

- Ultra-compact SIP-8 package
- Wide 2:1 input voltage range
- Continuous short-circuit protection
- Temperature range  $-40^{\circ}$  to  $+78^{\circ}\text{C}$
- High efficiency up to 86%
- I/O isolation 1600 VDC
- Remote On/Off control
- 3-year product warranty



The TMR-6 series is a new family of isolated 6W DC/DC converter modules with regulated output, featuring wide 2:1 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> of board space. 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 space critical applications.

Models						
Order Code	Input Voltage Range	Output 1		Output 2		Efficiency typ.
		Vnom	I <sub>max</sub>	Vnom	I <sub>max</sub>	
TMR 6-0510	4.5 - 9 VDC (5 VDC nom.)	3.3 VDC	1'300 mA			77 %
TMR 6-0511		5 VDC	1'200 mA			81 %
TMR 6-0519		9 VDC	666 mA			83 %
TMR 6-0512		12 VDC	500 mA			84 %
TMR 6-0513		15 VDC	400 mA			84 %
TMR 6-0515		24 VDC	250 mA			84 %
TMR 6-0521		+5 VDC	600 mA	-5 VDC	600 mA	81 %
TMR 6-0522		+12 VDC	250 mA	-12 VDC	250 mA	84 %
TMR 6-0523		+15 VDC	200 mA	-15 VDC	200 mA	84 %
TMR 6-1210	9 - 18 VDC (12 VDC nom.)	3.3 VDC	1'300 mA			78 %
TMR 6-1211		5 VDC	1'200 mA			83 %
TMR 6-1219		9 VDC	666 mA			85 %
TMR 6-1212		12 VDC	500 mA			85 %
TMR 6-1213		15 VDC	400 mA			85 %
TMR 6-1215		24 VDC	250 mA			84 %
TMR 6-1221		+5 VDC	600 mA	-5 VDC	600 mA	82 %
TMR 6-1222		+12 VDC	250 mA	-12 VDC	250 mA	84 %
TMR 6-1223		+15 VDC	200 mA	-15 VDC	200 mA	85 %
TMR 6-2410	18 - 36 VDC (24 VDC nom.)	3.3 VDC	1'300 mA			78 %
TMR 6-2411		5 VDC	1'200 mA			83 %
TMR 6-2419		9 VDC	666 mA			85 %
TMR 6-2412		12 VDC	500 mA			86 %
TMR 6-2413		15 VDC	400 mA			86 %
TMR 6-2415		24 VDC	250 mA			85 %
TMR 6-2421		+5 VDC	600 mA	-5 VDC	600 mA	82 %
TMR 6-2422		+12 VDC	250 mA	-12 VDC	250 mA	85 %
TMR 6-2423		+15 VDC	200 mA	-15 VDC	200 mA	85 %
TMR 6-4810	36 - 75 VDC (48 VDC nom.)	3.3 VDC	1'300 mA			78 %
TMR 6-4811		5 VDC	1'200 mA			82 %
TMR 6-4819		9 VDC	666 mA			84 %
TMR 6-4812		12 VDC	500 mA			85 %
TMR 6-4813		15 VDC	400 mA			86 %
TMR 6-4815		24 VDC	250 mA			84 %
TMR 6-4821		+5 VDC	600 mA	-5 VDC	600 mA	82 %
TMR 6-4822		+12 VDC	250 mA	-12 VDC	250 mA	84 %
TMR 6-4823		+15 VDC	200 mA	-15 VDC	200 mA	85 %

### Input Specifications

Input Current	- at no load	5 Vin models: 105 mA typ. 12 Vin models: 55 mA typ. 24 Vin models: 28 mA typ. 48 Vin models: 14 mA typ.
Surge Voltage		5 Vin models: 15 VDC max. (1 s max.) 12 Vin models: 36 VDC max. (1 s max.) 24 Vin models: 50 VDC max. (1 s max.) 48 Vin models: 100 VDC max. (1 s max.)
Under Voltage Lockout		5 Vin models: 2 VDC min. / 3.5 VDC typ. / 4 VDC max. 12 Vin models: 5 VDC min. / 7 VDC typ. / 8 VDC max. 24 Vin models: 12 VDC min. / 15 VDC typ. / 17 VDC max. 48 Vin models: 26 VDC min. / 33 VDC typ. / 35 VDC max.
Recommended Input Fuse		5 Vin models: 3000 mA (slow blow) 12 Vin models: 1600 mA (slow blow) 24 Vin models: 1000 mA (slow blow) 48 Vin models: 500 mA (slow blow)
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 (0 - 100%)	single output models: 1% 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	50 mVp-p typ.
Capacitive Load	- single output	3.3 Vout models: 6'600 µF max. 5 Vout models: 3'300 µF max. 9 Vout models: 2'000 µF max. 12 Vout models: 1'600 µF max. 15 Vout models: 1'400 µF max. 24 Vout models: 680 µF max.
	- dual output	5 / -5 Vout models: 2'000 / 2'000 µF max. 12 / -12 Vout models: 900 / 900 µF max. 15 / -15 Vout models: 600 / 600 µF max.
Minimum Load		Not required
Temperature Coefficient		±0.02 %/K max.
Start-up Time		5 ms typ. / 10 ms max.
Short Circuit Protection		Continuous, Automatic recovery
Transient Response	- Response Time	500 µs typ. (25% Load Step)

