

Features

- ◆ Wide 2:1 input voltage range
- ◆ Fully regulated output voltage
- ◆ Compact SIP-8 package
- ◆ Models with 1'500 VDC and 3'000 VDC I/O isolation (functional insulation)
- ◆ Small footprint
- ◆ Temperature range -40° to $+85^{\circ}\text{C}$
- ◆ High efficiency up to 85%
- ◆ Short-circuit protection
- ◆ Remote On/Off control
- ◆ 3-year product warranty



The TMR-3 series is a new family of isolated 3W dc-dc converter modules with regulated output, featuring wide 2:1 input voltage ranges. The product comes in a compact SIP-8 plastic package with a small footprint occupying only 2.0 cm² (0.3 square in.) of board space.

An excellent efficiency allows -40° to $+85^{\circ}\text{C}$ operation temperatures. Further features include remote On/Off control and continuous short circuit protection. The compact dimensions of these converters make them an ideal solution for many space critical applications in communication equipment, instrumentation and industrial electronics.

Models

| Order code | | Input voltage range | Output voltage | Output current max. | Efficiency typ. |
|--------------------|--------------------|----------------------------------|---------------------------------|---------------------|-----------------|
| 1500 VDC isolation | 3000 VDC isolation | | | | |
| TMR 3-0510 | TMR 3-0510HI | 4.5 – 9.0 VDC (5 VDC nominal) | 3.3 VDC | 700 mA | 75 % |
| TMR 3-0511 | TMR 3-0511HI | | 5 VDC | 600 mA | 79 % |
| TMR 3-0512 | TMR 3-0512HI | | 12 VDC | 250 mA | 81 % |
| TMR 3-0513 | TMR 3-0513HI | | 15 VDC | 200 mA | 82 % |
| TMR 3-0521 | TMR 3-0521HI | | ± 5 VDC | ± 300 mA | 78 % |
| TMR 3-0522 | TMR 3-0522HI | | ± 12 VDC | ± 125 mA | 81 % |
| TMR 3-0523 | TMR 3-0523HI | | ± 15 VDC | ± 100 mA | 81 % |
| TMR 3-1210 | TMR 3-1210HI | | 9 – 18 VDC (12 VDC nominal) | 3.3 VDC | 700 mA |
| TMR 3-1211 | TMR 3-1211HI | 5 VDC | | 600 mA | 81 % |
| TMR 3-1212 | TMR 3-1212HI | 12 VDC | | 250 mA | 83 % |
| TMR 3-1213 | TMR 3-1213HI | 15 VDC | | 200 mA | 83 % |
| TMR 3-1221 | TMR 3-1221HI | ± 5 VDC | | ± 300 mA | 82 % |
| TMR 3-1222 | TMR 3-1222HI | ± 12 VDC | | ± 125 mA | 83 % |
| TMR 3-1223 | TMR 3-1223HI | ± 15 VDC | | ± 100 mA | 83 % |
| TMR 3-2410 | TMR 3-2410HI | 18 – 36 VDC (24 VDC nominal) | | 3.3 VDC | 700 mA |
| TMR 3-2411 | TMR 3-2411HI | | 5 VDC | 600 mA | 82 % |
| TMR 3-2412 | TMR 3-2412HI | | 12 VDC | 250 mA | 83 % |
| TMR 3-2413 | TMR 3-2413HI | | 15 VDC | 200 mA | 84 % |
| TMR 3-2421 | TMR 3-2421HI | | ± 5 VDC | ± 300 mA | 80 % |
| TMR 3-2422 | TMR 3-2422HI | | ± 12 VDC | ± 125 mA | 83 % |
| TMR 3-2423 | TMR 3-2423HI | | ± 15 VDC | ± 100 mA | 85 % |
| TMR 3-4810 | TMR 3-4810HI | | 36 – 75 VDC (48 VDC nominal) | 3.3 VDC | 700 mA |
| TMR 3-4811 | TMR 3-4811HI | 5 VDC | | 600 mA | 79 % |
| TMR 3-4812 | TMR 3-4812HI | 12 VDC | | 250 mA | 81 % |
| TMR 3-4813 | TMR 3-4813HI | 15 VDC | | 200 mA | 82 % |
| TMR 3-4821 | TMR 3-4821HI | ± 5 VDC | | ± 300 mA | 79 % |
| TMR 3-4822 | TMR 3-4822HI | ± 12 VDC | | ± 125 mA | 82 % |
| TMR 3-4823 | TMR 3-4823HI | ± 15 VDC | | ± 100 mA | 83 % |

