

- Highest power density in SIP package
- Wide 4:1 input voltage range
- Ultra-compact SIP-8 package
- Smallest footprint 6 W converter
- Temperature range  $-40^{\circ}$  to  $+84^{\circ}\text{C}$
- High efficiency up to 88%
- Indefinite short-circuit protection
- I/O isolation 1600 VDC
- Remote On/Off control
- 3-year product warranty



The TMR 6WI series is a new family of isolated 6 W DC/DC converter modules with regulated output, featuring wide 4:1 input voltage ranges. The product comes in a ultra-compact SIP-8 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  $+84^{\circ}\text{C}$  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 communication equipment, instrumentation and industrial electronics.

### Models

Order Code	Input Voltage Range	Output 1		Output 2		Efficiency typ.
		Vnom	I <sub>max</sub>	Vnom	I <sub>max</sub>	
TMR 6-2410WI	9 - 36 VDC (24 VDC nom.)	3.3 VDC	1'500 mA			81 %
TMR 6-2411WI		5 VDC	1'200 mA			84 %
TMR 6-2419WI		9 VDC	666 mA			86 %
TMR 6-2412WI		12 VDC	500 mA			87 %
TMR 6-2413WI		15 VDC	400 mA			88 %
TMR 6-2415WI		24 VDC	250 mA			87 %
TMR 6-2421WI		+5 VDC	600 mA	-5 VDC	600 mA	84 %
TMR 6-2422WI		+12 VDC	250 mA	-12 VDC	250 mA	87 %
TMR 6-2423WI		+15 VDC	200 mA	-15 VDC	200 mA	87 %
TMR 6-4810WI		18 - 75 VDC (48 VDC nom.)	3.3 VDC	1'500 mA		
TMR 6-4811WI	5 VDC		1'200 mA			84 %
TMR 6-4819WI	9 VDC		666 mA			85 %
TMR 6-4812WI	12 VDC		500 mA			87 %
TMR 6-4813WI	15 VDC		400 mA			87 %
TMR 6-4815WI	24 VDC		250 mA			87 %
TMR 6-4821WI	+5 VDC		600 mA	-5 VDC	600 mA	84 %
TMR 6-4822WI	+12 VDC		250 mA	-12 VDC	250 mA	87 %
TMR 6-4823WI	+15 VDC		200 mA	-15 VDC	200 mA	87 %

## Input Specifications

Input Current	- At no load	24 Vin models: <b>6 mA typ.</b> 48 Vin models: <b>6 mA typ.</b>
Surge Voltage		24 Vin models: <b>50 VDC max.</b> (1 s max.) 48 Vin models: <b>100 VDC max.</b> (1 s max.)
Recommended Input Fuse		24 Vin models: <b>1'600 mA</b> (slow blow) 48 Vin models: <b>1'000 mA</b> (slow blow) (The need of an external fuse has to be assessed in the final application.)
Input Filter		<b>Internal Capacitor</b>

## Output Specifications

Voltage Set Accuracy		<b>±1% max.</b>
Regulation	- Input Variation (Vmin - Vmax) - Load Variation (0 - 100%)	single output models: <b>0.2% max.</b> 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)	- single output	3.3 Vout models: <b>50 mVp-p max.</b> 5 Vout models: <b>50 mVp-p max.</b> 9 Vout models: <b>50 mVp-p max.</b> 12 Vout models: <b>75 mVp-p max.</b> 15 Vout models: <b>75 mVp-p max.</b> 24 Vout models: <b>75 mVp-p max.</b>
	- dual output	5 / -5 Vout models: <b>50 / 50 mVp-p max.</b> 12 / -12 Vout models: <b>75 / 75 mVp-p max.</b> 15 / -15 Vout models: <b>75 / 75 mVp-p max.</b>
Capacitive Load	- single output	3.3 Vout models: <b>2'200 µF max.</b> 5 Vout models: <b>1'100 µF max.</b> 9 Vout models: <b>680 µF max.</b> 12 Vout models: <b>470 µF max.</b> 15 Vout models: <b>470 µF max.</b> 24 Vout models: <b>180 µF max.</b>
	- dual output	5 / -5 Vout models: <b>680 / 680 µF max.</b> 12 / -12 Vout models: <b>330 / 330 µF max.</b> 15 / -15 Vout models: <b>180 / 180 µF max.</b>
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±0.02 %/K max.</b>
Start-up Time		<b>30 ms typ.</b>
Short Circuit Protection		<b>Continuous, Automatic recovery</b>
Output Current Limitation		<b>180% typ. of Iout max.</b>
Transient Response	- Response Time	<b>250 µs typ.</b> (25% Load Step)

## Safety Specifications

Safety Standards	- IT / Multimedia Equipment	<b>EN 62368-1</b> <b>IEC 62368-1</b> <b>UL 62368-1</b>
	- Certification Documents	<a href="http://www.tracopower.com/overview/tmr6wi">www.tracopower.com/overview/tmr6wi</a>
Pollution Degree		<b>PD 2</b>
Over Voltage Category		<b>OVC I</b>

