The TMR 4Wi is a regulated 4 Watt DC/DC converter series with 4:1 input voltage range. It comes in a compact SIP-8 package featuring single and dual output models, I/O isolation voltage of 1600 VDC and protection against short-circuit and over load. Being a 4 Watt converter this series acts as an excellent gap closer between the more common 3 & 6 Watt converters. It offers a cost-efficient alternative to 5 and 6 Watt converters in applications where a 3 Watt converter would operate at the absolute technical limits (e.g. output power). The intelligent design provides efficiencies up to 83% and a temperature range of -40°C to +70°C without derating which enables an unrestricted use of this converter series in applications with demanding temperature requirements. Additionally, the integrated remote On/Off function offers a convenient way to control your application. Certified according to the latest IEC/EN/UL 62368-1 industrial standard the TMR 4Wi is designed to deliver a high quality, cost efficient and compact solution for many applications.

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**Models**

<table>
<thead>
<tr>
<th>Order Code</th>
<th>Input Voltage Range</th>
<th>Output 1 Vnom</th>
<th>Imax</th>
<th>Output 2 Vnom</th>
<th>Imax</th>
<th>Efficiency typ.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMR 4-2411WI</td>
<td>9 - 36 VDC (24 VDC nom.)</td>
<td>5 VDC</td>
<td>800 mA</td>
<td></td>
<td></td>
<td>79 %</td>
</tr>
<tr>
<td>TMR 4-2412WI</td>
<td></td>
<td>12 VDC</td>
<td>333 mA</td>
<td></td>
<td></td>
<td>83 %</td>
</tr>
<tr>
<td>TMR 4-2413WI</td>
<td></td>
<td>15 VDC</td>
<td>266 mA</td>
<td></td>
<td></td>
<td>83 %</td>
</tr>
<tr>
<td>TMR 4-2415WI</td>
<td></td>
<td>24 VDC</td>
<td>166 mA</td>
<td></td>
<td></td>
<td>83 %</td>
</tr>
<tr>
<td>TMR 4-2422WI</td>
<td></td>
<td>+12 VDC</td>
<td>166 mA</td>
<td></td>
<td>−12 VDC</td>
<td>166 mA</td>
</tr>
<tr>
<td>TMR 4-2423WI</td>
<td></td>
<td>+15 VDC</td>
<td>133 mA</td>
<td></td>
<td>−15 VDC</td>
<td>133 mA</td>
</tr>
<tr>
<td>TMR 4-4811WI</td>
<td>18 - 75 VDC (48 VDC nom.)</td>
<td>5 VDC</td>
<td>800 mA</td>
<td></td>
<td></td>
<td>78 %</td>
</tr>
<tr>
<td>TMR 4-4812WI</td>
<td></td>
<td>12 VDC</td>
<td>333 mA</td>
<td></td>
<td></td>
<td>82 %</td>
</tr>
<tr>
<td>TMR 4-4813WI</td>
<td></td>
<td>15 VDC</td>
<td>266 mA</td>
<td></td>
<td></td>
<td>82 %</td>
</tr>
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<td></td>
<td>+12 VDC</td>
<td>166 mA</td>
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<td>166 mA</td>
</tr>
<tr>
<td>TMR 4-4823WI</td>
<td></td>
<td>+15 VDC</td>
<td>133 mA</td>
<td></td>
<td>−15 VDC</td>
<td>133 mA</td>
</tr>
</tbody>
</table>
## Input Specifications

<table>
<thead>
<tr>
<th>Input Current</th>
<th>24 Vin models: 20 mA typ.</th>
<th>48 Vin models: 10 mA typ.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- At no load</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- At full load</td>
<td>24 Vin models: 202 mA typ.</td>
<td>48 Vin models: 102 mA typ.</td>
</tr>
</tbody>
</table>

### Surge Voltage

- 24 Vin models: 50 VDC max. (1 s max.)
- 48 Vin models: 100 VDC max. (1 s max.)

### Recommended Input Fuse

(The need of an external fuse has to be assessed in the final application.)

### Input Filter

Internal Capacitor

## Output Specifications

### Voltage Set Accuracy

±1% max.

### Regulation

- Input Variation (Vmin - Vmax)
  - single output models: 0.5% max.
  - dual output models: 0.5% max.
- Load Variation (0 - 100%)
  - single output models: 1% max.
  - dual output models: 1% max. (Output 1)
  - dual output models: 1% max. (Output 2)
- Voltage Balance (symmetrical load)
  - dual output models: 2% max.
- Cross Regulation (25% / 100% asym. load)
  - dual output models: 5% max.

### Ripple and Noise

- 20 MHz Bandwidth
  - 80 mVp-p max.

