Boardroom

Tutorial Abstract:
Power transformers, operating on the fundamental principles of magnetic flux coupling, are vital components spanning traditional line-frequency applications to modern high-frequency isolated DC-DC topologies, such as dual-active-bridge (DAB) converters. However, the presence of a DC bias in the magnetic flux—under either steady-state or transient conditions — severely degrades transformer performance. This phenomenon leads to core saturation, reduced efficiency, severe acoustic noise, mechanical vibration, and destructive inrush currents.

This tutorial presents recent advancements in the modeling, analysis, and active control of magnetic flux in power transformers. By actively regulating the flux trajectory, DC bias can be effectively eliminated across all operating regimes, inherently preventing transient inrush currents. Furthermore, this session will cover closed-loop control strategies for power semiconductor stacks to actively demagnetize and remove residual flux in cores featuring hard magnetic materials. Complementing these control-centric approaches, the tutorial will introduce novel, DC-current-tolerant power transformer designs tailored for high-power conversion. These innovations equip converter stations with critical ancillary functionalities without sacrificing footprint or incurring extra hardware costs.

Finally, the practical deployment and systemic benefits of these techniques will be comprehensively explored across a variety of critical applications. These include accelerated black-start restoration utilizing grid-forming (GFM) inverters, high-frequency DAB converters, converter stations within bipolar medium-voltage DC (MVDC) distribution networks, STATCOMs, and Enhanced STATCOMs (E-STATCOMs).

Shenghui Cui
Seoul National University

Biography

Shenghui Cui (Senior Member, IEEE) received the B.S. degree from Tsinghua University, Beijing, China, in 2012, the M.S. degree from Seoul National University, Seoul, South Korea, in 2014, and the Dr.-Ing. degree with the highest distinction (summa cum laude) from RWTH Aachen University, Aachen, Germany, in 2019, all in electrical engineering. Since September 2021, Dr. Cui is with Department of Electrical and Computer Engineering, Seoul National University, Seoul, South Korea, where he is currently an associate professor. From March 2015 to May 2021, he has been with the Institute for Power Generation and Storage Systems, E.ON Energy Research Center, RWTH Aachen University, Aachen, Germany, where he worked as research associate and later on senior scientist. Dr. Cui was the recipient of the STAWAG Best Dissertation Prize from Faculty of Electrical Engineering and Information Technology, RWTH Aachen University in 2019, the Second Place Prize Paper Award of the IEEE Transactions on Power Electronics in 2018, and Best Paper Award of IEEE PEDG in 2025, the Second Prize Paper Award of IEEE IPEC (ECCE Asia) in 2018, and the Outstanding Presentation Award of the IEEE Applied Power Electronics Conference in 2014. Dr. Cui has experience of instructing tutorials in various international conferences in the field of power electronics, including IEEE eGrid 2020, IEEE IPEMC ECCE Asia 2020, IEEE ECCE 2021, ICEE 2022, IEEE ECCE 2022, IEEE ICPE 2023, IEEE SYPS 2023, IEEE IPEMC ECCE Asia 2024, and IEEE ICDCM 2026.

Tutorials

09:00–12:30, August 14, Friday

Tutorial 1: Wideband Oscillation Analysis and Robust Stabilization Control for Grid-Tied Converter Systems

3F Harvest Room

Bao Xie[1], **Meiqin Mao**[1], **Zhiqing Yang**[1], **Xun Jiang**[2]
[1]Hefei University of Technology
[2]Sungrow Power Supply

Tutorial 2: Powering Next Generation AI Infrastructure: Ultra-Efficient/Compact Three-Phase Isolated Rectifier and Solid-State Transformer Concepts

3F Grand Ballroom B

Daifei Zhang[1], **Junzhong Xu**[2], **Johann W. Kolar**[3]
[1]University of Toronto
[2]Shanghai Jiao Tong University
[3]ETH Zurich

Tutorial 3: Advanced Inductive Power Transfer: From Fundamentals to Magnetics, Control, and System Topologies

4F Diplomat Boardroom

Chi-Fong Ieong, **Chi-Seng Lam**, **Muxing Wu**
University of Macau

Tutorials

13:30–17:00, August 14, Friday

Tutorial 4: Integrated Digital Signal Processing and Machine Learning Frameworks for Real-Time Power Quality Disturbance Recognition and Embedded Implementation

3F Harvest Room

Sanjib Kumar Panda, **Mrutyunjaya Sahani**
National University of Singapore

Tutorial 5: Inside the Solid-State Transformers

3F Grand Ballroom B

Drazen Dujic, **Zhenchao Li**
École Polytechnique Fédérale de Lausanne (EPFL)

Tutorial 6: Recent Advancements on Active Flux Control and DC Bias Prevention of Transformer Magnetic Core in AC-DC and DC-DC Applications

4F Diplomat Boardroom

Shenghui Cui
Seoul National University

August 14, Friday

Keynote Session

08:30–08:50 **Opening Ceremony** 3F Grand Ballroom
Chair: Yenan Chen, Zhejiang University

Keynote Speeches 3F Grand Ballroom
Chairs: Yongheng Yang, Zhejiang University
Alpha J. Zhang, Delta Electronics Design Center

08:50–09:30 Next-Generation GaN/SiC Monolithic Bidirectional Switch-Based Power Electronics
Johann W. Kolar
ETH Zurich

09:30–10:10 Full-Range Zero-Voltage-Switching Non-Resonant PWM Converters
Xinbo Ruan
Nanjing University of Aeronautics and Astronautics

10:10–10:50 Powering AI Energy Transition: How SiC Technologies Enable Efficient HVDC, SST, and Solid-State Circuit Breakers
Xing Huang
PNJ Semiconductor LLC

10:50–11:20 **Coffee Break** 3F Foyer

Panel Session

Panel Discussion 1: Is Solid-State Transformer Necessary for GW AI Data Centers?

Moderator: Yenan Chen, Zhejiang University
Time: 11:20–12:20, August 15, Saturday
Venue: 3F Grand Ballroom

11:20–11:25 Introduction

11:25–11:45 Opening Perspectives
Johann W. Kolar
ETH Zurich

Alpha J. Zhang
Delta Electronics Design Center

Xinbo Ruan
Nanjing University of Aeronautics and Astronautics

Yanhua Lin
Alibaba Cloud Infrastructure

11:45–12:15 Moderated and Interactive Discussions

12:15–12:20 Wrap-Up

August 15, Saturday

Oral Technical Sessions

T01 Grid-Forming Technologies & Stability

Time: 13:30–15:10, August 15
Venue: 3F Harvest Room
Chairs: Georgios Konstantinou, The University of New South Wales
Rongwu Zhu, Harbin Institute of Technology (Shenzhen)

13:30–13:50 T01.1
Large-Delay-Tolerant Voltage Control Damping for Grid-Forming VSCs with Virtual Immittance

Boxue Zhang[1], Shan He[2,3], Xin Sui[3], Rui Zhang[4], Xiangyang Xing[4], Poh Chiang Loh[1]
[1]The Chinese University of Hong Kong; [2]Hefei University of Technology; [3]Hefei Comprehensive National Science Center; [4]Shandong University

13:50–14:10 T01.2
Impact of Reactive Power Feedback Structure on Damping Characteristics of Grid-Forming Converters

Haoran Wang[1], Rongwu Zhu[1], Ji Qi[2], Yong Yi[2]
[1]Harbin Institute of Technology, Shenzhen; [2]Shenzhen Power Supply Co., Ltd.

14:10–14:30 T01.3
Stability Analysis of Voltage Amplitude Control in Virtual-Admittance-Based VSGs

Xueqing Li[1], Kai Wang[1], Lehong Xiang[2], Olfa Bel Hadj Brahim Kechiche[3], Mahmoud Hamouda[3], Xibo Yuan[1]
[1]China University of Mining and Technology; [2]Loctek Ergonomic Technology-Corp.; [3]University of Sousse

14:30–14:50 T01.4
Modeling and Stability Analysis of Sequence Impedance in Grid-Forming Converters

Haoran Wang[1], Rongwu Zhu[1], Ji Qi[2], Yong Yi[2]
[1]Harbin Institute of Technology, Shenzhen; [2]Shenzhen Power Supply Co., Ltd.

14:50–15:10 T01.5
Analysis of Transient Angle and Voltage Stability for Multiple Paralleled Grid-Forming Converters

Mengtong Huang, Yang Liu, Jingyang Fang
Shandong University

T02 Solid-State Transformers & Multiport Converters

Time: 13:30–15:10, August 15
Venue: 3F Grand Ballroom A
Chairs: Drazen Dujic, École Polytechnique Fédérale de Lausanne (EPFL)
Jinming Xu, Nanjing University of Aeronautics and Astronautics

13:30–13:50 T02.1
Transformer Configurations for Multi-Port Active Bridge Converter in Modularized Bridge Rectifier Solid-State Transformer

Zhenchao Li, Rafael Riber, Drazen Dujic
École Polytechnique Fédérale de Lausanne (EPFL)

13:50–14:10 T02.2
Energy Balancing of an AC-DC MMC Near-Zero Voltage or Current on the DC Side

Max Dupont, Drazen Dujic
École Polytechnique Fédérale de Lausanne (EPFL)

August 15, Saturday

14:10–14:30 T02.3

Analysis and Design of Diode Clamped Resonant DC/DC Converter based Solid State Transformer with Synchronous Rectification

Zhiyuan Wang, Junrun Yang, Binbin Li, Yingzong Jiao, Dianguo Xu
Harbin Institute of Technology

14:30–14:50 T02.4

A Four-Port Resonant DC/DC Converter with Switch Multiplexing for Hybrid Energy Systems

Sirui Huang[1], Xilin Chen[1], Zidong Tang[2], Jingtao Xu[1]
[1]Central South University; [2]Guangxi University

14:50–15:10 T02.5

Generalized Control Strategy for Multi-Port T-Type Non-Isolated Modular Multilevel DC-DC Converter

Baichuan Teng[1], Jianjun Ma[1], Xuejun Xiong[2], Miao Zhu[1], Hongyi Zhang[1], Zhaoxin Du[2]
[1]Shanghai Jiao Tong University; [2]State Grid Shanghai Electric Power Company

Industry Session

I01 Power Electronics for AI Data Center

Time: 13:30–15:10, August 15
Venue: 3F Grand Ballroom B
Chairs: Chen Zhao, Silergy Semiconductor Technology (Hangzhou) Co., Ltd.
Junming Zhang, Zhejiang University

13:30–13:55

HVDC power solution for next-generation AI data center: development and challenge

Dongyu Wang
Delta Electronics, Inc.

