DC/DC Converter TDR 3WISM Series, 3 Watt

- Compact design in SMD package
- Ultra wide 4:1 input voltage range
- Fully regulated outputs
- Low ripple and noise
- Temperature range –40°C to +85°C without derating
- I/O isolation 1600 VDC
- Continuous short-circuit protection
- Remote On/Off control
- Fully RoHS compliant
- 3-year product warranty

The TDR 3WISM series is a family of compact 3 W DC/DC-converters with 4:1 input voltage ranges and tightly regulated output voltages even under no load conditions. The product is available in SMD-package. They work with high efficiency over the full load range and come with a remote On/Off input. The usability in temperature ranges of up to +85°C, continuous short circuit protection and excellent immunity against environmental influences make these converters very reliable. A TDR 3WISM converter is the ideal solution for space critical high end applications in communication equipment, instrumentation and industrial electronics.

<table>
<thead>
<tr>
<th>Models</th>
<th>Input Voltage Range</th>
<th>Output 1</th>
<th>Output 2</th>
<th>Efficiency typ.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vnom</td>
<td>Imax</td>
<td>Vnom</td>
<td>Imax</td>
</tr>
<tr>
<td>TDR 3-1211WISM</td>
<td>4.5 - 18 VDC (12 VDC nom.)</td>
<td>5 VDC</td>
<td>600 mA</td>
<td>12 VDC</td>
</tr>
<tr>
<td>TDR 3-1212WISM</td>
<td>4.5 - 18 VDC (12 VDC nom.)</td>
<td>12 VDC</td>
<td>250 mA</td>
<td>12 VDC</td>
</tr>
<tr>
<td>TDR 3-1213WISM</td>
<td>4.5 - 18 VDC (12 VDC nom.)</td>
<td>15 VDC</td>
<td>200 mA</td>
<td>12 VDC</td>
</tr>
<tr>
<td>TDR 3-1222WISM</td>
<td>+12 VDC</td>
<td>125 mA</td>
<td>–12 VDC</td>
<td>125 mA</td>
</tr>
<tr>
<td>TDR 3-1223WISM</td>
<td>+15 VDC</td>
<td>100 mA</td>
<td>–15 VDC</td>
<td>100 mA</td>
</tr>
<tr>
<td>TDR 3-2411WISM</td>
<td>9 - 36 VDC (24 VDC nom.)</td>
<td>5 VDC</td>
<td>600 mA</td>
<td>12 VDC</td>
</tr>
<tr>
<td>TDR 3-2412WISM</td>
<td>9 - 36 VDC (24 VDC nom.)</td>
<td>12 VDC</td>
<td>250 mA</td>
<td>12 VDC</td>
</tr>
<tr>
<td>TDR 3-2413WISM</td>
<td>9 - 36 VDC (24 VDC nom.)</td>
<td>15 VDC</td>
<td>200 mA</td>
<td>12 VDC</td>
</tr>
<tr>
<td>TDR 3-2422WISM</td>
<td>+12 VDC</td>
<td>125 mA</td>
<td>–12 VDC</td>
<td>125 mA</td>
</tr>
<tr>
<td>TDR 3-2423WISM</td>
<td>+15 VDC</td>
<td>100 mA</td>
<td>–15 VDC</td>
<td>100 mA</td>
</tr>
<tr>
<td>TDR 3-4811WISM</td>
<td>18 - 75 VDC (48 VDC nom.)</td>
<td>5 VDC</td>
<td>600 mA</td>
<td>12 VDC</td>
</tr>
<tr>
<td>TDR 3-4812WISM</td>
<td>18 - 75 VDC (48 VDC nom.)</td>
<td>12 VDC</td>
<td>250 mA</td>
<td>12 VDC</td>
</tr>
<tr>
<td>TDR 3-4813WISM</td>
<td>18 - 75 VDC (48 VDC nom.)</td>
<td>15 VDC</td>
<td>200 mA</td>
<td>12 VDC</td>
</tr>
<tr>
<td>TDR 3-4822WISM</td>
<td>+12 VDC</td>
<td>125 mA</td>
<td>–12 VDC</td>
<td>125 mA</td>
</tr>
<tr>
<td>TDR 3-4823WISM</td>
<td>+15 VDC</td>
<td>100 mA</td>
<td>–15 VDC</td>
<td>100 mA</td>
</tr>
</tbody>
</table>
### Input Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>12 Vin models</th>
<th>24 Vin models</th>
<th>48 Vin models</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input Current</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- At no load</td>
<td>40 mA typ.</td>
<td>20 mA typ.</td>
<td>13 mA typ.</td>
</tr>
<tr>
<td>- At full load</td>
