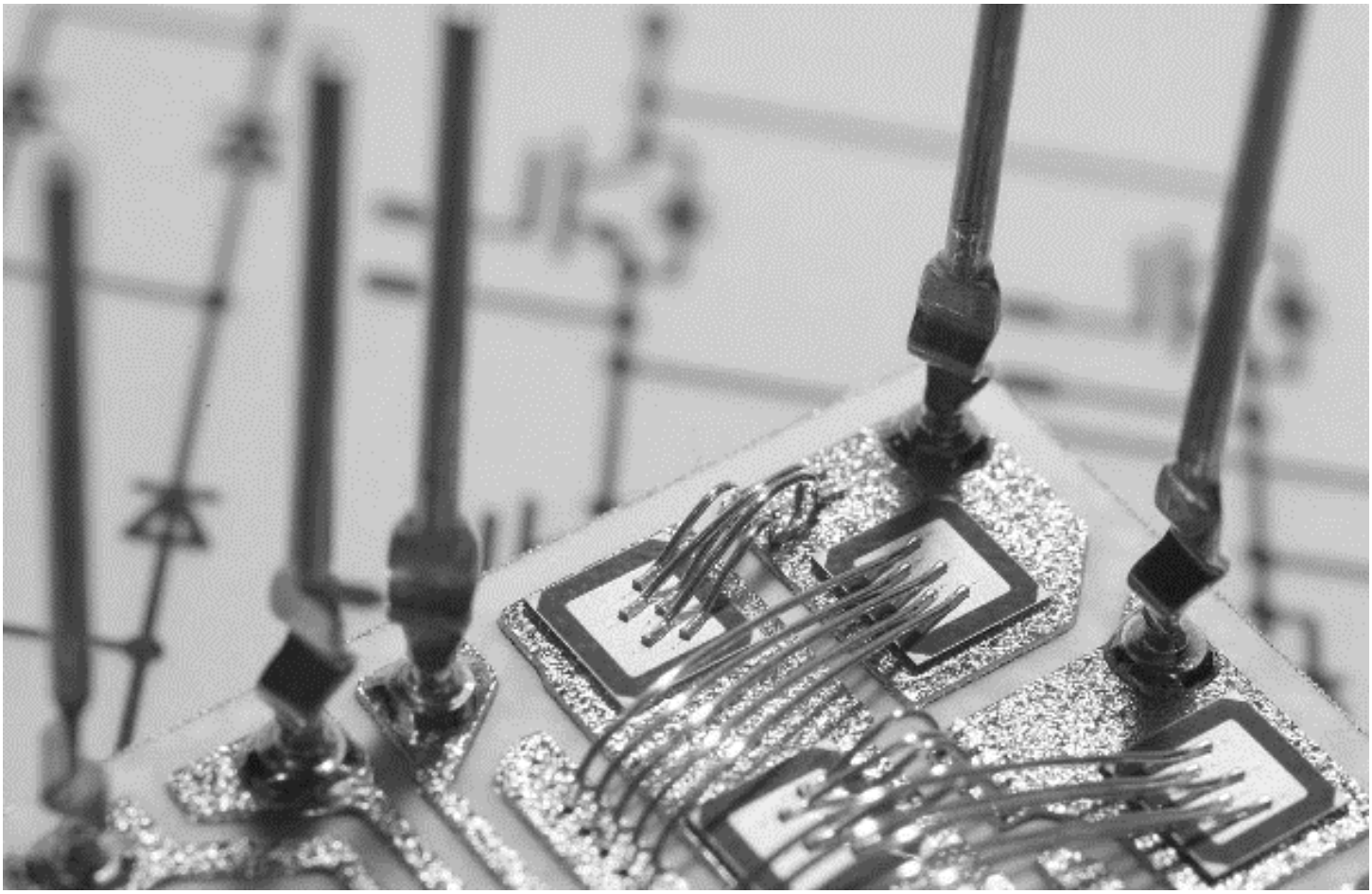

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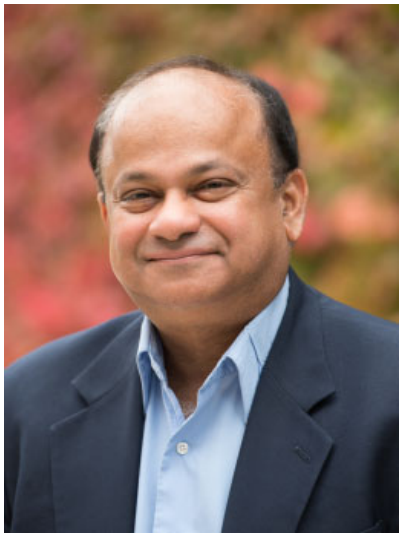
Welcome Message from the General Chair

