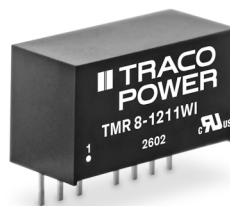


- Ultra compact 8 Watt converter in SIP-8 casing
- High power density of 3,12W/cm³
- Wide 4:1 input voltage ranges
- I/O-isolation 1500 VDC
- High efficiency (up to 88%) for low thermal loss
- Operating temperature range -40°C to +75°C (without derating)
- Fully regulated outputs
- Remote On/Off control
- Indefinite short circuit protection
- 3-year product warranty



The TMR 8WI series is a family of isolated 8W DC/DC converter modules with regulated output, featuring wide 4:1 input voltage ranges. The product offers a very high power density of 3.19W/cm³ in an ultra-compact SIP-8 package occupying only 2.0 cm² (0.3 square inch) of board space. An excellent efficiency of up to 88% allows for an extended operating temperature range of -40° to +70°C without derating under natural convection conditions. Further features include remote On/Off control, continuous short circuit protection and an I/O isolation voltage of 1500 VDC. The very compact dimensions of these converters make them an ideal solution for many space critical applications in communication equipment, instrumentation and industrial electronics.

Models						
Order Code	Input Voltage Range	Output 1		Output 2		Efficiency typ.
		Vnom	I _{max}	Vnom	I _{max}	
TMR 8-1211WI	4.5 - 18 VDC (12 VDC nom.)	5 VDC	1'600 mA			88 %
TMR 8-1212WI		12 VDC	665 mA			88 %
TMR 8-1213WI		15 VDC	535 mA			88 %
TMR 8-1215WI		24 VDC	335 mA			88 %
TMR 8-1222WI		+12 VDC	335 mA	-12 VDC	335 mA	88 %
TMR 8-1223WI		+15 VDC	265 mA	-15 VDC	265 mA	88 %
TMR 8-2411WI	9 - 36 VDC (24 VDC nom.)	5 VDC	1'600 mA			88 %
TMR 8-2412WI		12 VDC	665 mA			88 %
TMR 8-2413WI		15 VDC	535 mA			88 %
TMR 8-2415WI		24 VDC	335 mA			88 %
TMR 8-2422WI		+12 VDC	335 mA	-12 VDC	335 mA	88 %
TMR 8-2423WI		+15 VDC	265 mA	-15 VDC	265 mA	88 %
TMR 8-4811WI	18 - 75 VDC (48 VDC nom.)	5 VDC	1'600 mA			88 %
TMR 8-4812WI		12 VDC	665 mA			88 %
TMR 8-4813WI		15 VDC	535 mA			88 %
TMR 8-4815WI		24 VDC	335 mA			88 %
TMR 8-4822WI		+12 VDC	335 mA	-12 VDC	335 mA	88 %
TMR 8-4823WI		+15 VDC	265 mA	-15 VDC	265 mA	88 %

Note - If the input will be switched electromechanically, use an external 68 µF / 100 V / KZE capacitor to reduce voltage transient.

