SolarInnovate Energy Solutions

Inverter high voltage front stage

Overview

How to choose a suitable inverter?

With the thermal impedance information of the thermal system design, the proper device rating can be selected. The 1200-V/75-mΩ SiC MOSFET and 650-V/60-mΩ SiC MOSFET is a good tradeoff among thermal, efficiency and cost. The primary source of lost efficiency in any inverter is going to be a result of the losses incurred in the switching devices.

Which boards work together to form a three-phase inverter reference design?

The following boards work in tandem to form this three-phase inverter reference design: The UCC21710 device is a 5.7-kVRMS, reinforced isolated gate driver for Insulated-Gate Bipolar Transistors (IGBT) and SiC MOSFETs with split outputs, providing 10-A source and 10-A sink current.

What is a T-type 3-level inverter?

The next step up from a standard two-level inverter is a T-type three-level inverter. This type is implemented by inserting two back-to-back switching devices between the switch node and the neutral point of the DC link created by the bulk input capacitors.

How is a 3 phase Star connected resistive load connected?

Three-phase star connected resistive load is connected across terminals J14, J16, and J17. J30 is the protective earth terminal which is connected to the high-voltage power source earth. A check for DC bus overvoltage is added to all Inverter Labs, Lab 1 through Lab 5, using a filtered value for the DC bus voltage.

Which resistor is used for inverting PWM Input?

The inverting PWM input IN– is not used in the design and is connected to primary side ground. A 3.3-Ω gate resistor (for example, R258) is used for MOSFETs turn-on and turn-off. A 10-kΩ resistor (for example, R85) is

connected across the MOSFET gate to collector pins close to the MOSFET on the main power board.

What is the supply voltage at VDD?

The supply voltage at VDD can range from 15 V up to 30 V with respect to VEE. The PWM is applied across the IN+ and IN– pins of the gate driver. On the secondary-side of the gate driver, gate resistors (for example, R203 and R204) control the gate current of the switching device.

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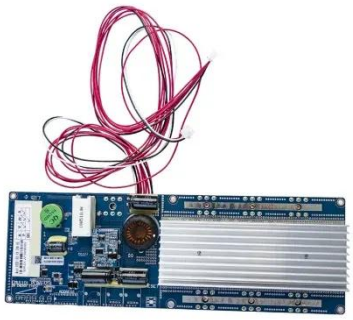

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