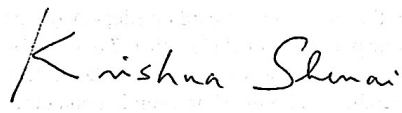


As the founding General Chair of IEEE International Workshop on Integrated Power Packaging (IWIPP) it gives me immense pleasure to welcome you to Chicago, Illinois, USA. Chicago's climate is usually very pleasant in the month of May and the Workshop will be held in the historic Congress Plaza hotel situated on the Magnificent Mile and adjacent to the world-famous Grant Park. There are countless number of attractions within walking distance of Congress Plaza hotel for first time visitors to Chicago, and for those who have been here before, Chicago always offers a plethora of new things to see every time you visit.

The power electronic module (PEM) forms the heart of all power converters. The PEM represents the engine of growth for 21st century energy economy just as the microprocessor was for 20th century information economy. The first edition of IWIPP was also held in 1998 at the Congress Plaza hotel which was a grand success. We expect IWIPP 2015 to be an event to remember for many years to come.

I would like to take this opportunity to thank IEEE Power Electronics Society (PELS) for sponsoring this event. The Organizing Committee deserves all the credit for putting together excellent technical and social programs. In particular, Ty McNutt and Wayne Johnson, along with the Technical Program Committee worked hard to assemble a set of high-quality technical papers, a professional panel and two timely short courses. John Shen provided excellent support as Finance and Local Arrangements Chair, and Lauren Kegley worked hard to obtain additional industry sponsorships as the Sponsorship Chair.

Again, I welcome you all to beautiful Chicago. I hope IWIPP 2015 will provide you with a forum to engage in the vigorous exchange of technical information in this burgeoning field. I am certain that Chicago will provide you with a much needed spring getaway after all the harsh winter weather we have had to bear this year.



Krishna Shenai, Ph. D.
General Chair

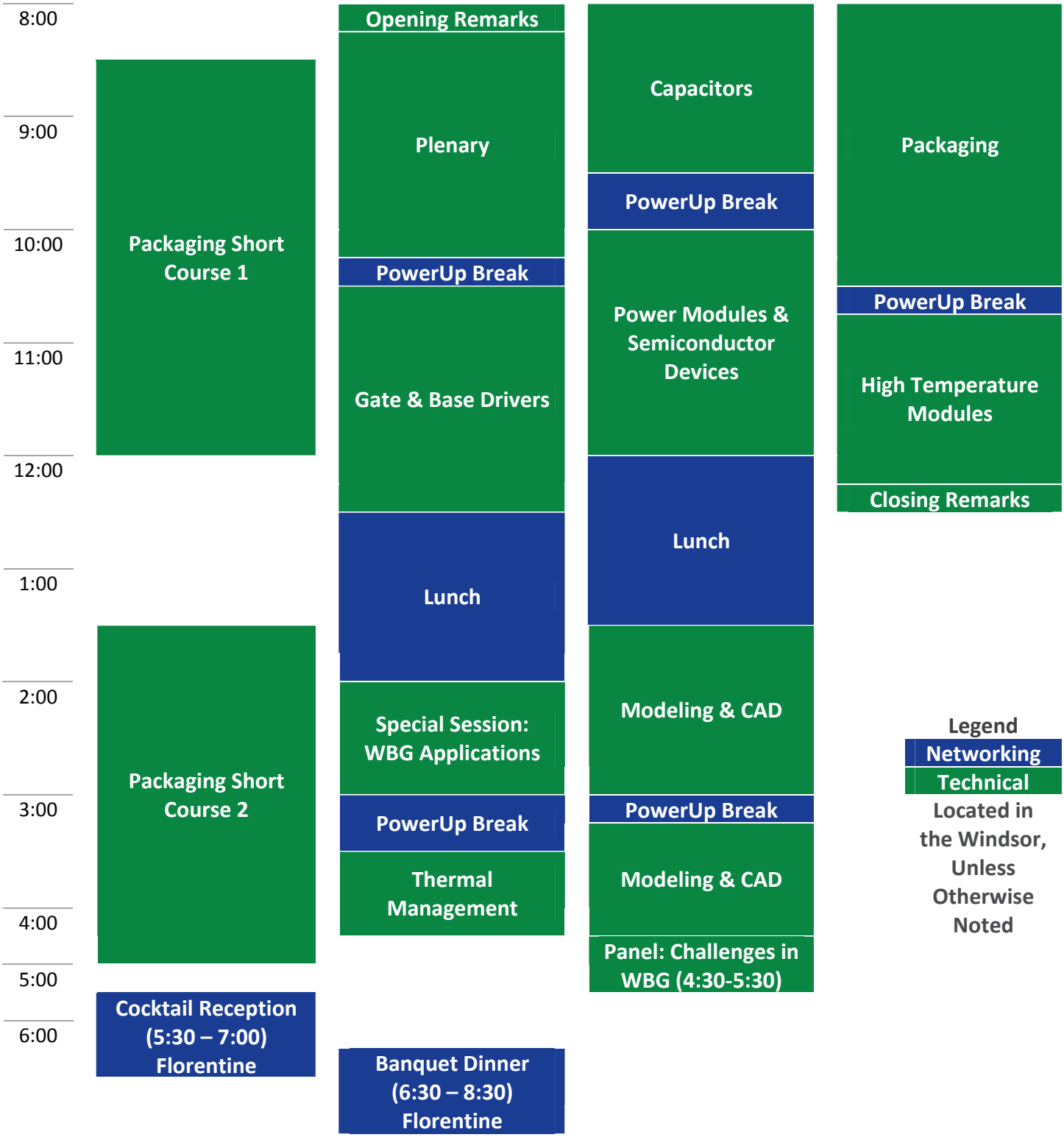
Welcome Message from the Technical Chair

