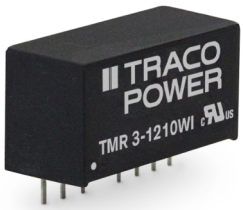
TRACO POWER

DC/DC Converter

TMR 3WI Series, 3 Watt

- **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°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**



UL 62368-1 IEC 62368-1

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°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
		Vnom	Imax	Vnom	Imax	typ.
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 %

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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

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/tmr3wi-safety-cert/
Energy Source	- Output, acc. to 62368-1	ES1
Power Source	- Output, acc. to 62368-1	PS3
Over Voltage Category		Not mains connected

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/tmr3wi-emc-filter/

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

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EMS (Immunity)	- Electrostatic Discharge	Air:	EN 61000-4-2, ±8 kV, perf. criteria A
		Contact:	EN 61000-4-2, ±6 kV, perf. criteria A
	- RF Electromagnetic Field		EN 61000-4-3, 10 V/m, perf. criteria A
	- EFT (Burst) / Surge		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
EMC / Environmental	- Certification Documents		www.tracopower.com/tmr3wi-emc-cert/

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/tmr3wi-cc/
Cooling System			Natural convection (20 LFM)
Remote Control	- Current Controlled Remote (passive = on)		On: open circuit Off: 2 to 4 mA current (internal 1 kΩ resistor) Refers to 'Remote' and '-Vin' Pin
		External circuit proposal:	www.tracopower.com/info/current-remote.pdf
	- Off Idle Input Current		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 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			According to 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
Soldering Profile			Lead-Free Wave Soldering 260°C / 6 s max.
Weight			4.8 g
Environmental Compliance	- REACH Declaration		www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant
	- RoHS Declaration		www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7(a), 7(c)-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.

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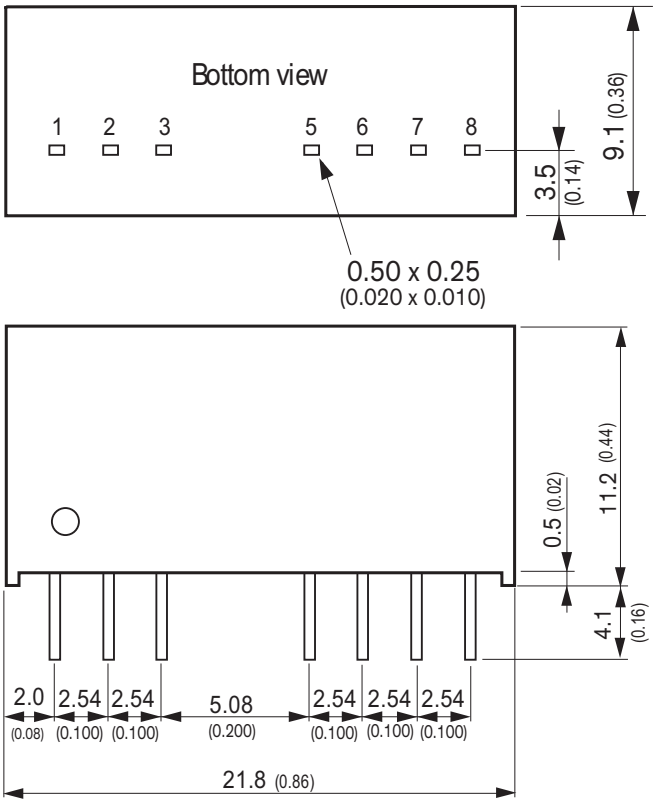
Additional Information

Supporting Documents	www.tracopower.com/overview/tmr3wi
Frequently Asked Questions	www.tracopower.com/glossary-faq
Glossary	www.tracopower.com/info/glossary.pdf
Service Portal	www.tracoserviceportal.com

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

Avoid routing PCB traces under the converter.

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