



LOTWA SYSTEM

Combined three-phase bidirectional inverter





Overview

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. The input side operates from a single 3-V to 5.5-V supply.

What is three-phase bidirectional power-flow transition?

Three-phase bidirectional power-flow transition: full-power 11 kW inverter mode to full-power 11 kW PFC mode- under 230 VAC line-to-neutral voltage. (a) Full time-scale view; (b) Zoom-in view.

What is the efficiency and power loss of three-phase inverter mode?

Figure 51 and Figure 52 display the measured efficiency and power loss under three-phase inverter mode operation at different line voltages. The peak efficiencies of 99.263%, 99.122%, and 98.855% and the full-load efficiencies of 99.166%, 98.938%, and 98.632% are measured for the high-line, nominal, and low-line conditions, respectively.

What is the efficiency of ACDC bidirectional converter?

The system incorporates three-level active neutral point clamped ACDC bidirectional converter, achieving a peak efficiency of 99.15% and 98.95% in three-phase PFC rectifier mode and inverter mode respectively.



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11 kW high-efficiency high-density bidirectional three ...

Aug 21, 2025 · Scope and purpose This document introduces a 11kW high-efficiency high-density bidirectional three-/single-phase AC-DC power converter, i.e., REF_11KW_PFC_SIC_QD ...

25 kW Bi-Directional Three-Phase Inverter Active Front End ...

2 days ago · The CRD25DA12N-FMC-AFE 25 kW three-phase inverter acts as an AC/DC active front end (AFE) power stage with an EMI filter and boost inductor adapter board to serve as an ...

Three-phase bidirectional active split source inverter for ...

Oct 1, 2024 · This paper introduces a new inverter topology derived from the SSI, aimed at addressing the DC voltage utilization issue and assessing its viability for traction applications. ...

25 kW Bi-Directional Three-Phase Inverter ...

2 days ago · The CRD25DA12N-FMC-AFE 25 kW three-phase inverter acts as an AC/DC active front end (AFE) power stage with an EMI filter and ...

Bidirectional DC-AC Solution in Solar Application System ...

Apr 1, 2023 · ABSTRACT This application note presents a detailed solution for implementing a 3-phase solar inverter application system based on the TMS320F28035 microcontrollers ...

11-kW, Bidirectional Three-Phase Three-Level (T-type) ...

Feb 20, 2025 · 11-kW, Bidirectional Three-Phase Three-Level (T-type) Inverter and PFC Reference Design Description This reference design provides an overview on how to ...

11-kW, Bidirectional, Three-Phase ANPC Based on GaN ...

May 11, 2022 · Description This reference design provides a design template for implementing a three-level, three-phase, gallium nitride (GaN) based ANPC inverter power stage. The use of ...

Novel Control Scheme to Reduce THD in Bidirectional Three-Phase

Jul 24, 2025 · This study presents a novel control model for bidirectional three-phase inverters that adjusts the DC-Link voltage reference based on AC load feedback, aiming to reduce total ...

Bidirectional Power Control for a Three-Phase ...

Dec 16, 2022 · Discussed in this study is a bidirectional power control technique for a three-phase grid connected inverter under different ...

Bidirectional Power Control for a Three-Phase Grid-Connected Inverter

Dec 16, 2022 · Discussed in this study is a bidirectional power control technique for a three-phase grid connected inverter under different unbalanced grid conditions. Prior researchers have ...



Novel Control Scheme to Reduce THD in Bidirectional ...

Jul 24, 2025 · 1 Introduction Among the various inverter topologies and control methods, the three-phase inverter using a three-phase unfolder stands out for its unique advantages in grid ...

Voltage Control Method of Boost Integrated Bidirectional Three-Phase

Jun 20, 2025 · This paper proposes a voltage control method of a three-phase bidirectional battery inverter with integrated boost function. The proposed voltage control utilizes feedback ...

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