

Bidirectional CLLLC DCDC Power Converter for OBC

Description

This is a Bidirectional CLLLC DCDC Power Converter for OBC reference design. It operates at high switching frequency with Silicon Carbide (SiC) MOSFET to achieve high efficiency and reduction of size & weight. It may be used for high power charging systems, such as EV charger, OBC, UPS, Solar system etc. This EVB helps users to speed up SiC MOSFET system designs and shorten product development cycle significantly.

This reference design works seamlessly together with the ESC “Bidirectional Totem-Pole PFC Power Converter for OBC” reference design.



Advantages

Approx. 50% reduction in size vs IGBT designs, High output power (6.6kW), High efficiency (>99%), Digital control bidirectional output, Reinforced isolation

Features

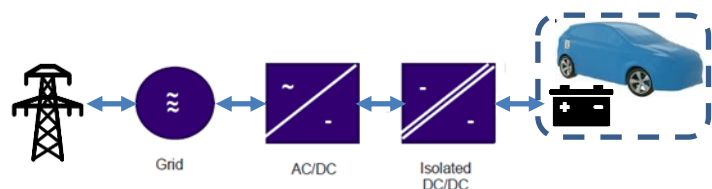
- DC/DC CLLLC Bidirectional Power Conversion
- Max. Charging Power: 6.6kW
- DC Input Voltage: 390Vdc to 680Vdc
- DC Output Voltage: 250Vdc to 450Vdc (Max. 19.6A, rated voltage 336Vdc)
- Max. Inversion Power: 3.3kW
- Inversion Rated Input: 336Vdc
- Inversion Rated Output: 504Vdc
- Efficiency: >98%

Core Chip (Automotive grade Part Numbers)

- DSP Control: **TI** TMS320F280049CPZS
- SiC MOSFET: **Nexperia** NSF040120L4A0
- Isolated Gate Driver: **Infineon** 2EDS8265H / **ADI** ADuM223 / **ST** STGAP2SiCS
- Isolated DC-DC Module: **Murata** NCS12S1212C / NCS6S1205C / MGJ2D122005SC
- CAN: **Infineon** TLE9251SJ / **ST** L9616
- ESD Protection: **ST** HDMIULC6-4SC6Y / ESDCAN03-2BWY
- Hi-Precision OP-AMP: **ADI** AD8538WAUJZ-R7 / **ST** TSZ181IYLT
- Current Sensor: **Allegro** ACS770LCB-050B-PFF-T
- EEPROM: **Microchip** 93LC56C-E/SN

Applications

- On Board Charger
- Bidirectional power converters
- Energy storage system
- UPS



Block Diagram

