

- Wide 4:1 input voltage range
- Compact SIP-8 package
- Cost optimized design
- Temperature range  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- I/O isolation 1600 VDC
- Remote On/Off control
- 3-year product warranty



UL 62368-1 IEC 62368-1

The TMR 3WIE series is a family of isolated 3 W DC/DC converter modules with regulated output, featuring wide 4:1 input voltage ranges. The product comes in a compact SIP-8 plastic package with small footprint occupying only 2.0 cm<sup>2</sup> (0.3 square inch) of board space.

An excellent efficiency allows  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  operation temperature. Further features include remote On/Off control and continuous short circuit protection. The compact dimensions and cost optimized design make this converters an ideal solution for 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 3-1210WIE	4.5 - 18 VDC (12 VDC nom.)	3.3 VDC	700 mA			74 %
TMR 3-1211WIE		5 VDC	600 mA			78 %
TMR 3-1212WIE		12 VDC	250 mA			80 %
TMR 3-1213WIE		15 VDC	200 mA			80 %
TMR 3-1221WIE		+5 VDC	300 mA	-5 VDC	300 mA	80 %
TMR 3-1222WIE		+12 VDC	125 mA	-12 VDC	125 mA	80 %
TMR 3-1223WIE		+15 VDC	100 mA	-15 VDC	100 mA	80 %
TMR 3-2410WIE	9 - 36 VDC (24 VDC nom.)	3.3 VDC	700 mA			75 %
TMR 3-2411WIE		5 VDC	600 mA			80 %
TMR 3-2412WIE		12 VDC	250 mA			81 %
TMR 3-2413WIE		15 VDC	200 mA			81 %
TMR 3-2421WIE		+5 VDC	300 mA	-5 VDC	300 mA	79 %
TMR 3-2422WIE		+12 VDC	125 mA	-12 VDC	125 mA	80 %
TMR 3-2423WIE		+15 VDC	100 mA	-15 VDC	100 mA	81 %
TMR 3-4810WIE	18 - 75 VDC (48 VDC nom.)	3.3 VDC	700 mA			74 %
TMR 3-4811WIE		5 VDC	600 mA			79 %
TMR 3-4812WIE		12 VDC	250 mA			79 %
TMR 3-4813WIE		15 VDC	200 mA			79 %
TMR 3-4821WIE		+5 VDC	300 mA	-5 VDC	300 mA	79 %
TMR 3-4822WIE		+12 VDC	125 mA	-12 VDC	125 mA	79 %
TMR 3-4823WIE		+15 VDC	100 mA	-15 VDC	100 mA	80 %

## Input Specifications

Input Current	- At no load	12 Vin models: <b>60 mA typ.</b> 24 Vin models: <b>25 mA typ.</b> 48 Vin models: <b>15 mA typ.</b>
	- At full load	12 Vin models: <b>300 mA typ.</b> 24 Vin models: <b>150 mA typ.</b> 48 Vin models: <b>75 mA typ.</b>
Surge Voltage		12 Vin models: <b>25 VDC max.</b> (1 s max.) 24 Vin models: <b>50 VDC max.</b> (1 s max.) 48 Vin models: <b>100 VDC max.</b> (1 s max.)
Under Voltage Lockout		12 Vin models: <b>4 VDC max.</b> 24 Vin models: <b>8 VDC max.</b> 48 Vin models: <b>16 VDC max.</b>
Recommended Input Fuse		12 Vin models: <b>1'500 mA</b> (slow blow) 24 Vin models: <b>700 mA</b> (slow blow) 48 Vin models: <b>350 mA</b> (slow blow) (The need of an external fuse has to be assessed in the final application.)
Input Filter		<b>Internal Capacitor</b>
Short Circuit Input Power		<b>2.5 W max.</b>

## Output Specifications

Voltage Set Accuracy		<b>±1% max.</b>
Regulation	- Input Variation (Vmin - Vmax)	single output models: <b>0.5% max.</b> dual output models: <b>0.5% max.</b>
	- Load Variation (25 - 100%)	single output models: <b>1% max.</b> dual output models: <b>1% max.</b> (Output 1) <b>1% max.</b> (Output 2)
	- Voltage Balance (symmetrical load)	dual output models: <b>2% max.</b>
Ripple and Noise	- 20 MHz Bandwidth	<b>75 mVp-p max.</b>
Capacitive Load	- single output	3,3 Vout models: <b>1'760 µF max.</b> 5 Vout models: <b>1'000 µF max.</b> 12 Vout models: <b>170 µF max.</b> 15 Vout models: <b>110 µF max.</b>
	- dual output	5 / -5 Vout models: <b>470 / 470 µF max.</b> 12 / -12 Vout models: <b>100 / 100 µF max.</b> 15 / -15 Vout models: <b>47 / 47 µF max.</b>
Minimum Load		<b>25 % of Iout max.</b> (Operation at lower load will not damage the converter, but it may not meet all specifications)
Temperature Coefficient		<b>±0.02 %/K max.</b>
Short Circuit Protection		<b>Automatic recovery</b>
Overload Protection		<b>Foldback Mode</b>
Output Current Limitation		<b>110% min. of Iout max.</b> <b>140% typ. of Iout max.</b>
Transient Response	- Response Deviation	<b>5% max.</b> (25% Load Step)
	- Response Time	<b>300 µs typ. / 500 µs max.</b> (25% Load Step)

