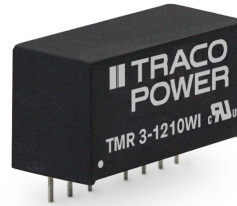




**THE DATASHEET OF  
TMR 3-4821WI**



- Highest power density in SIP package
- Ultra wide 4:1 input range
- Small footprint: 21.8 x 9.2 mm
- Temperature range  $-40^{\circ}$  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 cm<sup>2</sup> (0.3 square inch) of board space. An excellent efficiency allows  $-40^{\circ}$  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 <sub>max</sub>	Vnom	I <sub>max</sub>	
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: <b>40 mA typ.</b> 24 Vin models: <b>25 mA typ.</b> 48 Vin models: <b>15 mA typ.</b>
	- At full load	12 Vin models: <b>340 mA max.</b> 24 Vin models: <b>170 mA max.</b> 48 Vin models: <b>85 mA max.</b>
Surge Voltage		12 Vin models: <b>36 VDC max.</b> (100 ms max.) 24 Vin models: <b>50 VDC max.</b> (100 ms max.) 48 Vin models: <b>100 VDC max.</b> (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		<b>±1% max.</b>	
Regulation	- Input Variation (Vmin - Vmax)	single output models: <b>0.2% max.</b> dual output models: <b>0.2% max.</b>	
	- Load Variation (5 - 100%)	single output models: <b>0.5% max.</b> dual output models: <b>1% max.</b> (Output 1) <b>1% max.</b> (Output 2)	
	- Cross Regulation (25% / 100% asym. load)	dual output models: <b>5% max.</b>	
Ripple and Noise	- 20 MHz Bandwidth	<b>30 mVp-p max.</b>	
Capacitive Load	- single output	3.3 Vout models: <b>3'300 µF max.</b> 5 Vout models: <b>1'680 µF max.</b> 12 Vout models: <b>820 µF max.</b> 15 Vout models: <b>680 µF max.</b>	
		- dual output	5 / -5 Vout models: <b>1'000 / 1'000 µF max.</b> 12 / -12 Vout models: <b>470 / 470 µF max.</b> 15 / -15 Vout models: <b>330 / 330 µF max.</b>
	Minimum Load		Not required
	Temperature Coefficient		<b>±0.02 %/K max.</b>
Start-up Time		<b>30 ms typ.</b>	
Short Circuit Protection		<b>Continuous, Automatic recovery</b>	
Transient Response	- Response Time	<b>250 µs typ.</b> (25% Load Step)	

### Safety Specifications

Standards	- IT / Multimedia Equipment	EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1
	- Certification Documents	<a href="http://www.tracopower.com/overview/tmr3wi">www.tracopower.com/overview/tmr3wi</a>

### 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:	<a href="http://www.tracopower.com/overview/tmr3wi">www.tracopower.com/overview/tmr3wi</a>

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, $\pm 8$ kV, perf. criteria A
	- RF Electromagnetic Field	Contact: EN 61000-4-2, $\pm 6$ kV, perf. criteria A
	- EFT (Burst) / Surge	EN 61000-4-3, 10 V/m, perf. criteria A
	- Conducted RF Disturbances	EN 61000-4-4, $\pm 2$ kV, perf. criteria A
	- PF Magnetic Field	EN 61000-4-5, $\pm 1$ kV, perf. criteria A
		Ext. input component: Nippon chemi-con KY, 100 $\mu$ F / 110 mOhm
		Continuous: EN 61000-4-6, 10 Vrms, perf. criteria A
		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: <a href="http://www.tracopower.com/overview/tmr3wi">www.tracopower.com/overview/tmr3wi</a>
Cooling System		Natural convection (20 LFM)
Remote Control	- Current Controlled Remote (passive = on)	On: open circuit
		Off: 2 to 4 mA current (internal 1 k $\Omega$ resistor)
		Refers to 'Remote' and '-Vin' Pin
	- Off Idle Input Current	External circuit proposal: <a href="http://www.tracopower.com/info/current-remote.pdf">www.tracopower.com/info/current-remote.pdf</a>
		2.5 mA max.
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 M $\Omega$ 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		According to Cleaning Guideline
		<a href="http://www.tracopower.com/info/cleaning.pdf">www.tracopower.com/info/cleaning.pdf</a>
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 $\mu$ m)
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		Lead-Free Wave Soldering
		260°C / 6 s max.
Weight		4.8 g
Environmental Compliance	- REACH Declaration	<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
	- RoHS Declaration	<a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a>
		Exemptions: 7a, 7c-I
		(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule.))
	- SCIP Reference Number	c463e4b5-9f69-4661-a424-6478acdbe545

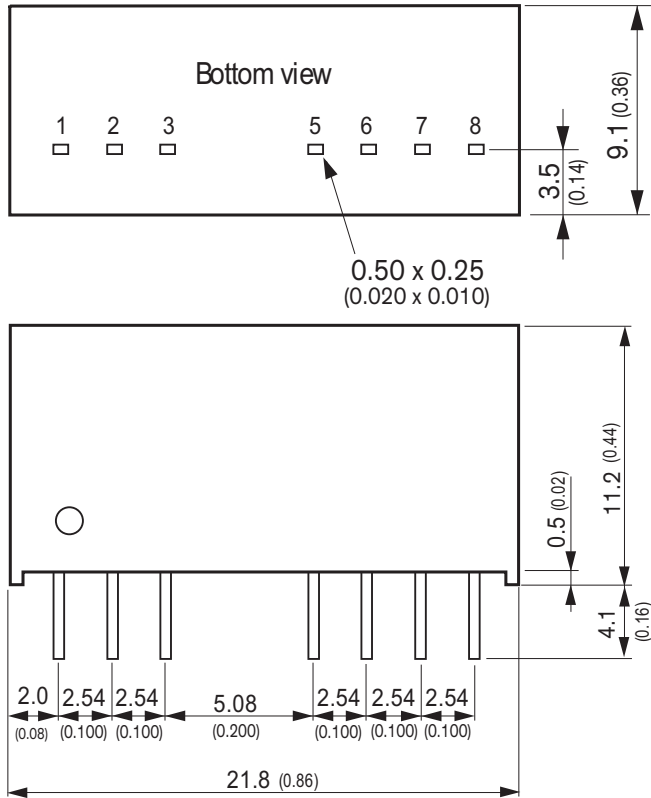
All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

### Supporting Documents

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

[www.tracopower.com/overview/tmr3wi](http://www.tracopower.com/overview/tmr3wi)

### Outline Dimensions





Dimensions in mm (inch)  
 Tolerances: x.x ±0.5 (x.xx ±0.02)  
               x.xx ±0.25 (x.xxx ±0.01)  
 Pin dimension tolerance: ±0.1 (±0.004)

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: Not connected

## Looking for pricing, stock, or lifecycle information?

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