

- Compact SIP-8 metal case
- EN 50155 railway approval
- Ultra wide 4:1 Input: 9–36, 18–75 and 43–160 VDC
- I/O-isolation 3'000 VDC
- Fully regulated outputs
- Operating temperature range –40°C to +80°C
- Protection against overload and short circuit
- Remote On/Off
- 3-year product warranty



The TMR 6WIR series is a set of 6 Watt DC/DC converters in a SIP-8 metal case. They operate up to 60°C environment temperature at full load and up to 80°C with a 50% load derating. With EN 50155 and UL 60950-1 certification, 3'000 VDC I/O-isolation voltage, external On/Off, overload and short current protection they cover a wide range of application when space is limited. The input of the converters is designed for a wide voltage range (4:1) and minimum load is not required.

Models				
Order code	Input voltage	Output voltage	Output current max.	Efficiency typ.
TMR 6-2410WIR	9 – 36 VDC (24 VDC nominal)	3.3 VDC	1500 mA	81 %
TMR 6-2411WIR		5.0 VDC	1200 mA	84 %
TMR 6-2419WIR		9.0 VDC	666 mA	86 %
TMR 6-2412WIR		12 VDC	500 mA	87 %
TMR 6-2413WIR		15 VDC	400 mA	88 %
TMR 6-2415WIR		24 VDC	250 mA	87 %
TMR 6-2421WIR		±5 VDC	±600 mA	84 %
TMR 6-2422WIR		±12 VDC	±250 mA	87 %
TMR 6-2423WIR		±15 VDC	±200 mA	87 %
TMR 6-4810WIR	18 – 75 VDC (48 VDC nominal)	3.3 VDC	1500 mA	81 %
TMR 6-4811WIR		5.0 VDC	1200 mA	84 %
TMR 6-4819WIR		9.0 VDC	666 mA	85 %
TMR 6-4812WIR		12 VDC	500 mA	87 %
TMR 6-4813WIR		15 VDC	400 mA	87 %
TMR 6-4815WIR		24 VDC	250 mA	87 %
TMR 6-4821WIR		±5 VDC	±600 mA	84 %
TMR 6-4822WIR		±12 VDC	±250 mA	87 %
TMR 6-4823WIR		±15 VDC	±200 mA	87 %
TMR 6-7210WIR	43 – 160 VDC (110 VDC nominal)	3.3 VDC	1500 mA	80 %
TMR 6-7211WIR		5.0 VDC	1200 mA	83 %
TMR 6-7219WIR		9.0 VDC	666 mA	85 %
TMR 6-7212WIR		12 VDC	500 mA	86 %
TMR 6-7213WIR		15 VDC	400 mA	86 %
TMR 6-7215WIR		24 VDC	250 mA	86 %
TMR 6-7221WIR		±5 VDC	±600 mA	83 %
TMR 6-7222WIR		±12 VDC	±250 mA	86 %
TMR 6-7223WIR		±15 VDC	±200 mA	86 %

## Input Specifications

Input current no load	24 Vin models: 6 mA typ 48 Vin models: 6 mA typ. 110 Vin models: 2 mA typ.
Surge voltage (1 s max.)	24 Vin models: 50 V max. 48 Vin models: 100 V max. 110 Vin models: 185 V max.
EMC emissions	– Conducted & Radiated input suppression – Application note for filter class A/B proposal EN 55011, EN 55032 class A or B (with ext. filter) <a href="http://www.tracopower.com/overview/tmr6wir">www.tracopower.com/overview/tmr6wir</a>
EMC immunity	– ESD (electrostatic discharge) – Radiated immunity – Fast transient / surge (with external input capacitor / diode) – Conducted immunity – Magnetic field immunity EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A EN 61000-4-3, 20 V/m, perf. criteria A EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±2 kV perf. criteria A 24 Vin models: Nippon chemi-con KY 220 µF / 100 V and TVS (SMDJ70A, 70 V, 3000 W) in parallel 48 Vin models: Nippon chemi-con KY 220 µF / 100 V and TVS (SMDJ120A, 120 V, 3000 W) in parallel 110 Vin models: Nippon chemi-con KY 150 µF / 200 V and TVS (SMDJ250A, 250 V, 600 W) in parallel EN 61000-4-6, 10 Vrms, perf. criteria A EN 61000-4-8 100 A/m, continuous, perf. criteria A 1000 A/m, 1 sec., perf. criteria A
Input filter	capacitor type
Recommended input fuse	24 Vin models: 1.25 A (slow blow) 48 Vin models: 0.63 A (slow blow) 110 Vin models: 0.15 A (slow blow)