### Capacitive Load

- single output
  - 5 Vout models: 1'800 µF max.
  - 12 Vout models: 1'000 µF max.
  - 15 Vout models: 820 µF max.
  - 24 Vout models: 470 µF max.
- dual output
  - 12 / -12 Vout models: 560 / 560 µF max.
  - 15 / -15 Vout models: 390 / 390 µF max.

### Minimum Load

- Not required

### Temperature Coefficient

±0.02 %/K max.

### Start-up Time

30 ms typ.

### Short Circuit Protection

Continuous, Automatic recovery

### Overload Protection

Foldback Mode

### Output Current Limitation

160% typ. of Iout max.

### Transient Response

- Response Deviation: 3% typ. / 5% max. (25% Load Step)
- Response Time: 250 µs typ. (25% Load Step)

## Safety Specifications

### Safety Standards

- IT / Multimedia Equipment
  - EN 62368-1
  - IEC 62368-1
  - UL 62368-1
- Certification Documents
  - www.tracopower.com/overview/tmr4wi

## EMC Specifications

### EMI Emissions

- Conducted Emissions
  - EN 55032 class A (with external filter)
  - EN 55032 class B (with external filter)
  - FCC Part 15 class A (with external filter)
  - FCC Part 15 class B (with external filter)
- Radiated Emissions
  - EN 55032 class A (with external filter)
  - EN 55032 class B (with external filter)
  - FCC Part 15 class A (with external filter)
  - FCC Part 15 class B (with external filter)

External filter proposal: www.tracopower.com/overview/tmr4wi

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

- **Electrostatic Discharge**
  - Air: EN 61000-4-2, ±8 kV, perf. criteria A
  - Contact: EN 61000-4-2, ±6 kV, perf. criteria A
- **RF Electromagnetic Field**
  - EFT (Burst) / Surge
    - EN 61000-4-4, ±2 kV, perf. criteria A
- **Conducted RF Disturbances**
  - PF Magnetic Field
    - Continuous: EN 61000-4-8, 100 A/m, perf. criteria A
    - 1 s: EN 61000-4-8, 1000 A/m, perf. criteria A

**External filter proposal:**
www.tracopower.com/overview/tmr4wi

**General Specifications**

<table>
<thead>
<tr>
<th>Relative Humidity</th>
<th>95% max. (non condensing)</th>
</tr>
</thead>
</table>
| **Temperature Ranges** | - Operating Temperature: -40°C to +85°C
- Case Temperature: +100°C max.
- Storage Temperature: -55°C to +125°C |
| **Power Derating** | 3.33 %/K above 70°C |
| **Cooling System** | Natural convection (20 LFM) |
| **Remote Control** | - Voltage Controlled Remote On: < 0.6 VDC or open circuit
  - Off: 6 to 15 VDC
  - Off idle Input Current: 2.5 mA typ. |
| **Altitude During Operation** | 6’000 m max. |
| **Switching Frequency** | 100 kHz min. (PFM) |
| **Insulation System** | Functional Insulation |
| **Isolation Test Voltage** | - Input to Output, 60 s: 1’600 VDC
- Input to Output, 1 s: 1’920 VDC |
| **Isolation Capacitance** | - Input to Output, 500 VDC: 1’000 MΩ min. |
| **Reliability** | - Calculated MTBF: 2’860’000 h (MIL-HDBK-217F, ground benign) |
| **Housing Material** | Non-conductive Plastic (UL94 V-0 rated) |
| **Pin Material** | Phosphor Bronze (C5191) |
| **Pin Foundation Plating** | Nickel (1 µm min) |
| **Pin Surface Plating** | Tin (3 – 5 µm), matte |
| **Connection Type** | THD (Through-Hole Device) |
| **Weight** | 4.8 g |
| **Environmental Compliance** | www.tracopower.com/info/reach-declaration.pdf
  - REACH Declaration
  - RoHS Declaration
  - REACH SVHC list compliant
  - REACH Annex XVII compliant
  - Exemptions: 7a |

**Supporting Documents**

- [Overview Link](www.tracopower.com/overview/tmr4wi)

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

Pinout

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single</th>
<th>Dual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>–Vin (GND)</td>
<td>–Vin (GND)</td>
</tr>
<tr>
<td>2</td>
<td>+Vin (Vcc)</td>
<td>+Vin (Vcc)</td>
</tr>
<tr>
<td>3</td>
<td>Remote On/Off</td>
<td>Remote On/Off</td>
</tr>
<tr>
<td>5</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>6</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>7</td>
<td>–Vout</td>
<td>Common</td>
</tr>
<tr>
<td>8</td>
<td>NC</td>
<td>–Vout</td>
</tr>
</tbody>
</table>

NC: Not connected

Dimensions in mm (inch)

Tolerances:
- x.x ±0.5 (±0.02)
- x.xx ±0.25 (±0.01)
- Pins: ±0.1 (±0.004)