13:55–14:20

Microsecond Response · Megawatt Feedback — Technological Breakthroughs and Practices of High-Dynamic Feedback Loads

Pengfei Xie
Shanghai Changce Electronic System Co., Ltd.

14:20–14:45

DC Power Built for Computing — Forge a New Ecosystem of DC-Based AIDC

Linglin Chen
Digital Energy Central Research Institute, Hangzhou Zhonhen Electric

14:45–15:10

Technology Trends of On-Board Power Delivery for AI Computing

Zhengyu Ye
MetaPWR Electronics Co., Ltd.

Poster Sessions

P01 Wireless Power Transfer & HF Systems

Time: 15:30–18:00, August 15
Venue: 3F Grand Ballroom A
Chair: Chaoqiang Jiang, City University of Hong Kong

P01.1 Dead-Zone Elimination for Voltage Transient Synchronization Method in Bidirectional Wireless Power Transfer Systems

Zhaozheng Zhu, Xiaosheng Wang, Tianlu Ma, Junhui Yang, Hao Guo, C.Q. Jiang
City University of Hong Kong

P01.2 A 2.2 MHz 5 kW Wireless Power Transfer System for Compact Robotic Charging

Zhen Sun, Kaiyuan Wang, Chenyu Shi, Junming Zeng, Yun Yang
Nanyang Technological University

P01.3 Cross-Level Parasitic Parameter Extraction Method for Power Devices and Its Impact on Switching Transients

Dezhong Lai[1,2], Ge Teng[1,2], Xiaokang Zhang[1,2], Mila Xiao[3], Fei Wang[1], Tianling Shi[1]
[1]Shanghai University; [2]Engineering Research Center of Integrated Circuit and Novel Display Materials; [3]Infineon Semiconductors (Shenzhen) Co., Ltd.

P01.4 Anti-misalignment Coupler Design Based on Matrix Coil

Nuoyan Xu, Hao Liu, Henglin Chen
Zhejiang University

P01.5 Anti-Misalignment Coupler Design Based on Non-congruent Matrix Coils

Xue Zhou, Jiaqi Wu, Hao Liu, Henglin Chen
Zhejiang University

P01.6 Interrupt-Nested-Based Multirate Control of High-Switching-Frequency Three-Phase Buck Rectifier

Li Ding, Dehong Zhou, Siping Feng, Jianxiao Zou
University of Electronic Science and Technology of China

P01.7 A Unified Energy-Normalized Correction Factor for Parasitic Capacitance Estimation in High-Voltage High-Frequency Transformer Winding

Md Ahnaf Tahmid Anon[1], Qiming Liu[1], Lei Li [2], Ruze Song[3], Junjie Zhang[4], Zhan Shen[1], Wu Chen[1]
[1]Southeast University; [2]ZTT Transformer Co., Ltd.; [3]ZTT Submarine Cable Co., Ltd.; [4]Wuxi Putian Iron Core Co., Ltd.

P01.8 DCR Current Sensing Design for High-Frequency GaN Buck Converter

Man Liu, Yanqing Wu, Yenan Chen
Zhejiang University

P01.9 Overvoltage and Oscillations Suppression in the Commutation Loop of a 3L-ANPC Converter Based on PCB shielding layer

Ziyi Wang, Xinpeng Zhang, Junpeng Cheng, Wenxi Yao, Wuhua Li
Zhejiang University

August 15, Saturday

P02 EMI & Power Quality

Time: 15:30–18:00, August 15
Venue: 3F Grand Ballroom A
Chair: Chi-Seng Lam, University of Macau

P02.1 Modeling and Evaluation of EMI Coupling in a T-type Three-level Inverter with Middle Line

Zhaocheng Zhong, Yikun Jiang, Junhao Chang, Henglin Chen
Zhejiang University

P02.2 Conducted EMI modeling method for high-voltage high-power motor drive system

Junhao Chang, Yuxiang Liu, Zhaocheng Zhong, Henglin Chen
Zhejiang University

P02.3 Electromagnetic Interference Coupling Measurement Method Based on High-Pass Filters

Yikun Jiang[1], Zhaocheng Zhong[1], Zili Zhu[2], Henglin Chen[1]
[1]Zhejiang University; [2]Electric Power Research Institute, State Grid Hubei Electric Power Company

P02.4 Modeling and Suppression of EMI coupling in a Four-Module Three-Phase Motor Drive System

Hongyang Liu[1], Zhaocheng Zhong[2], Yaoda Fang[1], Yanqi Li[1], Henglin Chen[2]
[1]AVIC Xi'an Flight Automatic Control Research Institute; [2]Zhejiang University

P02.5 Conducted EMI Mechanism and Characteristics of Doubly Grounded Transformerless PV Inverters

Lanfu Dong, Zhilei Yao, Youtong Cao
Shanghai Maritime University

P02.6 Design of Electromagnetic Interference Filter Based on Surrogate-Assisted Evolutionary Optimization

Hongyang Liu[1], Zhaocheng Zhong[2], Yaoda Fang[1], Yanqi Li[1], Henglin Chen[2]
[1]AVIC Xi'an Flight Automatic Control Research Institute; [2]Zhejiang University

P02.7 A Current Distortion Suppression Method for Three-Phase Single-Stage Isolated DC-AC Matrix Converters During Sector Transitions

Chaofan Wei, Jiatao Yang, Rui Li
Shanghai Jiao Tong University

P02.8 Modeling and Experimental Analysis of Capacitor Voltage Imbalance in MISN-PFC Converters Under Parameter Mismatches

Wending Zhao[1], Yuhao Zhang[1], Xinke Wu[2,3]
[1]The University of Hong Kong; [2]Zhejiang University; [3]ZJU-Hangzhou Global Scientific and Technological Innovation Center

P02.9 **A Method for Suppressing Harmonic Circulating Currents in Parallel Inverter System**

Jingru Yang[1], Min Chen[1], Yan Zhang[1], Qiang Ding[2], Chong Yao[1], Yenan Chen[1]
[1]Zhejiang University; [2]Power Electronics Hanotronies Company LTD

P02.10 **Edge-Smoothed Discontinuous PWM for Three-Phase Voltage-Source Inverters with Improved Output-Current Quality**

Xiang Zheng[1], Lijun Hang[1], Yandong Chen[2], Ke Sun[3], Xinfu Li[4], Yibin Feng[3], Yanlong Li[4], Xubin Huang[5], Ming Huang[6], Yangwei Yu[7], Sai Tang[1], Yuanbin He[1]
[1]Hangzhou Dianzi University; [2]Hunan University; [3]State Grid Ningbo Power Supply Company; [4]SolaX Power Network Technology Co., Ltd.; [5]Zhengtai Instrument Co., Ltd.; [6]Alibaba Cloud Feitian Cloud Computing Technology Co., Ltd.; [7]Zhejiang University

P03 Power Converter Modeling and Control

Time: 15:30-18:00, August 15
Venue: 3F Grand Ballroom A
Chair: Hafsa Qamar, Lahore University of Management Sciences

P03.1 **Adaptive Differential Compensation VDCM Control Strategy Based on the Sigmoid Function**

Jun Li[1], Zhao Liu[1], Cong Tian[1], Hongming Huang[1], Jie Jiang[2]
[1]Nanjing University of Science and Technology; [2]Suqian Electric Power Design Institute Co., Ltd.

P03.2 **Flexible Switching Control of Zero-Sequence Current Limitation and Power Oscillation for Three-Phase Four-Leg Inverters Under Unbalanced Grids**

Cong Tian[1], Zhao Liu[1], Jun Li[1], Hongming Huang[1], Wei Lin[2]
[1]Nanjing University of Science and Technology; [2]Nantong Gotion New Energy Technology Co., Ltd.

P03.3 **EDC-Inspired Model Order Selection for Frequency-Domain Modeling of Grid-Tied Converters**

Rui Chen, Lingyun Yang, Zhicong Huang
South China University of Technology

P03.4 **Fast-Transient Digital Dual-Balance Control for Buck Converters**

Yu Fu, Yucheng Zhao, Shouxiang Li
Beijing Institute of Technology

P03.5 **Model Predictive Control of Dual Parallel Converters for Comprehensive Optimization of Parallel and Circulating Currents**

Wei He[1], Zhiyong Zeng[1], Xiaoliang Jin[2]
[1]Nanjing University of Science and Technology; [2]Nanjing Institute of Technology

P03.6 **A Synchronous Dual-Phase-Shift Control Strategy to Achieve Zero Backflow Power in a Three-Port Grid-Tied PV-Storage Inverter**

Jianhong Xie, Hanchao Zeng, Long Chen, Yanhui Qiu, Damin Zhang
Xiamen University of Technology

August 15, Saturday

P03.7 **A Comprehensive Evaluation of Modulation Techniques for Grid-Connected Inverter**

Maniha Inam[1], Hafsa Qamar[1], Yongheng Yang[2]
[1]Lahore University of Management Sciences; [2]Zhejiang University

P03.8 **Modelling and Synchronization Stability-Oriented Design of Grid-Following Inverter Considering Low-Voltage Ride-Through Control**

Liang Song, Jinming Xu, Yichen Xu
Nanjing University of Aeronautics and Astronautics

P03.9 **Impact of Bridge-Leg Midpoint Parasitic Inductance on SiC MOSFET Switching Performance and PCB Layout Optimization**

Jingkai Lin, Qing Guo, Junze Li, Kuang Sheng
Zhejiang University

P04 Microgrids & DC Systems

Time: 15:30-18:00, August 15
Venue: 3F Grand Ballroom A
Chair: Daifei Zhang, University of Toronto

P04.1 **Distributed Norm Free Event Triggered Control for Voltage Restoration in DC Microgrids**

Peiran Zhang[1], Yu Zeng[2], Josep Pou[1]
[1]City University of Hong Kong; [2]Shenzhen Institute for Advanced Studies, University of Electronic Science and Technology of China

P04.2 **Disturbance Isolation of Asynchronous Grids Using Energy Routers**

Xianxian Zhao, Frede Blaabjerg
Aalborg University

P04.3 **Constrained Deep Reinforcement Learning for Energy Management of Islanded Small Modular Reactor Microgrids**

Tong Zhou[1], Yinhui Yu[2], Hong Wang[1]
[1]Harbin Institute of Technology, Shenzhen; [2]China Nuclear Power Technology Research Institute Co., Ltd.