Input Specifications

Input Current	- At no load	12 Vin models: 20 mA typ. / 30 mA max. 24 Vin models: 10 mA typ. / 15 mA max. 48 Vin models: 8 mA typ. / 13 mA max.
	- At full load	12 Vin models: 758 mA typ. / 779 mA max. 24 Vin models: 379 mA typ. / 390 mA max. 48 Vin models: 189 mA typ. / 195 mA max.
Surge Voltage		12 Vin models: 25 VDC max. (1 s max.) 24 Vin models: 50 VDC max. (1 s max.) 48 Vin models: 100 VDC max. (1 s max.)
Start-up Voltage		12 Vin models: 4.2 VDC - 4.5 VDC 24 Vin models: 8.4 VDC - 9 VDC 48 Vin models: 16.8 VDC - 18 VDC
Under Voltage Lockout		12 Vin models: 3.8 - 4.15 VDC max. 24 Vin models: 7.6 - 8.3 VDC max. 48 Vin models: 15.2 - 16.6 VDC max.
Recommended Input Fuse		12 Vin models: 4'000 mA (slow blow) 24 Vin models: 2'000 mA (slow blow) 48 Vin models: 1'000 mA (slow blow) (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: 0.8% max. dual output models: 0.8% 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)	- single output	5 Vout models: 100 mVp-p max. (w/ 1µF) 12 Vout models: 140 mVp-p max. (w/ 1µF) 15 Vout models: 140 mVp-p max. (w/ 1µF) 24 Vout models: 140 mVp-p max. (w/ 1µF)
	- dual output	12 / -12 Vout models: 140 / 140 mVp-p max. (w/ 1µF) 15 / -15 Vout models: 140 / 140 mVp-p max. (w/ 1µF)
	- single output	5 Vout models: 80 mVp-p typ. (w/ 1µF) 12 Vout models: 100 mVp-p typ. (w/ 1µF) 15 Vout models: 100 mVp-p typ. (w/ 1µF) 24 Vout models: 100 mVp-p typ. (w/ 1µF)
	- dual output	12 / -12 Vout models: 100 / 100 mVp-p typ. (w/ 1µF) 15 / -15 Vout models: 100 / 100 mVp-p typ. (w/ 1µF)
	- single output	5 Vout models: 3'300 µF max. 12 Vout models: 560 µF max. 15 Vout models: 390 µF max. 24 Vout models: 150 µF max.
	- dual output	12 / -12 Vout models: 330 / 330 µF max. 15 / -15 Vout models: 180 / 180 µF max.
Capacitive Load		
Minimum Load		Not required
Temperature Coefficient		±0.02 %/K max.
Hold-up Time		3 ms min. (12 Vin models) 10 ms min. (24 Vin models) 30 ms min. (48 Vin models)

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

Start-up Time	30 ms typ. / 50 ms max.
Start-up Overshoot Voltage	5% max.
Short Circuit Protection	Continuous, Automatic recovery
Overload Protection	Switch off after 4 s delay, automatic restart
Output Current Limitation	110 - 180% of I _{out} max. 145% typ. of I _{out} max.
Transient Response	- Response Deviation - Response Time
	5% max. (75% to 100% Load Step) 500 µs max. (75% to 100% Load Step)

Safety Specifications

Standards	- IT / Multimedia Equipment	EN 62368-1 IEC 62368-1 UL 62368-1
	- Certification Documents	www.tracopower.com/tmr8wi-safety-cert/
Energy Source	- Output, acc. to 62368-1	ES1
Power Source	- Output, acc. to 62368-1	PS1
Pollution Degree		PD 3
Over Voltage Category		Not mains connected

EMC Specifications

EMI (Emissions)	- Conducted Emissions - Radiated Emissions	EN 61000-6-4 (Generic Industrial) EN 55032 class A (with external filter) EN 55032 class A (with external filter)
	External filter proposal:	www.tracopower.com/tmr8wi-emc-filter/
EMS (Immunity)	- Electrostatic Discharge - RF Electromagnetic Field - EFT (Burst) / Surge	EN 55035 (Multimedia) Air: EN 61000-4-2, ±8 kV, perf. criteria A 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, ±2 kV, perf. criteria A
	External filter proposal:	www.tracopower.com/tmr8wi-emc-filter/
	- Conducted RF Disturbances - PF Magnetic Field	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
EMC / Environmental	- Certification Documents	www.tracopower.com/tmr8wi-emc-cert/

General Specifications

Relative Humidity	95% max. (non condensing)
Temperature Ranges	- Operating Temperature - Approved Ambient Temp. - Case Temperature - Storage Temperature
	-40°C to +90°C 62368-1: +70°C max. (5 V _{out} models) 62368-1: +75°C max. (other models) +105°C max. -50°C to +125°C max.
Power Derating	- High Temperature
	Depending on model See application note: www.tracopower.com/tmr8wi-cc/
Cooling System	Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote (passive = on) - Off Idle Input Current - Remote Pin Input Current
	On: 3.5 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin 2.5 mA typ. / 5 mA max. -0.5 to 0.5 mA
Altitude During Operation	6'000 m max.
Regulator Topology	Flyback Converter

