TRACO POWER

DC/DC Railway 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**

UL 62368-1 IEC 62368-1

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 circuit 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 Range	Output 1		Output 2		Efficiency
		Vnom	Imax	Vnom	Imax	typ.
TMR 3-2410WIR	9 - 36 VDC (24 VDC nom.)	3.3 VDC	700 mA			76 %
TMR 3-2411WIR		5 VDC	600 mA			81 %
TMR 3-2419WIR		9 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	–5 VDC	300 mA	80 %
TMR 3-2422WIR		+12 VDC	125 mA	–12 VDC	125 mA	82 %
TMR 3-2423WIR		+15 VDC	100 mA	–15 VDC	100 mA	82 %
TMR 3-4810WIR	18 - 75 VDC (48 VDC nom.)	3.3 VDC	700 mA			75 %
TMR 3-4811WIR		5 VDC	600 mA			81 %
TMR 3-4819WIR		9 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	–5 VDC	300 mA	80 %
TMR 3-4822WIR		+12 VDC	125 mA	–12 VDC	125 mA	82 %
TMR 3-4823WIR		+15 VDC	100 mA	–15 VDC	100 mA	82 %
TMR 3-7210WIR	43 - 160 VDC (110 VDC nom.)	3.3 VDC	700 mA			76 %
TMR 3-7211WIR		5 VDC	600 mA			80 %
TMR 3-7219WIR		9 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	–5 VDC	300 mA	80 %
TMR 3-7222WIR		+12 VDC	125 mA	–12 VDC	125 mA	83 %
TMR 3-7223WIR		+15 VDC	100 mA	–15 VDC	100 mA	81 %

Input Specifications

Input Current	- at no load	24 Vin models:	4 mA typ.
		48 Vin models:	4 mA typ.
		110 Vin models:	2 mA typ.
Surge Voltage		24 Vin models:	50 VDC max. (1 s max.)
		48 Vin models:	100 VDC max. (1 s max.)
		110 Vin models:	185 VDC max. (1 s max.)
Recommended Input Fuse		24 Vin models:	800 mA (slow blow)
		48 Vin models:	500 mA (slow blow)
		110 Vin models:	160 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:	0.5% 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		75 mVp-p max. (with 1 µF)
			50 mVp-p typ. (with 1 µF)
Capacitive Load	- single output	3.3 Vout models:	1'100 µF max.
		5 Vout models:	550 µF max.
		9 Vout models:	340 µF max.
		12 Vout models:	240 µF max.
		15 Vout models:	240 µF max.
		24 Vout models:	90 µF max.
	- dual output	5 / -5 Vout models:	340 / 340 µF max.
		12 / -12 Vout models:	170 / 170 µF max.
		15 / -15 Vout models:	90 / 90 µF max.
Minimum Load			Not required
Temperature Coefficient			±0.02 %/K max.
Start-up Time			75 ms max.
Short Circuit Protection			Continuous, Automatic recovery
Output Current Limitation			180% typ. of Iout max.
Transient Response	- Response Time		250 µs typ. (25% Load Step)

Safety Specifications

Safety Standards	- IT / Multimedia Equipment	EN 62368-1
		IEC 62368-1
		UL 62368-1
	- Railway Applications	EN 50155
	- Certification Documents	www.tracopower.com/overview/tmr3wir
Pollution Degree		PD 2

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

EMC Specifications

EMI Emissions	- Conducted Emissions		EN 55011 class A (with external filter)
			EN 55011 class B (with external filter)
			EN 55032 class A (with external filter)
			EN 55032 class B (with external filter)
	- Radiated Emissions		EN 55011 class A (with external filter)
			EN 55011 class B (with external filter)
			EN 55032 class A (with external filter)
			EN 55032 class B (with external filter)
	- External Filter Proposal		www.tracopower.com/overview/tmr3wir
EMS Immunity			EN 50155 (Railway Applications)
	- Electrostatic Discharge	Air:	EN 61000-4-2, ±8 kV, perf. criteria A
		Contact:	EN 61000-4-2, ±6 kV, perf. criteria A
	- RF Electromagnetic Field		EN 61000-4-3, 20 V/m, perf. criteria A
	- EFT (Burst)		EN 61000-4-4, ±2 kV, perf. criteria A
	- Surge		EN 61000-4-5, ±2 kV, perf. criteria A
		Ext. Input Component:	24 Vin models: KY 220 µF // TVS SMDJ70A
			48 Vin models: KY 220 µF // TVS SMDJ120A
			110 Vin models: KY 150 µF // TVS SMDJ250A
	- Conducted RF Disturbances		EN 61000-4-6, 10 Vrms, perf. criteria A
	- PF Magnetic Field	Continuous:	EN 61000-4-8, 100 A/m, perf. criteria A
		1 s:	EN 61000-4-8, 1000 A/m, perf. criteria A

