

- Compact SIP-8 package
- Wide 4:1 input voltage range
- Temperature range  $-40^{\circ}$  to  $+70^{\circ}\text{C}$  without derating
- High efficiency up to 83%
- I/O isolation 1600 VDC
- Protection against short-circuit and over load
- Fully regulated outputs
- Remote On/Off control
- 3-year product warranty



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  $-40^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  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.

Models						
Order Code	Input Voltage Range	Output 1		Output 2		Efficiency typ.
		Vnom	I <sub>max</sub>	Vnom	I <sub>max</sub>	
TMR 4-2411WI	9 - 36 VDC (24 VDC nom.)	5 VDC	800 mA			79 %
TMR 4-2412WI		12 VDC	333 mA			83 %
TMR 4-2413WI		15 VDC	266 mA			83 %
TMR 4-2415WI		24 VDC	166 mA			83 %
TMR 4-2422WI		+12 VDC	166 mA	-12 VDC	166 mA	83 %
TMR 4-2423WI		+15 VDC	133 mA	-15 VDC	133 mA	83 %
TMR 4-4811WI	18 - 75 VDC (48 VDC nom.)	5 VDC	800 mA			78 %
TMR 4-4812WI		12 VDC	333 mA			82 %
TMR 4-4813WI		15 VDC	266 mA			82 %
TMR 4-4815WI		24 VDC	166 mA			82 %
TMR 4-4822WI		+12 VDC	166 mA	-12 VDC	166 mA	82 %
TMR 4-4823WI		+15 VDC	133 mA	-15 VDC	133 mA	82 %

### Input Specifications

Input Current	- At no load	24 Vin models: <b>20 mA typ.</b> 48 Vin models: <b>10 mA typ.</b>
	- At full load	24 Vin models: <b>202 mA typ.</b> 48 Vin models: <b>102 mA typ.</b>
Surge Voltage		24 Vin models: <b>50 VDC max.</b> (1 s max.) 48 Vin models: <b>100 VDC max.</b> (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		<b>±1% max.</b>
Regulation	- Input Variation (Vmin - Vmax)	single output models: <b>0.5% max.</b> dual output models: <b>0.5% max.</b>
	- Load Variation (0 - 100%)	single output models: <b>1% max.</b> dual output models: <b>1% max.</b> (Output 1) <b>1% max.</b> (Output 2)
	- Voltage Balance (symmetrical load)	dual output models: <b>2% max.</b>
	- Cross Regulation (25% / 100% asym. load)	dual output models: <b>5% max.</b>
Ripple and Noise	- 20 MHz Bandwidth	<b>80 mVp-p max.</b>
Capacitive Load	- single output	5 Vout models: <b>1'800 µF max.</b>
		12 Vout models: <b>1'000 µF max.</b>
		15 Vout models: <b>820 µF max.</b>
		24 Vout models: <b>470 µF max.</b>
	- dual output	12 / -12 Vout models: <b>560 / 560 µF max.</b> 15 / -15 Vout models: <b>390 / 390 µF max.</b>
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±0.02 %/K max.</b>
Start-up Time		<b>30 ms typ.</b>
Short Circuit Protection		<b>Continuous, Automatic recovery</b>
Overload Protection		<b>Foldback Mode</b>
Output Current Limitation		<b>160% typ. of Iout max.</b>
Transient Response	- Response Deviation	<b>3% typ. / 5% max.</b> (25% Load Step)
	- Response Time	<b>250 µs typ.</b> (25% Load Step)

### Safety Specifications

Safety Standards	- IT / Multimedia Equipment	<b>EN 62368-1</b> <b>IEC 62368-1</b> <b>UL 62368-1</b>
	- Certification Documents	<a href="http://www.tracopower.com/overview/tmr4wi">www.tracopower.com/overview/tmr4wi</a>
Pollution Degree		<b>PD 3</b>

### EMC Specifications

EMI Emissions	- Conducted Emissions	<b>EN 55032 class A</b> (with external filter) <b>EN 55032 class B</b> (with external filter) <b>FCC Part 15 class A</b> (with external filter) <b>FCC Part 15 class B</b> (with external filter)
	- Radiated Emissions	<b>EN 55032 class A</b> (with external filter) <b>EN 55032 class B</b> (with external filter) <b>FCC Part 15 class A</b> (with external filter) <b>FCC Part 15 class B</b> (with external filter)
		External filter proposal: <a href="http://www.tracopower.com/overview/tmr4wi">www.tracopower.com/overview/tmr4wi</a>

