

- Highest power density in SIP package
- Ultra wide 4:1 input range
- Small footprint: 21.8 x 9.2 mm
- Temperature range -40° to $+85^{\circ}\text{C}$
- High efficiency up to 82%
- Excellent load and line regulation
- Short-circuit protection
- I/O isolation 1600 VDC
- Remote On/Off control
- 3-year product warranty



The TMR 3WI series is a new family of isolated 3W DC/DC converters with regulated output, featuring ultra-wide 4:1 input voltage range. The product comes in a ultra-compact SIP plastic package with a small footprint occupying only 2.0 cm² (0.3 square inch) of board space. An excellent efficiency allows -40° to $+85^{\circ}\text{C}$ operation temperatures.

Further features include remote On/Off control and continuous short circuit protection. The very compact dimensions of these converters make them an ideal solution for many space critical applications in battery-powered equipment and instrumentation.

Models

Order Code	Input Voltage Range	Output 1		Output 2		Efficiency typ.
		Vnom	I _{max}	Vnom	I _{max}	
TMR 3-1210WI	4.5 - 18 VDC (12 VDC nom.)	3.3 VDC	700 mA			74 %
TMR 3-1211WI		5 VDC	600 mA			78 %
TMR 3-1212WI		12 VDC	250 mA			80 %
TMR 3-1213WI		15 VDC	200 mA			80 %
TMR 3-1221WI		+5 VDC	300 mA	-5 VDC	300 mA	80 %
TMR 3-1222WI		+12 VDC	125 mA	-12 VDC	125 mA	80 %
TMR 3-1223WI		+15 VDC	100 mA	-15 VDC	100 mA	80 %
TMR 3-2410WI	9 - 36 VDC (24 VDC nom.)	3.3 VDC	700 mA			75 %
TMR 3-2411WI		5 VDC	600 mA			80 %
TMR 3-2412WI		12 VDC	250 mA			82 %
TMR 3-2413WI		15 VDC	200 mA			82 %
TMR 3-2421WI		+5 VDC	300 mA	-5 VDC	300 mA	79 %
TMR 3-2422WI		+12 VDC	125 mA	-12 VDC	125 mA	81 %
TMR 3-2423WI		+15 VDC	100 mA	-15 VDC	100 mA	81 %
TMR 3-4810WI	18 - 75 VDC (48 VDC nom.)	3.3 VDC	700 mA			74 %
TMR 3-4811WI		5 VDC	600 mA			80 %
TMR 3-4812WI		12 VDC	250 mA			81 %
TMR 3-4813WI		15 VDC	200 mA			81 %
TMR 3-4821WI		+5 VDC	300 mA	-5 VDC	300 mA	79 %
TMR 3-4822WI		+12 VDC	125 mA	-12 VDC	125 mA	81 %
TMR 3-4823WI		+15 VDC	100 mA	-15 VDC	100 mA	81 %

Input Specifications

Input Current	- At no load	12 Vin models: 40 mA typ. 24 Vin models: 25 mA typ. 48 Vin models: 15 mA typ.
	- At full load	12 Vin models: 340 mA max. 24 Vin models: 170 mA max. 48 Vin models: 85 mA max.
Surge Voltage		12 Vin models: 36 VDC max. (100 ms max.) 24 Vin models: 50 VDC max. (100 ms max.) 48 Vin models: 100 VDC max. (100 ms 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: 0.2% max. dual output models: 0.2% max.	
	- Load Variation (5 - 100%)	single output models: 0.5% max. dual output models: 1% max. (Output 1) 1% max. (Output 2)	
	- Cross Regulation (25% / 100% asym. load)	dual output models: 5% max.	
Ripple and Noise	- 20 MHz Bandwidth	30 mVp-p max.	
Capacitive Load	- single output	3.3 Vout models: 3'300 µF max. 5 Vout models: 1'680 µF max. 12 Vout models: 820 µF max. 15 Vout models: 680 µF max.	
		- dual output	5 / -5 Vout models: 1'000 / 1'000 µF max. 12 / -12 Vout models: 470 / 470 µF max. 15 / -15 Vout models: 330 / 330 µF max.
	Minimum Load		Not required
	Temperature Coefficient		±0.02 %/K max.
Start-up Time		30 ms typ.	
Short Circuit Protection		Continuous, Automatic recovery	
Transient Response	- Response Time	250 µs typ. (25% Load Step)	