<td>330 mA max.</td>
<td>185 mA max.</td>
<td>80 mA max.</td>
</tr>
<tr>
<td><strong>Surge Voltage</strong></td>
<td>25 VDC max. (1 s max.)</td>
<td>50 VDC max. (1 s max.)</td>
<td>100 VDC max. (1 s max.)</td>
</tr>
<tr>
<td><strong>Reflected Ripple Current</strong></td>
<td>80 mA-p-p typ.</td>
<td>40 mA-p-p typ.</td>
<td>30 mA-p-p typ.</td>
</tr>
<tr>
<td><strong>Recommended Input Fuse</strong></td>
<td>2'500 mA (Slow blow)</td>
<td>1'500 mA (Slow blow)</td>
<td>1'000 mA (Slow blow)</td>
</tr>
<tr>
<td><strong>Input Filter</strong></td>
<td>Internal Capacitor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Output Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Voltage Set Accuracy</strong></td>
<td>±1% max.</td>
</tr>
<tr>
<td><strong>Regulation</strong></td>
<td></td>
</tr>
<tr>
<td>- Input Variation (Vmin - Vmax)</td>
<td></td>
</tr>
<tr>
<td>single output models</td>
<td>0.2% max.</td>
</tr>
<tr>
<td>dual output models</td>
<td>0.2% max.</td>
</tr>
<tr>
<td>- Load Variation (0 - 100%)</td>
<td></td>
</tr>
<tr>
<td>single output models</td>
<td>1% max.</td>
</tr>
<tr>
<td>dual output models</td>
<td>1% max. (Output 1)</td>
</tr>
<tr>
<td>- Cross Regulation (25% / 100% asym. load)</td>
<td>1% max. (Output 2)</td>
</tr>
<tr>
<td>dual output models</td>
<td>5% max.</td>
</tr>
<tr>
<td><strong>Ripple and Noise</strong></td>
<td>30 mA-p-p typ.</td>
</tr>
<tr>
<td><strong>Capacitive Load</strong></td>
<td></td>
</tr>
<tr>
<td>- single output</td>
<td></td>
</tr>
<tr>
<td>5 Vout models</td>
<td>1'680 µF max.</td>
</tr>
<tr>
<td>12 Vout models</td>
<td>820 µF max.</td>
</tr>
<tr>
<td>15 Vout models</td>
<td>680 µF max.</td>
</tr>
<tr>
<td>- dual output</td>
<td></td>
</tr>
<tr>
<td>12 / -12 Vout models</td>
<td>470 / 470 µF max.</td>
</tr>
<tr>
<td>15 / -15 Vout models</td>
<td>330 / 330 µF max.</td>
</tr>
<tr>
<td><strong>Minimum Load</strong></td>
<td>Not required</td>
</tr>
<tr>
<td><strong>Temperature Coefficient</strong></td>
<td>±0.02%/K max.</td>
</tr>
<tr>
<td><strong>Start-up Time</strong></td>
<td>5 ms typ.</td>
</tr>
<tr>
<td><strong>Short Circuit Protection</strong></td>
<td>Continuous, Automatic recovery</td>
</tr>
<tr>
<td><strong>Transient Response</strong></td>
<td>Response Time</td>
</tr>
<tr>
<td>- Response Time</td>
<td>250 µs typ. (25% Load Step)</td>
</tr>
</tbody>
</table>

### Safety Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Safety Standards</strong></td>
<td>EN 60950-1</td>
</tr>
<tr>
<td></td>
<td>EN 62368-1</td>
</tr>
<tr>
<td></td>
<td>IEC 60950-1</td>
</tr>
<tr>
<td></td>
<td>IEC 62368-1</td>
</tr>
<tr>
<td></td>
<td>UL 60950-1</td>
</tr>
<tr>
<td></td>
<td>UL 62368-1</td>
</tr>
<tr>
<td><strong>Certification Documents</strong></td>
<td><a href="http://www.tracopower.com/overview/tdr3wism">www.tracopower.com/overview/tdr3wism</a></td>
</tr>
<tr>
<td><strong>Pollution Degree</strong></td>
<td>PD 2</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>EMI Emissions</th>
<th>EN 55032 class A (with external filter)</th>
<th>EN 55032 class B (with external filter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Conducted Emissions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Radiated Emissions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