On behalf of the technical committee, I take great joy in welcoming you the IEEE International Workshop on Integrated Power Packaging (IWIPP). The committee has worked very hard the past 12+ months to broaden the exposure of the IWIPP conference and proclaim the pressing need for advanced packaging approaches. As an industry, we are in a critical time when wide bandgap semiconductors are requiring a paradigm shift in packaging design and system design to exploit new performance advantages. As such, we have worked hard to assemble tutorial lecturers, plenary speakers and panelists from around the world, from device scientists through system engineers, all experts in their respective research areas.

With this in mind, the organizing committee felt it essential to couple these world-renowned experts with a social program and workshop schedule designed to enable networking, in fact, it was our top priority. The sessions are built around presentations and intimate Q&A sessions where dialogue is encouraged and time built in to allow for in-depth discussions.

In addition, the technical program was written in such a manner that the great city of Chicago could be enjoyed Tuesday evening and Wednesday afternoon during such a pleasant time of year. During your visit, please do try to catch a Cubs or White Sox baseball game, explore Navy pier and its surroundings, or relax and take in the magnificent views of Chicago and the great Michigan Lake from atop the Willis or John Hancock towers. With this wonderful city to explore and a workshop program full of experts from across the industry, we believe the workshop will be a very rewarding experience and we welcome you to experience all that IWIPP 2015 has to offer.

Ty McNutt, Ph. D.
Technical Chair


Sunday, May 3rd
Monday, May 4th
Tuesday, May 5th
Wednesday, May 6th
8:00
9:00
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5:00
6:00
Opening Remarks
Plenary
PowerUp Break
Gate & Base Drivers
Lunch
Special Session: WBG Applications
PowerUp Break
Thermal Management
Banquet Dinner (6:30 – 8:30) Florentine
Capacitors
PowerUp Break
Power Modules & Semiconductor Devices
Lunch
Modeling & CAD
PowerUp Break
Modeling & CAD
Panel: Challenges in WBG (4:30-5:30)
Packaging
PowerUp Break
High Temperature Modules
Closing Remarks
Packaging Short Course 1
Packaging Short Course 2
Cocktail Reception (5:30 – 7:00) Florentine
Legend
Networking
Technical
Located in the Windsor, Unless Otherwise Noted

Packaging Short Courses

Sunday, May 3rd | 8:30 AM – 12:00 PM

Low-Voltage GaN Power Switch Modules for Increased Energy Efficiency

Krishna Shenai | LoPel Corporation, United States
David Reusch | EPC, United States

Sunday, May 3rd | 1:30 PM – 5:00 PM

Power Module Packaging Technologies

Wayne Johnson | Tennessee Tech University, United States
Patrick McCluskey | University of Maryland, United States

Opening Remarks

Monday, May 4th | 8:00 AM – 8:15 AM

Krishna Shenai, LoPel Corporation, United States

Plenary

Monday, May 4th | 8:15 AM – 10:15 AM

Chairs: Ty McNutt, APEI, United States
Wayne Johnson, Tennessee Tech University, United States

SiC Power Devices Aspects for High Power Density and System Approach for a Successful Market Implementation