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

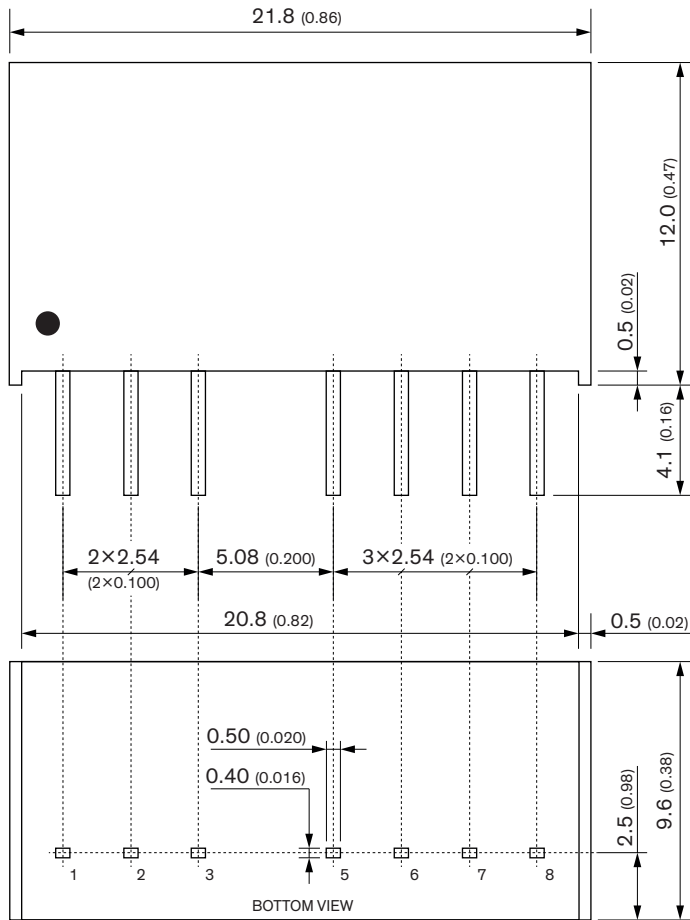
Switching Frequency		308 - 392 kHz (PWM) 350 kHz typ. (PWM)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s - Input to Output, 1 s - Input to Case, 60 s - Output to Case, 60 s	1'500 VDC 1'800 VDC 1'500 VDC 1'500 VDC
Isolation Resistance	- Input to Output, 500 VDC	1'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	650 pF typ. 1'500 pF max.
Reliability	- Calculated MTBF	2'000'000 h (MIL-HDBK-217F, ground benign)
Washing Process		According to Cleaning Guideline www.tracopower.com/info/cleaning.pdf
Environment	- Vibration - Mechanical Shock - Thermal Shock	IPC-9592B 2.4 g, 3 axis, random waveform, 30 min IPC-9592B 30 g, 3 axis, half sine, 11 ms IPC-9592B -40 to +125°C, 100 cycles, 30 min each
Housing Material		Plastic (UL 94 V-0 rated)
Potting Material		Silicone (UL 94 V-0 rated)
Pin Material		Phosphor Bronze (C5191)
Pin Foundation Plating		Nickel (1 - 3 μm)
Pin Surface Plating		Tin (7.5 μm min.), matte
Housing Type		Plastic Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		SIP8
Soldering Profile		Lead-Free Wave Soldering 245°C / 10 s max.
Weight		7 g
Thermal Impedance	- Case to Ambient	28.0 K/W typ.
Environmental Compliance	- REACH Declaration - RoHS Declaration - SCIP Reference Number	www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7(a) (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).) cb3777ca-e557-4b33-b4b1-9f4821ec4dc2

Additional Information

Supporting Documents	www.tracopower.com/overview/tmr8wi
Frequently Asked Questions	www.tracopower.com/glossary-faq
Glossary	www.tracopower.com/info/glossary.pdf
Service Portal	www.tracoserviceportal.com

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Outline Dimensions

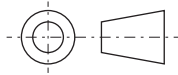


Dimensions in mm (inch)

Tolerances: x.x ±0.5 (x.xx ±0.02)

$$x.xx \pm 0.25 \text{ (} x.xxx \pm 0.01 \text{)}$$

Pin tolerances: ± 0.25 (± 0.01)



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

NC: Not connected

Avoid routing PCB traces under the converter.