

Features

- ◆ Semi-regulated output (load)
- ◆ Industry standard pinout
- ◆ High efficiency up to 87%
- ◆ I/O isolation voltage 3000 VDC
- ◆ Operationally reliable up to 5'000m altitude
- ◆ Operating temperature range
-40°C to +85°C
- ◆ 3-year product warranty



The TRV-1 series are ultra miniature, 1 Watt DC/DC-converters with high 3000VDC I/O-isolation and semi load regulation. They are the ideal solution to power drivers and circuits where unregulated DC/DC converters do not meet the input voltage range at load change.

Models

| Ordercode | Input voltage | Output voltage | Output current max. | Efficiency typ. |
|------------|---------------|----------------|---------------------|-----------------|
| TRV 1-0511 | 5 VDC ±10% | 5 VDC | 200 mA | 84 % |
| TRV 1-0519 | | 9 VDC | 110 mA | 86.5 % |
| TRV 1-0512 | | 12 VDC | 84 mA | 87 % |
| TRV 1-0513 | | 15 VDC | 67 mA | 87.5 % |
| TRV 1-1211 | 12 VDC ±10% | 5 VDC | 200 mA | 84 % |
| TRV 1-1219 | | 9 VDC | 110 mA | 86 % |
| TRV 1-1212 | | 12 VDC | 84 mA | 88 % |
| TRV 1-1213 | | 15 VDC | 67 mA | 88 % |
| TRV 1-2411 | 24 VDC ±10% | 5 VDC | 200 mA | 84 % |
| TRV 1-2419 | | 9 VDC | 110 mA | 86.5 % |
| TRV 1-2412 | | 12 VDC | 84 mA | 87.5 % |
| TRV 1-2413 | | 15 VDC | 67 mA | 87.5 % |

Input Specifications

| | |
|---|--|
| Input current no load / full load | 5 Vin models: 30 mA / 230 mA typ. 12 Vin models: 12 mA / 100 mA typ. 24 Vin models: 11 mA / 50 mA typ. |
| Surge voltage (1 sec. max.) | 5 Vin models: 9 V max. 12 Vin models: 18 V max. 24 Vin models: 30 V max. |
| Reflected input ripple current | 5 Vin models: 11 mA typ. other models: 5 mA typ. |
| Input filter | internal capacitors |
| Reverse voltage protection | 0.3 A max. |
| Recommended input fuse (slow blow type) | 5 Vin models: 500 mA 12 Vin models: 200 mA 24 Vin models: 100 mA |

Output Specifications

| | | |
|-------------------------------------|---------------------------------------|---|
| Regulation | – Input variation – Load variation | 1.2 % / 1 % change Vin see graph 1 on page 3 |
| Ripple and noise (20 MHz Bandwidth) | | 60 mV pk-pk max. |
| Temperature coefficient | | ±0.02 %/K |
| Short circuit protection | | limited 0.5 sec. max. |
| Capacitive load | | 220 µF max. |

General Specifications

| | | |
|---|--|--|
| Temperature ranges | – Operating – Case temperature – Storage | –40°C to +85°C (without derating) +105°C max. –50°C to +125°C |
| Humidity (non condensing) | | 95 % rel H max. |
| Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign) | | >2'000'000 h |
| Isolation voltage (60 sec.) | Input/Output | 3'000 VDC |
| Isolation capacitance | Input/Output | 60 pF typ. |
| Isolation resistance | Input/Output | >1'000 Mohm |
| Switching frequency | | 100 kHz typ. (frequency modulation) |
| Frequency change over line and load | | –50 / +20 kHz max. |
| Altitude during operation | | up to 5'000 m (16'400 ft) approved |
| Safety standards | | IEC 60950-1:2005 (2nd edition) + Am 1:2009 EN 60950-1:2006 + Am 1:2010 + Am 11:2009 |
| Safety approvals | – CB test report (IEC 60950-1) – CSA certification (UL 60950-1, CSA 60950-1-07) | www.tracopower.com/products/trv-cb.pdf www.tracopower.com/products/trv-csa.pdf |

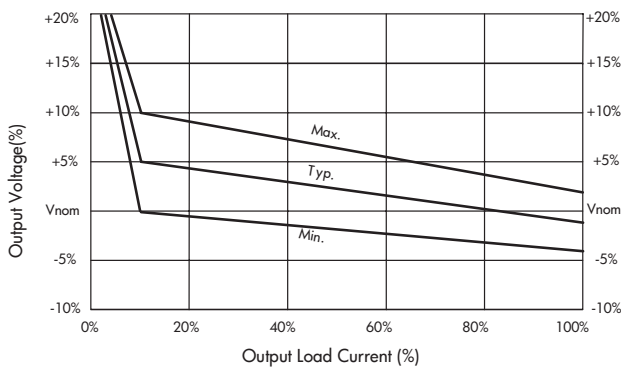
Application note: www.tracopower.com/products/trv1-application.pdf

All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

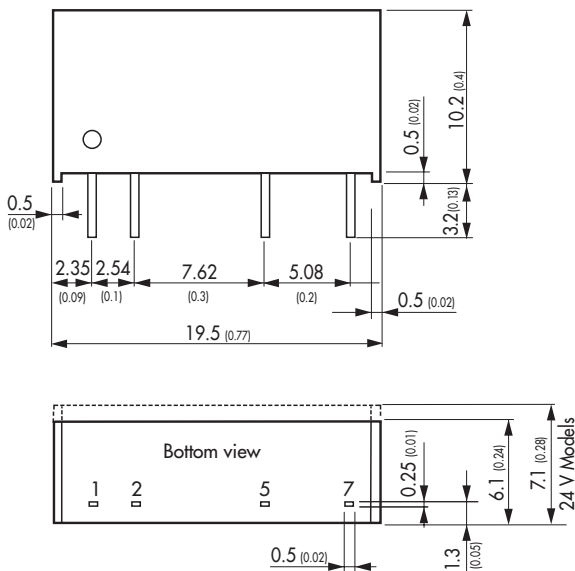
Physical Specifications

| | | |
|--------------------------|--|---|
| Casing material | | non conductive plastic (UL 94V-0 rated) |
| Weight | - 5 & 12 Vin models - 24 Vin models | 2.2 g (0.07 oz) 2.6 g (0.09 oz) |
| Soldering temperature | | max. 260°C, 10 sec, 1.5 mm from case |
| Environmental compliance | - Reach - RoHS | www.tracopower.com/products/reach-declaration.pdf RoHS directive 2011/65/EU |

Graph 1: Load regulation



Outline Dimensions



| Pin-Out | |
|---------|------------|
| Pin | |
| 1 | +Vin (Vcc) |
| 2 | -Vin (GND) |
| 5 | -Vout |
| 7 | +Vout |

Dimensions in [mm], () = Inch
Pin pitch tolerances: ± 0.13 (± 0.005)
Case tolerances: ± 0.25 (± 0.01)

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at www.tracopower.com