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

## 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)
EMS Immunity	- Electrostatic Discharge	Air: EN 61000-4-2, $\pm 8$ kV, perf. criteria A Contact: EN 61000-4-2, $\pm 6$ kV, perf. criteria A
	- RF Electromagnetic Field	EN 61000-4-3, 20 V/m, perf. criteria A
	- EFT (Burst) / Surge	EN 61000-4-4, $\pm 2$ kV, perf. criteria A EN 61000-4-5, $\pm 2$ kV, perf. criteria A
	- Conducted RF Disturbances	Ext. input component: 24 VDC models: KY 220 $\mu$ F // TVS (SMDJ70A) 48 VDC models: KY 220 $\mu$ F //TVS (SMDJ120A)
	- PF Magnetic Field	Continuous: EN 61000-4-6, 10 Vrms, perf. criteria A EN 61000-4-8, 100 A/m, perf. criteria A

## General Specifications

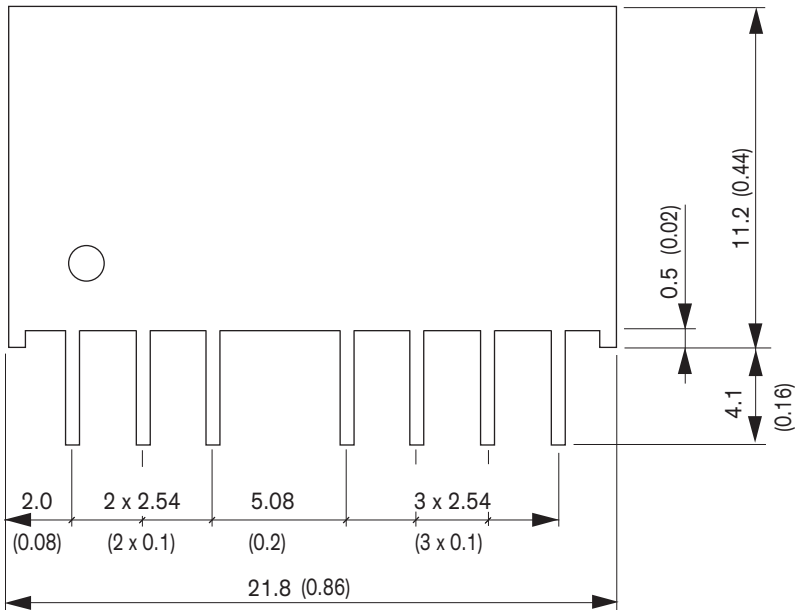
Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +84°C
	- Case Temperature	+100°C max.
	- Storage Temperature	-55°C to +125°C
Power Derating	- High Temperature	See application note: <a href="http://www.tracopower.com/overview/tmr6wi">www.tracopower.com/overview/tmr6wi</a>
Cooling System		Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote	On: 0 to 0.5 VDC or open circuit Off: 3 to 12 VDC
Altitude During Operation		2'000 m max.
Switching Frequency		522 - 638 kHz (PWM) 580 kHz typ. (PWM)
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	50 pF max.
Reliability	- Calculated MTBF	2'930'000 h (MIL-HDBK-217F, ground benign)
Environment	- Vibration	MIL-STD-810F
	- Thermal Shock	MIL-STD-810F
Housing Material		Non-conductive Plastic
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
Connection Type		THD (Through-Hole Device)
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-l

## Supporting Documents

Overview Link (for additional Documents)	<a href="http://www.tracopower.com/overview/tmr6wi">www.tracopower.com/overview/tmr6wi</a>
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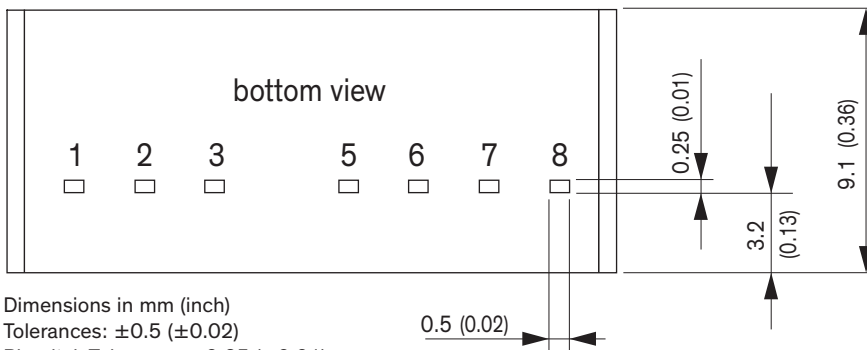
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**Outline Dimensions**



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



Dimensions in mm (inch)  
 Tolerances:  $\pm 0.5$  ( $\pm 0.02$ )  
 Pin pitch Tolerance:  $\pm 0.25$  ( $\pm 0.01$ )