### Safety Specifications

Safety Standards	- IT / Multimedia Equipment	IEC 60950-1 EN 60950-1 UL 60950-1
	- Certification Documents	<a href="http://www.tracopower.com/overview/tmr6">www.tracopower.com/overview/tmr6</a>
Pollution Degree		PD 2: Office or Laboratory Environments

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

### EMC Specifications

EMC 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/tmr6">www.tracopower.com/overview/tmr6</a>
EMC 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, 10 V/m, perf. criteria A
	- EFT (Burst)	EN 61000-4-4, $\pm 2$ kV, perf. criteria A
	- Surge	EN 61000-4-5, $\pm 1$ kV, perf. criteria A
	- Conducted RF Disturbances	Ext. Input Component: 5 Vin models: Nippon chemi-con KY 330 $\mu$ F Other models: Nippon chemi-con KY 220 $\mu$ F EN 61000-4-6, 10 Vrms, perf. criteria A
	- PF Magnetic Field	EN 61000-4-8, 100 A/m, perf. criteria A

### General Specifications

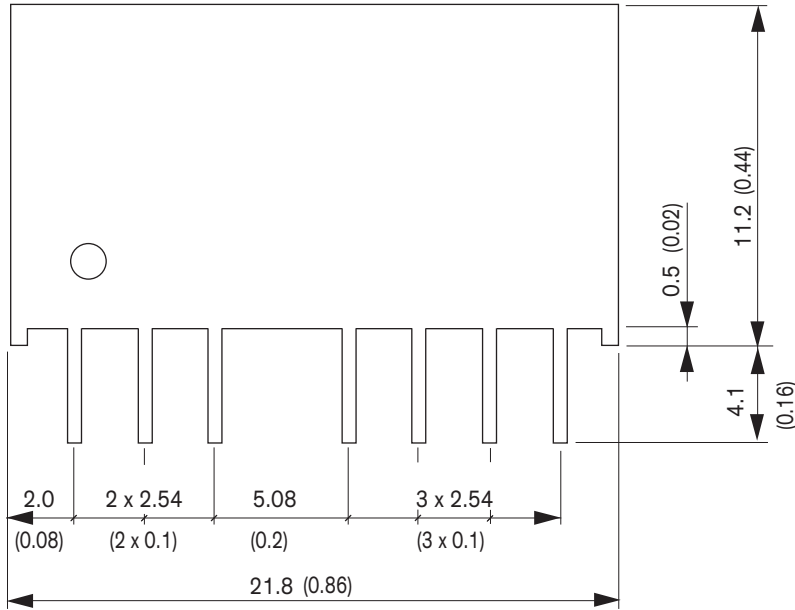
Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +78°C
	- Case Temperature	+105°C max.
	- Storage Temperature	-55°C to +125°C
Power Derating	- High Temperature	4 %/K above 65°C
Cooling System		Natural convection (20 LFM)
Altitude During Operation		2'000 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 MOhm min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	50 pF max.
Reliability	- Calculated MTBF	2'135'000 h (MIL-HDBK-217F, ground benign)
Environment	- Vibration	MIL-STD-810F
	- Thermal Shock	MIL-STD-810F
Housing Material		Non-conductive Plastic
Potting Material		Silicone (UL94 V-0 rated)
Connection Type		THD (Through-Hole Device)
Weight		4.8 g
Remote Control	- Current Controlled Remote	On: open circuit Off: 2 to 4 mA current (internal 1 kOhm resistor)
	- External Circuit Proposal	<a href="http://www.tracopower.com/info/current-remote.pdf">www.tracopower.com/info/current-remote.pdf</a>
	- Off Idle Input Current	2.5 mA max.
Environmental Compliance	- Reach	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a>
	- RoHS	<a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a>

### Supporting Documents

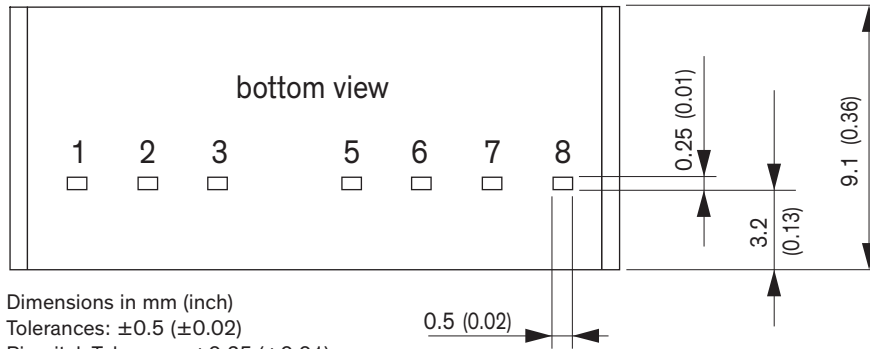
Overview Link (for additional Documents)	<a href="http://www.tracopower.com/overview/tmr6">www.tracopower.com/overview/tmr6</a>
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**Outline Dimensions**



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



Dimensions in mm (inch)  
 Tolerances: ±0.5 (±0.02)  
 Pin pitch Tolerance: ±0.25 (±0.01)