Entegris

SiC: Paving the way for Sustainable Mobility

Porsche Consulting
Strategic Vision. Smart Implementation.

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Abstract
Power transistors based on silicon carbide (SiC) technology will play an important role in a wide range of industries in the context of electrification and decarbonization. For the automotive industry, with the shift to battery-electric vehicles in many regions, SiC will be an important technical lever to improve charging performance and efficiency, and thus range. There are also weight and packaging benefits to consider. However, as the maturity of SiC technology is still relatively low compared to mature silicon-based products, the semiconductor industry, as well as Tier-1s and OEMs, need to address three main challenges. First, unit costs must be reduced to penetrate volume segments and make the technical benefits widely available. Second, automotive quality requirements are high, especially when considering the higher mileage mission profiles of future vehicles. Third, global capacity must keep pace with rapidly growing global demand. By addressing these three levers, OEMs, Tier-1s and the semiconductor industry can make the most of SiC technology and pave the way for a sustainable automotive future.

Biography
Since 2019: Porsche Consulting Germany and France
Manager with competence focus semiconductor technology, product strategy and development, product cost optimization, design to cost, cost reduction and profitability programs

The Role of SiC in E-Mobility

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Abstract
The fast adoption of battery electric vehicles (BEVs) boosts the use of wide bandgap semiconductor materials. Silicon carbide has become tantamount to electro-mobility due to its superior performance in improving efficiency of electric drivetrains. However, it still has a higher cost than conventional silicon-based technology. This presentation will focus on efficiency and affordability aspects. We will go through the latest SiC innovations in material development, device structures and drivetrain concepts, and show how, all put together, enable not only efficient but most importantly affordable electrification from an end user perspective.

Biography
Ralf Bornefeld is Senior Vice President with responsibility for business line and engineering of Power Semiconductors & Modules at Bosch. He joined Bosch in November 2019.
Before he held various management positions at Infineon Technologies AG: senior director technology in frontend production from 2005-2008, senior director engineering of automotive sensors until 2011 and finally vice president and general manager business line automotive sensors.
Ralf started his career at Elmos Semiconductor in 1992 as a technology development engineer. Afterwards he took several management positions until end of 2004, mostly serving as vice president of R&D and eventually as vice president of business line microsystems.
Ralf Bornefeld was born in Schalksmuehle, Germany, in 1964. He graduated with a degree in Electrical Engineering from Technical University of Dortmund in 1992.