TechSquare-TSQDCDC281412500RM

High-Reliability Ground Army DC-DC Converter Datasheet

Product Overview



The TSQDCDC281412500RM is a ruggedized, high-density DC-DC converter designed for severe military ground-army applications. Utilizing Zero Voltage Switching (ZVS) high-frequency topology, this module delivers up to 500 W of continuous power with up to 91.7% peak efficiency in a compact VIA package. It features full compliance with defence standards when paired with standard front-end compliance modules.

Key Technical Specifications

Parameter	Specification	Notes / Conditions
Input Voltage Range (VIN)	16.0–38.0 Vdc	28 Vdc Nominal continuous operating range
Output Voltage (VOUT)	12.0 Vdc (Nominal)	Trimmable from 9 V to 13.1 V
Output Current (IOUT)	**41.67 A (Max)**	Continuous at ≤ 12.0 VOUT
Output Power (POUT)	**Up to 500 W**	Continuous power output
Peak Efficiency	Up to 91.7%	VIN = 28 V, nominal load/trim
Power Density	**138.3 W/in³**	VIA Package format
Dimensions (L × B × H)	170.00 × 40.00 × 35.00 mm	6.69 × 1.575 × 1.378 in
Weight	700 to 1.24 kg	Base module weight

Ground Army Military Qualifications & Standards Compliance

- **MIL-STD-461E / MIL-STD-461F / MIL-STD-461G:** Guaranteed compliance for Conducted Emissions (CE102), Conducted Susceptibility (CS101, CS114, CS115, CS116), and Radiated EMI when deployed with an LVMFM+ 10–50 V input filter module.
- **MIL-STD-1275D / MIL-STD-1275E:** Full immunity against 28 V DC input voltage spikes, surges, and load dumps typical for ground vehicles (with front-end filter).
- **Operating Temperature (M-Grade):** -55 ℃ to +125 ℃ internal operating temperature range; -65 ℃ to +125 ℃ storage range.
- **Dielectric Withstand:** 1500 Vdc (Input-to-Output and Input-to-Case isolation).
- **Reliability:** MTBF > 3,45,000 Hours.

Features & Protections

- **Protections:** Input Undervoltage Lockout (UVLO), Overvoltage Lockout (OVLO), Output Overvoltage (OVP), Overcurrent (OCP), Short Circuit (SCP), and Thermal Shutdown (OTP).
- **Control Features:** Primary/Secondary Enable (EN), Dynamic Output Trim Control (TR), and Remote/Local Sense compensation (+SENSE / -SENSE).
- **Thermal Interface:** Aluminum-clad VIA chassis for low thermal impedance, supporting single-sided or double-sided cold-plate/heatsink conduction cooling.