P04.4 **Power Transfer Limit Analysis of DC Soft Open Point Interconnected DC Distribution Networks**

Xiaoxiao Meng, Jiawen Liu, Yan Du
Hefei University of Technology

P04.5 **Generalized Virtual Output Impedance Design Technique for Improving the FDIA Resilience of Droop-Controlled Microgrids**

Yifeng Huang[1], Chee Shen Lim[2], Fei Xue[2], Lin Jiang[1], Huiqing Wen[2]
[1]University of Liverpool; [2]Xi'an Jiaotong-Liverpool University

P04.6 **High-adaptability Control Strategy of Three-phase Four-wire Grid-forming Converter in Microgrid**

Jiazhi Wang, Wenxi Yao, Wuhua Li
Zhejiang University

P04.7 **A Fault-Tolerant Three-Port Converter for Aerospace Applications**

Zihao Liu, Songlin Chen, Yujie Huang
Nanjing University of Aeronautics and Astronautics

P04.8 **Comparative Assessment of Contactors and SSPCs on Grid Safety in 540 V DC Aircraft Power Distribution Systems**

Yongsheng He, Li Wang
Nanjing University of Aeronautics and Astronautics

P04.9 **A coordinated control strategy for power sharing and stability improvement under master-slave control considering line impedance differences**

Hongming Huang[1], Zhao Liu[1], Jun Li[1], Cong Tian[1], Wei Lin[2]
[1]Nanjing University of Science and Technology; [2]Nantong Guoxuan New Energy Technology Co., Ltd.

P05 AI, ML & Data-Driven Methods

Time: 15:30-18:00, August 15
Venue: 3F Grand Ballroom A
Chair: Xingshuo Li, Nanjing Normal University

P05.1 **A Two-Stage Graph Neural Network Framework for Automated RLC Filter Inverse Design and Harmonic Suppression**

Zong Deng, Qiwen Ye, Zhengzheng Liu
Huazhong University of Science and Technology

P05.2 **A Data-Driven Eigenmodes Identification Method for Inverter-based Renewables**

Hanrui Yang, Haoxiang Zong, Chen Zhang, Yu Zhang
Shanghai Jiao Tong University

P05.3 **Digital Twin-Driven Quantification and Mitigation of the Closed-Loop Masking Effect for IGBT Condition Monitoring in AC-DC-AC Converters**

Yuhao Zhu, Dong Xie, Huimin Wang, Xinglai Ge
Southwest Jiaotong University

P05.4 **Physics-in-Architecture Neural Network for Explainable Modeling of Wide-Bandgap-Based Boost Converters**

Jiarong Xu, Jingzhou Ding, Fanfan Lin
ZJU-UIUC Institute, Zhejiang University

P05.5 **DQN-Based Optimization of Weakly Coupled Integrated Inductors for Interleaved FSBB Converters**

Qizhou Xi, Wei Liu, Qi Liu, Qinsong Qian, Weifeng Sun
Southeast University

P05.6 **Sim-to-Real Translation of Reflectometry Signals for Bond Wire State Estimation Under Unseen Failure Condition**

Valentyna Afanasenko[1], Marius Niculescu[1], Markus Pfeiffer[2], Tim Sailer[2], Ingmar Kallfass[1]
[1]University of Stuttgart; [2]Robert Bosch GmbH

P05.7 **Why Customized Core Design Matters: A Comparative Study of AI-Assisted Inductor Optimization**

Zhihao Zhang[1], Yanbo Zhu[2], Xibin Yang[2], Han Cui[1]
[1]Tianjin University
[2]Beijing Tech Seed Technology Co., Ltd.

P05.8 **A General Physics-Guided Data-Driven Methodology for Digital Twins of Alkaline Water Electrolyzers**

Dan Yu, Vicente Godoy, Frede Blaabjerg
Aalborg University

P05.9 **Reinforcement Learning Based High-Bandwidth Output Voltage Tracking Control for a Modular Multilevel Converter DC Power Amplifier**

Linjie Han, Licong Wu, Binbin Li, Yingzong Jiao
Harbin Institute of Technology

P05.10 **Transmission-Line SLG Fault Diagnosis based on LightGBM in IBR Power Generation Systems**

Zhiheng Lin
Nanjing University of Aeronautics and Astronautics

P06 Power Devices & Reliability

Time: 15:30-18:00, August 15
Venue: 3F Grand Ballroom A
Chair: Hengyu Wang, Zhejiang University

P06.1 **Dynamic Modeling of MOSFET Considering Temperature Effects**

Xue Xia[1], Fei Wang[1], Chen Wang[2], Xiaokang Zhang[13], Tianling Shi[1]
[1]Shanghai University; [2]Panxin Technology Co., Ltd.
[3]Engineering Research Center of Integrated Circuit and Novel Display Materials

P06.2 **GaN Dual-Drain HEMT to Investigate 2DEG Dynamic Depletion in High Voltage Switching Operations**

Jiawei Cui, Maojun Wang, Junjie Yang, Jingjing Yu, Teng Li, Hao Chang, Xuelin Yang, Bo Shen, Jin Wei
Peking University

P06.3 **SiC Lateral MOSFET with Shielded Transverse Trench Gate for Reduced Resistance and Oxide Field**

Youyi Yin, Sihang Liu, Meng Zhang, Maojun Wang, Jin Wei
Peking University

P06.4 **Influence of Local Altitude Environmental Conditions on SiC MOSFET Lifetime Consumption in Photovoltaic Inverters**

Lan Chen, Pengju Sun, Bo Wang, Wang Lei
Chongqing University

P06.5 **An Improved SPICE Model for SiC MOSFETs Considering Gate Current-Extracted Dynamic Capacitances**

Kechi Gao[1], Hengyu Wang[1], Yifan Wang[2], Mingquan Zeng[2], Jingkai Lin[1], Changwei Lei[1], Yike Fan[1], Qing Guo[1], Kuang Sheng[1]
[1]Zhejiang University; [2]State Grid Zhejiang Electric Power Co., Ltd.

P06.6 **A Charge-Pump-Based Ultrasonic Transmitter with Programmable Amplitude, Pulse Width, and Pulse Count**

Xu Zhang[1], Chenxue Hou[1], Zhaoxi Li[1], Wenliang Zeng[2], Dongdong Chen[1], Di Li[1], Yintang Yang[1]
[1]Xidian University; [2]University of Macau

P06.7 **Dynamic Stress Evaluation of a 4.5 kV/2 kA Press-pack IGBT during Overcurrent Turn-off Using Turn-off Miller Plateau Voltage**

Dingyuan Bao[1], Junli Xiang[1], Taohui Zhang[1], Xiaohe Wang[2], Ming Yan[2], Haoze Luo[1], Wuhua Li[1]
[1]Zhejiang University; [2]PowerChina Huadong Engineering Corporation Limited

P06.8 **Analytical Modeling and Design of an Active Gate Driver for Voltage Balancing in Series-Connected 3.3-kV SiC MOSFETs**

Minrui Zhang[1], Dehua Wang[2], Chen Jiang[2], Shun Lu[2], Deao Shen[1], Zhiqiang Wang[1]
[1]Huazhong University of Science and Technology; [2]Nanjing Chenguang Group Co., Ltd.

P06.9 **Integrating Miller Clamping and Desat Protection in Centralized Drive for Hard-Paralleled SiC Modules**

Zhongjie Wang[1], Lingxiao Xue[1], Xiangqian Zhang[2]
[1]Tianjin University; [2]Tianjin Research Institute of Electric Science Co., Ltd.

P06.10 **1200-V E-mode GaN Power Transistor with Low Dynamic Degradation Realized on Thick-buffer GaN on-Si Platform**

Hao Chang, Junjie Yang, Youyi Yin, Maojun Wang, Bo Shen, Jin Wei
Peking University

P07 OBC & Renewable Energy Systems

Time: 15:30-18:00, August 15
Venue: 3F Grand Ballroom A
Chair: Qingsong Wang, Southeast University

P07.1 **Highly Efficient Multiport EV Charger with Low Loss Modulation**

Hafsa Qamar[1], Yongheng Yang[2]
[1]Lahore University of Management Sciences; [2]Zhejiang University

P07.2 **Comparison and Hardware Design Optimization for single-stage On-board Chargers**

Tengfei Wang[1,2], Tianyi Ren[2], Junjie Li[2], Zhiyuan Wang[2], Jiangtao Xu[2], Shuying Yang[1]
[1]Hefei University of Technology; [2]Sungrow Power Supply Co., Ltd.

August 15, Saturday

P07.3 **High-Dynamic Control of SRC Charging-Discharging System with Fuzzy PI-RBF Online Feedforward Method**

Peng Chen[1,2], Zhan Shen[1,2], Wu Chen[2], Yiqiao Fu[2], Yujia Shi[2], Liangcheng Ruan[2], Lei Li[3], Ruze Song[4], Junjie Zhang[5]
[1]Jiangsu Collaborative Innovation Center for Smart Distribution Network; [2]Southeast University; [3]ZTT Transformer Co., Ltd.; [4]ZTT Submarine Cable Co., Ltd.; [5]Wuxi Putian Iron Core Co., Ltd.

