Electrification & Power Semiconductors

The SiC Power Revolution is Ready for High-Volume Car Manufacturing

M. Gärtner
Director
STMicroelectronics, EMEA Region - ADG Marketing and Application, Aschheim-Dornach, Germany

Abstract
Early adopters are already receiving significant quantities of SiC devices as we ramp up for the broader automotive industry. SiC wide-bandgap characteristics enable extraordinary efficiency in EV traction systems, on-board chargers, and DC-DC converters, as well as new applications including climate compressors, fuel cell power DC-DC, and high-speed air compressor pumps.

By 2025, most European carmakers will have transitioned to the 800V DC bus domain where the high-voltage efficiency and thermal performance of SiC is even more appealing.
The SiC revolution has many strategic implications and we will describe ST's manufacturing and vertical integration initiatives to meet the mounting demand, the ambitious electrification targets of legislators, and the stringent quality requirements of critical automotive applications.

Biography
Manuel Gärtner–Director – Wide bandgap & Electrification–Automotive & Discrete Group - STMicroelectronics

Manuel Gärtner joined STMicroelectronics Munich in 1999 and is Director of wide bandgap & electrification for automotive applications. He has worked as a development engineer for smart power products and as a research engineer at the university of Berlin.
He has published over 35 articles and conference speeches on automotive power electronics and holds more than five different patents.
He is member of the EEHE Scientific Advisory Board, the SIA POWER TRAIN & ELECTRONICS scientific committee for Power Electronics, and he represents STMicroelectronics as principal partner in ECPE.

Topic Coming Soon

S. Preti
Global Product Manager SiC
ASM International, Global Product Management,
Milan, Italy

Abstract
Coming Soon

Biography
Coming Soon

Radiation Hardness of SiC TrenchMOS Devices for Automotive Applications

S. Schwaiger
Automotive Electronics
Robert Bosch GmbH, Automotive Electronics,
Reutlingen, Germany

Abstract
The lecture will investigate the cosmic radiation hardness of SiC TrenchMOSFET devices. It will sum up the effect of cosmic radiation on SiC power devices and the way of characterizing the cosmic radiation hardness. We will point out guidelines to improve the cosmic radiation hardness of devices and a method to estimate it in early computational design. Furthermore, we present our experimental results of the investigation of the cosmic radiation hardness of SiC TrenchMOSFET devices. Finally, we will evaluate on the results with respect to the operation of the devices in a traction inverter for electric vehicles in different operations modes.

Biography
Stephan Schwaiger studied physics at the university of Hamburg and finished with a doctorate degree in 2012. He started in semiconductor industry in Bosch's central research department working power semiconductors. Since 2015 he works on the development of SiC semiconductors for the section Automotive Electronics at Bosch focusing on technology and device development.