



## DESCRIPTION

Isolated dc/dc converter for railway rolling stock applications, according to EN50155.

## INPUT

|                        |                 |
|------------------------|-----------------|
| DC input voltage       | 72Vdc           |
| DC input voltage range | 54.4 ... 154Vdc |
| Maximum input current  | <3.5A           |
| Inrush current         | < 60A           |
| Efficiency             | > 85%           |

## OUTPUT

|                                 | 1                              | 2    | 3    |      |
|---------------------------------|--------------------------------|------|------|------|
| Output voltage                  | 5                              | 3.3  | 12   | V    |
| Voltage tolerance               | 3                              | 3    | 3    | ±%   |
| Maximum continuous current (Io) | 13                             | 15   | 3    | A    |
| Maximum overload current        | 26                             | 18   | 3.6  | A    |
| Line regulation                 | 0,5                            | 0,5  | 0,5  | %    |
| Load regulation                 | 1                              | 1    | 1    | %    |
| Cross regulation                | 1                              | 1    | 0.5  | %    |
| Temperature regulation          | 0.02                           | 0.02 | 0.02 | %/°C |
| Dynamic regulation              | 10                             | 10   | 10   | %    |
| Regulation time                 | 0.5                            | 0.5  | 0.5  | ms   |
| Ripple                          | 50                             | 50   | 50   | mVpp |
| Noise (BW 20MHz)                | 100                            | 100  | 100  | mVpp |
| Max. overvoltage protection     | 6.8                            | 4.6  | ---  | V    |
| Max. remote sense               | 0.6                            | 0.6  | ---  | V    |
| Starting delay time             | 300                            | 300  | 300  | ms   |
| Hold-up time                    | 10                             | 10   | 10   | ms   |
| Total Output power (Po):        | 150,5W                         |      |      |      |
| Outputs reference               | Outputs referenced to 0 common |      |      |      |

## ENVIRONMENTAL

|                             |  |
|-----------------------------|--|
| Storage temperature         | -40...85°C                                   |
| Operating temperature range | -25...80°C                                   |
| Cooling                     | Natural convection                           |
| Vibration                   | EN61373 Category 1 class A body mounted      |
| Shock                       | EN61373 Category 1 class A body mounted      |
| M.T.B.F.                    | 600.000 h according to MIL-HDBK-217F GB 40°C |
| Service life                | 15 years                                     |
| Fire and smoke regulations  | NFF16-101, NFF16-102                         |
| Environmental regulations   | RoHS according to directive 2002/95/EC       |

## EMC

|                              |             |
|------------------------------|-------------|
| Emission according to norm/s | EN50121-3-2 |
| Immunity according to norm/s | EN50121-3-2 |



| TEST                    | NORM         | PORT       | SEVERITY | CONDITIONS                 | CRIT. |
|-------------------------|--------------|------------|----------|----------------------------|-------|
| Radiated high-frequency | IEC61000-4-3 | X/Y/Z Axis | 20V/m    | 80...1000MHz M. 80% 1kHz   | A     |
|                         |              | X/Y/Z Axis | 10V/m    | 1G...2GHz M. 80% 1kHz      | A     |
|                         |              | X/Y/Z Axis | 5V/m     | 2G...2.7GHz M. 80% 1kHz    | A     |
| Conducted RF            | IEC61000-4-6 | Input      | 10V      | 0.15...80MHz M. 80% 1kHz   | A     |
|                         |              | Output     | 10V      | 0.15...80MHz M. 80% 1kHz   | A     |
|                         |              | Signal     | 10V      | 0.15...80MHz M. 80% 1kHz   | A     |
| Electrostatic discharge | IEC61000-4-2 | Case       | ±8kV     | Air (isolated parts)       | B     |
|                         |              | Case       | ±6kV     | Contact (conductive parts) | B     |
| Fast transients         | IEC61000-4-4 | Input      | ±2kV     | Tr/Th: 5/50 ns             | A     |
|                         |              | Output     | ±2kV     | Tr/Th: 5/50 ns             | A     |
|                         |              | Signal     | ±2kV     | Tr/Th: 5/50 ns             | A     |
| Surges                  | IEC61000-4-5 | L to L     | ±1kV     | Tr/Th: 1.2/50µs            | B     |
|                         |              | L to PE    | ±2kV     | Tr/Th: 1.2/50µs            | B     |

### SAFETY

|                                  |                 |
|----------------------------------|-----------------|
| Safety according to norm/s       | EN60950 Class I |
| Dielectric strength Input/Output | 3000Vac         |
| Dielectric strength Input/PE     | 1500Vac         |
| Dielectric strength Output/PE    | 500Vac          |

### MECHANICS

|                  |                                 |
|------------------|---------------------------------|
| Mechanical shape | Eurocassette                    |
| Dimensions       | 3U; 8HP x 220mm or 12HP x 160mm |
| Connection type  | DIN 41612 H15                   |

|    |  |
|----|--|
| 4  | +V1  |
| 6  | +V1  |
| 8  | +V2  |
| 10 | +V2  |
| 12 | +sensing 1                                   |
| 14 | -sensing 1                                   |
| 16 | +sensing 2                                   |
| 18 | -sensing 2                                   |
| 20 | 0V Comon                                     |
| 22 | 0V Comon                                     |
| 24 | 0V Comon                                     |
| 26 | +V3  |
| 28 | PE (protective earth, connected to the case) |
| 30 | +Vin   |
| 32 | -Vin   |

### PROTECTIONS

Output/s protected against overloads and shortcircuits  
 Input protected against reverse polarity  
 PCB material type: Epoxy FR4  
 PCB conformal coated. Coating references: SRC400 from ELECTROLUBE  
 Electrofuge 200-ND from CRC