External filter proposal: [www.tracopower.com/overview/tdr3wism](http://www.tracopower.com/overview/tdr3wism)

<table>
<thead>
<tr>
<th>EMS Immunity</th>
<th>EN 61000-4-2, ±8 kV, perf. criteria A</th>
<th>EN 61000-4-2, ±6 kV, perf. criteria A</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Electrostatic Discharge</td>
<td>Air:</td>
<td>Contact:</td>
</tr>
<tr>
<td>- RF Electromagnetic Field</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- EFT (Burst) / Surge</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ext. input component: 220 µF / 100 V

- Conducted RF Disturbances  |
- PF Magnetic Field

Continuous: EN 61000-4-6, 10 Vrms, perf. criteria A

1 s: EN 61000-4-8, 100 A/m, perf. criteria A

**General Specifications**

<table>
<thead>
<tr>
<th>Relative Humidity</th>
<th>95% max. (non-condensing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Ranges</td>
<td></td>
</tr>
<tr>
<td>- Operating Temperature</td>
<td>-40°C to +85°C</td>
</tr>
<tr>
<td>- Case Temperature</td>
<td>+100°C max.</td>
</tr>
<tr>
<td>- Storage Temperature</td>
<td>-55°C to +125°C</td>
</tr>
<tr>
<td>Power Derating</td>
<td>3.3 %/K above 70°C</td>
</tr>
<tr>
<td>Cooling System</td>
<td>Natural convection (20 LFM)</td>
</tr>
<tr>
<td>Remote Control</td>
<td></td>
</tr>
<tr>
<td>- Current Controlled Remote</td>
<td>On: open circuit</td>
</tr>
<tr>
<td>- Off Idle Input Current</td>
<td>Off: 2 to 4 mA current (internal 1 kΩ resistor)</td>
</tr>
</tbody>
</table>


2.5 mA max.

- Altitude During Operation 5'000 m max.
- Switching Frequency 100 kHz min. (RCC)
- Insulation System Basic Insulation
- Isolation Test Voltage - Input to Output, 60 s 1'600 VDC
- Isolation Resistance - Input to Output, 500 VDC 1'000 MΩ min.
- Isolation Capacitance - Input to Output, 100 kHz, 1 V 50 pF max.
- Reliability Calculated MTBF 5'700'000 h (MIL-HDBK-217F, ground benign)
- Moisture Sensitivity (MSL) Level 2a (J-STD-020C)
- Washing Process Allowed (hermetical product)


- Environment MIL-STD-810F
  - Vibration MIL-STD-810F
  - Thermal Shock Non-conductive Plastic (UL 94 V-0 rated)
- Housing Material Epoxy (UL 94 V-0 rated)
- Potting Material Copper
- Pin Material Nickel (40 µm - 120 µm)
- Pin Foundation Plating Gold (25 - 75 nm), matte
- Pin Surface Plating Overmold
- Housing Type SMD (Surface-Mount Device)
- Mounting Type SMD 14 Pin
- Connection Type Reflow Soldering (J-STD-O20E)
- Footprint Type SMD
- Soldering Profile 4.5 g
- Weight

All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.
Environmental Compliance - REACH Declaration

- REACH SVHC list compliant
- REACH Annex XVII compliant

RoHS Declaration

Exemptions: 7a, 7c-1
(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule). The SCIP number is provided on request.)

Supporting Documents

Overview Link (for additional Documents)

Outline Dimensions

Dimensions in mm (inch)
Tolerances: ±0.5 (±0.02)
Pin pitch tolerances ±0.25 (±0.01)

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>Remote On/Off</td>
<td>Remote On/Off</td>
</tr>
<tr>
<td>6</td>
<td>NC</td>
<td>Common</td>
</tr>
<tr>
<td>7</td>
<td>NC</td>
<td>−Vout</td>
</tr>
<tr>
<td>8</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>9</td>
<td>−Vout</td>
<td>Common</td>
</tr>
<tr>
<td>14</td>
<td>+Vin (Vcc)</td>
<td>+Vin (Vcc)</td>
</tr>
</tbody>
</table>

NC: Not connected

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