

SolarTech Power Solutions

High-frequency communication inverter



Overview

This paper reviews the high-frequency inverters for WPT systems, summarizes the derived topologies based on power amplifiers and H-bridge inverters, investigates the main factors restricting the development of high-frequency inverters, and analyzes the research directions for future development. What is a high frequency inverter?

In many applications, it is important for an inverter to be lightweight and of a relatively small size. This can be achieved by using a High-Frequency Inverter that involves an isolated DC-DC stage (Voltage Fed Push-Pull/Full Bridge) and the DC-AC section, which provides the AC output.

Which power supply topologies are suitable for a high frequency inverter?

The power supply topologies suitable for the High-Frequency Inverter includes push-pull, half-bridge and the full-bridge converter as the core operation occurs in both the quadrants, thereby, increasing the power handling capability to twice of that of the converters operating in single quadrant (forward and flyback converter).

What is a high-efficiency high-frequency inverter?

MHz systems such as wireless power transfer (WPT) require high-power, high-efficiency high-frequency inverters. In recent years, Gallium-Nitride high electron mobility transistors (GaN-HEMT) have been developed that are capable of high-speed switching, making it possible to realize high-efficiency high-frequency inverters.

Can high-frequency resonant inverters achieve high-power high-efficiency sinusoidal output?

VOL.E105-C, NO.9 SEPTEMBER 2022] This paper proposes a method of improving high-frequency resonant inverters to achieve high-power, high-efficiency, low-distortion sinusoidal output in the MHz frequency band such as 13.56MHz. MHz systems such as wireless power transfer (WPT) require high-power, high-efficiency high-frequency inverters.

Can a half-bridge inverter achieve high power?

In this paper, the authors focus on half-bridge inverters in which the GaN-HEMT voltage does not exceed the input DC supply voltage. In addition, high power is achieved by increasing current rather than increasing GaN-HEMT voltage.

What is a bridge type inverter?

The simplest form of an inverter is the bridge-type, where a power bridge is controlled according to the sinusoidal pulse-width modulation (SPWM) principle and the resulting SPWM wave is filtered to produce the alternating output voltage. In many applications, it is important for an inverter to be lightweight and of a relatively small size.

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