Peter Friedrichs | Infineon AG, Germany

Power Electronics Packaging Challenges for Future Warship Applications

Robert Cuzner | University of Wisconsin-Milwaukee, United States

A New Package of High-Voltage Cascode Gallium Nitride Device for High-Frequency Applications

Fred Lee, Wenli Zhang, Xiucheng Huang, Zhengyang Liu, Weijing Du, Qiang Li | CPES / Virginia Tech, United States

Industry Perspective

Gary Skibinski | Rockwell Automation, United States

Gate & Base Drivers

Monday, May 4th | 10:30 AM – 12:30 PM

Chairs: Ben Blalock, University of Tennessee, United States
Peter Wilson, University of Southampton, United Kingdom

Integrated Gate Drivers for E-Mode GaN Power Transistors

John Roberts, Julian Styles, Di Chen | GaN Systems, Canada

Reliability-Oriented Design of Gate Driver for SiC Devices in Voltage Source Converter

Zheyu Zhang, Zhiqiang Wang, Fred Wang, Leon M. Tolbert, Benjamin J. Blalock | University of Tennessee, United States

SiC MOSFET Gate Drive Design Considerations

Julius Rice, John Mookken | Cree, United States

Advanced Packaging Technologies for Fully Exploiting Attributes of WBG Power Electronics

Zhenxian Liang | ORNL, United States

Special Session

Monday, May 4th | 2:00 PM – 3:00 PM

Chairs: Krishna Shenai, LoPel Corporation, United States
Dennis Stephens, Continental, United States

Wide Bandgap (WBG) Power Switch Datasheets and Circuit Models

Krishna Shenai | LoPel Corporation, United States

WBG Inverter for Commercial Power Generation and Vehicle Electrification

Dakshina Murthy-Bellur[1], Elias Ayana[1], Sergey Kunin[1], Brad Palmer[1], Subbarao Varigonda[2] | [1]Cummins Power Generation, United States [2]Cummins Inc., United States

Thermal Management

Monday, May 4th | 3:30 PM – 4:30 PM

Chairs: Arun Gowda, GE, United States
Dachuan Yu, Caterpillar, Inc., United States

Thermal Management of Lateral GaN Power Devices

Chenjiang Yu[1], Eric Laboure[1], Cyril Buttay[2] | [1]LGEP, France; [2]AMPERE, France

Design of a Reduced Form Factor Passive Heat Sink for High Power Applications

Sayan Seal, Michael Glover, Alan Mantooth | University of Arkansas, United States

Capacitors

Tuesday, May 5th | 8:00 AM – 9:30 AM

Chairs: Patrick McCluskey, University of Maryland, United States
Andy Pinkos, Magna Electronics, United States

Silicon High-Density Capacitors for Power Decoupling Applications

Frederic Voiron, Ludovic Fourneaud | IPDIA, France

Energy and Power Densities of Capacitors and Dielectrics

Doo-Hyun Choi[1], Clive Randall[1], Michael Lanagan[1], Beihai Ma[2], Balu Balachandran[2] | [1] Penn State, United States [2]Argonne National Lab, United States;

Energy Storage Utilizing Advanced CVD Nanodiamond Technology

Stephen Minden[1]; John Fraley[1]; Lauren Kegley[1], Jim Davidson[2], David Kerns[2] | [1]APEI, United States; [2] International FemtoScience, Inc., United States

Power Modules & Semiconductor Devices

Tuesday, May 5th | 10:00 AM – 12:00 Noon

Chairs: Ty McNutt, APEI, United States
Satoshi Tanimoto, Nissan Motor Company, Japan

Compact and Optimized Solar Power Converter: Taking Another Step to Augment Solar Energy Efficiency

Yogesh Kumar[1], Sachin Beniwal[2], Shivender Dahiya[2] | [1] Havells India Pvt. Ltd., India; [2] University of Windsor, Canada

6.5 kV Si/SiC Hybrid Power Module: an Ideal Next Step?

