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A subsidiary of Emrise Electronics

POWERMITE 50 WATT DC/DC CONVERTERS



18-32 Volts dc input
EMC to MIL STD 461C
Fixed Switching Frequency
Low Output Noise

This series of switch mode power dc/dc converters provide the military electronics design engineer with a highly specified, cost effective and space efficient solution for air borne, ship and ground based applications. These converters accept a wide input voltage range, conforming with standard military 28 Volt dc supplies and are available in single, dual and triple output configurations.

In order to satisfy military requirements the Powermite series has been designed and tested in accordance with stringent NAVMAT guidelines to provide exceptional electrical and environmental performance.

Model	Output Voltages & Currents		Case Code
CDA-50	5V	10A	2
CDB-50	+ -12V	2A	2
CDC-50	+ -15V	0.6A	2
CDG-50	12V	4A	2
CDH-50	15V	3.3A	2

OTHER MODELS AVAILABLE - SEE WEBSITE OR DATA SHEET

Input Voltage:

18V to 32V DC.

Input Power Characteristics:

MIL-STD-704E, Transients as per Fig.9, including voltage spikes specified in MIL-E-6051.
DEF STAN 61-5 Part 6 (A1, A2, B1, B2).
MIL-STD-1275A, excluding the single fault condition.

Isolation:

Input to Output >10MΩ @ 500VDC.
Input to Chassis >10MΩ @ 500VDC.
Outputs to Chassis >10MΩ @ 500VDC.

Efficiency:

Not less than 70% at full load, nominal input voltage and at 25°C baseplate temperature.

Output Voltages:

See Output Rating Table for details.
Other V/A combinations are available.
Contact sales team for further information.

Load, Line & Temperature Regulation (CEB):

Prime Output ±2% of output voltage.
Auxiliary Outputs ±7% of output voltage.

Noise and Ripple (PARD):

Measured over bandwidth DC-20MHz
Prime Output ±2% of output voltage.
Auxiliary Outputs ±2% of output voltage.

Total Effect Band (TEB):

Total combination of CEB + PARD + drift and warm-up.
Prime Output ±5% of output voltage.
Auxiliary Outputs ±10% of output voltage.

Cross Regulation:

Prime Output ±2% of output voltage.
Auxiliary Output ±7% of output voltage.

Dynamic Load Regulation:

Maximum transient over or undershoot of 5% of nominal output voltage for a 50% step load change in 20µs. Recovery within 1ms.

Dynamic Line Regulation:

Maximum transient over or undershoot of 5% of nominal output voltage with recovery within 1ms for all line transients and surges defined in Input Power Characteristics above.

Minimum Load Conditions:

For full specified performance
Prime Output ±10% of maximum current.
Auxiliary Outputs ±20% of maximum current.

Output Protection:

Outputs are protected against indefinite overload and short circuit. Power limiting circuitry operates at 110-130% of full rated power. Output voltages recover automatically following removal of overload.

Remote Sense:

Fitted as standard on +5V single output converter only. This feature can however be incorporated on other models in this range if required. Please contact our sales office for further information.

Output Overvoltage Protection:

All outputs are protected by means of zener diode clamps. These limit the output voltage to 120%, typically, of the nominal value.

Soft Start:

Under all conditions the converters start up in an orderly fashion. Rise time of supplies is less than 10ms.

Synchronisation:

These modules can be synchronised to an external source or to other modules in the Powermite range.
(Synchronisation frequency = 400kHz ± 5%).

Undervoltage Lockout:

To protect internal circuits against low input voltages, the converters will not operate below an input of 13V dc.

Remote Shutdown:

Connecting the shutdown terminal to a voltage of (±0.4V) with respect to the prime output return terminal, will cause the unit to shutdown. Leaving the terminal open circuit or connecting it to a logic high signal (3V to 5.5V) will allow the unit to operate.

Hold Up:

Pins are provided for the connection of an external hold-up capacitor.
(Not available as standard in case size 2A).

EMI:

The units are designed to meet the following requirements of MIL-STD-461C, Part 2, category A1b:-

CE01	CE03	CE07
CS01	CS02	CS06
RE02	RS02	RS03

Operating Temperature:

Full specified performance with the baseplate temperature maintained within the range -55°C to +100°C.

Storage Temperature:

-55°C to +125°C.

Cooling:

Conduction cooling via baseplate.

Humidity:

MIL-STD-810C, Method 507.3, 95% at 25°C.
BS3G100, Part 2, Section 3, Sub-Section 3.2, Para.6.2.

Construction:

Fully enclosed construction utilising Aluminium Alloy LM25M to BSI 490.
Paint finish Matt Black to DTD 5555A.
Mounting surface Achromate finish.

Weight and dimensions:

The maximum weight is 260 grams.
Refer to outline drawing for unit dimensions and fixing positions.

Vibration:

MIL-STD-810E, Method 514.4 category 5.
BS3G100, Part 2, Section 3, Sub-Section 3.1, tests 4.3, 4.4.2 and 4.4.4.

Acceleration:

MIL-STD-810E, Method 513.4 Procedure 11.
BS3G100, Part 2, Section 3, Sub-Section 3.6.

Shock:

MIL-STD-810E, Method 516.4 Procedure V.
DEF-STAN-07-55 Part 2, Section 1.1 Test A2 (100g, 6ms, 3 shocks per axis).

Salt Mist:

BS3G100, Part 2, Section 3, Sub-Section 3.8.

Explosion Proofness:

BS3G100, Part 2, Section 3, Sub-Section 3.5.

Nuclear Hardening:

The circuitry of all Powermite converters is designed to limit the effects of nuclear radiation.

Maintainability:

Units are constructed in a non-hermetically sealed two part housing. Internal circuitry is protected by means of conformal coating.
All Powermite modules are repairable.

MTBF:

The MTBF for any unit in the Powermite range, calculated in accordance with MIL-HDBK-217, can be provided upon request.
HI-REL versions with active components screened to JANTX, MIL-STD-883 or similar are available.

Shelf Life:

The shelf life of the units is ten years, they may be left in deep store, without the need for intermittent powering-up or any form of servicing for the period of the shelf life.

Burn In:

All units are subjected to an environmental stress screening programme. For standard versions this consists of a 48 hour bake at 85°C baseplate temperature. High reliability versions are subjected to 10 minutes of random vibration followed by 48 hours of power and temperature cycling between -55°C and +85°C, with full load applied.

For further information a detailed specification is available upon request. Please contact our sales office.