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

## Safety Specifications

Safety Standards	- IT / Multimedia Equipment	CSA-C22.2, No. 60950-1 EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1
	- Certification Documents	<a href="http://www.tracopower.com/overview/tmr3wie">www.tracopower.com/overview/tmr3wie</a>

## EMC Specifications

EMI Emissions	- Conducted Emissions	EN 55032 class A (with external filter) FCC Part 15 class A (with external filter)
	- Radiated Emissions	EN 55032 class A (with external filter) FCC Part 15 class A (with external filter)
		External filter proposal: <a href="http://www.tracopower.com/overview/tmr3wie">www.tracopower.com/overview/tmr3wie</a>

## General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature - Case Temperature - Storage Temperature	-40°C to +85°C +105°C max. -55°C to +125°C
Power Derating	- High Temperature	3.3 %/K above 70°C
Cooling System		Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote  - Off Idle Input Current - Remote Pin Input Current	On: < 0.6 VDC or open circuit Off: 2.7 to 15 VDC Refers to 'Remote' and '-Vin' Pin 2.5 mA max. -1.0 to 1.0 mA
Altitude During Operation		6'000 m max.
Switching Frequency		350 kHz typ. (PFM)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s - Input to Output, 1 s	1'600 VDC 1'920 VDC
Isolation Resistance	- Input to Output, 500 VDC	1'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	200 pF typ.
Reliability	- Calculated MTBF	900'000 h (MIL-HDBK-217F, ground benign)
Washing Process		Allowed (hermetical product)
	See Cleaning Guideline:	<a href="http://www.tracopower.com/info/cleaning.pdf">www.tracopower.com/info/cleaning.pdf</a>
Housing Material		Non-conductive Plastic (UL 94 V-0 rated)
Potting Material		Epoxy (UL 94 V-0 rated)
Pin Material		Nickel-Iron (Alloy 42)
Pin Foundation Plating		Nickel (1 μm min.)
Pin Surface Plating		Tin (3 - 5 μm), matte
Housing Type		Plastic Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		SIP8
Soldering Profile		260°C / 10 s max.
Weight		4.8 g

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

Environmental Compliance - REACH Declaration

[www.tracopower.com/info/reach-declaration.pdf](http://www.tracopower.com/info/reach-declaration.pdf)

REACH SVHC list compliant

REACH Annex XVII compliant

- RoHS Declaration

[www.tracopower.com/info/rohs-declaration.pdf](http://www.tracopower.com/info/rohs-declaration.pdf)

Exemptions: 7a

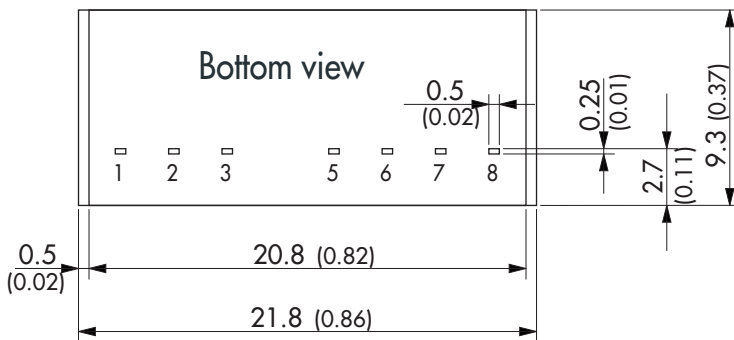
(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).  
The SCIP number is provided on request.)

### Supporting Documents

Overview Link (for additional Documents)

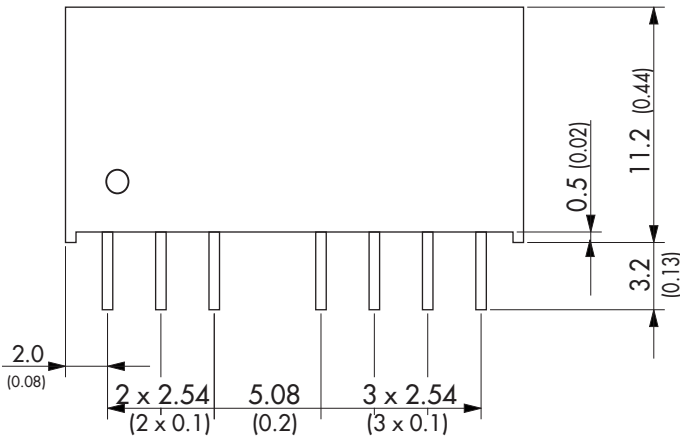
[www.tracopower.com/overview/tmr3wie](http://www.tracopower.com/overview/tmr3wie)

### Outline Dimensions



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

NTC: Not to connect



Dimensions in [mm], () = Inch

Tolerances:  $\pm 0.5$  ( $\pm 0.02$ )

Pin pitch tolerances:  $\pm 0.25$  ( $\pm 0.01$ )