Alex Huang, Xiaoqing Song, Liqi Zhang | NCSU, United States

Influence of Si & SiC Device Selection on Losses and Magnetics Design in an Isolated DC-DC Converter

Minyu Cai[1], Liyao Wu[2], Dakshina[3] Murthy-Bellur, Maryam Saeedifard(2), Oleg Wasynczuk[1] | [1]Purdue University, United States; [2] Georgia Institute of Technology, United States; [3]Cummins Power Generation, United States

Recent Developments in Medium to High Voltage SiC Power Technology

David Grider, Vipindas Pala, Edward Van Brunt, Sei-Hyung Ryu, Scott Allen, Jeffrey Casady, John Palmour | Cree, United States

Modeling & CAD

Tuesday, May 5th | 1:30 PM – 4:30 PM

Chairs: Alan Mantooth, University of Arkansas, United States
Jerry Hudgins, University of Nebraska, United States

A Carrier-Based Discontinuous Space Vector Modulation for Three-Level NPC Inverter

Chengzhu Piao, John Y. Hung | Auburn University, United States

Chip-Level and Package-Level Thermal Constraints in Power Semiconductor Modules

Krishna Shenai | LoPel Corporation, United States

Electromagnetic Interference Simulations of Power Electronic Modules

Atanu Dutta, Simon Ang | University of Arkansas, United States

Behavioral Modeling for Stability in Multi-Chip Power Modules

Michael Mazzola[1], Maryam Rahmani[1], James Gafford[1], Andrew Lemmon[2], Ryan Graves[2] | [1]Mississippi State University, United States; [2]University of Alabama, United States

Parasitic Extraction Procedure for SiC Power Modules

Andrew Lemmon, Ryan Graves | University of Alabama, United States

Accurate Characterization and Modeling of Switching Losses in High-Speed-Voltage Power Switching Devices

Alejandro Pozo Arribas[1], Mahesh Krishnamurthy[1], Krishna Shenai[2] | [1]Illinois Institute of Technology, United States; [2]Lopel Corporation, United States

Panel

Tuesday, May 5th | 4:30 PM – 5:30 PM

Chairs: Ty McNutt, APEI, United States
Wayne Johnson, Tennessee Tech University, United States

Challenges in Wide Bandgap Power Modules and Applications

Peter Friedrichs
Infinen AG, Germany

Fred Lee
CPES/Virginia Tech, United States

Alexander Lidow
EPC, United States

Brandon Passmore
APEI, United States

Packaging

Wednesday, May 6th | 8:00 AM – 10:30 AM

Chairs: Simon Ang, University of Arkansas, United States
Reinhold Bayerer, Infineon, Germany

A New Generation of Semiconductor Packaging Paves the Way for Higher Efficiency Power Conversion

Alexander Lidow, David Reusch | EPC, United States

Silver Sintered Double-Sided Cooling Power Package Process for Controlled Si Power Semi-conductcor Devices with Aluminum Top-Metallization

Maxime Barriere[1], Stéphane Azzopardi[1], Raphael Roder[1], Isabelle Favre[1], Eric Woirgard[1], Serge Bontemps[2], François Le Henaff[3] | [1]ALENT, United States; [2]MICROSEMI, France; [3]IMS Laboratory, France

Embedding Active and Passive Components in PCBs and Inorganic Substrates for Power Electronics

Ernie Parker[1], Brian Narveson[1], Arnold Alderman[2], Louis Burgyan[3] | [1]PSMA, United States; [2]Anagenesis, United States; [3]LTEC, United States;

Thermal Interface Material Evaluation for IGBT Modules Under Realistic Power Cycling Conditions

Garron Morris[1], Matthew Polakowski[2], Lixiang Wei[1], Martin Ball[1], Mark Phillips[1], Craig Mosey[1], Richard Lukaszewski[1] | [1]Rockwell Automation, United States; [2]Milwaukee Tool, United States

Planar-Bond-All: a Technology for Three-Dimensional Integration of Multiple Packaging Functions Into Advanced Power Modules

Zhenxian Liang | ORNL, United States

High Temperature Modules

Wednesday, May 6th | 10:45 AM – 12:15 PM

Chairs: Wayne Johnson, Tennessee Tech University, United States
Rick Eddins, GE, United States

High Temperature, Wide Bandgap Full-Bridge Power Modules for High Frequency Applications

Zach Cole, Brad McGee, Jennifer Stabach, Sergei Storkov, Greg Falling, Bret Whitaker, Dan Martin, Robert Shaw, Brandon Passmore | APEI, United States

Development of a Board-Level Integrated Silicon Carbide MOSFET Power Module for High Temperature Application

Zhiqiang Wang[1], Xiaojie Shi Shi[1], Leon Tolbert[1], Fred Wang[1], Zhenxian Liang[2], Daniel Costinett[1], Benjamin Blalock[1] | [1]The University of Tennessee, United States; [2]Oak Ridge National Lab, United States

Compact, High-Temperature, Single-Level Power Modules for 10 to 25 kV DC Link Voltages Using Silicon Carbide Power Electronics

Chad O'Neal, Zach Cole, Jennifer Stabach, Greg Falling, Peter Killeen, Brandon Passmore | APEI, United States

