Silicon Carbide Three-Phase Inverter

What is a Wolfspeed 3 phase inverter?

Wolfspeed presents a new high-performance,low-cost,compact3-phase inverter based on next generation power modules which are specifically optimized to fully utilize Wolfspeed's third generation of Silicon Carbide (SiC) MOSFETs.

Can a 3 kW 3 phase CSI drive a high-power compact drive?

The theoretical findings are experimentally validated using an ultra-compact,high-efficiency 3 kW three-phase CSI prototype operating at up to 100 kHz switching frequency. The experimental results confirm the efficiency of the proposed design and demonstrate its potential for high-power,compact drive applications. 1. Introduction

What is a hybrid inverter?

Designed for hybrid and electric vehicles in automotive, marine, and off-highway applications, this cutting-edge inverter combines advanced technologies with hardware and software necessary to meet the rigors of the required applications. Suitable for hybrid and electric vehicles in automotive, motorsport and off-highway applications...

What is a current source inverter (CSI) topology?

A promising alternative to the conventional VSI with its limitation is the application of a current source inverter (CSI) topology,as discussed in [3,4,5]. The CSI inherently filters the output quantities,i.e.,inverter output voltages and output currents,mitigating the negative effects of high switching frequencies.

What is the design philosophy for the inverter?

The design philosophy for the inverter directly follows the design philosophy utilized in the module: maximize performance through highampacity, low-inductance designs while minimizing cost and complexity. To achieve this, 5 key parameters were considered.

How big is a Wolfspeed inverter?

The inverter measures 279 mm by 291 mm by 155 mmfor a total volume of 9.3 L and a power density of 32.25 kW/L. This design offers an improvement over Wolfspeed's previous 250 kW,1.2 kV 3- phase inverter of ~65% reduction in volume and ~340% increase in power density .

The review analyzes approximately 70 recent three-phase SiC inverter designs, categorizing them by topology, specifically two-level, Neutral Point Clamped (NPC), T-type, and Multilevel, and ...

This paper discusses a design methodology for high power density converter design. The ideas are applicable to any topology and any switching technology. Particular attention is paid to the ...

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The objective of this thesis is to present a design for a low parasitic inductance, high power density 3-phase inverter using silicon-carbide power modules for traction application in the ...

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