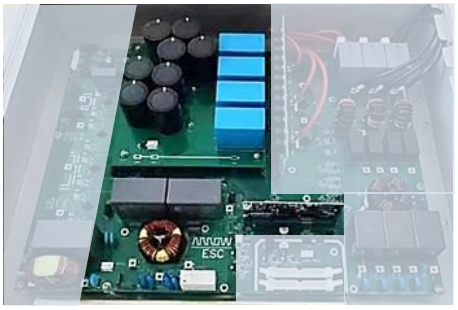
Design ID: 2023P002 Release date: Sep-2023

MPPT Interleaved Boost Converter

Description

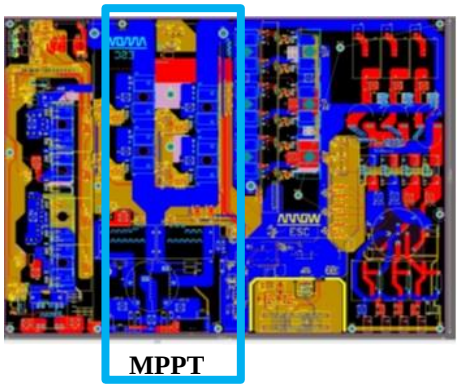
The MPPT (Maximum power point tracking) Interleaved Boost Converter is for PV (Photovoltaic) applications reference design. Which is an Interleaved Booster circuit with digital controlled MPPT algorithm for the Solar Power System Applications. It operates at high switching frequency with Silicon Carbide (SiC) MOSFET to achieve low power losses, high efficiency, and reduction of size & weight.



Advantages

High output power (10kW Max. for 2 rails, 5kW per rail); Digital control MPPT algorithm (Perturb & Observe algorithm; P&O Method) for solar power application, reliable and not dependent on the panel properties and characteristics.

Features



- DC/DC Interleaved Booster Topology
- Max. Output Power: 10kW for 2 rails, 5kW per rail
- Solar Input Voltage: 150Vdc to 550Vdc
- DC Output Voltage: 600Vdc to 800Vdc
- Efficiency: Not measured

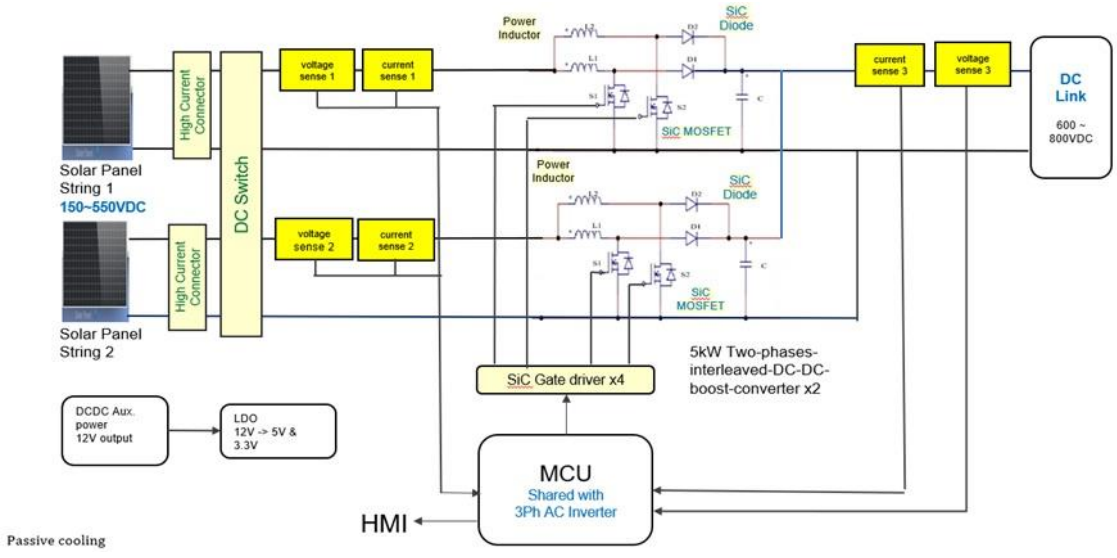
Core Chip

- MCU control: **TI** TMS320F28379D
- SiC MOSFET: **Wolfspeed** C3M0075120K
- SiC Diode: **Wolfspeed** C4D20120D
- Isolated gate driver: **Infineon** 1EDN7550B
- Current Sensor: **ALLEGRO MICROSYSTEMS** ACS37002LMABTR-050U5
- Isolated Power Module: **Murata** MGJ2D121503SC
- Isolated CAN Transceivers: **CHIPANALOG** CA-IS3062W
- Varistor: **TDK/EPCOS** B72214P2461K101
- HV Capacitors: **Kemet** C4AQQBW5300A3MJ, C4AQCBW5550A3MJ, ALA7DA301DF600
- Power Inductor: **knitter-switch** ICSC97430700LHS61, ICSI36430700LVK61

Applications

- Solar power system power conversion
- PV inverter
- PV power optimizer

Block Diagram



ArrowTechnicalSupport.AP@arrow.com