P07.4 **Design and Control of a GaN-Based Single-Stage Bidirectional On-Board Charger with Reactive Power Regulation Capability**

Mingqian Chen, Jiahao Zhang, Qingsong Wang
Southeast University

P07.5 **Topology and Modulation Strategy of DR-AAMC Hybrid HVDC System for Offshore Wind Power Transmission**

Xiangjin Zhang, Heya Yang, Xin Xiang, Wuhua Li
Zhejiang University

P07.6 **Optimal Configuration of PV-Storage-Charging Stations Considering Node Voltage Constraints**

Hao Zhang[1], Lu Cheng[1], Linyun Cheng[1], Yan Zhang[2], Yan Du[3], Jinzhong Li[2], Jiawen Liu[3]
[1]State Grid Hefei Power Supply Company, State Grid Anhui Electric Power Co., Ltd.; [2]State Grid Anhui Electric Power Research Institute, State Grid Anhui Electric Power Co., Ltd.; [3]Hefei University of Technology

P07.7 **Optimization Of Wake Effect Collaborative Strategy In Wind Farms Based On Improved Snake Optimization Algorithm**

Kaitai Yang, Suqin Qian
Donghua University

P07.8 **Distributed Cooperative Control Based Voltage Violation Mitigation for High-Penetration PV Distribution Networks**

Gaige Liang[1], Beibei Li[1], Cheng Shu[1], Cun Li[1], Yifeng Su[2], Zheng Gong[2]
[1]State Grid Xuzhou Power Supply Company; [2]China University of Mining and Technology

P07.9 **A Photovoltaic GMPPT Method Based on Region Segmentation Principle and Shallow Decision Tree**

Du Chen, Yinxiao Zhu, Chengjie Ni, Xinbao Kang, Yongheng Yang
Zhejiang University

P08 Advanced Converter Topologies & Control

Time: 15:30-18:00, August 15
Venue: 3F Grand Ballroom A
Chair: Fei Li, Hefei University of Technology

P08.1 **A Soft-Switching Common-Ground Switched-Capacitor Multilevel Inverter**

Yu Qing, Hongye Liu, Lei Ma, Yangming Kou, Jia Yao
Nanjing University of Science and Technology

P08.2 **Modulation and Control of a Five-Level AC/DC Converter**

Yipeng Ren, Dehong Xu
Zhejiang University

P08.3 **An Inductor-Series High-Gain Boost Converter Based on an Automated Topology Derivation Method**

Huizhu Zhuang[1], Hong Li[2], Yidi Liang[1], Peng Sun[1], Xu Shangguan[1], Huamin Jie[3]
[1]Beijing Jiaotong University; [2]Zhejiang University; [3]Nanyang Technological University

P08.4 **Single-Phase MISN PFC Converter Based on Half-Bridge Submodules and Energy-Balancing Control**

Jiahao Zhang, Qingsong Wang
Southeast University

P08.5 **An Online Capacitor Condition Monitoring Method for Four-Switch Buck-Boost Converter**

Chio-Hong Leong[1,2,3], Wai-Kit Sou[1,2], Chi-Fong Ieong[1,2], Chi-Kong Wong[4], Chi-Seng Lam[1,2,3]
[1]State Key Laboratory of Analog and Mixed-Signal VLSI, University of Macau; [2]Institute of Microelectronics, University of Macau; [3]Department of Microelectronics, Faculty of Information Science and Computing, University of Macau; [4]Macau Baptist College

P08.6 **Design and Verification of a Grid-Connected Control System for a Single-Phase Photovoltaic Inverter Based on Hardware-in-the-Loop Simulation**

Sicheng Dai, Guoao Li, Jiande Wu, Xiangning He
Zhejiang University

P08.7 **Characteristic Analysis of Three-Phase SL-VMC High-Gain Converter Based on Asymmetrical Phase-Shift Control**

Longlong Zhang, Wenbo Dong, Shiyu Ji, Qiongting Jin, Xiang Sun, Litao Xu
China University of Petroleum (East China)

P08.8 **Minimum Current Stress Regulation for Single-Stage Isolated DC-AC Converters: Topology Reconfiguration and Extended Phase-Shift**

Yuhang Duan[1], Peiran Zhang[2], Yiming Xu[1], Zhenbin Zhang[1]
[1]Shandong University; [2]City University of Hong Kong

P08.9 **A High Step-Down Ratio Converter With Current Doubler Rectification for Vertical Power Delivery**

Jiahe Qiu, Junming Zhang
Zhejiang University

P09 Resonant & Active Bridge Converters

Time: 15:30–18:00, August 15
Venue: 3F Grand Ballroom A
Chair: Wenxi Yao, Zhejiang University

P09.1 A ZVS-Oriented Modulation Strategy for Resonant Three-Phase Cycloconverter

Mingqi Du, Sixin Lin, Guipeng Chen
Xiamen University

P09.2 Hybrid ZCS/ZVS Modulation Strategies for 8:1 Multi-Resonant Switched-Capacitor Converter

Jieyun Zhao, Yu Fu, Shouxiang Li
Beijing Institute of Technology

P09.3 TD3-Based Current-Sharing Control for Interleaved LLC Resonant Converters

Xin Pan[1], Peng Chen[2]
[1]Nanjing Forestry University; [2]Southeast University

P09.4 A PSFB-Resonant Three-Port Converter Based on Parallel Coupled Inductor and Resonant Capacitor

Kang Hong, Guo Xu, Guangfu Ning, Mei Su
Central South University

P09.5 A Double-Sided LCC Resonant Converter for High-Voltage and High-Current Applications

Youming Jiang[1], Zhiyong Zeng[1], Xiaoliang Jin[2]
[1]Nanjing University of Science and Technology;
[2]Nanjing Institute of Technology

P09.6 Oscillation Analysis and Suppression Methods for LLC Converter With Phase-Shifted Working Mode

Zeyu Yan, Qi Li, Changsheng Hu
Zhejiang University

P09.7 Design and Optimization of Modular Single Active Bridge Converter

Xiaoying Chen, Jun Zhang, Yizhan Zhuang, Xiangpeng Cheng, Yiming Zhang, Zehong Yao
Fuzhou University

P09.8 Distributed Multi-Agent Consensus Control With Dynamic Task Allocation for Modular IPOP Dual-Active-Bridge Converter Systems

Yuefeng Liao, Huanhuan Cui, Duo Yang, Jiarui Dong
Zhengzhou University

P09.9 Startup-Transient-Based Parameter Identification of Dual Active Bridge Converters for Digital Twin Updating

Xiangbo Wang[1], Zhan Shen[1], Kaiyuan Liu[1], Wu Chen[1], Junjie Zhang[2], Ruze Song[3], Lei Li[4]
[1]Southeast University; [2]Wuxi Putian Iron Core Co., Ltd.; [3]ZTT Submarine Cable Co., Ltd.; [4]ZTT Transformer Co., Ltd.

P09.10 Symmetry-Breaking-Based Fault Localization in Dual Active Bridge Converters at the Unity-Gain Boundary

Krishna Laksheta, Yohan Fajar Sidik, Fransisco Danang Wijaya
Universitas Gadjah Mada

August 15, Saturday

P10 Grid-forming Converters & Control – I

Time: 15:30–18:00, August 15
Venue: 3F Grand Ballroom A
Chair: Chao Wu, Shanghai Jiao Tong University

P10.1 Analysis of Wideband Oscillation Characteristics of Grid-Following Photovoltaic and Grid-Forming Energy Storage Grid-Connected Systems for Power Grids

Yingqi Liu, Guoling Wang, Gaoyuan Qiu, Ruolin Chen
Jimei University

P10.2 Transient Stability Analysis of Multi-VSG Grid-Connected Systems Considering Multi-Machine Coupling

Fei Li, Bofei Liao, Wenhao Han, Xing Zhang, Muzi Sun
Hefei University of Technology

P10.3 A Hybrid Series-Shunt Configuration for Overcurrent Suppression in Grid-Forming Systems

Hetianyi Xie, Kai Yin, Yongheng Yang
Zhejiang University

P10.4 Current Saturation Ratio Compensation in Overcurrent Relay Protection for Grid-Forming Converters

Decheng Gao[1], Shan Jiang[1], Ye Zhu[2], Georgios Konstantinou[1]
[1]UNSW Sydney; [2]ShanghaiTech University

P10.5 An improved Cascaded Control for Grid-forming Inverter under Parameter Uncertainties

Cong Peng[1], Jiashun Zhang[2], Yi Yuan[1], Pengju Sun[2]
[1]Shizhu Power Supply Branch, State Grid Chongqing Electric Power Company; [2]State Key Laboratory of Power Transmission Equipment Technology, Chongqing University

P10.6 A PSO-Tuned Fuzzy Adaptive Inertia and Damping Control Strategy for Virtual Synchronous Generators

Zhifei Wang, Rongwu Zhu, Hongjie Wang
[1]Harbin Institute of Technology, Shenzhen

P10.7 DC-Side Coordinated Control Strategy for Grid-Forming Hybrid Energy Storage Systems Considering SOC Constraints

Zheyi Fan[1], Pengfei Hu[1], Mingjun Sheng[2], Zhilong He[2]
[1]Zhejiang University; [2]China Datang Corporation Science and Technology General Research Institute Ltd

P10.8 Evaluation of Voltage-Source Properties of Grid-Forming Converters with Different Control Frameworks under Weak Grid

Yitian Wang, Chao Wu, Yong Wang
Shanghai Jiao Tong University

P10.9 Evaluation of Anti-disturbance Capability for Grid-Forming Converter Control Based on AHP-EWM and TOPSIS

Fei Li, Zhicheng Xu
Hefei University of Technology

P11 Grid-forming Converters & Control – II

Time: 15:30–18:00, August 15
Venue: 3F Grand Ballroom A
Chair: Ye Zhu, Shanghai Tech University

P11.1 Comparison of Different APCL Structures for VSG under Power-Frequency Disturbance

Jinqiang Zhao, Xingshuo Li, Guishu Zhao
Nanjing Normal University

P11.2 Transient Synchronization Stability Analysis and Reactive Injection Parameter Optimization for Multi-Converter Systems

Hongjian Jiao, Jinming Xu
Nanjing University of Aeronautics and Astronautics

P11.3 Oscillation Identification and Stability Enhancement for Grid-Following and Grid-Forming Hybrid Systems

Yinfeng Wang[1], Xiaohe Wang[2], Wenjie Li[1], Liangcheng Fang[1], Zhihui Zhu[1], Yitian Wang[3], Chao Wu[3]
[1]PowerChina (Wenzhou) Green Energy Development Co., Ltd.; [2]PowerChina Huadong Engineering Co., Ltd.; [3]Shanghai Jiao Tong University

P11.4 Design and Analysis of the Synchronous Loop in an SVG under Weak Grid Conditions

Jingyi Li[1], Fei Wang[1], Ke Jin[2], Lintao Ren[2], Tianling Shi[1], Xiaokang Zhang[1]
[1]Shanghai University; [2]Panxin Technology (Shanghai) Co., Ltd.