Closing Remarks

Wednesday, May 6th | 12:15 PM – 12:30 PM

Krishna Shenai, LoPel Corporation, United States

Short Course Overview

Low Voltage GaN Power Switch Modules for Increased Energy Efficiency

Dr. Krishna Shenai
Vice President
LoPel Corporation
kshenai@yahoo.com

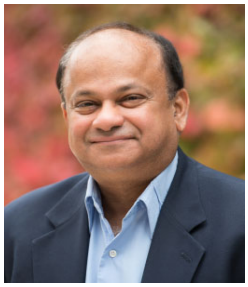
Dr. David Reusch
Director of Applications Engineering
Efficient Power Conversion Corporation
david.reusch@epc-co.com

Abstract

Silicon Carbide (SiC) and Gallium Nitride (GaN) power devices promise significant energy and cost savings for power electronics converters than feasible with silicon power devices. Low-voltage GaN power diodes and HEMTs rated up to 650V volts are now commercially available; and GaN power devices rated up to 3.5kV are expected soon.

This half-day short course will present the physics, technology, application engineering of low-voltage (< 650V) GaN power switch modules for increased energy efficiency in a wide range of DC-DC power converter applications including computing, communication, transportation, and renewable energy integration. The design and performance of GaN power switch modules for prototype point-of-load (POL) DC-DC power converters will be discussed and tradeoffs in performance vs. cost will be critically assessed.

Instructor Biographies



Krishna Shenai (F'01) is Vice President of LoPel Corporation in Naperville, IL. He is also an Adjunct Professor of Electrical Engineering and Computer Science at Northwestern University, Evanston, IL. For more than 35 years, Dr. Shenai has pioneered and made seminal contributions to power semiconductor devices and power electronics converters. He is a Fellow of IEEE, a Fellow of the American Physical Society, and a Fellow of the American Association for the Advancement of Science. Dr. Shenai has authored over 400 peer-reviewed papers and 10 book chapters, edited 4 books and 10 conference digests, and holds 13 issued US patents. He is an Editor of IEEE J. Electron Device Society (JEDS) and a Distinguished Lecturer of IEEE Electron Device Society (EDS).

David Reusch is the Director of Applications Engineering at Efficient Power Conversion Corporation (EPC). He received his B.S, M.S. and Ph.D. degrees from Virginia Tech, Blacksburg, VA. While pursuing his Ph.D. degree, he was a Research Assistant with the Center for Power Electronics Systems (CPES), where he was the recipient of the Bradley Graduate Fellowship. He has published over 25 peer-reviewed technical papers at conferences and in IEEE journals and is a co-author of the textbook, GaN Transistors for Efficient Power Conversion, second edition.

Outline

- **Introduction – System requirements (15 min.)**
- **Review of commercial power diodes, MOSFETs and HEMTs (30 min.)**
  - Device structures
  - Data sheets
  - Key performance and reliability parameters
- **Circuit modeling of single-chip devices and power switch modules (45 min.)**
  - Power diodes
  - Power MOSFETs
  - HEMTs
- **Coffee Break (15 min.)**
- **State-of-the-art of GaN/Si power devices (15 min.)**
  - Latest generation eGaN FET performance in terms of BV, $R_{DS(on)}$, power conversion efficiency, figures of merit, and IC developments
- **Design Basics (30 min.)**
  - Gate drive requirements, Dead-time management, Layout techniques for high-frequency, multi-megahertz switching, Paralleling techniques for higher current, Thermal design considerations
- **Design Examples (30 min.)**
  - Resonant and Hard-Switched DC-DC converters
- **A Look into the Future (15 min.)**

Power Module Packaging Technologies

Dr. Wayne Johnson
Professor & Chair | Department of
Electrical & Computer Engineering
Tennessee Tech University
wjohnson@tntech.edu

Dr. Patrick McCluskey
Professor | Department
of Mechanical Engineering
University of Maryland
mcclupa@umd.edu

Abstract

SiC and GaN power devices offer advantages in power density, high temperature operation and higher switching speeds. To realize these advantages in power modules, advanced packaging technologies are needed.

This half-day short course will present materials, technology, and reliability engineering of wide bandgap power modules for a range of applications including computing, communication, transportation, and renewable energy integration. The design and performance different packaging options will be discussed.

