

SolarTech Power Solutions

Digital three-phase inverter



Overview

Can a single DC-link-based three-phase inverter be used for high power applications?

Provided by the Springer Nature SharedIt content-sharing initiative Simulation and implementation of a single DC-link-based three-phase inverter are investigated in this article. The primary focus is on designing a single DC-link three-phase inverter for high power applications.

What is a reference design for a 3 phase inverter?

This reference design reduces system cost and enables a compact design for a reinforced, isolated, 10-kW, three-phase inverter. A lower system cost and compact form factor is achieved by using a dual gate driver in a single package and bootstrap configuration to generate floating voltages for the gate drive power supply.

What is a DC-link three-phase inverter?

The primary focus is on designing a single DC-link three-phase inverter for high power applications. Unlike conventional inverters that require 600 V to generate 400 V (RMS) at the output, the proposed system achieves this with only 330 V, facilitated by a 12-terminal 1:1 transformer.

What is a three-phase inverter?

Apart from isolated gate-drivers for IGBTs, the three-phase inverters include DC bus voltage sensing, inverter current sensing, and IGBT protection (like overtemperature, overload, ground fault, and so on). There are many end applications such as HVAC, solar pumps, and appliances where cost is major concern without compromising the performance.

What is the DC link voltage of a 3 phase inverter?

The DC-link voltage of the inverter is almost half the rate of a conventional three-phase inverter. The DC-link voltage rating is only 330 V and it is very

less as compared to the conventional inverter and it is shown in Fig. 8. DC link voltage (a) PI controller (b) NN controller.

How many power switches does a three-phase inverter use?

A three-phase inverter application uses six power switches (IGBTs in this case). To drive these switches, six totally independent gate drivers are required. Also, with a high-voltage operation, it is necessary to have enough isolation between primary and secondary side of the gate driver.

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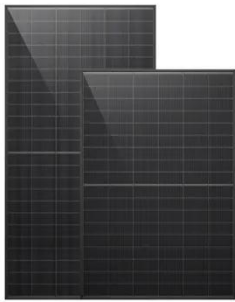
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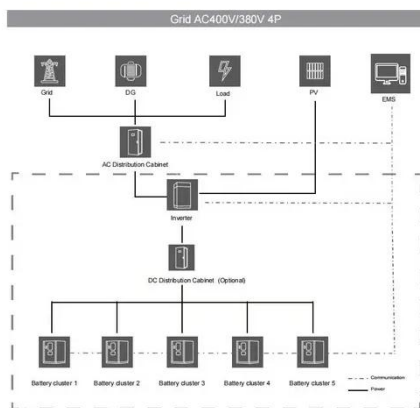
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