P11.5 Full-order Modelling of Grid-Forming Inverter and Its Active Power Oscillation Characteristics

Si Wu[1], Xiao Liu[2], Xiong Liu[2]
[1]Jiangsu Longyuan Offshore New Energy Co., Ltd.; [2]Jinan University

P11.6 An Adaptive Inertia and Damping Coefficient Control Strategy for Virtual Synchronous Generator

Fanshu Ma[1], Hao Wu[1], Mingjun Sheng[2], Zhilong He[2]
[1]Zhejiang University; [2]Datang East China Electric Power Test & Research Institute

P11.7 Small-Signal Impedance Modeling and Analysis of Grid-Forming Hydrogen Electrolyzer

Peibo Sun[1], Jialin Liu[2], Lihan Qiu[1], Haijiao Wang[1]
[1]China Electric Power Research Institute; [2]Shangluo University

P11.8 Grid-Forming Offshore Wind Farm and VSC-HVDC-based Communication-Free Frequency Support

Peng Chen[1], Ke Hu[1], Ming Zhao[1], Hongjie Wang[2], Yao Zeng[2], Rongwu Zhu[2]
[1]Zhongnan Engineering Corporation Limited; [2]Harbin Institute of Technology, Shenzhen

August 15, Saturday

P12 Power Electronics for Motor Drives & Machines

Time: 15:30–18:00, August 15
Venue: 3F Grand Ballroom A
Chair: Xiong Liu, Jinan University

P12.1 A Dual-Paralleled GaN Motor Drive for Humanoid Robotic Joints

Ziheng Zhang, Junpeng Cheng, Wenxi Yao, Wuhua Li
Zhejiang University

P12.2 Outer-Rotor PMSMs for Quasi-Direct-Drive Actuators: A Comparative Study of Pole-Slot Combinations

Xing-Ao Pan[1], Shifeng Bai[2], Shi-Chun Bao[3]
[1]Harbin Institute of Technology; [2]National Innovation Center for Advanced Medical Devices; [3]Shenzhen University of Advanced Technology

P12.3 Research on Axial Magnetic Field Motor Vector Control System Based on Differential Flatness Control and T-Type Three-Level Inverter

Yi Ding[1], Xiaokang Zhang[1], Fei Wang[1], Tianling Shi[1], Jun Zhu[2], Lintao Ren[3]
[1]Shanghai University; [2]Leadrive Technology (Shanghai) Co., Ltd.; [3]Panxin Technology (Shanghai) Co., Ltd.

P12.4 Interturn Fault Diagnosis of Interior Permanent Magnet Synchronous Motors for Electric Vehicles Based on Reactive Power Distortion

Haobo Sun[1], Ziqian Hu[1], Wenxi Yao[1], Liang Cao[2], Zhihao Song[2], Heya Yang[1]
[1]Zhejiang University; [2]Leadrive Technology (Hangzhou) Co., Ltd.

P12.5 Analysis and Compensation of Current Sampling Delay for IPMSM in Synchronous Reference Frame

Xiangding Guo[1], Liang Cao[2], Zhihao Song[2], Wenxi Yao[1], Wuhua Li[1], Cong Wen[1]
[1]Zhejiang University; [2]Leadrive Technology (Hangzhou) Co., Ltd.

P12.6 Fault-Tolerant Control Strategy for Standard Three-Phase PMSM Under Single Open-Switch Fault

Tao Lou[1], Ziqian Hu[1], Wenxi Yao[1], Liang Cao[2], Zhihao Song[2], Heya Yang[1]
[1]Zhejiang University; [2]Leadrive Technology (Hangzhou) Co., Ltd.

P12.7 Sensorless Control for Ultra-High-Speed Permanent Magnet Synchronous Motor Based on Gallium Nitride Inverter

Kunbiao Cen, Yang Huang, Xiong Liu
Jinan University

P12.8 A NARX-Based Online IGBT Junction Temperature Estimation Method for Embedded Deployment in Electric Drive Systems

Lingyu Zhou[1], Huichuang Bao[2], Liang Cao[3], Wenxi Yao[1], Wuhua Li[1]
[1]Zhejiang University; [2]Leadrive Technology (Shanghai) Co., Ltd.; [3]Leadrive Technology (Hangzhou) Co., Ltd.

Keynote Session

08:30–12:00	**Registration**	**Hotel Lobby**

Keynote Speeches — **3F Grand Ballroom**

Chairs: Junming Zhang, Zhejiang University
Bo Zhang, South China University of Technology

09:00–09:40	**Model Predictive Control: Basic Concepts, Applications, Advances and Challenges** **Jose Rodriguez** Universidad San Sebastian
09:40–10:20	**High Voltage Transformerless Grid-Tied Battery Energy Storage System** **Rui Li** Shanghai Jiao Tong University
10:20–11:00	**Embedded Packaging Technology for SiC Power Modules** **Min Chen** Zhejiang University
11:00–11:20	**Coffee Break** — **3F Foyer**

Panel Session

Panel Discussion 2: AI for Power

Moderator: Yongheng Yang, Zhejiang University
Time: 11:20–12:20, August 16, Sunday
Venue: 3F Grand Ballroom

11:20–11:25	**Introduction**
11:25–11:45	**Opening Perspectives** **Power Electronics with Edge Intelligence** **Feng Gao** Shandong University **Three Things AI Still Can't Do in Power Electronics (and Why They Matter Most)** **Huai Wang** Aalborg University **AI for Power: Go Big, Go Small or Go Home?** **Georgios Konstantinou** The University of New South Wales
11:45–12:15	**Moderated and Interactive Discussions**
12:15–12:20	**Wrap-Up**

Oral Technical Sessions

T03 AI for Power Electronics

Time: 13:30–15:10, August 16
Venue: 3F Harvest Room
Chairs: Huai Wang, Aalborg University
Zhicong Huang, South China University of Technology

13:30–13:50 T03.1
Neural Ordinary Differential Equations Surrogated Grid-tied Inverters for Real-Time Simulation in RT-LAB

Jiawei Li, Yaofeng Liang, Zhicong Huang
South China University of Technology

13:50–14:10 T03.2
PINN-Based Time-Domain Analysis for LLC Converters Operating in PO Mode

Sixin Lin, Wen Cao, Mingqi Du, Guipeng Chen
Xiamen University

14:10–14:30 T03.3
TIM: A Topology-Informed GNN Framework for Peak Current Prediction in LC-DAB Converters

Jingzhou Ding, Fanfan Lin
ZJU-UIUC Institute, Zhejiang University

14:30–14:50 T03.4
An Adjacency-Matrix-Based Method for Reducing Isomorphic Structures in Power Electronic Circuit Topology Generation

Yi Zhou[1], Hanqiu Xu[1], Yanxuan Du[1], Xingshuo Li[1], Liping Mo[2]
[1]Nanjing Normal University; [2]Hefei University of Technology

14:50–15:10 T03.5
FluxMind: Combining Large Language Models and Machine Learning for Inductor Design

Haopeng Shi, Han Cui
Tianjin University

T04 Data Center Power Systems

Time: 13:30–15:10, August 16
Venue: 3F Grand Ballroom A
Chairs: Maohang Qiu, Southwest Jiaotong University
Yenan Chen, Zhejiang University

13:30–13:50 T04.1
Comparative Analysis of PWM-Regulated Topologies for 48-V Intermediate Bus Converter

Yujie Jiang, Binyuan Chen, Yenan Chen
Zhejiang University

13:50–14:10 T04.2
Optimised Winding and Component Arrangement for Low-Voltage, High-Current LLC-DCX Converters

Haochen Zhang, Yueshi Guan, Yijie Wang, Dianguo Xu
Harbin Institute of Technology

14:10–14:30 T04.3
A Switched-Capacitor Auto-Transformer Based DC-DC Converter for Data Center Application

Maohang Qiu, Yongbo Wang, Hongbo Ma
Southwest Jiaotong University

14:30–14:50 T04.4

A Wide-Load-Range Integrated 4-Phase TLVR With Current-Mode Control

Caolei Pan[1,2], Wen-Liang Zeng[1,2], Zhaoxi Li[3], Di Li[3], Dongdong Chen[3], Chi-Seng Lam[1,2]
[1]State Key Laboratory of Analog and Mixed-Signal VLSI; [2]University of Macau; [3]Xidian University

14:50–15:10 T04.5

Power Delivery Challenges of 800 V HVDC AI Datacenter Microgrids: A GPU Load Dynamics Case Study

Kejun Qin, Yuzhuo Li, Yunwei Li
University of Alberta

T05 Invited Session: DC Grids

Time: 15:30–17:10, August 16
Venue: 3F Harvest Room
Chairs: Jingxin Hu, Nanjing University of Aeronautics and Astronautics
Ting Wang, Xi'an Jiaotong University

15:30–15:50 T05.1

A Review of Fault Diagnosis and Fault-Tolerant Control for Isolated DC-DC Converters: Switches, Capacitors, and Transformers

Chuang Wang, Mingwei Lu, Hao Hu, Jingxin Hu
Nanjing University of Aeronautics and Astronautics

15:50–16:10 T05.2

Quantitative Evaluation on Cascaded Control Performance of Wide-range Buck/Boost-DAB Based on Impedance Interaction Stability Analysis

Yang Shen[1], Zixiang Cai[1], Hua Ni[1], Zhiqing Yang[1], Jingxin Hu[2], Helong Li[1]
[1]Hefei University of Technology; [2]Nanjing University of Aeronautics and Astronautics

16:10–16:30 T05.3

An Improved Modulation Method for Hybrid Cascaded Multilevel Converter based on SHEPWM

Lining Yan[1], Hang Yang[1], Zhizhen Song[1], Heya Yang[1], Wenxi Yao,[1] Wuhua Li[1], Chen Jia[2]
[1]Zhejiang University; [2]State Grid Liaoning Electric Power Co., Ltd.

