

- Highest power density in SIP package
- Wide 2:1 input voltage range
- Ultra-compact SIP-8 package
- Smallest footprint 6W converter
- Temperature range -40° to $+65^{\circ}\text{C}$
- High efficiency up to 86%
- Indefinite short-circuit protection
- I/O isolation 1600 VDC
- Remote On/Off control
- Fully RoHS compliant
- 3-year product warranty



The TMR-6 series is a new family of isolated 6W DC/DC converter modules with regulated output, featuring wide 2:1 input voltage ranges. The product comes in an ultra-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 $+65^{\circ}\text{C}$ operation temperatures. Further features include remote On/Off control and continuous short circuit protection. The very 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. |
| TMR 6-0510 | 4.5 – 9.0 VDC (5 VDC nominal) | 3.3 VDC | 1300 mA | 77 % |
| TMR 6-0511 | | 5 VDC | 1200 mA | 81 % |
| TMR 6-0519 | | 9 VDC | 666 mA | 83 % |
| TMR 6-0512 | | 12 VDC | 500 mA | 84 % |
| TMR 6-0513 | | 15 VDC | 400 mA | 84 % |
| TMR 6-0515 | | 24 VDC | 250 mA | 84 % |
| TMR 6-0521 | | ± 5 VDC | ± 600 mA | 81 % |
| TMR 6-0522 | | ± 12 VDC | ± 250 mA | 84 % |
| TMR 6-0523 | | ± 15 VDC | ± 200 mA | 84 % |
| TMR 6-1210 | 9 – 18 VDC (12 VDC nominal) | 3.3 VDC | 1300 mA | 78 % |
| TMR 6-1211 | | 5 VDC | 1200 mA | 83 % |
| TMR 6-1219 | | 9 VDC | 666 mA | 84 % |
| TMR 6-1212 | | 12 VDC | 500 mA | 85 % |
| TMR 6-1213 | | 15 VDC | 400 mA | 85 % |
| TMR 6-1215 | | 24 VDC | 250 mA | 84 % |
| TMR 6-1221 | | ± 5 VDC | ± 600 mA | 82 % |
| TMR 6-1222 | | ± 12 VDC | ± 250 mA | 83 % |
| TMR 6-1223 | | ± 15 VDC | ± 200 mA | 84 % |
| TMR 6-2410 | 18 – 36 VDC (24 VDC nominal) | 3.3 VDC | 1300 mA | 78 % |
| TMR 6-2411 | | 5 VDC | 1200 mA | 83 % |
| TMR 6-2419 | | 9 VDC | 666 mA | 84 % |
| TMR 6-2412 | | 12 VDC | 500 mA | 85 % |
| TMR 6-2413 | | 15 VDC | 400 mA | 86 % |
| TMR 6-2415 | | 24 VDC | 250 mA | 85 % |
| TMR 6-2421 | | ± 5 VDC | ± 600 mA | 82 % |
| TMR 6-2422 | | ± 12 VDC | ± 250 mA | 84 % |
| TMR 6-2423 | | ± 15 VDC | ± 200 mA | 84 % |
| TMR 6-4810 | 36 – 75 VDC (48 VDC nominal) | 3.3 VDC | 1300 mA | 78 % |
| TMR 6-4811 | | 5 VDC | 1200 mA | 82 % |
| TMR 6-4819 | | 9 VDC | 666 mA | 84 % |
| TMR 6-4812 | | 12 VDC | 500 mA | 85 % |
| TMR 6-4813 | | 15 VDC | 400 mA | 86 % |
| TMR 6-4815 | | 24 VDC | 250 mA | 84 % |
| TMR 6-4821 | | ± 5 VDC | ± 600 mA | 82 % |
| TMR 6-4822 | | ± 12 VDC | ± 250 mA | 84 % |
| TMR 6-4823 | | ± 15 VDC | ± 200 mA | 85 % |