Instructor Biographies

Wayne Johnson (F'04) is Professor and Chair in the Electrical and Computer Engineering Department at Tennessee Tech University. Prior to joining TTU in 2013, he was with Auburn University for over 25 years. His research focus is on electronics manufacturing, electronics packaging for extreme environments and packaging reliability. Dr. Johnson is a Fellow of IEEE and the International Microelectronics Packaging and Assembly Society. He has served as General Co-chairman of the IMAPS International High Temperature Electronic Conference and Exhibition (HiTEC) and the International High Temperature Electronics Network Conference (HiTEN). Dr. Johnson is an Editor-in-Chief for the IEEE Transactions on Components, Packaging and Manufacturing Technology.

Patrick McCluskey is a Professor of Mechanical Engineering at the University of Maryland, College Park. Dr. McCluskey conducts research in the Center for Advanced Life Cycle Engineering (CALCE) focusing in the areas of thermal management, reliability, and packaging of electronic systems for use in extreme temperature environments and high power applications. He has authored or co-authored over 100 technical articles and 3 books, including "High Temperature Electronics." He has served as technical chairman of the IMAPS International High Temperature Electronic Conference and Exhibition (HiTEC) and is on the organizing committee for the International High Temperature Electronics Network Conference (HiTEN). He is an associate editor of the IEEE Transactions on Components and Packaging. He is a fellow of the International Microelectronics and Packaging Society (IMAPS), and is a member of ASME, IEEE, and SAE.

Outline

- **Introduction – Packaging requirements (15 min.) [Patrick]**
- **Review of packaging constructions (15 min.) [Wayne]**
  - SMT
  - Single sided
  - Double sided
- **Substrate Options (30 minutes) [Wayne]**
  - PWBs
  - Cu clad ceramic
  - Al clad ceramic
- **Die Attach Materials and Process (30 min.) [Patrick]**
  - Solders (High Lead and Lead-Free)
  - Sintered Ag (nanopowder and microflake)
  - Transient Liquid Phase Sintered Material
- **Coffee Break (15 min.)**
- **Electrical Interconnect (30 min.) [Wayne]**
  - Wire bonding
  - Flip chip
  - Double sided solder
  - HDI (direct copper attach)
- **Encapsulation/Packaging (15 min.) [Wayne]**
  - Encapsulant materials
  - Hermetic packaging
- **Thermal Management (15 min.) [Patrick]**
  - Materials
- **Prognostics and Reliability (15 min) [Patrick]**
- **A Look into the Future (15 min.) [Wayne]**

Plenary Sessions Overview

SiC Power Devices Aspects for High Power Density and System Approach for a Successful Market Implementation

Dr. Peter Friedrichs
Infineon AG
peter.friedrichs@infineon.com

Abstract

Silicon Carbide (SiC) and Gallium Nitride (GaN) power devices promise significant energy and cost savings for power electronics converters than feasible with silicon power devices. Low-voltage GaN power diodes and HEMTs rated up to 650V volts are now commercially available; and GaN power devices rated up to 3.5kV are expected soon.

This half-day short course will present the physics, technology, application engineering of low-voltage (< 650V) GaN power switch modules for increased energy efficiency in a wide range of DC-DC power converter applications including computing, communication, transportation, and renewable energy integration. The design and performance of GaN power switch modules for prototype point-of-load (POL) DC-DC power converters will be discussed and tradeoffs in performance vs. cost will be critically assessed.

Instructor Biography

Dr. Peter Friedrichs was born in 1968 in Aschersleben, Germany. After receiving his Dipl.-Ing. in microelectronics from the Technical University of Bratislava in 1993, he started a Ph.D work at the Fraunhofer Institut FhG-IIS-B in Erlangen. In 1996 he joined the Corporate Research of the Siemens AG and was involved in the development of power switching devices on SiC, mainly power MOSFETs and vertical junction FETs. In 1997 he received his PhD from University of Erlangen, Germany. He holds more than 10 patents in the field of SiC power devices and technology and was an author or co-author of more than 50 scientific publications and conference contributions in this field.

Peter Friedrichs joined SiCED GmbH & Co. KG, a company being a joint venture of Siemens and Infineon and originated from the former Siemens research group, on March the 1st, 2000. Since July 2004 he was the managing director of SiCED, responsible for all technical issues. In 2009 he received the Dipl.-Wirt.-Ing degree from the University of Hagen, Germany. After the integration of SiCED's activities into Infineon he joined Infineon as Senior Director Silicon Carbide from April 1st, 2011. In this role he is focusing on application relevant aspects of the new power semiconductor technology.