16:30–16:50 T05.4

Decentralized Fault Classification Model for DC Microgrids Based on Physics-Informed Neural Networks

Yishi Yang, Zeyang Cheng, Zhiguo Hao, Ting Wang
Xi'an Jiaotong University

16:50–17:10 T05.5

Coordinated Control of Modular DAB Converters for Power Routing in DC Microgrids

Zihan Zhou, Fan Jian, Zhiguo Hao, Ting Wang, Zeyang Cheng
Xi'an Jiaotong University

August 16, Sunday

T06 Invited Session: Microgrid Control and Applications

Time: 15:30–17:10, August 16
Venue: 3F Grand Ballroom A
Chair: Nie Hou, Tianjin University
Yuanhui Ruan, Southwest Jiaotong University

15:30–15:50 T06.1
Multimodal Dual Network with Cross Attention for LFP Battery State of Health Estimation

Beier Huang[1], Yu Zeng[1], Dehong Zhou[1], Xin Liu[1], Ziheng Xiao[2], Jianxiao Zou[1], Josep Pou[3]
[1]University of Electronic Science and Technology of China; [2]Nanyang Technological University; [3]City University of Hong Kong

15:50–16:10 T06.2
A Current-Direction Constrained Model Predictive Control for Common-Mode Voltage Suppression in Three-Phase Four-Leg Inverter

Yu Zheng[1], Jun Zheng[1], Shihong Zhong[1], Decan Liu[2], Junpeng Ma[2]
[1]China Southwest Architectural Design and Research Institute Co., Ltd.; [2]Sichuan University

16:10–16:30 T06.3
Back-to-Back Multiport Converters for Battery Integration in Direct-Drive Wind Turbine Systems

Yu Huang, Dehong Zhou, Zewei Shen, Jianxiao Zou, Yu Zeng
University of Electronic Science and Technology of China

16:30–16:50 T06.4
Hybrid Training TD^3 for Ripple Suppression of SSMPI in Islanded Microgrids

Xian Zhou[1], Yu Zeng[1], Dehong Zhou[1], Zewei Shen[1], Yuan Gao[2], Jianxiao Zou[1], Josep Pou[3]
[1]University of Electronic Science and Technology of China; [2]University of Leicester; [3]City University of Hong Kong

16:50–17:10 T06.5
Design, Optimization, and Experimental Validation of a 13.56 MHz Wireless Power Transfer System

Tianlu Ma[1], Jiusi Guo[2], Zhaozheng Zhu[1], Ben Zhang[1], Wei Qiao[2], Chaoqiang Jiang[1]
[1]City University of Hong Kong; [2]The University of Hong Kong

August 16, Sunday

Industry Sessions

I02 Power Devices and High-Efficiency Power Supply Technology

Time: 13:30–15:10, August 16
Venue: 3F Grand Ballroom B
Chairs: Sheng Zheng, Yongjiang Laboratory
Shuai Shao, Zhejiang University

13:30–13:55 The Best Supporting Actor on the AIDC Stage: Next-Gen High-efficiency High-density Power Systems Solutions
Justin Zhu
XPOWER

13:55–14:20 SiC JFET Devices and Their Advanced Package Technologies
Jie Dong
Infineon Technologies

14:20–14:45 Advanced Thermal Structure Innovates Next Generation Low-Voltage Power Semiconductor Technology
Yubo Zhang
Silicon Magic Semiconductor Technology

14:45–15:10 GaN Device Lifetime Assessment Based on H-Bridge Dynamic H-HTOL System
Yu Gao
Innoscience Technology Co., Ltd.

I03 Power Electronics for Renewable Energy

Time: 15:30–17:10, August 16
Venue: 3F Grand Ballroom B
Chairs: Dongyu Wang, Delta Electronics, Inc.
Yenan Chen, Zhejiang University

15:30–15:55 Practices on Key Technologies and Products of User-Side DC Microgrid for Industrial and Commercial Scenarios
Jian Li
Hangzhou BOCO Electronics Co., Ltd.

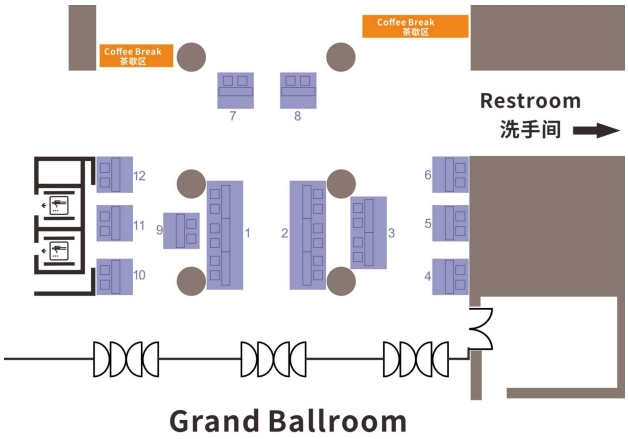
15:55–16:20 Modular Electronic Research Platform Based on Rapid Prototype Control
Qixian Mei
Nanjing Rtunit Information Technology Co., LTD

16:20–16:45 Digital-Intelligent Development and Prospect of New Electrochemical Energy Storage Systems Throughout the Whole Life Cycle
Siyang Zhao
Beijing HyperStrong Technology Co., Ltd.

16:45–17:10 Integrated PV-Storage Solution: Building a Green, Reliable, and Intelligent Independent Power System
Xinwei Liu
Sigenergy Technology Co., Ltd.

August 16, Sunday

Exhibition Map



Booth No.	Sponsorship Tier	Company Name
1	Diamond	PNJ Semiconductor
2	Diamond	rtunit
3	Platinum	DELTA
4	Gold	Changce Electronic System
5	Gold	EPLATINO
6	Gold	TCL Digital Power
7	Gold	Infineon
8	Gold	Fuji Electric
9	Silver	ITECH
10	Silver	Ningce
11	Silver	FIRSTACK
12	Silver	TDG

派恩杰半导体 PN JUNCTION SEMICONDUCTOR

2018 公司成立

300+ 企业员工

42% 研发人员占比

15亿+ 资产规模

双循环 公司供应链战略

全球化 业务遍布全球市场

派恩杰是一家专注于【碳化硅功率器件与模块】的研发、制造与应用的【国家高新技术企业】。

总部位于中国宁波前湾新区，并在上海、杭州、深圳、纽伦堡、首尔等地设有分支机构，业务扎根全球并实现快速增长。

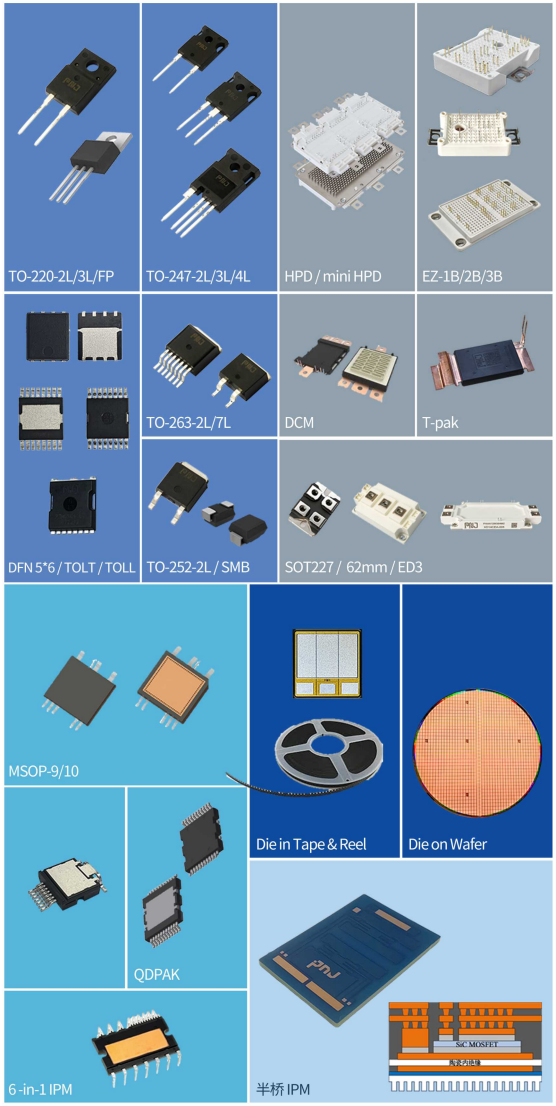
集成设计、制造与开放供应链的国际化企业，制造平台涵盖中国、东亚、东南亚、美国等地，灵活支撑客户的供应链需求。

- 全球领先 3.2 μm 超小元胞结构
- HDFM 性能指标
- JEDEC 标准制定参与者
- 车规级批量交付 (500w+)