Input Specifications

| | |
|---|--|
| Input current at no load (nominal input voltage) | 5 V models: 105 mA typ. 12 V models: 55 mA typ. 24 V models: 30 mA typ. 48 V models: 15 mA typ. |
| Surge voltage (100 msec. max.) | 5 V models: 15 V max. 12 V models: 36 V max. 24 V models: 50 V max. 48 V models: 100 V max. |
| Input filter | capacitor type. Application for compliance to EN 55022 class A/B (see supporting documents) |
| Recommended input fuse (slow blow, max. rating) | 5 V models: 3.0 A 12 V models: 1.6 A 24 V models: 1.0 A 48 V models: 500 mA |
| ESD (electrostatic discharge) | EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A |
| Radiated immunity | EN 61000-4-3, 10 V/m, perf. criteria A |
| Fast transient / surge (with external input capacitor) – external input capacitor | EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±2 kV perf. criteria A 5 Vin models: Nippon chemi-con KY 330 µF, 50 V, ESR 55 mOhm other models: Nippon chemi-con KY 220 µF, 100 V, ESR 48 mOhm |
| Conducted immunity | EN 61000-4-6, 10 Vrms, perf. criteria A |
| PF Magnetic Field | EN 61000-4-8, 100 A/m, perf. criteria A |

Output Specifications

| | |
|---|--|
| Voltage set accuracy | ±1 % max |
| Regulation | – Input variation Vin min. to Vin max. 0.2 % max. – Load variation 0–100% single out models: 1.0 % max. dual output models: 1.0 % max. balanced load – Load cross regulation 25/100% 5.0 % max. (dual output models) |
| Temperature coefficient | ±0.02 %/K |
| 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 |
| Start up time – Power On / Remote On | 10 ms max. |
| Capacitive load | 3.3 VDC / 5 VDC output models: 6600 µF max. / 3300 µF max. 9 VDC output models: 2000 µF max. 12 VDC / 15 VDC output models: 1600 µF max. / 1400 µF max. 24 VDC output models: 680 µF max. ±5 VDC / ±12 VDC output models: 2000 µF max. / 900 µF max. (each output) ±15 VDC output models: 660 µF max. (each output) |

General Specifications

| | |
|---|---|
| Temperature ranges | – Operating –40°C to +65°C (without derating) – Case temperature +105°C max. – Storage –55°C to +125°C |
| Load derating | 4 %/K above 65°C |
| Thermal shock, mechanical shock & vibration – Test conditions | EN 61373, MIL-STD-810F www.tracopower.com/products/mil810.pdf |
| Humidity (non condensing) | 5 – 95 % rel. H max. |

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

General Specifications

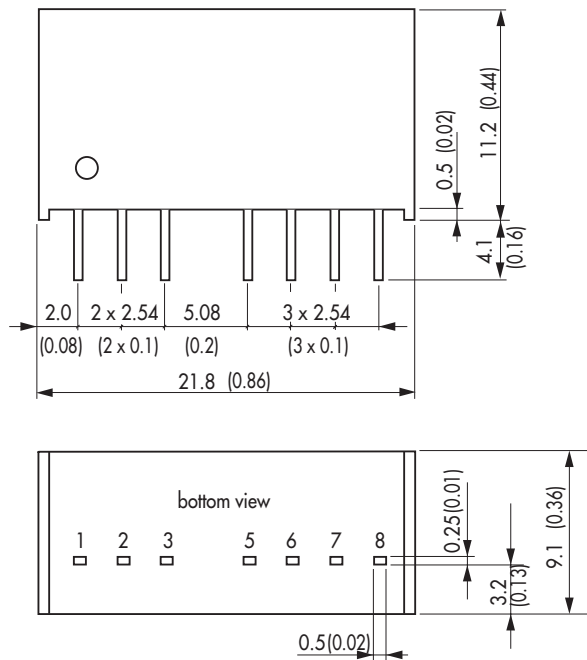
| | | |
|--|---|---|
| Reliability, calculated MTBF (MIL-HDBK-217F, at $T_c = +70^\circ\text{C}$, ground benign) | | >2.1 Mio h |
| Isolation voltage (60 s) | – Input/Output | 1600 VDC |
| Isolation capacitance | – Input/Output | 50 pF max. |
| Isolation resistance | – Input/Output (500 VDC) | >1 GOhm |
| Switching frequency | | 100 kHz min. (PFM) |
| Remote On/Off | – On: – Off: – Off stand by input current | open or high impedance 2...4 mA current applied via 1kOhm resistor 2.5 mA max. |
| Safety approvals | – Certification document | UL 60950-1 www.tracopower.com/overview/tmr6 |
| Altitude during operation | | 4'000 m max. (13'120 ft) approved |
| Environmental compliance | – Reach – RoHS | www.tracopower.com/products/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/tmr6

Outline Dimensions



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

ntc = not to connect

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