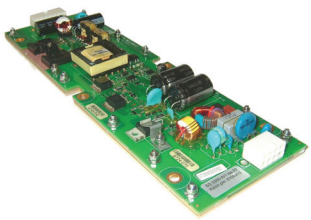
Martek Power
50W SQ Series
Datasheet

DC/DC converter for railway applications



Description

The 50W SQ Series converter has a very low profile, open frame construction and is intended for installation within the host equipment. The topology employed offers very high efficiency with outputs as low as 3.3V and is therefore ideal for driving LEDs in applications such as low voltage lighting and Passenger Information Systems. Compliance with UK RIA standards, as well as current national and international railway norms, makes the SQ series equally suited to both new build and refurbishment applications.

Special features include:

- Very low profile
- Low voltage output options - 3.3Vdc
- Ideal for LED applications

Input specifications

The following input voltages versions are available as standard:

110V (66.0 - 137.5V) dc (Suffix A)
72V (43.2 - 90.0V) dc (Suffix D)
52V (31.2 - 65.0V) dc (Suffix C)
36V (21.0 - 50.4V) dc (Suffix F)
24V (16.8 - 33.6V) dc (Suffix B)

Parameter	Detail
Input Ripple	To RIA and EN50155
Input Protection	Reverse polarity protection (series diode) Surges and transients to RIA 12, EN50155
Inrush Current	Limited to typically 5 x nominal current (after 0.1ms)
Efficiency	85% typical
Hold-up time	10ms to EN50155 S2
Input fuse	Board-mounted. Factory replacement

Output specifications

Parameter	Detail
Maximum Output Power	50W
Output Versions	Single output only
Output Voltage	Can be specified from 3.3V to 24V
Setting Tolerance	±0.6% at 50% load, 15°C to 25°C
Minimum Load	Zero
Line Regulation	±0.2%
Load Regulation	±0.5%
Temperature Coefficient	<0.02% / °C
Output Ripple	<1% Pk-Pk of Output Voltage

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Output specifications (Continued)

Parameter	Detail
Output Noise	<1% Pk-Pk superimposed (up to 20MHz)
Response Time	0.5ms to within 2% (for a 20% - 90% load change)
Output Protection	Protected against indirect transients to RIA12 & EN50155
Current limit	Operates at a minimum of 105% of nominal or peak load. Auto recovery.
Thermal Protection	Shuts down PSU if safe internal temperature is exceeded. Auto recovery.
Isolation (tested at dc equivalent voltage)	Input to Output 2.0kV ac Input to Chassis 1.0kV ac Output to Chassis 1.0kV ac

Environmental details

Parameter	Detail
Operating Temperature	-25°C to +71°C at full load -25°C to +85°C at 80% load
Storage Temperature	-40°C to +80°C
Cooling	Convection / conduction via base plate
Relative Humidity	95% max.
Shock & Vibration	EN 50155 (EN 61373)
Environmental Protection	Conformal coating on PCB

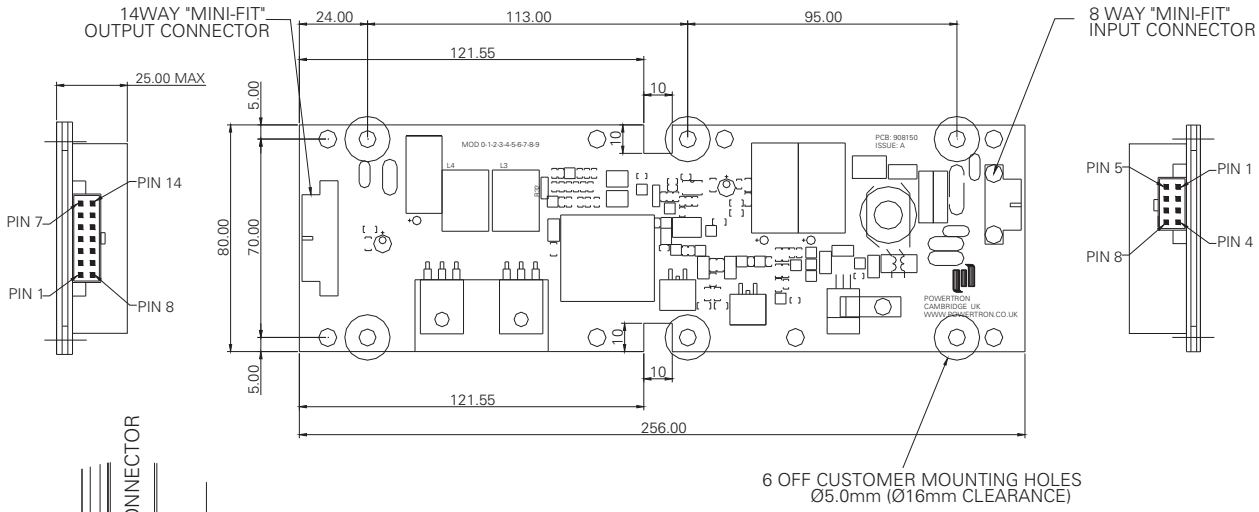
Applicable norms

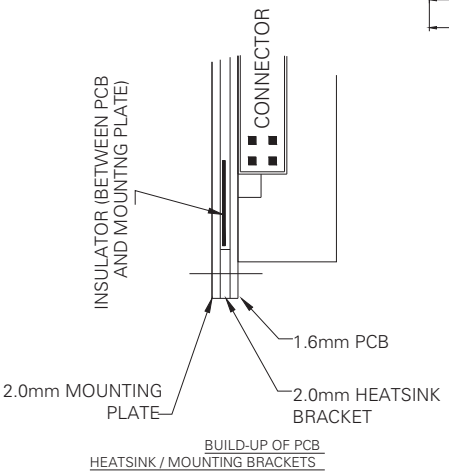
Parameter	Detail
EMC	RIA 12, EN50155 (2007), EN50121-3-2 (2006)
Other	EN50155 (2007), LUL G6621-A2 amendments to EN50155

Mechanical characteristics

Parameter	Detail
Construction	Open frame PCB with mounting plate for cold wall fixing
Dimensions	Length = 256 mm Width = 80 mm Height = 25 mm
Weight	0.5kg
Connections	Input via 8 way mini-fit connector or 3 way. Output via 14 way mini fit connector
Fixings	Six ø 5mm holes.

Technical drawing





INPUT CONNECTOR:
8 WAY MOLEX MINI-FIT JR
PINS 1 & 5: +Ve IN
PINS 2 & 6: -Ve IN
PINS 4 & 8: EARTH
PINS 3 & 7: UNUSED

OUTPUT CONNECTOR:
14 WAY MOLEX MINI-FIT JR
PINS 1 to 7: +Ve OUT
PINS 8 to 14: -Ve OUT

RECOMMENDED MATING CONNECTOR
MOLEX 8 WAY MINI-FIT JR
HOUSING: 39-01-2085
CRIMP: 5556 or 44476 SERIES
MOLEX 14 WAY MINI-FIT JR
HOUSING: 39-01-2145
CRIMP: 5556 or 44476 SERIES
OPTIONAL MOUNTING PLATES AVAILABLE

WEIGHT OF UNIT: <0.5 kg
SEE SPECIFICATION FOR ELECTRICAL AND MECHANICAL OPTIONS
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