



# POWERAMERICA

Next Generation Power  
Electronics Manufacturing  
Innovation Institute

**Annual Meeting  
February 12-14, 2019  
North Carolina State University**

**Tuesday, Feb. 12**

**N.C. State McKimmon Center, 1101 Gorman Street, Raleigh, N.C. 27606**

- 1-4 PM**                    **Tutorial/Technical Training**
- SiC Devices - *Ranbir Singh, GeneSiC Semiconductor*
  - GaN Power Devices and Applications Reliability - *Stephanie Butler, Texas Instruments*
  - WBG Module Standardization
    - *Rick Eddins, GE Aviation Systems*
    - *Ty McNutt, Wolfspeed*

**4-6 PM**                    **Membership Advisory Committee (*PowerAmerica Members Only*)**

**6-7:30 PM**                **Networking Session w/ Refreshments and Appetizers (*Open to All Attendees*)**

**Wednesday, Feb. 13**

**N.C. State McKimmon Center**

**8-8:30 AM**                **Sign In/Coffee and Light Breakfast**

**8:30-9 AM**                **Welcome and Opening Remarks**  
*Victor Veliadis*  
*Deputy Executive Director and CTO, PowerAmerica*

**9-9:30 AM**                **Keynote Address**  
*Adrian Kallis - Advanced Technology Manager, John Deere Electronic Solutions*

**9:30-10:30 AM**        **High Volume SiC Applications – Moderator: Victor Veliadis**  
*Ranbir Singh, GeneSiC Semiconductor*  
*Avinash Kashyap, Microchip*  
*Bruce Renouard, Pre-Switch*

**10:30 - 11AM**            **Networking Break – Posters & Hardware**

**11 AM to Noon**        **Power GaN Applications and Reliability – Moderator: Tom Byrd, Lockheed Martin**  
*Primit Parikh, Transphorm*  
*Stephanie Butler, Texas Instruments*  
*Tim McDonald, Infineon*

<b>Noon – 1 PM</b>	<b>Lunch – Sponsored by Silicon Power</b>
<b>1-1:30 PM</b>	<b>Presentation of Member-Initiated Projects – Jim LeMunyon</b> <ul style="list-style-type: none"> <li>• Short-Circuit Behavior and Protection of Next Generation SiC Modules, <i>Ohio State University</i></li> <li>• Integrated High Voltage APM/OBCM Converter for Future use in Autonomous Vehicles, <i>Virginia Tech</i></li> <li>• Reliability Analysis of Wide Bandgap Semiconductor Devices, <i>Texas Tech/Group NIRE</i></li> <li>• Quantifying Power Device Reliability Due to Terrestrial and other Radiation Sources, <i>CoolCAD Electronics</i></li> </ul>
<b>1:30-2:30 PM</b>	<b>System Peripheral Requirements – Moderator: Subhashish Bhattacharya</b> <ul style="list-style-type: none"> <li>• <i>Brij Singh, John Deere Electronic Solutions</i></li> <li>• <i>John Bultitude, KEMET</i></li> <li>• <i>Paul Ohodnicki, National Energy Technology Lab</i></li> </ul>
<b>2:30-3 PM</b>	<b>Education and Workforce Development Projects – Chair: Pam Carpenter</b> <ul style="list-style-type: none"> <li>• Documentation of Design and Process of GaN Power HEMPTs, <i>Rensselaer Polytechnic Institute</i></li> <li>• Wide Bandgap Power Converter Design Space Exploration, <i>N.C. State University</i></li> <li>• Universal Platform of Education, Research and Industrial Rapid Prototyping for High-Power WBG Applications, <i>N.C. State University</i></li> <li>• Graduate Wide Bandgap Semiconductor Device Lab, <i>N.C. State University</i></li> <li>• Power Electronics Teaching Lab Incorporating WBG Semiconductor Switches and Circuits, <i>University of North Carolina - Charlotte</i></li> </ul>
<b>3-3:30 PM</b>	<b>Student Perfect Pitch</b>
<b>3:30-4 PM</b>	<b>Networking Break (Posters &amp; Hardware)</b>
<b>4-5:10 PM</b>	<b>Foundry and Device Development, Modules and Manufacturing – Chair: Robert Stahlbush, Naval Research Lab</b>
<b>4-4:10 PM</b>	SiC Power Device Foundry Development, <i>X-FAB</i>
<b>4:10-4:20 PM</b>	Manufacturable Gen3 3.3kV/50mΩ SiC MOSFET Fabricated on 150 mm 4HN-SiC Wafers Along with Qualification, <i>Wolfspeed/Durham</i>
<b>4:20-4:30 PM</b>	6.5kV SiC DMOSFET Development, <i>GeneSiC</i>
<b>4:30-4:40 PM</b>	Commercialization of 3.3 kV & Technology Development of 6.5 kV SiC Devices, <i>Microsemi</i>
<b>4:40-4:50 PM</b>	Enable High Voltage 6.5kV & 10kV Power Module Commercialization and Manufacturing, <i>Wolfspeed-Fayetteville</i>
<b>4:50-5 PM</b>	Developing a BPD-Free, Room Temp, Al Implant and Activation Anneal Process for P-Wells in SiC MOSFETS, <i>Naval Research Laboratory</i>
<b>5-5:10 PM</b>	100A, 6.5kV Half-Bridge Module, <i>United Silicon Carbide</i>

