



POWERAMERICA

Next Generation Power
Electronics Manufacturing
Innovation Institute

Agenda
Annual Meeting
February 6-8, 2018
NC State University

Tuesday, Feb. 6

PowerAmerica HQ – 930 Main Campus Drive, Suite 200

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|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1-4 PM | Tutorial/Technical Training <ul style="list-style-type: none">• SiC Devices (<i>Victor Veliadis, PowerAmerica</i>)• SiC Packaging (<i>Ty McNutt, Wolfspeed</i>)• GaN Devices (<i>Lucas Lu, GaN Systems</i>) |
| 4-6 PM | Membership Advisory Committee – PowerAmerica Members Only |
| 6-8 PM | Networking Session (refreshments and appetizers) – All Annual Meeting Attendees Invited |

Wednesday, Feb. 7

Hunt Library Duke Energy Hall (2nd Floor)

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| 8:30 AM | Sign In/Coffee and Light Breakfast (Duke Energy Hall ABCD) |
| 9-10 AM | PowerAmerica Operations <ul style="list-style-type: none">• Strategic Direction and Technology Roadmap (<i>Victor Veliadis, Deputy Executive Director and CTO</i>)• Sustainability Progress (<i>Dan Stancil, ECE Department Head and PI</i>)• Value Proposition (<i>Jim LeMunyon, Membership and Industry Relations Manager</i>) |
| 10-12:30 PM | Wide Bandgap Industry Session <ul style="list-style-type: none">• Keynote Address: Ram Adapa, Electric Power Research Institute• Industry Talks:<ul style="list-style-type: none">○ <i>Tom Byrd, Lockheed Martin</i>○ <i>John Palmour, Wolfspeed</i>○ <i>James McBryde, Eaton</i>○ <i>Paul Wiener, GaN Systems</i>• Wide Bandgap Interactive Panel Discussion (<i>Victor Veliadis, PowerAmerica</i>) |

12:30-2 PM Lunch and Networking

2-2:45 PM Education and Workforce Development

- Short Courses & Tutorials (*Victor Veliadis, PowerAmerica*)
- Student Program (*Pam Carpenter, Director of Education and Workforce Development, PowerAmerica*)
- Graduate and Undergraduate Student Project Elevator Pitch

2:45-4 PM Student Poster & Industry Hardware Networking Session

4-5:30 PM Power Module Packaging and Reliability

Chair: Tim McDonald, Infineon

- Reliability Analysis of Wide Bandgap Power Devices (*Texas Tech - Bayne*)
- Enable High Voltage 6.5 & 10kV Power Module Commercialization and Manufacturing (*Wolfspeed - Fayetteville*)
- Challenges and Opportunities of PE Packaging (*Invited Speaker: Lauren Boteler, U.S. Army RDECOM*)
- Wide Bandgap Packaging Panel

Evening

5:30-6 PM Travel to NC Museum of Natural Sciences (Bus transport provided)

6-8:00 PM Reception and Heavy Hors D'oeuvres – *Sponsored by Wolfspeed*

Thursday, Feb. 8

Hunt Library Duke Energy Hall (2nd Floor)

Program Accomplishments

8:30 AM Sign In/Coffee and Light Breakfast

Track 1

***Foundry and Device
Development***

Duke Energy Hall A&B

Chair: Jim Cooper, Sonrisa

Track 2

***WBG Commercialization
Applications***

Duke Energy Hall C&D

Chair: Marko Jaksic, GM

9-9:15 AM SiC Power Device Foundry Development
(X-FAB)

5 kV DC to LV DC or 3 Phase AC
Microgrid Power Conditioning Modules
(Georgia Tech - Divan)

9:15-9:30 AM 1.2 kV SiC Shielded Trench Gate Power
MOSFETs *(NCSU - Baliga)*

SiC Based Power Electronic Motor
Driver for Class-8 Mild Hybrid Truck
(Bendix/University of Akron)

9:30-9:45 AM	Lower Cost Foundry Process for 1.2 kV SiC Planar Gate Power MOSFETs and JBS Rectifiers (NCSU – Baliga)	Multi-functional, High-efficiency, High-density, MV SiC Based Asynchronous Microgrid Power Conditioning System (UTK-Wang)
9:45-10 AM	Development of Manufacturable Gen3 6.5 kV/100 mOhm MOSFET and Establish Reliability Qualification (Wolfspeed – Durham)	Design, Fabrication, and Vehicular Testing of 200 kW 1050 VDC Bus SiC Dual Inverter for Heavy-Duty Vehicles (John Deere)
10-10:15 AM	1.7kV and 3.3kV SiC MOSFET Scale-Up (Microsemi)	Thermo-Mechanical Modeling and Stress Analysis of SiC Inverter (NREL)
10:15-10:30 AM	<i>Poll: WBG Device Advancements</i>	<i>Poll: WBG Application Issues</i>
10:30-11 AM	Networking Break	Networking Break
11-11:15 AM	Advanced SiC Trench MOSFETs: A Path to Record-Low RON, SP and Record-Low (\$/A) (Sonrisa)	SiC Device-Based Hybrid PV inverter with Li-ion Battery Integration (Toshiba)
11:15-11:30 AM	Manufacturable, Cost Effective, Low RON-SP 3.3 kV SiC DMOSFETs (Global Power)	100 kW PV Inverter with Efficiency > 99% Operating in Interleaved Triangular Conduction Mode (Virginia Tech-Burgos)
11:30-11:45 AM	Enable Commercialization of 1700V SiC Schottky Diodes Manufactured at X-FAB Texas (Monolith)	Open-Source, Compact, Transformerless Grid-Tied 3kW GaN PV Inverters (Transphorm)
11:45-12 PM	<i>Poll: WBG Device Advancements</i>	<i>Poll: WBG Application Issues</i>
12-1 PM	Lunch and Networking	Lunch and Networking
1-1:15 PM	3.3 kV SiC DMOSFET Development (Genesis)	100 kW PV Inverter (FSU-Li)
1:15-1:30 PM	Developing a BPD-Free Room Temperature Al Implant and Activation Anneal Process for P-Wells in SiC MOSFETs (NRL)	Next Generation 350 kW Three-Phase Medium-Voltage High-Efficiency EV Fast Charger (NCSU-Lukic)
1:30-1:45 PM	1.2 kV Diode and MOSFET Foundry Qualification of 150mm SiC Line (USCi)	SiC Active Harmonic Filter for Variable Frequency Drives (UTRC)
1:45-2 PM	Ultra-High Efficiency Full SiC-based Modular UPS (ABB)	Asynchronous Microgrid Power Conditioning System (NCSU-Bhattacharya)
2-2:30 PM		High Frequency GaN Power Converter (Lockheed-Martin, VPT, VA Tech-Li)

2:30 PM

Adjourn and Optional Discussions