产品类型	650V / 750V 平台	1200V / 1500V 平台	1700V / 2300V 平台
系统母线电压	230Vdc ~ 450Vdc	600Vdc ~ 1000Vdc	1050Vdc ~ 1500Vdc
SiC MOSFET	OBC / AI服务器电源 涵盖低导通电阻产品	新能源汽车主驱 光伏储能核心器件	智能电网 / 工业风电 高压高频应用
SiC SBD/JBS (肖特基二极管)	充电桩 / PFC电路 高效整流	光伏逆变器 / 充电桩 快恢复 / 低损耗	超高压工业电源 高能效整流
SiC 功率模块	高频高密度电源适配器 消费电子/数据中心	全桥/半桥 SiC 模块 针对车规级主驱 高功率密度集成方案	高压大功率模块 针对风光储/柔性 直流输电定制开发

特种器件	低压高鲁棒性 SiC MOSFET 100V	SiC JFET 750V / 1200V / 2300V	特高压平台 3300V/6500V/10KV/ 15KV/22KV
应用电压	48V	400V/800V/1500V	1050Vdc ~ 1500Vdc
利基应用 Niche Application	机器人关节电机	HVDC固态断路器 高海拔抗辐照电源	医疗器械 / 配电网 / 脉冲电源 / 直线电机驱动
产品优势	高温工作 / 抗短路 / 抗浪涌高鲁棒性	快速隔离故障 / 重复可靠无电弧关断	简化电路拓扑和控制策略 高温 / 高可靠性

■分立器件封装 ■裸芯片/晶圆 ■模块封装 ■嵌入式PCB封装 ■新型顶部散热封装



公司简介

ABOUT RTUNIT

南京瑞途优特信息科技有限公司(（rtunit®）)成立于2016年，是一家专注于电力电子、智能电网和电机驱动领域的创新型科技企业，致力于成为全球领先的工业级电力电子快速原型设备及解决方案供应商。作为国家认证的高新技术企业，公司始终坚持“自主研发、自主品牌、国产化”的发展理念，以创新驱动为核心，为客户提供高效、可靠的技术支持与产品服务。

Nanjing RTUNIT Information Technology Co., Ltd. (RTUNIT®) was founded in 2016. It is an innovative technology enterprise focusing on power electronics, smart grids and motor drives, dedicated to becoming a world-leading supplier of industrial-grade power electronics rapid prototyping equipment and solutions.

As a nationally certified high-tech enterprise, the company always adheres to the development philosophy of "independent R&D, self-owned brands and domestic production". Taking innovation as the core driving force, we provide customers with efficient and reliable technical support and product services.

项目应用案例

PROJECT APPLICATION CASES

如需定制化系统方案，敬请联系我们
For customized system solutions,
please feel free to contact us.

电机与驱动系统
Motor and Drive Systems

- Motor control test platform
- High-speed permanent magnet synchronous motor (PMSM) control algorithm verification platform
- Axial-flux motor drive control platform
- Linear motor drive control platform
- In-wheel motor drive control platform

微电网与综合能源系统
Microgrids and Integrated Energy Systems

- Multi-energy microgrid hardware-in-the-loop (HIL) test platform
- Source-grid-load-storage based distributed renewable energy microgrid system
- AC/DC hybrid microgrid system

多电平与模块化功率变换器
Multilevel and Modular Power Converters

- Three-level inverter
- Modular multilevel converter (MMC)
- Back-to-back MMC grid-connected system
- M3C matrix converter
- Cascaded H-bridge multilevel inverter

rtunit

新能源发电与并网技术
New Energy Generation and Grid-Connection Tech

- Dual Active Bridge (DAB) experimental platform
- Wave energy simulation power generation sys
- Electric vehicle V2G charging pile
- Grid-following inverter
- Grid-forming inverter
- Direct-drive wind power system
- Fuel cell power generation system

特种应用与先进仿真测试
Special Applications & Advanced Simulation Testing

- Variable-load traction inverter
- Smart energy digital-analog hybrid real-time simulation platform
- Light-duty DC transmission and high-voltage cascade converter experimental platform
- Simulation and testing platform for grid-forming converter equipment in microgrids for distribution-microgrid coordination

储能系统与技术
Energy Storage Systems and Technologies

- Energy storage PCS converter (Power Conversion System)
- Cascaded energy storage unit
- Cell-level reconfigurable battery system
- High-voltage direct-connected grid-forming hybrid energy storage system
- Open-type grid-following energy storage power generation system
- Open-type grid-forming energy storage power generation system

rtunit

About Delta

Delta, founded in 1971, is a global leader in power and thermal management with a thriving portfolio of IoT-based smart energy-saving solutions in the fields of data center infrastructure, microgrids, smart manufacturing, intelligent buildings, and E-mobility to nurture mankind's sustainable development.

Delta has consistently allocated 8% to 9% of its annual revenue to research and development (R&D), driving the creation of intelligent, energy-saving, and reliable solutions across industries. Delta has over 12,000 R&D engineers throughout the world with R&D activities coordinated on a global scale. Delta has continuously expanded R&D scale. We have not only enlarged the Design Center in Hangzhou but also established a new R&D building in Wuhan. Currently, Delta has 25 R&D centers in Mainland China, with over 3,100 R&D engineers. Its laboratories in Shanghai, Dongguan and Wujiang, have all been accredited by the China National Accreditation Service for Conformity Assessment (CNAS). Moreover, the R&D center in Wujiang has a post - doctoral workstation, and the R&D center in Shanghai has a post - doctoral innovation practice base.

www.deltaww.com

DELTA

昌测电子 X Kewell

上海昌测电子系统有限公司致力为新能源汽车、航天航空、光伏储能和半导体等行业提供测量仪器、定制化测试系统&解决方案。

昌测电子作为科威尔官方授权经销商，主营全系列电源测试设备。本次ZPEC 展会重点推荐数据中心 AI 服务器电源系统测试解决方案，可覆盖PSU、HVDC、SST、BBU、UPS 等测试；配套专业源载设备与自动化测试系统，为高校科研与算力设备研发提供专业测试支撑。

科威尔数据中心AI服务器电源系统测试解决方案

上海昌测电子系统有限公司

销售电话:18817391737
销售邮箱:simon@sh-changce.com
公司地址:上海浦东新区北蔡镇罗山路4088弄100号B402室

昌测电子 X Kewell

直流电子负载

E5100P系列
可编程直流电子负载
4U/6.6kW
单机最高功率72kW
电流斜率80A/us

D2000系列
可编程双向直流电源
单机最高功率500kW

直流源载

S7000/S7200系列
可编程双向直流源载系统
3U/30kW
动态响应时间500us
峰值效率95.5%
源载一体

D2100-LG系列
回馈式电子负载系列
单机最高功率600kW
峰值效率95.5%
源载一体

交流源载

G6000/G9000系列
可编程双向交流源载系统
3U/25kVA
交直流一体
源载一体

A2000-LG系列
可编程双向交流电源
单机最高功率
500kW
交直流一体

测试系统

Kewell TestWell系列
AI 服务器电源自动化测试系统
灵活、全面的测试能力
可覆盖HVDC、PSU、Power Shelf、Power Rack、BBU、DCDC 等测试

产品咨询请联系昌测电子

销售电话:18817391737
销售邮箱:simon@sh-changce.com
公司地址:上海浦东新区北蔡镇罗山路4088弄100号B402室

铂科电子 EPLATINO

杭州铂科电子股份有限公司

让能源使用更安全、更高效、更环保

Safer.Smarter.Greener

公司简介

· COMPANY PROFILE ·

杭州铂科电子股份有限公司是一家国家级高新技术企业、国家级专精特新重点 “小巨人” 企业，以高性能电能转换技术为核心，聚焦算力与储能场景，专业提供电源产品及配套系统解决方案。

公司业务覆盖研发设计、生产制造、销售服务全链条，主营算力服务器电源和 ESS 电能转换系统等相关产品与应用方案。

依托核心团队在高端电源领域二十余年的研发积淀与量产落地经验，铂科电子持续为客户交付更安全、更高效、更环保的电源产品及整套系统解决方案。

Hangzhou Boco Electronics Co., Ltd. is a national high-tech enterprise and a national key Specialised, Refined, Unique and Innovative "Little Giant" enterprise. Centred on high-performance energy conversion technology, it focuses on compute and energy storage applications, and specialises in supplying power supplies alongside supporting system solutions.

The company operates across the full value chain covering R&D, design, manufacturing, sales and after-sales services. Its core offerings include power supplies for compute servers, ESS energy conversion systems and related application solutions.

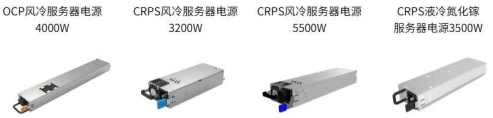
Drawing on its core team’s over 20 years of accumulated R&D expertise and mass production rollout experience in the high-end power supply sector, Boke Electronics consistently delivers safer, more efficient and more eco-friendly power supplies and complete system solutions to its clients.