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

EMS Immunity	<ul style="list-style-type: none"> <li>- Electrostatic Discharge</li> <li>- RF Electromagnetic Field</li> <li>- EFT (Burst) / Surge</li> <li>- Conducted RF Disturbances</li> <li>- PF Magnetic Field</li> </ul>	EN 55024 (IT Equipment) EN 55035 (Multimedia) Air: EN 61000-4-2, $\pm 8$ kV, perf. criteria A Contact: EN 61000-4-2, $\pm 6$ kV, perf. criteria A EN 61000-4-3, 10 V/m, perf. criteria A EN 61000-4-4, $\pm 2$ kV, perf. criteria A EN 61000-4-5, $\pm 1$ kV, perf. criteria A External filter proposal: <a href="http://www.tracopower.com/overview/tmr4wi">www.tracopower.com/overview/tmr4wi</a> EN 61000-4-6, 10 Vrms, perf. criteria A Continuous: EN 61000-4-8, 100 A/m, perf. criteria A 1 s: EN 61000-4-8, 1000 A/m, perf. criteria A
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## General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	<ul style="list-style-type: none"> <li>- Operating Temperature</li> <li>- Case Temperature</li> <li>- Storage Temperature</li> </ul>	-40°C to +85°C +100°C max. -55°C to +125°C
Power Derating	<ul style="list-style-type: none"> <li>- High Temperature</li> </ul>	3.33 %/K above 70°C See application note: <a href="http://www.tracopower.com/overview/tmr4wi">www.tracopower.com/overview/tmr4wi</a>
Cooling System		Natural convection (20 LFM)
Remote Control	<ul style="list-style-type: none"> <li>- Voltage Controlled Remote</li> <li>- Off Idle Input Current</li> </ul>	On: < 0.6 VDC or open circuit Off: 6 to 15 VDC Refers to 'Remote' and '-Vin' Pin 2.5 mA typ.
Altitude During Operation		6'000 m max.
Switching Frequency		100 kHz min. (PFM)
Insulation System		Functional Insulation
Isolation Test Voltage	<ul style="list-style-type: none"> <li>- Input to Output, 60 s</li> <li>- Input to Output, 1 s</li> </ul>	1'600 VDC 1'920 VDC
Isolation Resistance	<ul style="list-style-type: none"> <li>- Input to Output, 500 VDC</li> </ul>	1'000 M $\Omega$ min.
Isolation Capacitance	<ul style="list-style-type: none"> <li>- Input to Output, 100 kHz, 1 V</li> </ul>	200 pF typ.
Reliability	<ul style="list-style-type: none"> <li>- Calculated MTBF</li> </ul>	2'860'000 h (MIL-HDBK-217F, ground benign)
Washing Process		According to Cleaning Guideline <a href="http://www.tracopower.com/info/cleaning.pdf">www.tracopower.com/info/cleaning.pdf</a>
Housing Material		Non-conductive Plastic (UL 94 V-0 rated)
Potting Material		Epoxy (UL 94 V-0 rated)
Pin Material		Phosphor Bronze (C5191)
Pin Foundation Plating		Nickel (1 $\mu$ m min.)
Pin Surface Plating		Tin (3 - 5 $\mu$ m), matte
Housing Type		Plastic Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		SIP8
Soldering Profile		Wave Soldering 260°C / 10 s max.
Weight		4.8 g
Environmental Compliance	<ul style="list-style-type: none"> <li>- REACH Declaration</li> <li>- RoHS Declaration</li> <li>- SCIP Reference Number</li> </ul>	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a> REACH SVHC list compliant REACH Annex XVII compliant <a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a> Exemptions: 7a (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule)) be780d19-b914-44f1-aa6f-469cb7289237

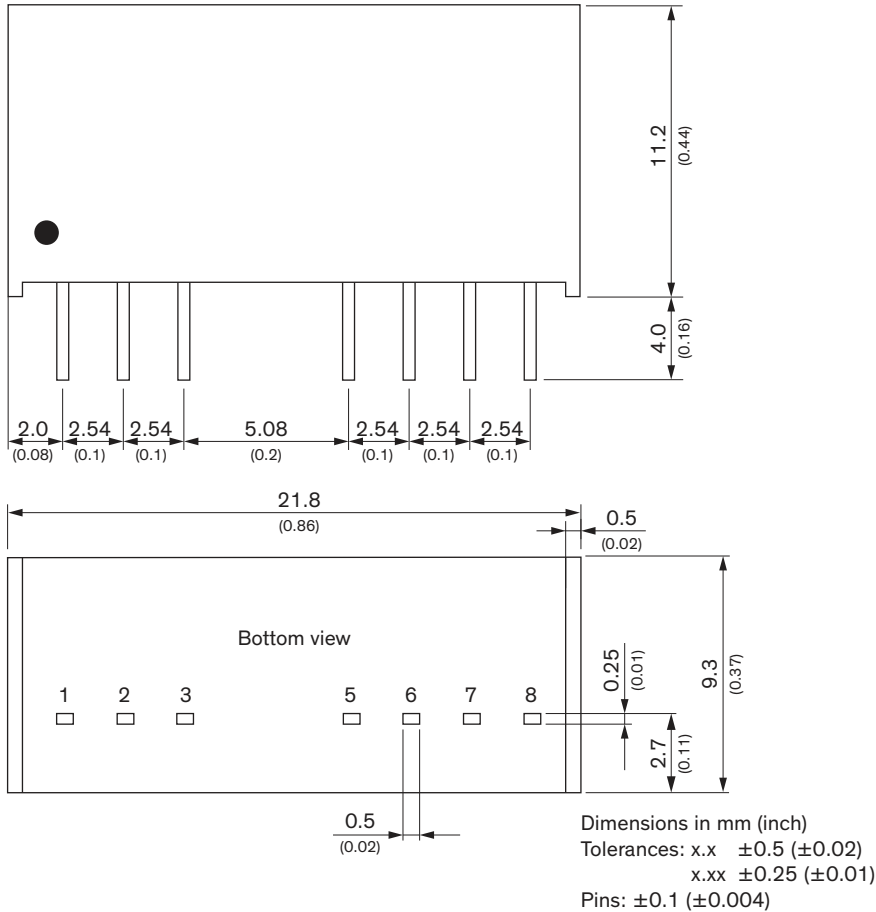
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### Supporting Documents

[Overview Link](#) (for additional Documents)

[www.tracopower.com/overview/tmr4wi](http://www.tracopower.com/overview/tmr4wi)

### Outline Dimensions



Pinout		
Pin	Single	Dual
1	-Vin (GND)	-Vin (GND)
2	+Vin (Vcc)	+Vin (Vcc)
3	Remote On/Off	Remote On/Off
5	NC	NC
6	+Vout	+Vout
7	-Vout	Common
8	NC	-Vout

NC: Not connected