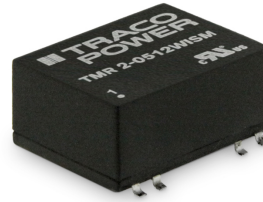


- Ultra wide 4:1 Input: 4.5–12, 9–36 and 18–75 VDC
- I/O-isolation 1'500 VDC
- Fully regulated outputs
- Operating temperature range –40°C to +80°C
- Protection against short circuit and overload
- Remote On/Off
- 3-year product warranty



The TMR 2WISM Series is a set of 2 Watt SMD DC/DC converters. They operate up to 70°C environment temperature at full load or up to 80°C with a 50% load derating. With UL 60950-1 certification, 1'500 VDC I/O-isolation voltage, external On/Off 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 Range	Output 1		Output 2		Efficiency typ.
		Vnom	I <sub>max</sub>	Vnom	I <sub>max</sub>	
TMR 2-0511WISM	4.5 - 12 VDC (9 VDC nom.)	5 VDC	400 mA			80 %
TMR 2-0512WISM		12 VDC	167 mA			84 %
TMR 2-0513WISM		15 VDC	134 mA			83 %
TMR 2-0515WISM		24 VDC	83 mA			84 %
TMR 2-0522WISM		+12 VDC	83 mA	-12 VDC	83 mA	83 %
TMR 2-0523WISM		+15 VDC	67 mA	-15 VDC	67 mA	82 %
TMR 2-2411WISM	9 - 36 VDC (24 VDC nom.)	5 VDC	400 mA			80 %
TMR 2-2412WISM		12 VDC	167 mA			84 %
TMR 2-2413WISM		15 VDC	134 mA			85 %
TMR 2-2415WISM		24 VDC	83 mA			85 %
TMR 2-2422WISM		+12 VDC	83 mA	-12 VDC	83 mA	83 %
TMR 2-2423WISM		+15 VDC	67 mA	-15 VDC	67 mA	83 %
TMR 2-4811WISM	18 - 75 VDC (48 VDC nom.)	5 VDC	400 mA			78 %
TMR 2-4812WISM		12 VDC	167 mA			82 %
TMR 2-4813WISM		15 VDC	134 mA			83 %
TMR 2-4815WISM		24 VDC	83 mA			84 %
TMR 2-4822WISM		+12 VDC	83 mA	-12 VDC	83 mA	82 %
TMR 2-4823WISM		+15 VDC	67 mA	-15 VDC	67 mA	82 %

### Input Specifications

Input Current	- At no load	9 Vin models: <b>40 mA typ.</b> 24 Vin models: <b>20 mA typ.</b> 48 Vin models: <b>10 mA typ.</b>
	- At full load	9 Vin models: <b>490 mA typ.</b> 24 Vin models: <b>100 mA typ.</b> 48 Vin models: <b>50 mA typ.</b>
Surge Voltage		9 Vin models: <b>15 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.)
Recommended Input Fuse		(The need of an external fuse has to be assessed in the final application.)
Input Filter		<b>Internal Pi-Type</b>
Short Circuit Input Power		<b>1.5 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 (0 - 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>
	- Cross Regulation (25% / 100% asym. load)	dual output models: <b>5% max.</b>
Ripple and Noise	- 20 MHz Bandwidth	<b>50 mVp-p max.</b>
Capacitive Load	- single output	5 Vout models: <b>1'680 µF max.</b> 12 Vout models: <b>820 µF max.</b> 15 Vout models: <b>680 µF max.</b> 24 Vout models: <b>390 µF max.</b>
	- dual output	12 / -12 Vout models: <b>470 / 470 µF max.</b> 15 / -15 Vout models: <b>330 / 330 µF max.</b>
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±0.02 %/K max.</b>
Start-up Time		<b>30 ms max.</b>
Short Circuit Protection		<b>Automatic recovery</b>
Overload Protection		<b>Foldback Mode</b>
Output Current Limitation		<b>160% typ. of Iout max.</b>
Transient Response	- Response Deviation	<b>5% max.</b> (25% Load Step)
	- Response Time	<b>250 µs typ.</b> (25% Load Step)

### Safety Specifications

Safety Standards	- IT / Multimedia Equipment	<b>EN 62368-1</b> <b>IEC 62368-1</b> <b>UL 62368-1</b>
	- Certification Documents	<a href="http://www.tracopower.com/overview/tmr2wism">www.tracopower.com/overview/tmr2wism</a>
Pollution Degree		<b>PD 3</b>

### EMC Specifications

EMI Emissions	- Conducted Emissions	<b>EN 55032 class A</b> (internal filter) <b>FCC Part 15 class A</b> (internal filter)
	- Radiated Emissions	<b>EN 55032 class A</b> (internal filter) <b>FCC Part 15 class A</b> (internal filter)