Safety Specifications

Safety Standards	- IT / Multimedia Equipment	EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1
	- Certification Documents	www.tracopower.com/overview/tmr3wi

EMC Specifications

EMI Emissions	- Conducted Emissions	EN 55032 class A (with external filter) EN 55032 class B (with external filter)
	- Radiated Emissions	EN 55032 class A (with external filter) EN 55032 class B (with external filter)
	External filter proposal:	www.tracopower.com/overview/tmr3wi

All specifications valid at nominal voltage, resistive 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
	- RF Electromagnetic Field	Contact: EN 61000-4-2, ±6 kV, perf. criteria A
	- EFT (Burst) / Surge	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
		Ext. input component: Nippon chemi-con KY, 100 µF / 110 mOhm
	- 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

General Specifications

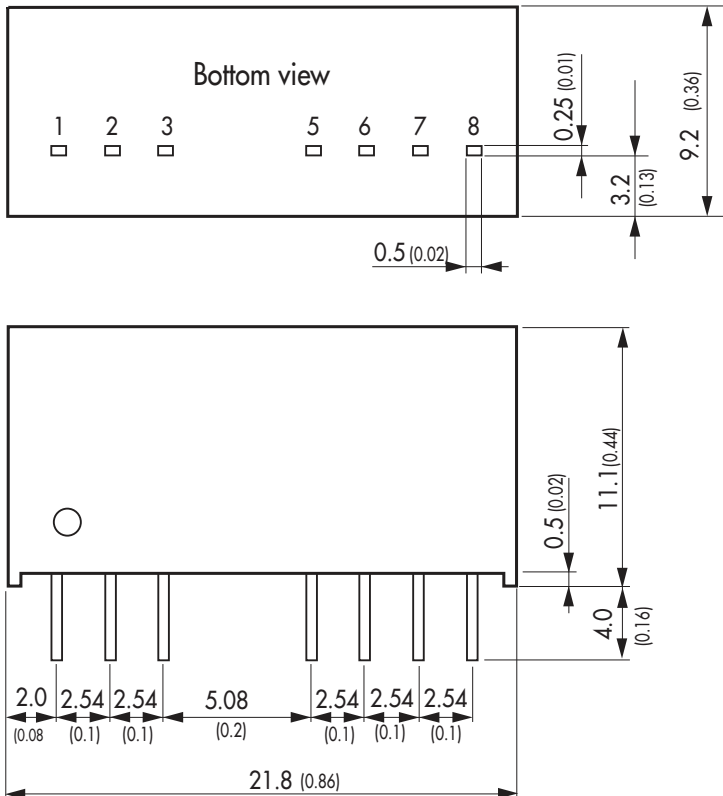
Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +85°C
	- Case Temperature	+100°C max.
	- Storage Temperature	-55°C to +125°C
Power Derating	- High Temperature	Depending on model
		See application note: www.tracopower.com/overview/tmr3wi
Cooling System		Natural convection (20 LFM)
Remote Control	- Current Controlled Remote	On: open circuit
		Off: 2 to 4 mA current (internal 1 kΩ resistor)
	External circuit proposal: www.tracopower.com/info/current-remote.pdf	2.5 mA max.
	- Off Idle Input Current	
Altitude During Operation		5'000 m max.
Switching Frequency		100 kHz min. (RCC)
Insulation System		Functional 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	200 pF max.
Reliability	- Calculated MTBF	3'400'000 h (MIL-HDBK-217F, ground benign)
Washing Process		Allowed (hermetical product)
	See Cleaning Guideline: www.tracopower.com/info/cleaning.pdf	
Environment	- Vibration	MIL-STD-810F
	- Thermal Shock	MIL-STD-810F
Housing Material		Non-conductive Plastic (UL 94 V-0 rated)
Potting Material		Silicone (UL 94 V-0 rated)
Pin Material		Copper
Pin Foundation Plating		Nickel (2 - 3 µm)
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	www.tracopower.com/info/reach-declaration.pdf
	- RoHS Declaration	REACH SVHC list compliant REACH Annex XVII compliant www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7a, 7c-I (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)	www.tracopower.com/overview/tmr3wi
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Outline Dimensions



Dimensions in mm (inch)
 Pin diameter $\varnothing 0.5 \pm 0.05$ (0.02 \pm 0.002)
 Tolerances ± 0.5 (± 0.02)
 Pin pitch tolerance ± 0.2 (± 0.008)

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

NC: No Connection