

Wide-Bandgap Power Transistors for Automotive Drivetrain Applications



The automotive on-board systems and especially the traction inverter are the lead applications for next-generation power transistors. These systems are highly demanding in terms of static, dynamic performance as well as robustness of the power switches. Power transistors made from wide-bandgap (WBG) materials such as Silicon Carbide (SiC) or Gallium Nitride (GaN) pave the way towards more efficient electric drivetrains and allow to lower the energy consumption and ecological footprint of future electric vehicles.

Fundamental requirements for the use in automotive on-board applications will be derived. Different vertical and lateral transistor architectures based on various WBG materials will be compared with respect to their performance perspective. A benchmark of current technologies and an outlook on future architectures and materials will be provided.

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