

Bidirectional Power Converter for Energy Storage CLLLC

Description

This is a bidirectional power converter for energy storage CLLLC reference design.

It comprises of CLLLC topologies. 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 system, such as the UPS, Solar system etc. This EVB helps users to speed up SiC MOSFET system designs and shorten product development cycle significantly.

Advantages: Approx. 50% reduction in size vs IGBT design, High output power (6.6kW Max.), High efficiency (>96%), Digital control bidirectional output, Reinforced isolation, Workable firmware ready,



Features

- DC/DC Bidirectional Power Conversion
- Max. Rated Output Power (Charge mode): 6.6kW
- Rated Input Voltage (Charge mode): 470Vdc to 565Vdc
- Rated Output Voltage (Charge mode): 60Vdc to 80Vdc
- Max. Rated Output Power (Discharge mode): 6.6kW
- Rated Input Voltage (Discharge mode): 60Vdc to 80Vdc
- Rated Output Voltage (Discharge mode): 440Vdc to 550Vdc
- Efficiency: >96%

Core Chip

- MCU control: **ST** STM32G474VBT6
- CLLLC SiC MOS: **ST** SCT040W120G3-4AG
- Isolated gate driver: **ST** STGAP2SiCS, STGAP2SM
- Isolated Aux. Power: **ST** L6986I
- CAN: **ST** L9616
- ESD protection: **ST** HDMIULC6-4SC6Y, ESDCAN03-2BWY
- Hi-Precision OP-AMP: **ST** TSZ181ILT
- Current sensor: **Allegro** ACS37002LMABTR-050B5-M, ACS72981LLRATR-100B5
- Resonant Capacitive Tank: **muRata** GRM43D7U3A472JW31L
- Electrolytic Capacitor: **Lelon** VZH-471M1ETR-1010, RGL221M2GBK-1845, LSG102M2C-A2545
- Magnetic component: **knitter-switch** ICSI15312700LVJ61, ICSI28175700LVK14, ICST20411000LVK61, ICSC30330600LVS2, ICSC64415600LHS61, ICST90211100SHSST61

Applications

- Bidirectional energy storage system
- Bidirectional power converters
- Solar power system
- High power charger
- UPS

Block Diagram