### ***Evening Reception - Sponsored by ABB***

<b>5:10-5:30 PM</b>	Travel to Reception
<b>5:30-7:30 PM</b>	Reception at N.C. Museum of History <i>5 E. Edenton St., Raleigh, NC 27601</i>

**Thursday, Feb. 14**

**N.C. State McKimmon Center**

<b>8-8:30 AM</b>	<b>Sign In/Coffee and Light Breakfast</b>
<b>8:30-9 AM</b>	<b>Keynote Address</b> <i>HanJong Kim</i> <i>Director of Global Power Electronics Group, United Technologies-Carrier</i>
<b>9-10 AM</b>	<b>2019 PowerAmerica Technology Roadmap drives Member Initiated Projects</b> <i>Jon Zhang, Director of Device Technology, PowerAmerica</i> <i>Jim LeMunyon, Manager of Membership and Industry Relations, PowerAmerica</i>
<b>10 AM-2:20 PM</b>	<b>WBG Commercialization Applications – Co-Chairs: Luis Arnedo - UTRC, Kevin Bennion - NREL</b>
<b>10-10:10 AM</b>	Power-Dense Engine-Coolant 200 kW 1050 V DC Bus SiC Inverter for Heavy-Duty Vehicles, <i>John Deere Electrical Systems</i>
<b>10:10-10:20 AM</b>	Thermal Management for Power-Dense Engine-Coolant 200 kW 1050 V DC Bus SiC Inverter for Heavy-Duty Vehicles, <i>National Renewable Energy Laboratory</i>
<b>10:20-10:30 AM</b>	Modular SiC based 3-phase AC/DC Front End Rectifier with 99% efficiency, <i>ABB</i>
<b>10:30 - 11AM</b>	<b>Networking Break – Posters &amp; Hardware</b>
<b>11-11:10 AM</b>	Development, Demonstration and Commercialization of SiC Based 1 MW Medium Voltage Motor Drive System, <i>Toshiba</i>
<b>11:10-11:20 AM</b>	Direct-To-Line Central Inverter for Utility-Scale PV using 10 kV SiC MOSFET Devices, <i>Virginia Tech</i>
<b>11:20-11:30 AM</b>	MV AC to Low Voltage DC Power Conversion for Data Center, <i>Virginia Tech</i>
<b>11:30-11:40 AM</b>	Transformerless Medium Voltage Central PV Inverter, <i>Florida State University</i>
<b>11:40-11:50 AM</b>	Multi-functional, High-efficiency, High-density, MV SiC Based Asynchronous Microgrid PCS, <i>University of Tennessee - Knoxville</i>
<b>11:50-12 PM</b>	High Efficiency, High Speed HVAC Drive, <i>United Technologies Research Center</i>
<b>Noon - 1 PM</b>	<b>Lunch and Networking</b>
<b>1-1:10 PM</b>	Isolated, Soft Switching SEPIC with Active Clamp for 480 V AC to 400 V DC Rectifier for Data Centers, <i>Arizona State University</i>
<b>1:10-1:20 PM</b>	Medium Voltage Asynchronous Microgrid Power Conditioning System, <i>N.C. State University</i>
<b>1:20-1:30 PM</b>	GaN-Based High Efficiency Multi-Load Wireless Power Supply, <i>University of Tennessee – Knoxville</i>
<b>1:30-1:40 PM</b>	Dual-Inductor Hybrid Converter For Direct 48v To Sub-1V Pol Dc-Dc Module, <i>University of Colorado – Boulder</i>
<b>1:40-1:50 PM</b>	Introduction of WBG Devices for Solid-State Circuit Breaking at the Medium Voltage Level, <i>University of North Carolina - Charlotte</i>
<b>1:50-2 PM</b>	600V GaN dual gate Bidirectional Switch, <i>Infineon</i>
<b>2-2:10 PM</b>	A High-efficiency Low-cost 22kW Fast On-board Charger for EVs Using Hybrid Switches Combining GaN HEMTs with Si MOSFET, <i>Hella</i>
<b>2:10-2:20 PM</b>	Development of an Active Harmonic Filter using an Interleaved SiC Inverter, <i>N.C. State University</i>

**Adjourn**