

SiC-based Automotive Power Converters, Opportunities and Challenges

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Abstract

In this presentation, key aspects of SiC-based automotive power converters compared with the Si ones will be discussed, including optimal operating conditions to achieve best performance, efficiency improvement with the required supporting factors, major component sizing methodologies and constraints, impact on reliability / durability, tolerance and protection requirements against extreme operating conditions, etc. Acceptable SiC cost on the die- and converter-levels for automotive applications will be described. Finally, even many SiC manufactures have released impressive reliability verification results, expectations / requests from the automotive industry on SiC reliability / failure rate will be reviewed.