

SiC High Voltage Busbar



Overview

Busbars are critical components that connect high-current and high-voltage subcomponents in high-power converters. This paper reviews the latest busbar design methodologies and offers design recommendations for both laminated and PCB-based busbars. This paper is an extended version of our published paper: Chen, Z. In Proceedings of the 2023 IEEE Energy Conversion Congress and Exposition (ECCE), Nashville, TN, USA, 29 October–2 November 2023. Silicon Carbide (SiC) power devices switch at much. In high - power converters using WBG devices, new demands are placed on busbar design due to factors like faster switching speed, higher power levels, and different device packaging types. Some applications in terms of rated power and shape are investigated regarding their particular requirements and challenges.



Article Content

FULL SiC DOUBLE SIDED BUSBAR POWER MODULE

Low inductance and high temperature power module for e-drives Fast switching with SiC DC+ & DC- on outer metallization for lowest parasitic C to ground High reliability and temperature capability by silver

ROLINX® Busbars

Benefits Low inductance Controlled partial discharge High current and voltage capabilities Compact and flexible Fully customized Possibility of component

Busbar Design for High-Power SiC Converters

PCB busbars in high-power converter applications are being increasingly used because more powerful discrete SiC and GaN power FETs are becoming widely available.

Insulation Optimization of PCB Busbar for an ANPC Converter Using

In 10kV medium-voltage distribution networks, higher electric field strengths demand more stringent insulation. Merely increasing the insulation layer thickness of busbar can lead to excessive parasitic

Bus-bar Design for Silicon-Carbide based Medium Voltage Full-bridge ...

Most critical aspect in medium voltage device based converter is isolation requirement between positive and negative dc-link bus bars. This paper deals with bus bar design of medium

Design and Demonstration of a Medium-Voltage High-Power All

In this article, the design and optimization of a high-power active-neutral-point-clamped (ANPC) converter using 1.7-kV silicon carbide (SiC) power modules and low-inductance laminated

Busbar Design for High-Power SiC Converters

The decoupling capacitor, together with the busbar and power semiconductor devices, forms the power commutation loop, which defines the fundamental performance of a high-power

(PDF) An Approach for the Design and Analysis of PCB Busbars in High ...

ABERG, BRYCE. An Approach for the Design and Analysis of PCB Busbars in High Power SiC Inverters using FEA Tools. (Under the direction of Iqbal Husain). Wide band gap

Busbar Design and Optimization for Voltage Overshoot Mitigation of a ...

To further minimize the busbar stray inductance, a hybrid busbar structure with printed circuit board based buffer circuit using high-frequency decoupling capacitors is designed and

PCB Busbars in High Power SiC Inverter

ABSTRACT ABERG, BRYCE. An Approach for the Design and Analysis of PCB Busbars in High Power SiC Inverters using FEA Tools. (Under the direction of

A System Level Approach to the Design and Analysis of PCB Busbars

The study of the 125 kVA SiC inverter's PCB busbar included an analysis of its design to determine its effect on the system in terms of voltage spikes and temperature rise.

PCB Busbar Design and Verification for a Multiphase SiC-based All ...

The development and implementation of silicon carbide (SiC) devices is steadily increasing facilitating the electrification of aircrafts. In this thesis, a printed circuit board (PCB) based

PowerPoint Presentation

Power electronic stacks are assemblies that include the power semiconductor modules, busbars, gate drivers, snubber capacitors, protection, DC-link capacitors and cooling.

Busbar Design for High-Power SiC Converters

Busbars are critical components that connect high-current and high-voltage subcomponents in high-power converters. This paper reviews the latest busbar design methodologies and offers design

Low Stray Inductance Busbar Design and Optimization

In this paper, the sensitivity of switching-off voltage spikes of SiC MOSFET and Si IGBT to stray inductance at the same voltage and current

PowerPoint Presentation

Innovative IGBT & SiC busbar technology for Improved Temperature, Partial Discharge Inception Voltage and Power Density Presented by:

Busbar Design and Optimization for Voltage Overshoot

Request PDF | Busbar Design and Optimization for Voltage Overshoot Mitigation of A Silicon Carbide High-Power Three-Phase T-Type Inverter | The SiC devices have faster switching

Bus-bar Design for Silicon-Carbide based Medium Voltage Full-bridge ...

The advancement in SiC technology is helping to achieve high efficiency and high power density in medium voltage high power applications. SiC comes with various challenges due to fast

(PDF) An Approach for the Design and Analysis of PCB Busbars in High ...

Simulation-based analysis using FEA tools significantly reduces PCB busbar voltage spikes by 19%. The 135 kW SiC inverter achieved a loop inductance of 12.8 nH, optimized to 7.4 nH.

Busbar Design for High-Power SiC Converters | CiteDrive

Busbars are critical components that connect high-current and high-voltage subcomponents in high-power converters. This paper reviews the latest busbar design methodologies and offers design

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Abstract—This paper presents a comprehensive analysis about bus bar design procedure. Some applications in terms of rated power and shape are investigated regarding their particular

PCB Busbar Design and Verification for a Fully

Meanwhile, the thinner insulator leads to smaller stray inductance. This is especially beneficial for aviation applications due to the dramatically lowered partial

High Power Multi-layer Molded Busbars: Design ...

High Power Multi-layer Molded Busbars: Design Considerations and Construction Options Minimizing efficiency loss is key to success for next-generation EV-Mobility Overview The accelerating adoption

Busbar Design and Optimization for Voltage Overshoot Mitigation of A ...

Abstract-The silicon carbide (SiC) devices have faster switching speed than that of the conventional silicon (Si) devices, which however may cause excessive device voltage overshoot. Larger gate

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