

DC/DC Converter**TMR 4WI Series, 4 Watt**

- **Compact SIP-8 package**
- **Wide 4:1 input voltage range**
- **Temperature range -40° to +70°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**



UL 62368-1 IEC 62368-1

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.

Models

Order Code	Input Voltage Range	Output 1		Output 2		Efficiency typ.
		V _{nom}	I _{max}	V _{nom}	I _{max}	
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: 20 mA typ. 48 Vin models: 10 mA typ.
	- At full load	24 Vin models: 202 mA typ. 48 Vin models: 102 mA typ.
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) 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, resistive full load and +25°C after warm-up time, unless otherwise stated.

EMS Immunity

- Electrostatic Discharge	EN 55024 (IT Equipment) EN 55035 (Multimedia)
- RF Electromagnetic Field	Air: EN 61000-4-2, ± 8 kV, perf. criteria A
- EFT (Burst) / Surge	Contact: EN 61000-4-2, ± 6 kV, perf. criteria A
	EN 61000-4-3, 10 V/m, perf. criteria A
	EN 61000-4-4, ± 2 kV, perf. criteria A
	EN 61000-4-5, ± 1 kV, perf. criteria A
	External filter proposal: www.tracopower.com/overview/tmr4wi
- Conducted RF Disturbances	EN 61000-4-6, 10 Vrms, perf. criteria A
- 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

General Specifications

Relative Humidity	95% max. (non condensing)	
Temperature Ranges	- Operating Temperature - Case Temperature - Storage Temperature	-40°C to +85°C +100°C max. -55°C to +125°C
Power Derating	- High Temperature	3.33 %/K above 70°C
Cooling System		Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote - Off Idle Input Current	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	- Input to Output, 60 s - Input to Output, 1 s	1'600 VDC 1'920 VDC
Isolation Resistance	- Input to Output, 500 VDC	1'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	200 pF typ.
Reliability	- Calculated MTBF	2'860'000 h (MIL-HDBK-217F, ground benign)
Washing Process	See Cleaning Guideline:	Allowed (hermetical product) www.tracopower.com/info/cleaning.pdf
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 µm min.)	
Pin Surface Plating	Tin (3 - 5 µm), matte	
Housing Type	Plastic Case	
Mounting Type	PCB Mount	
Connection Type	THD (Through-Hole Device)	
Footprint Type	SIP8	
Weight	4.8 g	
Environmental Compliance	- REACH Declaration - RoHS Declaration	www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7a (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (Q5A rule). The SCIP number is provided on request.)

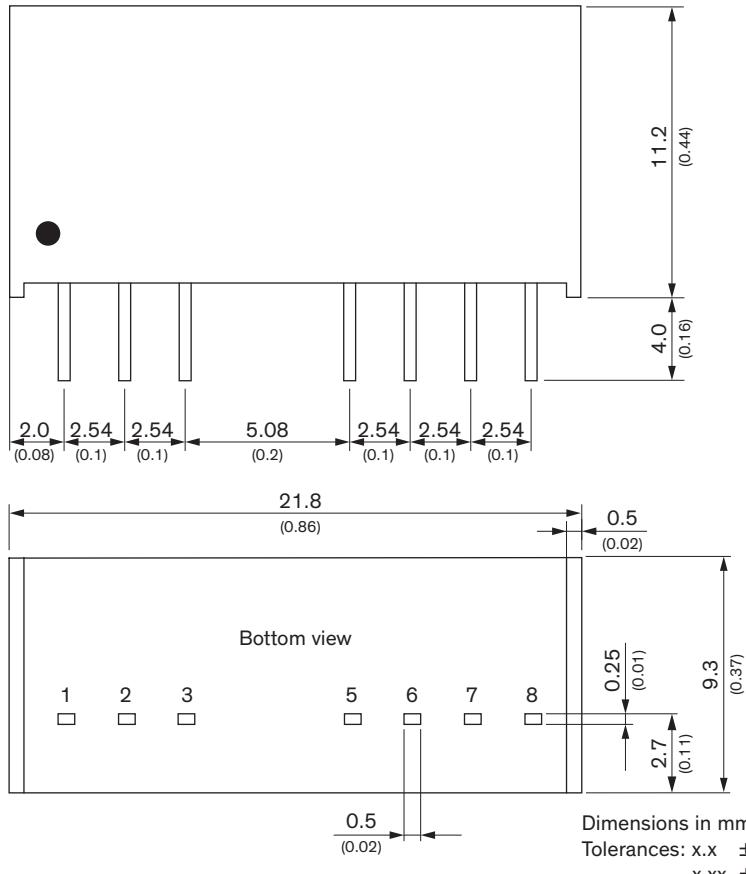
Supporting Documents

Overview Link (for additional Documents)

www.tracopower.com/overview/tmr4wi

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

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