Input Specifications

| | |
|--|--|
| Input current at full load / at no load (nominal input voltage) | 5 Vnom models: 810 mA max. / 60 mA typ. 12 Vnom models: 330 mA max. / 30 mA typ. 24 Vnom models: 160 mA max. / 18 mA typ. 48 Vnom models: 85 mA max. / 12 mA typ. |
| Surge voltage (100 msec. max.) | 5 Vnom models: 15 V max. 12 Vnom models: 36 V max. 24 Vnom models: 50 V max. 48 Vnom models: 100 V max. |
| Input voltage variation (dv/dt) | 5 V/ms, max. (complies with ETS300 132 part 4.4) |
| Input filter | capacitor type (see application note for compliance to EN 55022 class A/B) |
| Start up time (constant resistive load) | – Power On: 30 ms typ. – Remote On: 30 ms typ. |

Output Specifications

| | |
|--|--|
| Voltage set accuracy | ±1 % max |
| Regulation | – Input variation Vin min. to Vin max.: 0.2 % max. – Load variation 5 – 100% single output models: 0.5 % max. dual output models: 1.0 % max. balanced load – Load variation 0 – 100% single output models: 1.0 % max. dual output models: 1.0 % max. balanced load – Load cross regulation 25/100%: 5.0 % max. (dual output models) |
| Minimum load | not required |
| Ripple and noise (20 MHz Bandwidth) | 50 mVp-p max. |
| Transient response setting time (25% load step change) | 500 µs typ. |
| Short circuit protection | continuous, automatic recovery |
| Capacitive load | 3.3 VDC / 5 VDC output models: 3300 µF max. / 1680 µF max. 12 VDC / 15 VDC output models: 820 µF max. / 680 µF max. ±5 VDC / ±12 VDC output models: ±1000 µF max. / ±470 µF max. ±15 VDC output models: ±330 µF max. |

General Specifications

| | |
|---|---|
| Temperature ranges | – Operating: –40°C to +85°C – Case temperature: +100°C max. – Storage: –55°C to +105°C |
| Load derating | 3.3 %/K above 70°C |
| Humidity (non condensing) | 5 – 95 % rel. H max. |
| Temperature coefficient | ±0.02 %/K |
| Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign) | >4.8 Mio h |
| Isolation voltage (60 sec.) | – Input/Output: 1600 VDC with suffix -HI: 3000 VDC |
| Isolation capacitance | – Input/Output: 200 pF max. with suffix -HI: 40 pF max. |
| Isolation resistance | – Input/Output (500 VDC): >1 GOhm |
| Switching frequency | 100 kHz min. (PFM) |
| Remote On/Off | – On: open or high impedance – Off: 2...4 mA (internal 1 kOhm resistor) – Off stand by input current: 2.5 mA max. |

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

General Specifications

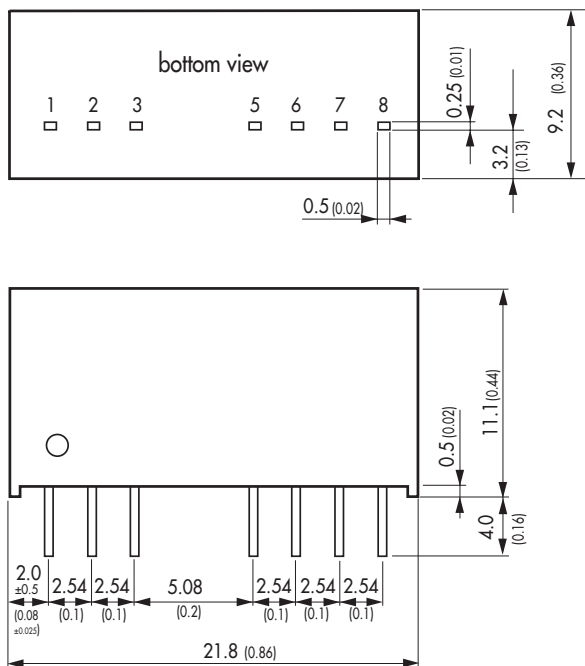
| | | |
|--------------------------|---------------------------|---|
| Safety standards | - Certification documents | IEC/EN 60950-1, UL 60950-1 www.tracopower.com/overview/tmr3 |
| Environmental compliance | - Reach - RoHS | www.tracopower.com/info/reach-declaration.pdf RoHS directive 2011/65/EU |

Physical Specifications

| | |
|------------------|----------------------------|
| Casing material | non-conductive plastic |
| Potting material | silicone, (UL 94V-0 rated) |
| Weight | 4.8 g (0.17oz) |

Supporting documents: www.tracopower.com/overview/tmr3

Outline Dimensions mm (inches)



| Pin-Out | | |
|---------|---------------|---------------|
| Pin | Single | Dual |
| 1 | -Vin (GND) | -Vin (GND) |
| 2 | +Vin (Vcc) | +Vin (Vcc) |
| 3 | Remote On/Off | Remote On/Off |
| 5* | No function | No function |
| 6 | +Vout | +Vout |
| 7 | -Vout | Common |
| 8 | No function | -Vout |

*No pin 5 with HI version

Dimensions in [mm], () = Inch
Tolerances: ±0.5 (±0.02)
Pin pitch tolerances: ±0.25 (±0.01)

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