General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	–40°C to +90°C
	- Case Temperature	+100°C max.
	- Storage Temperature	–55°C to +125°C
Power Derating	- High Temperature	4.55 %/K above 78°C
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
		Refers to 'Remote' and '-Vin' Pin
	- Current Controlled Remote	On: open circuit
		Off: 2 to 4 mA current
	- Off Idle Input Current	2.5 mA typ.
Altitude During Operation		2'000 m max.
Switching Frequency		270 - 330 kHz (PWM) (110 Vin model)
		360 - 440 kHz (PWM) (other input models)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s	2'121 VAC
	- Input to Case or PE, 60 s	1'061 VAC
	- Output to Case or PE, 60 s	1'061 VAC
Isolation Resistance	- Input to Output, 500 VDC	1'000 MOhm min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	100 pF max.
Reliability	- Calculated MTBF	5'535'000 h (MIL-HDBK-217F, ground benign)
Environment	- Vibration	MIL-STD-810F
		EN 61373
	- Mechanical Shock	MIL-STD-810F
		EN 61373
	- Thermal Shock	MIL-STD-810F
Housing Material		Copper
Potting Material		Silicone (UL94 V-0 rated)
Soldering Profile		265°C / 10 s max.
Connection Type		THD (Through-Hole Device)
Weight		5.9 g

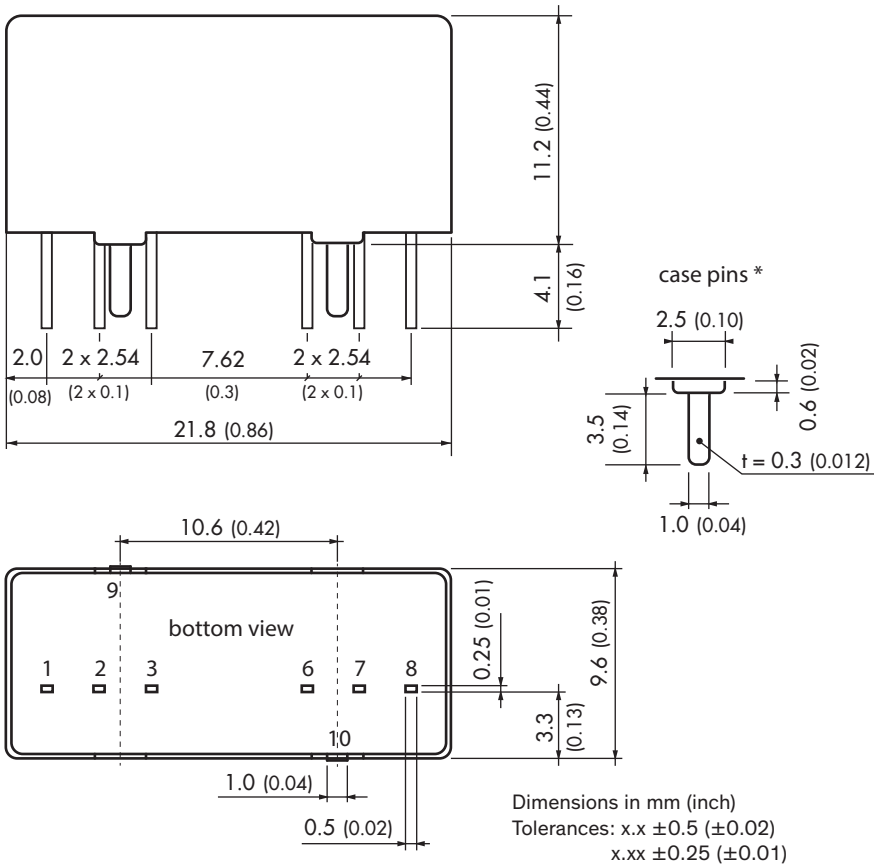
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Environmental Compliance	- Reach	www.tracopower.com/info/reach-declaration.pdf
	- RoHS	www.tracopower.com/info/rohs-declaration.pdf
	- Flammability (EN 45545-2)	www.tracopower.com/info/en45545-declaration.pdf

Supporting Documents

Overview Link (for additional Documents)	www.tracopower.com/overview/tmr3wir

Outline Dimensions



Dimensions in mm (inch)
Tolerances: x.x ±0.5 (±0.02)
x.xx ±0.25 (±0.01)
Pin dimension tolerance ±0.1 (±0.004)

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
9, 10	Case	Case

NC: No Connection

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

TRACO Power:

TMR 3-4811WIR TMR 3-7211WIR TMR 3-7210WIR TMR 3-4813WIR TMR 3-2419WIR TMR 3-4810WIR TMR 3-4812WIR TMR 3-2413WIR TMR 3-4815WIR TMR 3-7221WIR TMR 3-7213WIR TMR 3-7222WIR TMR 3-2412WIR TMR 3-2411WIR TMR 3-7215WIR TMR 3-4819WIR TMR 3-2410WIR TMR 3-7219WIR TMR 3-2422WIR TMR 3-7223WIR TMR 3-2421WIR TMR 3-4821WIR TMR 3-4822WIR TMR 3-4823WIR TMR 3-7212WIR TMR 3-2415WIR TMR 3-2423WIR