铂科电子 EPLATINO

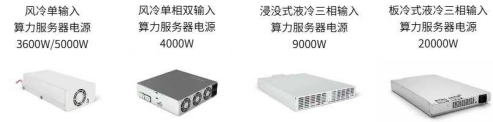
产品矩阵

· PRODUCT PORTFOLIO ·

AI服务器电源



专用服务器电源



户用及便携式储能电源

光储充电源

官方热线：0571-87379097

联系地址：杭州市滨江区浦沿街道东冠路611号金盛科技园A座

TCL Digital Power

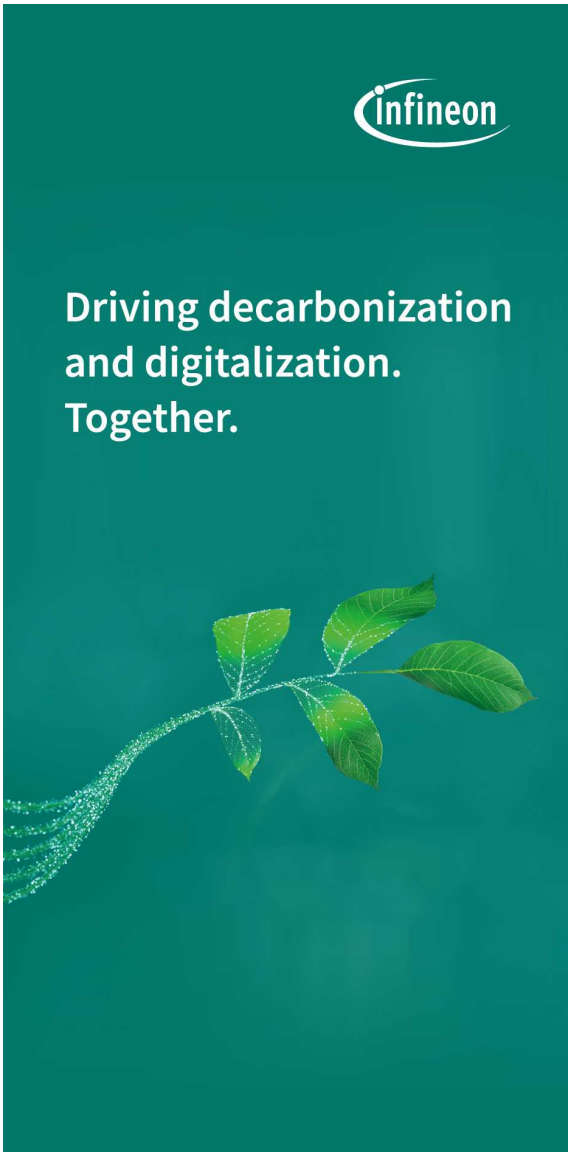
广东TCL深蓝技术有限公司

成立于2025年3月，是TCL集团全球产业布局的重要组成部分。公司专注于为全球电力用户提供经济、稳定、智能、清洁的智慧能源解决方案，致力于推动全球能源结构转型与绿色低碳发展。

关注公众号　访问官网

TCL Digital Power

TCL深蓝以电力电子技术、电化学储能技术为核心，融合人工智能、大数据、物联网等前沿科技，打造覆盖源网荷储全场景的智慧能源产品体系。公司产品广泛应用于家庭储能、工商业储能、源网侧储能、通信基站、数据中心等多个领域，助力客户实现能源的高效利用与绿色转型。



About Infineon:

Semiconductors are crucial to solve the energy challenges of our time and shape the digital transformation. This is why Infineon is committed to actively driving decarbonization and digitalization. As a global semiconductor leader in power systems and IoT, we enable game-changing solutions for green and efficient energy, clean and safe mobility, as well as smart and secure IoT. We make life easier, safer, and greener. Together with our customers and partners. For a better tomorrow.

Infineon designs, develops, manufactures, and markets a broad range of semiconductors and semiconductor-based solutions, focusing on key markets in the automotive, industrial, and consumer sectors. Its products range from standard components to special components for digital, analog, and mixed-signal applications to customer-specific solutions together with the appropriate software.

英飞凌中国

Infineon

富士电机(中国)有限公司
Fuji Electric (China) CO.,Ltd.

富士电机
Fuji Electric

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Fuji Electric (China) CO.,Ltd.
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网址 / Web:http://www.fujielectric.com.cn

公司简介 / Company Profile:

富士电机一直是功率半导体全球主流供应商和芯片生产商之一。不断进行技术革新,在行业中起领先作用,开发出具有独创性的产品。作为快速开发新产品的客户最佳伙伴,信守提供世界顶级品质的电子元件和服务的承诺

Fuji Electric has been one of the world's leading power semiconductor suppliers and chip manufacturers.
Constantly carry out technological innovation, play a leading role in the industry, develop innovative products.
As the best partner of customers for rapid development of new products, we keep our promise to provide the world's top quality electronic components and services.

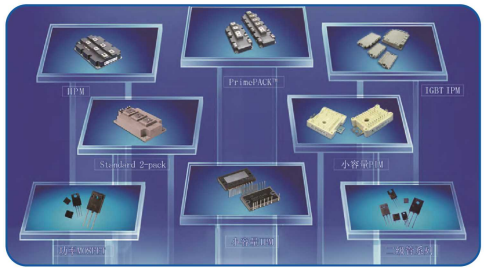
产品介绍 / Products Description:

1.GBT模块X系列:减少电力损耗,利于节能;实现机器的小型化;有助于提高机器的可靠性。
2.EV、HEV用IGBT模块:采用直接水冷散热器结构、实现了高功率密度和小型封装。
3.电平电源转换电路用IGBT模块:与2电平模块相比,输出波形近似正弦波,因此可实现LC滤波器小型化。另外,开关损耗降低一半,因此效率得以提高。针对太阳能发电、不间断电源装置等用途。
4.IPM:内置有包含IGBT驱动电路和保护电路的控制IC,因而容易设计外围电路,从而能够确保系统的高可靠性。适用于AC伺服系统,空调机、升降机等。
5.PIM:将3相变频器电路,二极管桥接电路,制动电路集成到1个模块上的产品,能够紧凑地设计主电路。分为小型轻量的小容量PIM和EconoPIMTM的两大类。
6.分立IGBT:可适用于UPS、功率变换器,空调、焊机和DC/AC转换器等电路中。
7.SiC器件:具有出色的特性,能够实现高耐压、低功耗、高频动作和高温动作,使用SiC的功率半导体能够实现大幅节能和安装产品的小型化、轻量化。

富士电机(中国)有限公司
Fuji Electric (China) CO.,Ltd.

富士电机
Fuji Electric

1. IGBT module - X series:
   Save energy by reduce power loss significantly. Realize system downsizing and to improve reliability.
2. EV and HEV used IGBT:
   Utilizing direct water cooling technology to achieve high power density and small size package;
3. 3-level topology IGBT:
   Compare to 2-level convertor, output waveform is very close to perfect sine wave. LC filter can be miniaturized.
4. IPM:
   Built-in IC including gate drive unit and protection circuit, makes peripheral circuit design easier and enhance system reliability, for AC servo system, air conditioner, and elevator application.
5. PIM:
   Integrate 3-phase inverter, rectifier and brake circuit into one module, making main circuit simpler and compacter, including Small PIM and Econo PIM two kinds of package.
6. Discrete IGBT:
   Suitable for UPS, power converter, air conditioner, welding machine and DC/AC convertors.
7. SiC devices:
   With its excellent characteristics, Fuji Electric' s SiC power semiconductor has high statistic voltage resistance, low power loss, high frequency switching and high temperature tolerance; can realize energy saving, system downsizing and lightness reduction significantly



Notes

SCHEDULE-AT-A-GLANCE

August 14, Friday

08:15 – 21:00	**Registration**	**Hotel Lobby**

09:00 – 12:30 Tutorials

3F Harvest Room	3F Grand Ballroom B	4F Diplomat Boardroom
Tutorial 1 Wideband Oscillation Analysis and Robust Stabilization Control for Grid-Tied Converter Systems	**Tutorial 2** Powering Next Generation AI Infrastructure: Ultra-Efficient/Compact Three-Phase Isolated Rectifier and Solid-State Transformer Concepts	**Tutorial 3** Advanced Inductive Power Transfer: From Fundamentals to Magnetics, Control, and System Topologies

12:30 – 13:30	**Lunch Break**	**2F Window Pavilion Cafe**

13:30 – 17:00 Tutorials

3F Harvest Room	3F Grand Ballroom B	4F Diplomat Boardroom
Tutorial 4 Integrated Digital Signal Processing and Machine Learning Frameworks for Real-Time Power Quality Disturbance Recognition and Embedded Implementation	**Tutorial 5** Inside the Solid-State Transformers	**Tutorial 6** Recent Advancements on Active Flux Control and DC Bias Prevention of Transformer Magnetic Core in AC-DC and DC-DC Applications

18:00 – 20:00	**Welcome Reception**	**2F Window Pavilion Cafe**
19:00 – 21:00	**IEEE PELS YP & WIE Events**	**17F Narada Tea House**

August 15, Saturday

08:15 – 21:00	**Registration**	**Hotel Lobby**
08:30 – 08:50	**Opening Ceremony**	**3F Grand Ballroom**
08:50 – 10:50	**Keynotes**	**3F Grand Ballroom**
10:50 – 11:20	**Coffee Break**	**3F Foyer**
11:20 – 12:20	**Panel 1: Is Solid-State Transformer Necessary for GW AI Data Centers?**	**3F Grand Ballroom**
12:20 – 13:30	**Lunch Break**	**2F Window Pavilion Cafe**

SCHEDULE-AT-A-GLANCE

August 15, Saturday

13:30 – 15:10 Industry & Technical Sessions

3F Harvest Room	3F Grand Ballroom A	3F Grand Ballroom B
TS 01 Grid-Forming Technologies & Stability	**TS 02** Solid-State Transformers & Multiport Converters	**IS 01** Power Electronics for AI Data Center
15:10 – 15:30	**Coffee Break**	**3F Foyer**
15:30 – 18:00	**Poster Sessions**	**3F Grand Ballroom A**
18:30 – 21:30	**Rtunit Night: Banquet & Awards Ceremony**	**3F Grand Ballroom**

August 16, Sunday

08:30 – 12:00	**Registration**	**Hotel Lobby**
09:00 – 11:00	**Keynotes**	**3F Grand Ballroom**
11:00 – 11:20	**Coffee Break**	**3F Foyer**
11:20 – 12:20	**Panel 2: AI for Power**	**3F Grand Ballroom**
12:20 – 13:30	**Lunch Break**	**2F Window Pavilion Cafe**

13:30 – 15:10 Industry & Technical Sessions

3F Harvest Room	3F Grand Ballroom A	3F Grand Ballroom B
TS 03 AI for Power Electronics	**TS 04** Data Center Power Systems	**IS 02** Power Devices and High-Efficiency Power Supply Technology
15:10 – 15:30	**Coffee Break**	**3F Foyer**

15:30 – 17:10 Industry & Technical Sessions

3F Harvest Room	3F Grand Ballroom A	3F Grand Ballroom B
TS 05 Invited Session: DC Grids	**TS 06** Invited Session: Microgrid Control and Applications	**IS 03** Power Electronics for Renewable Energy
17:30 – 19:30	**Dinner**	**2F Window Pavilion Cafe**