## Output Specifications

Voltage set accuracy	±1 % max.
Regulation	– Input variation (Vin min. to Vin max.) – Load variation (0 – 100 %) – Cross regulation single output: 0.2 % max. dual output: 0.5 % max. dual output: 1 % max. dual output: 5 % max. (asymmetrical load 25 % / 100 %)
Temperature coefficient	±0.02 %/K max.
Minimum load	not required
Ripple and noise (20 MHz Bandwidth with 1 µF / 50 V)	75 mVp-p max.
Start up time (constant resistive load)	75 ms max.
Transient response	– Recovery time (25% load step change) 250 µs typ.
Current limitation	180 % of Iout nom. typ. (hiccup)
Short circuit protection	continuous, automatic recovery
Capacitive load	– Single output 3.3 VDC models: 2200 µF max. 5.0 VDC models: 1100 µF max. 9.0 VDC models: 680 µF max. 12 & 15 VDC models: 470 µF max. 24 VDC models: 180 µF max. – Dual output ±5 VDC models: 680 µF max. (each output) ±12 VDC models: 330 µF max. (each output) ±15 VDC models: 180 µF max. (each output)

## General Specifications

Temperature ranges	– Operating (natural convection: 20 LFM, 0.1 m/s) – Case temperature – Storage temperature –40°C to +80°C +100°C max. –55°C to +125°C
Derating	2.5%/K above 60°C
Humidity (non condensing)	5 – 95 % rel H max.

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

### General Specifications

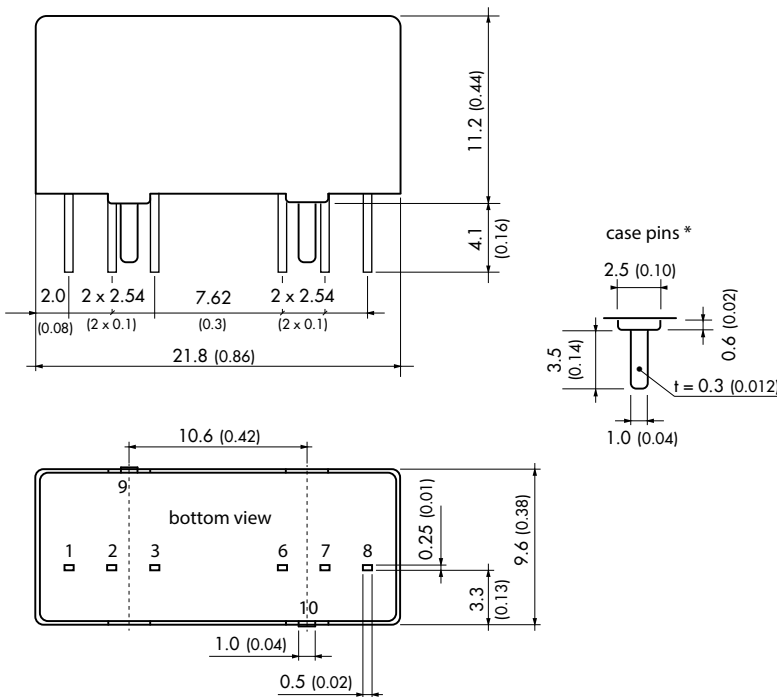
Isolation voltage (60 s)	– Input to Output – Input/Output to Case	3'000 VDC 1'500 VDC
Isolation capacitance		100 pF max.
Isolation resistance (at 500 VDC)		>1 GOhm
Thermal Shock		acc. MIL-STD-810F
Shock & Vibration		acc. EN 61373, MIL-STD-810F
Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign)		2'950'000 h
Switching frequency	24 & 48 Vin models: 110 Vin models:	580 kHz (±60 kHz) (pulse width modulation) 300 kHz (±30 kHz) (pulse width modulation)
Safety standards	– Certification documents	IEC/EN/UL 60950-1, EN 50155 <a href="http://www.tracopower.com/overview/tmr6wir">www.tracopower.com/overview/tmr6wir</a>
Remote On/Off	– On: – Off: – Off idle current:	open circuit or high impedance 2 – 4 mA current applied via 1kOhm resistor 2.5 mA max.
Environmental compliance	– Reach – RoHS – Flamability identified acc. EN 45545-2	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a> RoHS directive 2011/65/EU <a href="http://www.tracopower.com/info/en45545-declaration.pdf">www.tracopower.com/info/en45545-declaration.pdf</a>

### Physical Specifications

Casing material	copper
Potting material	silicone (UL94 V-0 rated)
Package weight	5.9 g (0.21 oz)

Supporting Documents: [www.tracopower.com/overview/tmr6wir](http://www.tracopower.com/overview/tmr6wir)

### Outline Dimensions



Pin-Out		
Pin	Single	Dual
1	–Vin (GND)	–Vin (GND)
2	+Vin (Vcc)	+Vin (Vcc)
3	On/Off	On/Off
6	+Vout	+Vout
7	–Vout	Common
8	NC	–Vout
9, 10	Case	Case

Dimensions in [mm], ( ) = Inch

Tolerances: x.x	±0.5 (±0.02)
x.xx	±0.25 (±0.01)
Pin pitch tolerance	±0.25 (±0.01)
Pin dimension tolerance	±0.1 (±0.004)

\* Case pins should not be connected to any circuit