Wide Bandgap Technology Trends, Manufacturing Innovations, and Commercialization

2:00PM – 3:40PM
Venue: Legacy Ballroom

Panel Organizer and Moderator:
Brij Singh - John Deere Electronics Solutions, Inc.

Panelists:
Allen Hefner - US Department of Energy
Victor Veliadis - PowerAmerica in NC State University
Bhim Singh – Indian Institute of Technology
Lauren Boteler – US Army Research Laboratory

Panel Description:
Wide bandgap (WBG) power electronics have gained significant momentum in past four years. Some vehicle manufacturers have launched cars with the SiC inverter-based electric-power-train. The mass adoption of WBG power converters requires manufacturing innovations targeted to address supply-chain issues starting from wafer through packaging to end users. Manufacturing innovations targeted for commercialization in niche applications could be aided by availability of power devices with acceptable lead-time, WBG inverter designers with multi-disciplinary expertise and problem-solving experts with systems level knowledge. This panel will discuss how industry and government agencies could partner to mitigate risks involved with the WBG power converter technology. Application examples with success stories from industries will be covered.

Panelists' Short Biographies:
Victor Veliadis is Deputy Executive Director and CTO of PowerAmerica, which is a U.S Department of Energy wide bandgap power electronics public-private Manufacturing Institute. Dr. Veliadis manages a budget in excess of $30 million per year that he strategically allocates to over 35 industrial, University, and National-Laboratory projects, to enable US leadership in WBG power electronics manufacturing, work force development, job creation, and energy savings.

Alan Hefner is presently a Technology Manager in the US Department of Energy in Advanced Manufacturing Office. Dr. Hefner is managing several DOE research programs including PowerAmerica. Dr. Hefner has over two decades experience in WBG devices, technology and applications. In his current role, he is tasked to promote WBG power electronics product manufacturing in US. Before working at DoE, Alan Hefner has been an electronics engineer in the Applied Electrical Metrology Group in the Quantum Measurement Division of the Physical Measurement Laboratory (PML) at the National Institute of Standards and Technology (NIST).
Panelists' Short Biographies (Continued):

Bhim Singh is IEEE Fellow and he is a professor at Indian Institute of Technology Delhi, India since 1997. His areas of research interests are power electronics, electric machines and drives, HVDC, FACTS, power quality, renewable energy and DSP based control of power converter and drive. Prof. Singh is a Fellow of the Indian National Academy of Engineering (FNAE), The Indian National Science Academy (FNA), The National Academy of Science, India (FNASc), The Indian Academy of Sciences, India (FASc), The World Academy of Sciences (FTWAS), Institute of Electrical and Electronics Engineers (FIEEE), the Institute of Engineering and Technology (FIET), Institution of Engineers (India) (FIE), and Institution of Electronics and Telecommunication Engineers (FIETE) and a Life Member of the Indian Society for Technical Education (ISTE), System Society of India (SSI), and National Institution of Quality and Reliability (NIQR). He has been the General Chair of the 2006 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES'2006).

Lauren Boteler leads the thermal and packaging research programs as part of the Advanced Power Electronics group at the U.S. Army Research Laboratory (ARL). She received her PhD degree in mechanical engineering from the University of Maryland. Her work at ARL, beginning in 2005, has included electronics packaging and thermal management solutions for a wide range of Army applications. Her research programs focus on design tool development and package integrated thermal solutions including 3D chip stacking, power electronics, laser diodes, double side cooling, and phase change materials. More recently, she has initiated a research program in Advanced Power Electronics Packaging and Thermal Management which defines the four main challenges of power electronics packaging: co-engineering/co-design, transient thermal mitigation, additive manufacturing, and high-voltage packaging. She is an adjunct professor at Johns Hopkins University and was awarded the 2018 ASME EPPD Woman Engineer of the Year award for her contributions to the electronics packaging community.