



## DC/DC converter for railway applications

Encapsulated version



Open frame PCB version



### Description

The 10W D10R series is a range of low power converters, which incorporate full surge and transient protection to RIA 12 and EN50155. They are single output units with nominal inputs from 24Vdc up to 110Vdc. The D10R is available in encapsulated and open frame versions and can be supplied with pins for PCB mounting or input / output cables for bulkhead mounting.

### Special features include:

- Fully protected to rail norms EN50155 and BRB RIA12
- Choice of construction - encapsulated or open frame PCB
- Choice of connections - PCB pins or cables

### 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 13 and EN50155
Input Protection	Reverse polarity protection. 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 Class S2 (including input short)

### Output specifications

Parameter	Detail
Maximum Output Power	Up to 10W
Output Versions	Single output only
Output Voltage	Can be specified from 5V to 48V
Setting Tolerance	±1.0% at 50% load, 15°C to 25°C
Minimum Load	Zero



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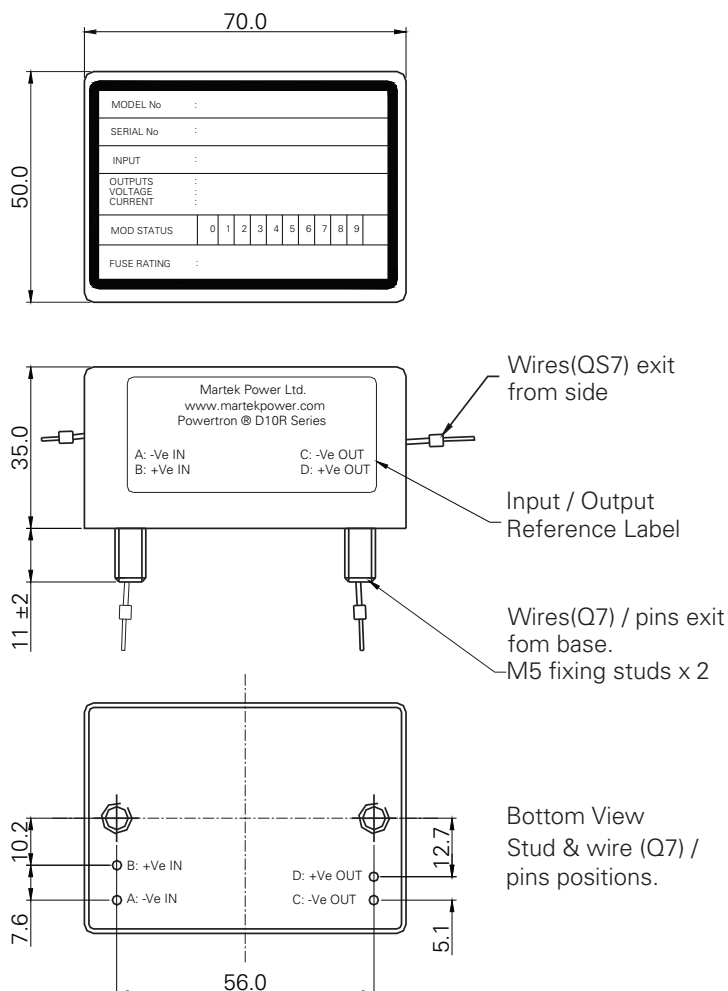
## Output specifications (Continued)

Parameter	Detail
Line Regulation	±0.2%
Load Regulation	±0.5%
Temperature Coefficient	<0.02% / °C
Output Ripple	<1% Pk-Pk of Output Voltage
Output Noise	<50mV Pk-Pk superimposed (up to 20MHz)
Response Time	1.0ms to within 2% (for a 20% - 90% load change)
Output Protection	Protected against indirect transients to RIA 12
Current Limit	Operates at approximately 120% of rated output current
Isolation (tested at dc equivalent voltage)	Input to Output 2.0kV ac

## Environmental details

Parameter	Detail
Operating Temperature	Encapsulated versions -25°C to +65°C (no derating) Open frame versions -40°C to +70°C (no derating)
De rating	Open frame versions can be derated at 2.25%/°C to 95°C
Storage Temperature	-40°C to +85°C
Cooling	Convection
Relative Humidity	99% max. (encapsulated version)
Shock & Vibration	EN 50155 (EN 61373)
Environmental Protection	IP65 (encapsulated version)

## Technical drawing



## Applicable norms

Parameter	Detail
EMC	EN50155 (2017), EN50121-3-2 (2016) RIA 12
Other	EN50155 (2017), EN45545-2

## Mechanical characteristics

Parameter	Detail
Construction	Encapsulated Module or conformal coated PCB
Dimensions, (L,W,H)	Encapsulated 70x50x35 mm Open frame 66x46x25 mm
Weight	250g
Connections	PCB pins as standard or option for cables
Fixings	Two ø 5mm fixing studs (encapsulated version)

## Options for Encapsulated & Open frame series

Code	Detail
Q7	Connections cables from underside Drawing 867-901
QS7	Connections cables from side Drawing 867-901
U	Non encapsulated, open frame PCB Drawing 867-901
D	DIN rail mounting (encapsulated version only)

### Notes:

All dimensions in mm.

**Case:** Moulded in ABS

Flame retardant to UL94 V-0

Pins fitted as standard

Option U denotes Open-frame

Option Q7 denotes wire version

(wires exit from base; for open-frame wires fitted to component side)

Option QS7 denotes wire version (exit from sides)

### Wires are zero halogen type:

Martek Power 361072 (0.6sq. mm 20AWG)

Wire Length - 370mm

Wire termination - None

### Cable marker code (as per label):

A: -Ve IN C: -Ve OUT

B: +Ve IN D: +Ve OUT

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