Power Electronics Packaging Challenges for Future Warship Applications

Dr. Rob Cuzner
University of Wisconson - Milwaukee
cuzner@uwm.edu

Abstract

In small to medium size surface combatants there is an increasing need for efficient energy usage, which depends upon power electronics operating in constrained spaces with sensitive equipment. The vision for next generation integrated power systems (NG-IPS) includes MVDC distribution with integrated power conversion, energy storage management and automated fault isolation and recovery. Power conversion and solid state protection technologies are the critical enablers to the accomplishment of the Navy's vision. Wide bandgap power semiconductors enable medium voltage power conversion and protection and simultaneously power dense, efficient and environmentally compatible power supplies. The need for MVDC power distribution is for reliable packaging of modules at high current levels in order meet the power processing demands. The need for ship service loads is a higher level of functionality within a module to reduce risks and costs of technology upgrades. The purpose of this paper is to focus in on three applications to shipboard NG-IPS and identify present and future packaging challenges: (1) low to medium horsepower drives for pumps and fans, (2) medium voltage power converters interfacing into a MVDC distribution system and (3) MVDC solid state protective devices (SSPDs).

Instructor Biography

Rob Cuzner is an Assistant Professor at University of Wisconsin-Milwaukee. He was previously a Staff Systems Engineer at DRS Power and Control Technologies where he worked for 20 years on the development of power conversion equipment for Navy Shipboard Integrated Power Systems, electric propulsion and shipboard compatible variable speed drives.

His main research interest is the development of power electronic topologies and systems that are power dense with high input power quality and electromagnetic compatibility in constrained space environments. Additional research areas of interest include: the use of solid state transformer and solid state protective devices for future power system distribution, DC and hybrid AC/DC power distribution architectures for applications such as Naval shipboard, buildings, server farms and industrial parks, micro-grid protection methodologies, wireless power transfer and multi-level and current source power converter topologies.

A New Package of High-Voltage Cascode Gallium Nitride Device for High-Frequency Applications

Dr. Fred Lee
CPES / Virginia Tech
fclee@vt.edu

Abstract

Recently a number of Gallium Nitride high electron mobility transistor (GaN HEMT) devices have been made available ranging from low voltage to high voltage and for both depletion-mode and enhancement-mode devices. Compared to silicon MOSFET, GaN has a much improved figure of merit and thus potentially capable of much higher operating frequencies, well into the mega Hertz range. Some of the high voltage (600V) GaN HEMT are based on normally-on device. GaN is connected in series with a low-voltage silicon MOSFET to emulate a conventional normally off device. Although somewhat cumbersome, it does offer some interesting switching characteristics can be quite effective if properly used. GaN devices are switching at a considerably higher speed. However, it is accompanied with high di/dt and dv/dt, thus, sensitive to parasitics. The high di/dt and dv/dt, if not contended, can result in high switching stresses, losses and noises.

This presentation will cover the basic switching characteristics as well as merits and demerits of the currently available low voltage and high voltage GaN devices. A number of design examples, ranging from point-of-load to off-line converters, will be use to illustrate the potential impact of GaN devices when operated at a significantly higher switching frequencies. The achieved level of power density and efficiency is quite remarkable. This open the door of a paradigm shift of the distributed power architecture, together with profound change of the current design and manufacturing practices.

Instructor Biography

Dr. Lee is currently a University Distinguished Professor and Founder and Director of the NSF ERC for Power Electronics Systems (CPES), a preeminent academic center in power electronics research at Virginia Tech. As CPES Director, Dr. Lee leads a program encompassing research, technology development, educational outreach, industry collaboration, and technology transfer. To date, more than 150 companies worldwide have benefited from this industry partnership program. Dr. Lee is a recipient of William E. Newell Power Electronics Award in 1989; the Ernst-Blickle Award sponsored by SEW-EURODRIVE FOUNDATION in 2005; the inaugural member of the Virginia Tech Entrepreneur Hall of Fame in 2012: and IEEE Medal of Power Engineering, in 2015. Dr. Lee is a member of the US National Academy of Engineering, an Academician of the Academia Sinica and a foreign member of the Chinese Academy of Engineering. Dr. Lee has served as major advisor to 83 MS and 76 Ph.D. students. He holds 74 US patents, and has published 270 journal articles and over 660 refereed technical papers. His research interests include high-frequency power conversion, magnetics and EMI, distributed power systems, renewable energy, power quality, high-density electronics packaging and integration, and modeling and control.

Thank you for attending IWIPP 2015! We look forward to seeing you again next year.

Sincerely,
The IWIPP Organizing &
Technical Committees

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LoPel Corporation
General Chair

Ty McNutt
APEI
Technical Chair

Wayne Johnson
Tennessee Tech University
Technical Vice Chair

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