

WEDNESDAY

ORAL PRESENTATIONS

4:15 PM TU.B3.4

DC Bias Dependence of Local Deep Level Transient Spectroscopy Signal and Quantitative Two-Dimensional Imaging of SiO₂/SiC Interface Trap Density

Norimichi Chinone¹, Ryoji Kosugi², Yasunori Tanaka², Shinsuke Harada², Hajime Okumura² and Yasuo Cho¹; ¹Tohoku University, Japan; ²National Institute of Advanced Industrial Science and Technology, Japan.

4:30 PM TU.B3.5

Investigation of Trap Behavior in SiC MOSCAPs with High Temperature High Frequency Method

Zhaoyang Peng¹, Shengkai Wang¹, Yun Bai¹, Yidan Tang¹, Ximing Chen², Chengzhan Li³, Kean Liu³ and Xinyu Liu¹; ¹Institute of Microelectronics of Chinese Academy of Sciences, China; ²University of Electronic Science and Technology of China, China; ³Zhuzhou CRRC Times Electric Co., Ltd, China.

Tutorial

SiC Power Electronic Applications

Session Chair: Victor Veliadis

Tuesday Afternoon, September 19, 2017

Thurgood Marshall Ballroom, North Salon

5:45 pm – 6:45 pm

5:45 PM

15 kV IGBT Converters and High Voltage Circuit Topologies

Subhashish Bhattacharya, North Carolina State University

6:15 PM

Heavy-Duty Vehicle Inverter

Brij Singh, John Deere Electronic Solutions

* Invited Paper

Applications and Package Integration

Session Chairs: Anup Bhalla and Peter Friedrichs

Wednesday Morning, September 20, 2017

Thurgood Marshall Ballroom, North Salon

8:30 am – 10:30 am

8:30 AM *WE.D1.1

SiC MOSFETs for Multi-MW PV Inverters—Opportunities and Challenges

Ljubisa Stevanovic; GE Global Research, United States.

9:00 AM WE.D1.2

30-kW All-SiC Inverter with 3D-Printed Air Cooled Heatsinks for Plug-in and Full Electric Vehicle Applications

Madhu Chinthavali; Oak Ridge National Laboratory, United States.

9:15 AM WE.D1.3

Module and System Considerations to Maximize Performance Advantages of SiC Power Devices

Ty R. McNutt¹, Kraig Olejniczak², Stephen Minden², Daniel Martin², Jonathan Hayes², Ajith Wijenayake² and David Simco²; ¹Wolfspeed, A Cree Company, United States; ²Wolfspeed, A Cree Company, United States.

9:30 AM WE.D1.4

Impact of a Kelvin Source Connection on Discrete High Power SiC-MOSFETs

Christian Bödeker¹, Edgar Ayerbe² and Nando Kaminski¹; ¹University of Bremen, Germany; ²Wolfspeed, A Cree Company, United States.

9:45 AM WE.D1.5

The Development of High Thermal Conductivity SiC Power Modules through the Implementation of Advanced Cooling Techniques Coupled with High Heat Transfer Materials

Brandon Passmore, Brice McPherson and Alex Lostetter; Wolfspeed, A Cree Company, United States.

10:00 AM WE.D1.6

Benefits of High Voltage SiC Applications in Medium Voltage Power Distribution Grids

Shiqi Ji¹, Xiaojie Shi², Zheyu Zhang¹, Wenchao Cao¹ and Fred Wang¹; ¹University of Tennessee Knoxville, United States; ²EPRI, United States.

10:15 AM WE.D1.7

30 kV Pulse Diode Stack Based on 4H-SiC

Vladimir A. Ilyin², Alexey V. Afanasyev², Yuri S. Demin², Boris V. Ivanov², Alexey F. Kardo-Sysoev³, Victor V. Luchinin², Sergey A. Reshanov¹, Adolf Schöner¹, K. A. Sergushichev² and A. A. Smirnov²; ¹Ascatron AB, Sweden; ²St. Petersburg Electrotechnical University "LETI", Russian Federation; ³Ioffe Physical Technical Institute of the Russian Academy of Science, Russian Federation.

Novel Sensors, Devices and Circuits
Session Chairs: Robert Okojie and Anping Zhang
Wednesday Morning, September 20, 2017
Thurgood Marshall Ballroom, West Salon
8:30 am – 10:30 am

8:30 AM WE.E1.1

Opto-Mechanical 3C-SiC High Pressure Sensors for Harsh Environments

Francesco La Via; CNR-IMM, Italy.

8:45 AM WE.E1.2

Single Crystal 3C-SiC MEMS Resonators on 3C-SiC on Si₃N₄

Vida Pashaie; Case Western Reserve University, United States.

9:00 AM WE.E1.3

Magnetic Field Sensing with 4H SiC Diodes—Nitrogen vs Phosphorous Implantation

Corey J. Cochrane¹, Philip G. Neudeck² and David J. Spry²; ¹JPL/CalTech, United States; ²NASA GRC, United States.

9:15 AM WE.E1.4

400°C Operation of SiC N- and P-Channel JFETs Fabricated by Ion Implantation into a High-Purity Semi-Insulating Substrate

Mitsuaki Kaneko and Tsunenobu Kimoto; Kyoto University, Japan.

9:30 AM WE.E1.5

Electrical Characterization of Integrated 2-Input TTL NAND Gate at Elevated Temperature, Fabricated in Bipolar SiC-Technology

Muhammad Shakir, Hossein Elahipanah, Raheleh Hedayati and Carl-Mikael Zetterling; KTH Royal Institute of Technology, Sweden.

9:45 AM *WE.E1.6

Power Electronic Devices and Systems Based on Bulk GaN Substrates

Isik c. Kizilyalli, Eric Carlson and Daniel Cunningham; ARPA-E, United States.

10:15 AM WE.E1.7

(LATE NEWS) First Demonstration of Ga₂O₃ Junction Barrier Schottky Diodes

Kohei Sasaki^{1,2}, Quang Tu Thieu¹, Daiki Wakimoto^{1,2}, Yuki Koishikawa^{1,2}, Akito Kuramata^{1,2} and Shigenobu Yamakoshi^{1,2}; ¹Novel Crystal Technology, Japan; ²Tamura Corporation, Japan.

Tutorial

SiC Material Properties—Advantages, Challenges and Solutions

Session Chair: Victor Veliadis
Wednesday Morning, September 20, 2017
Thurgood Marshall Ballroom, North Salon
11:30 am – 12:30 pm

11:30 AM

SiC Bulksubstrates

Elif Balkas, Wolfspeed, A Cree Company

12:00 PM

SiC Epitaxy

Al Burk, Wolfspeed, A Cree Company