TRACO POWER

DC/DC Converter

TMR 3WIR Series, 3 Watt

- **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 +90°C**
- **Short circuit protection and current limitation**
- **Remote On/Off**
- **3-year product warranty**

The TMR 3WIR series is a set of 3 Watt DC/DC converters in a SIP-8 metal case. They operate up to 78°C environment temperature at full load and up to 90°C with a 50% load derating. With EN 50155 and UL 60950-1 certification, 3’000 VDC I/O-isolation voltage, external On/Off, current limitation 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 3-2410WIR	**9 – 36 VDC** (24 VDC nominal)	3.3 VDC	700 mA	76 %
TMR 3-2411WIR		5.0 VDC	600 mA	81 %
TMR 3-2419WIR		9.0 VDC	333 mA	81 %
TMR 3-2412WIR		12 VDC	250 mA	83 %
TMR 3-2413WIR		15 VDC	200 mA	83 %
TMR 3-2415WIR		24 VDC	125 mA	82 %
TMR 3-2421WIR		±5 VDC	±300 mA	80 %
TMR 3-2422WIR		±12 VDC	±125 mA	82 %
TMR 3-2423WIR		±15 VDC	±100 mA	82 %
TMR 3-4810WIR	**18 – 75 VDC** (48 VDC nominal)	3.3 VDC	700 mA	75 %
TMR 3-4811WIR		5.0 VDC	600 mA	81 %
TMR 3-4819WIR		9.0 VDC	333 mA	81 %
TMR 3-4812WIR		12 VDC	250 mA	82 %
TMR 3-4813WIR		15 VDC	200 mA	82 %
TMR 3-4815WIR		24 VDC	125 mA	82 %
TMR 3-4821WIR		±5 VDC	±300 mA	80 %
TMR 3-4822WIR		±12 VDC	±125 mA	82 %
TMR 3-4823WIR		±15 VDC	±100 mA	82 %
TMR 3-7210WIR	**43 – 160 VDC** (110 VDC nominal)	3.3 VDC	700 mA	76 %
TMR 3-7211WIR		5.0 VDC	600 mA	80 %
TMR 3-7219WIR		9.0 VDC	333 mA	81 %
TMR 3-7212WIR		12 VDC	250 mA	82 %
TMR 3-7213WIR		15 VDC	200 mA	83 %
TMR 3-7215WIR		24 VDC	125 mA	83 %
TMR 3-7221WIR		±5 VDC	±300 mA	80 %
TMR 3-7222WIR		±12 VDC	±125 mA	83 %
TMR 3-7223WIR		±15 VDC	±100 mA	81 %

Input Specifications

Input current no load		24 Vin models:	4 mA typ
		48 Vin models:	4 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		EN 55011, EN 55032 class A or B (with ext. filter)
	– Application note for filter class A/B proposal		www.tracopower.com/overview/tmr3wir
EMC immunity	– ESD (electrostatic discharge)		EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A
	– Radiated immunity		EN 61000-4-3, 20 V/m, perf. criteria A
	– Fast transient / surge		EN 61000-4-4, ±2 kV, perf. criteria A
	(with external input capacitor / diode)		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 (SMBJ250A, 250 V, 600 W) in parallel
	– Conducted immunity		EN 61000-4-6, 10 Vrms, perf. criteria A
	– Magnetic field immunity		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:	0.8 A (slow blow)
		48 Vin models:	0.5 A (slow blow)
		110 Vin models:	0.16 A (slow blow)

Output Specifications

Voltage set accuracy			±1 % max.
Regulation	– Input variation (Vin min. to Vin max.)		0.2 % max.
	– Load variation (0 – 100 %)	single output:	0.5 % max.
		dual output:	1 % max.
	– Cross regulation	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:	1100 µF max.
		5.0 VDC models:	550 µF max.
		9.0 VDC models:	340 µF max.
		12 & 15 VDC models:	240 µF max.
		24 VDC models:	90 µF max.
	– Dual output	±5 VDC models:	340 µF max. (each output)
		±12 VDC models:	170 µF max. (each output)
		+15 VDC models:	90 µF max. (each output)

General Specifications

Temperature ranges	– Operating (natural convection: 20 LFM, 0.1m/s)	–40°C to +90°C
	– Case temperature	+100°C max.
	– Storage temperature	–55°C to +125°C
Derating		4.5 %/K above 78°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

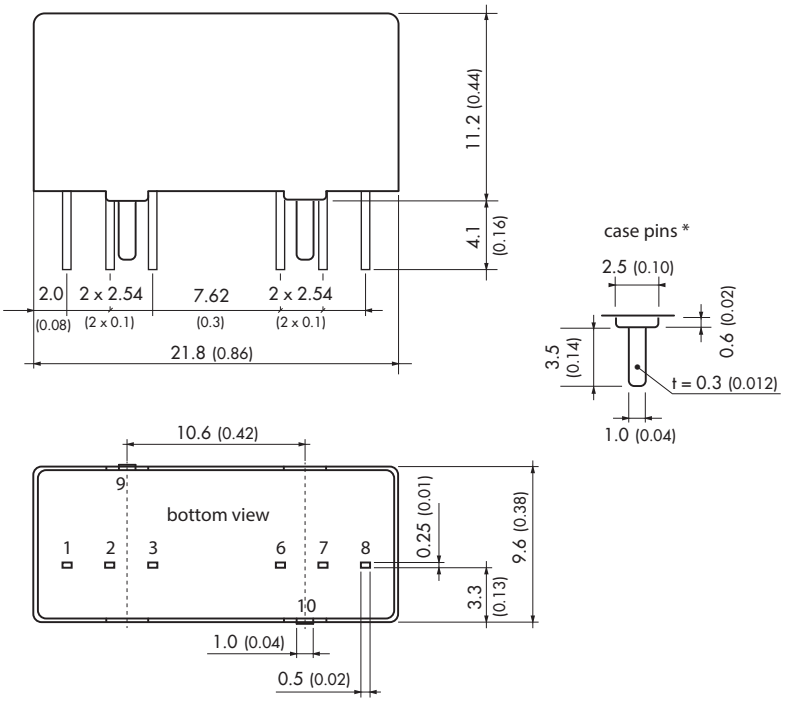
Isolation voltage (60 s)	– Input to output isolation voltage – Input/output to case isolation voltage	3'000 VDC 1'500 VDC
Isolation capacitance		100 pF max.
Isolation resistance (at 500 VDC)		>1 GOhm
Thermal Shock		acc. MIL-STD-810F
Shock & Vibration		acc. EN 61373, MIL-STD-810F
Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign)		5'535'000 h
Switching frequency	24 & 48 Vin models: 110 Vin models:	400 kHz (±40 kHz) (pulse width modulation) 300 kHz (±30 kHz) (pulse width modulation)
Safety standards	– Certification documents	IEC/EN/UL 60950-1, EN 50155 www.tracopower.com/overview/tmr3wir
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	www.tracopower.com/info/reach-declaration.pdf RoHS directive 2011/65/EU www.tracopower.com/info/en45545-declaration.pdf

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/tmr3wir

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