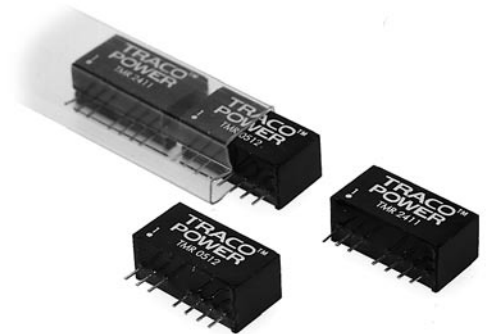




Features

- ◆ Wide 2:1 Input Voltage Range
- ◆ Compact SIP-8 Package
- ◆ Small Footprint
- ◆ Full SMD Design
- ◆ Temperature Range -40° to $+75^{\circ}\text{C}$
- ◆ High Efficiency
- ◆ Excellent Load and Line Regulation
- ◆ Indefinite Short-circuit Protection
- ◆ I/O-Isolation 1000VDC
- ◆ Remote On/Off Control
- ◆ Fully RoHS compliant
- ◆ 3 Year Product Warranty



The TMR-2 series is a family of isolated 2W 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 small footprint occupying only 2.0 cm² (0.3 square in.) of board space.

An excellent efficiency allows -40° to $+75^{\circ}\text{C}$ operation temperatures at full load. Further features include remote On/Off control and continuous short circuit protection. The ultra-compact dimensions of these converters make them an ideal solution for many space critical applications in communication equipment, instrumentation and industrial electronics.

Models

| Ordercode | Input voltage range | Output voltage | Output current max. | Efficiency typ. |
|-----------|---------------------|----------------|---------------------|-----------------|
| TMR 0510 | 4.5 – 9.0 VDC | 3.3 VDC | 500 mA | 64 % |
| TMR 0511 | | 5 VDC | 400 mA | 66 % |
| TMR 0512 | | 12 VDC | 165 mA | 71 % |
| TMR 0521 | | ± 5 VDC | ± 200 mA | 64 % |
| TMR 0522 | | ± 12 VDC | ± 85 mA | 69 % |
| TMR 0523 | | ± 15 VDC | ± 65 mA | 71 % |
| TMR 1210 | 9 – 18 VDC | 3.3 VDC | 500 mA | 70 % |
| TMR 1211 | | 5 VDC | 400 mA | 73 % |
| TMR 1212 | | 12 VDC | 165 mA | 80 % |
| TMR 1221 | | ± 5 VDC | ± 200 mA | 73 % |
| TMR 1222 | | ± 12 VDC | ± 85 mA | 78 % |
| TMR 1223 | | ± 15 VDC | ± 65 mA | 78 % |
| TMR 2410 | 18 – 36 VDC | 3.3 VDC | 500 mA | 71 % |
| TMR 2411 | | 5 VDC | 400 mA | 74 % |
| TMR 2412 | | 12 VDC | 165 mA | 81 % |
| TMR 2421 | | ± 5 VDC | ± 200 mA | 74 % |
| TMR 2422 | | ± 12 VDC | ± 85 mA | 78 % |
| TMR 2423 | | ± 15 VDC | ± 65 mA | 80 % |
| TMR 4810 | 36 – 75 VDC | 3.3 VDC | 500 mA | 70 % |
| TMR 4811 | | 5 VDC | 400 mA | 73 % |
| TMR 4812 | | 12 VDC | 165 mA | 79 % |
| TMR 4821 | | ± 5 VDC | ± 200 mA | 71 % |
| TMR 4822 | | ± 12 VDC | ± 85 mA | 77 % |
| TMR 4823 | | ± 15 VDC | ± 65 mA | 77 % |

Input Specifications

| | |
|--|--|
| Input current at full load (nominal input) | 5 Vin models: 645 mA max. 12 Vin models: 242 mA max. 24 Vin models: 117 mA max. 48 Vin models: 62 mA max. |
| Surge voltage (100 msec. max.) | 5 Vin models: 15 V max. 12 Vin models: 25 V max. 24 Vin models: 50 V max. 48 Vin models: 100 V max. |
| Input voltage variation (dv/dt) | 5 V/ms, max. (complies to ETS 300 132 part. 4.4) |
| Input Filter | capacitor type |
| Start up time | 1 ms typ. (at nominal input and resistive load) |

