

PIENAAR ENERGY (PTY) LTD

High frequency inverter silicon carbide



Overview

ABSTRACT This article provides a comprehensive review of Silicon Carbide (SiC) based inverters designed for High-Speed (HS) drive applications, which require higher output frequencies to enhance efficiency and power density. The review analyzes approximately 70 recent three-phase SiC inverter. SSPS 1 MW, 4160 Vac- 1000 Vdc tests ongoing at CAPS-FSU Unit tested to full voltage. full power testing yet to be done. (Locomotive Power Electronic Transformers. ABB, Alstom and others) Alstom, ABB. SiC MOSFETs and SiC diodes certainly outperform conventional silicon-based devices. Higher breakdown voltages, faster switching speeds, far greater efficiency. To address these challenges, Motion Applied has developed a next generation, 800V Silicon Carbide (SiC) inverter platform. These benefits make them essential in modern electric. To achieve lower switching losses and higher frequency capabilities in converter design, researchers worldwide have been investigating Silicon carbide (SiC) modules and MOSFETs.

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Recent Advances in High-Voltage, High-Frequency Silicon ...

frequency (HV-HF) power devices with 10 kV, 20 kHz power switching capability. The emergence of HV-HF devices with such capability is expected to revolutionize commercial and military power ...

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(PDF) Review on Silicon Carbide based High-Fundamental Frequency

This article provides a comprehensive review of Silicon Carbide (SiC) based inverters designed for High-Speed (HS) drive applications, which require higher output frequencies to enhance



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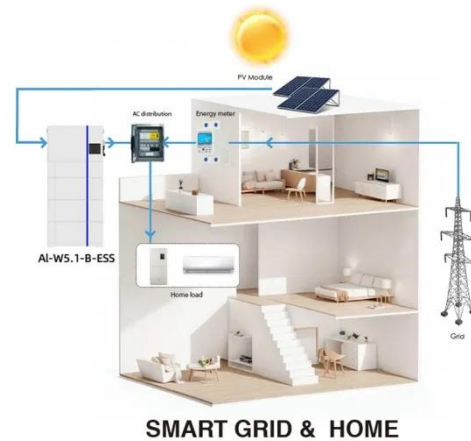
Review on Silicon Carbide based High-Fundamental Frequency ...

This literature review specifically focuses on advancements in PWM technique-based Silicon Carbide (SiC) inverters, emphasizing their critical role in high-performance HS drives.

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Extreme high efficiency enabled by silicon carbide (SiC) power devices

Thanks to the high switching frequency of SiC, the high-frequency transformer can reduce the size and weight proportionally with the frequency. Depending on the power level of the ...



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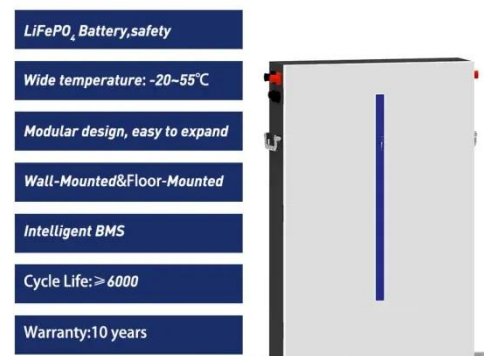
Silicon Carbide Converter Design: A Review

Silicon carbide and Gallium nitride-based converters give excellent efficiency, can operate in high switching frequency, and gives lower losses as compared to traditional silicon-based ...

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Silicon Carbide High Voltage, High Frequency Conversion

Both projects use 10 kV SiC devices and high frequency transformers 10 kV SiC modules: Cree/ Powerex HF transformers: Los Alamos, IAP, Dynapower



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IPG5 800V Silicon Carbide Integrated Inverter

Our Silicon Carbide inverter has the



highest frequency switching rate that is currently possible and is 800V compatible. This means faster power transfer and a lighter system compared to 400V inverters.

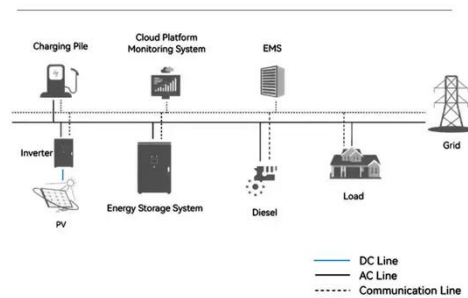
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Advancing Industrial Power Conversion With Silicon Carbide

For one, they use SiC where its benefits are most impactful, such as in power modules' high-frequency parts. For the other, they retain Si in low-frequency parts where its performance ...

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System Topology



Silicon Carbide Inverters: Technology, Advantages, and Applications

A silicon carbide (SiC) inverter uses power semiconductor devices made from silicon carbide instead of conventional silicon (Si). SiC inverters offer higher efficiency, higher switching frequencies, smaller ...

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