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

EMS Immunity		EN 55024 (IT Equipment) EN 55035 (Multimedia)
	- Electrostatic Discharge	Air: EN 61000-4-2, $\pm 8$ kV, perf. criteria A
	- RF Electromagnetic Field	Contact: EN 61000-4-2, $\pm 6$ kV, perf. criteria A
	- EFT (Burst) / Surge	EN 61000-4-3, 10 V/m, perf. criteria A
		EN 61000-4-4, $\pm 2$ kV, perf. criteria A
		EN 61000-4-5, $\pm 1$ kV, perf. criteria A
	- Conducted RF Disturbances	Ext. input component: Capacitor: 220 $\mu$ F / 100 V
	- PF Magnetic Field	Continuous: EN 61000-4-6, 10 Vrms, perf. criteria A
		EN 61000-4-8, 3 A/m, perf. criteria A

## General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +80°C
	- Case Temperature	+95°C max.
	- Storage Temperature	-55°C to +125°C
Power Derating	- High Temperature	4 %/K above 70°C
		See application note: <a href="http://www.tracopower.com/overview/tmr2wism">www.tracopower.com/overview/tmr2wism</a>
Cooling System		Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote	On: < 0.6 VDC or open circuit
		Off: 4.7 to 15 VDC
		Refers to 'Remote' and '-Vin' Pin
	- Current Controlled Remote	On: open circuit
		Off: 2 to 4 mA current
	- Off Idle Input Current	3 mA max.
Altitude During Operation		5'000 m max.
Switching Frequency		100 kHz min. (PFM)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s	1'500 VDC
	- Input to Output, 1 s	1'800 VDC
Isolation Resistance	- Input to Output, 500 VDC	1'000 M $\Omega$ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	500 pF typ.
Reliability	- Calculated MTBF	6'430'000 h (MIL-HDBK-217F, ground benign)
Moisture Sensitivity (MSL)		Level 2 (J-STD-033C)
Washing Process		Not allowed
Housing Material		Non-conductive Plastic (UL 94 V-0 rated)
Pin Material		Phosphor Bronze (C5191)
Pin Foundation Plating		Copper (1 - 3 $\mu$ m)
Pin Surface Plating		Tin (7.5 $\mu$ m min.), matte
Housing Type		Plastic Case
Mounting Type		PCB Mount
Connection Type		SMD (Surface-Mount Device)
Footprint Type		SMD14
Soldering Profile		Lead-Free Reflow Soldering (acc. J-STD-020E)
		See application note: <a href="http://www.tracopower.com/info/reflow-soldering.pdf">www.tracopower.com/info/reflow-soldering.pdf</a>
Weight		3.5 g
Environmental Compliance	- REACH Declaration	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a>
		REACH SVHC list compliant
		REACH Annex XVII compliant
	- RoHS Declaration	<a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a>
		Exemptions: 7a
		(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)
	- SCIP Reference Number	89a118d2-489f-4d56-b893-caef8277e3a4

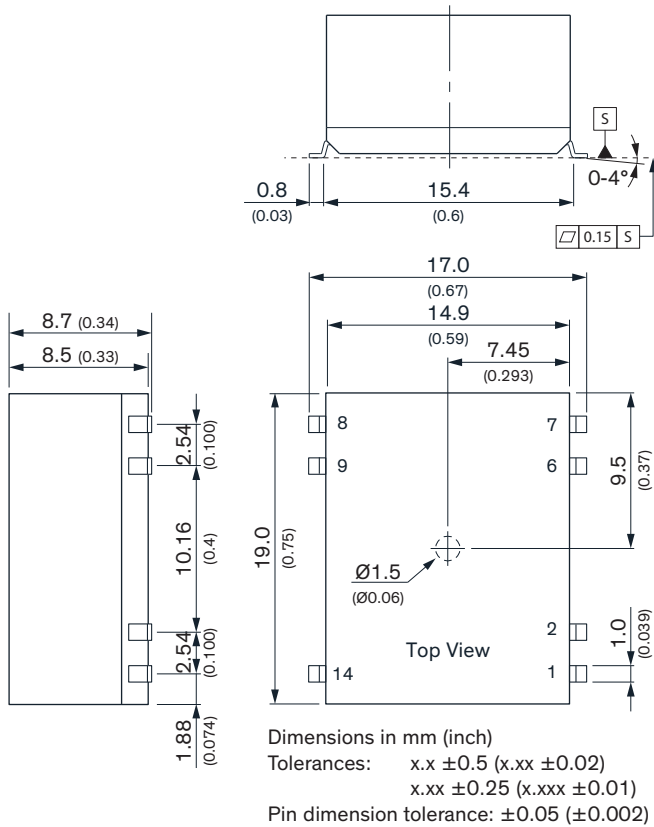
All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

### Supporting Documents

[Overview Link](#) (for additional Documents)

[www.tracopower.com/overview/tmr2wism](http://www.tracopower.com/overview/tmr2wism)

### Outline Dimensions



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

NC: Not connected

### Recommended Solder Pad Layout