Output Specifications

| | |
|-------------------------------------|---|
| Voltage set accuracy | ±1 % |
| Regulation | – Input variation Vin min. to Vin max. 0.5 % max. – Load variation 10–100 % 3.3 VDC models: 0.85 % max. single output models: 0.75 % max. dual output models balanced load: 1.0 % max. dual output models asymmetric load: 5.0 % max. (25% /100%) |
| Ripple and noise (20 MHz Bandwidth) | 50 mVpk-pk max. |
| Temperature coefficient | ± 0.1 %/°C |
| Short circuit protection | continuous, automatic recovery |
| Minimum load | 10% of rated max current (operation at lower load condition is safe but a higher output ripple will be experienced) |
| Capacitive load | 3.3 VDC / 5 VDC output models: 2'200 µF max. / 1'000 µF max. 12 VDC / ±5 VDC output models: 170 µF max. / ±470 µF max. ±12 VDC / ±15 VDC output models: 100 µF max. / ± 47 µF max. |

General Specifications

| | |
|---|---|
| Temperature ranges | – Operating –40 °C ... +75 °C (no derating) – Storage –55 °C ... +105 °C |
| Humidity (non condensing) | 95 % rel. H max. |
| Reliability, calculated MTBF (MIL-HDBK-217 F) | > 2.3 Mio h @ 25°C |
| Isolation voltage (60 sec) | – Input/Output 1'000 VDC |
| Isolation capacity | – Input/Output 300 pF max. |
| Isolation resistance | – Input/Output (500 VDC) > 1'000 MOhm |
| Switching frequency | 100 to 650 kHz (PFM) |
| Remote On/Off | – On: open or high impedance – Off: 4...8 mA input current applied via 1KW resistor – Off stand by input current max. 1mA |

Physical Specifications

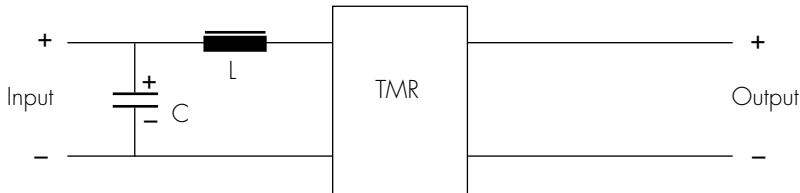
| | |
|------------------|-------------------------|
| Case material | non-conductive plastic |
| Potting material | epoxy, UL 94V-0 - rated |
| Weight | 4.8g (0.17oz) |

Application notes can be downloaded under:
www.tracopower.com/products/tmr2_application.pdf

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

EMC Characteristics

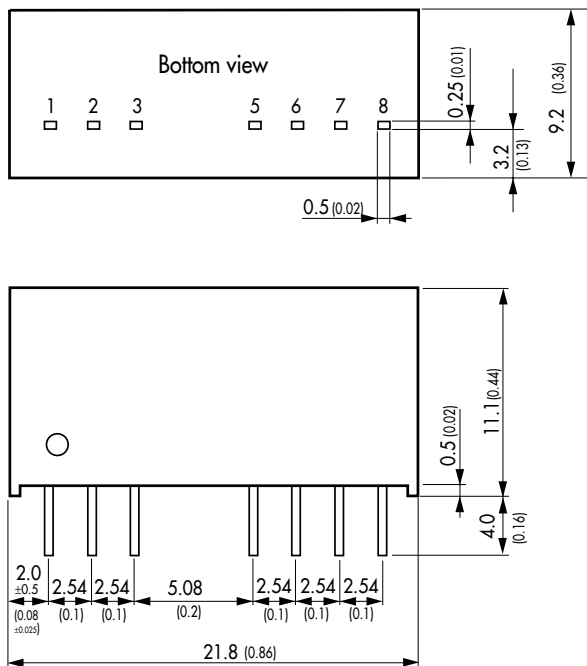
- Use an electrolytic low ESR capacitor at input side to reduce reflected ripple current.
- In order to meet EN55022 class B additionally use a choke to build an L/C filter as follows:



Recommended values for filter:

| Input | C | L |
|-------|-------|-------|
| 5VDC | 100µF | 10µH |
| 12VDC | 100µF | 10µH |
| 24VDC | 10µF | 120µH |
| 48VDC | 10µF | 120µH |

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 |

Specifications can be changed any time without notice