



**THE DATASHEET OF
TMR 1-4811SM**



- Wide 2:1 input voltage range
- Compact SMD package
- Fully regulated outputs
- Cost optimised design
- No minimum load required
- Continuous short circuit protection
- Temperature range -40°C to $+85^{\circ}\text{C}$
- I/O isolation 1500 VDC
- Remote On/Off control
- 3-year product warranty



UL 62368-1 IEC 62368-1

The TMR 1SM series is a family of isolated 1 W DC/DC converter modules with regulated output, featuring wide 2:1 input voltage ranges. These products come in a compact SMD package with small footprint.

An excellent efficiency allows -40°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 optimised 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 _{max}	Vnom	I _{max}	
TMR 1-0511SM TMR 1-0512SM TMR 1-0513SM TMR 1-0522SM TMR 1-0523SM	4.5 - 9 VDC (5 VDC nom.)	5 VDC 12 VDC 15 VDC +12 VDC +15 VDC	200 mA 83 mA 67 mA 42 mA 33 mA	-12 VDC -15 VDC	42 mA 33 mA	78 % 79 % 81 % 79 % 80 %
TMR 1-1211SM TMR 1-1212SM TMR 1-1213SM TMR 1-1222SM TMR 1-1223SM	9 - 18 VDC (12 VDC nom.)	5 VDC 12 VDC 15 VDC +12 VDC +15 VDC	200 mA 83 mA 67 mA 42 mA 33 mA	-12 VDC -15 VDC	42 mA 33 mA	79 % 79 % 82 % 81 % 80 %
TMR 1-2411SM TMR 1-2412SM TMR 1-2413SM TMR 1-2422SM TMR 1-2423SM	18 - 36 VDC (24 VDC nom.)	5 VDC 12 VDC 15 VDC +12 VDC +15 VDC	200 mA 83 mA 67 mA 42 mA 33 mA	-12 VDC -15 VDC	42 mA 33 mA	79 % 82 % 82 % 82 % 82 %
TMR 1-4811SM TMR 1-4812SM TMR 1-4813SM TMR 1-4822SM TMR 1-4823SM	36 - 75 VDC (48 VDC nom.)	5 VDC 12 VDC 15 VDC +12 VDC +15 VDC	200 mA 83 mA 67 mA 42 mA 33 mA	-12 VDC -15 VDC	42 mA 33 mA	79 % 80 % 80 % 81 % 81 %

Input Specifications

Input Current	- At no load	5 Vin models: 40 mA typ. 12 Vin models: 20 mA typ. 24 Vin models: 10 mA typ. 48 Vin models: 7 mA typ.
Surge Voltage		5 Vin models: 15 VDC max. (1 s max.) 12 Vin models: 25 VDC max. (1 s max.) 24 Vin models: 50 VDC max. (1 s max.) 48 Vin models: 100 VDC max. (1 s max.)
Reflected Ripple Current		5 Vin models: 80 mA_{p-p} typ. 12 Vin models: 40 mA_{p-p} typ. 24 Vin models: 30 mA_{p-p} typ. 48 Vin models: 20 mA_{p-p} typ.
Recommended Input Fuse		5 Vin models: 500 mA (slow blow) 12 Vin models: 250 mA (slow blow) 24 Vin models: 120 mA (slow blow) 48 Vin models: 60 mA (slow blow) (The need of an external fuse has to be assessed in the final application.)

Output Specifications

Voltage Set Accuracy		±1% max.
Regulation	- Input Variation (V _{min} - V _{max})	single output models: 0.2% max. dual output models: 0.2% max.
	- Load Variation (10 - 90%)	single output models: 0.5% max. dual output models: 0.8% max. (Output 1) 0.8% max. (Output 2)
Ripple and Noise	- 20 MHz Bandwidth	75 mV_{p-p} max.
Capacitive Load	- single output	5 Vout models: 1'680 µF max. 12 Vout models: 820 µF max. 15 Vout models: 680 µF max.
	- dual output	12 / -12 Vout models: 470 / 470 µF max. 15 / -15 Vout models: 330 / 330 µF max.
Minimum Load		Not required
Temperature Coefficient		±0.02 %/K max.
Short Circuit Protection		Automatic recovery
Overload Protection		Foldback Mode
Output Current Limitation		120% min. of I_{out} max. 130% typ. of I_{out} max.
Transient Response	- Response Deviation	5% max. (25% Load Step)
	- Response Time	250 µs typ. (25% Load Step)

Safety Specifications

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	www.tracopower.com/overview/tmr1sm
Pollution Degree		PD 2

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

EMC Specifications

EMI Emissions	- Conducted Emissions	EN 55032 class A (with external filter) FCC Part 15 class A (with external filter)
		External filter proposal: www.tracopower.com/overview/tmr1sm

General Specifications

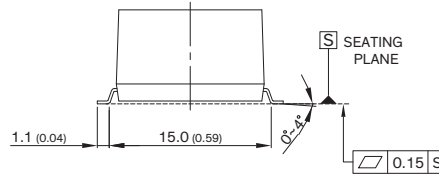
Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature - Case Temperature - Storage Temperature	-40°C to +85°C +95°C max. -55°C to +125°C
Power Derating	- High Temperature	5 %/K above 75°C
		See application note: www.tracopower.com/overview/tmr1sm
Cooling System		Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote (passive = on) - Current Controlled Remote (passive = on) - Off Idle Input Current	On: < 0.6 VDC or open circuit Off: 3 to 15 VDC Refers to 'Remote' and '-Vin' Pin On: open circuit Off: 2 to 4 mA current 3 mA max.
Altitude During Operation		6'000 m max.
Regulator Topology		RCC Converter
Switching Frequency		220 kHz typ. (PFM)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s	1'500 VDC
Isolation Resistance	- Input to Output, 500 VDC	1'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	50 pF max.
Reliability	- Calculated MTBF	2'800'000 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 μm)
Pin Surface Plating		Tin (7.5 μm 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: www.tracopower.com/info/reflow-soldering.pdf
Weight		2.9 g
Environmental Compliance	- REACH Declaration - RoHS Declaration - SCIP Reference Number	www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant 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)) bdd04b85-62c3-4e4e-abcc-acf49c9007d6

Supporting Documents

Overview Link (for additional Documents)	www.tracopower.com/overview/tmr1sm
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Outline Dimensions

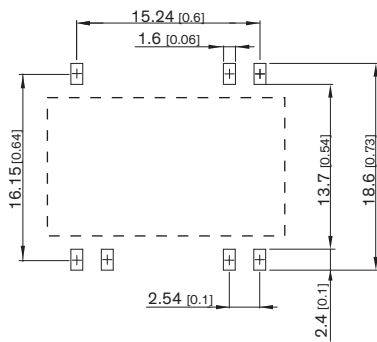


Dimensions in mm (inch)
 Tolerances: x.x±0.5 (x.xx±0.02)
 x.xx±0.25 (x.xxx±0.01)
 Pin tolerances: x.x±0.05 (±0.002)

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



Dimensions in mm [inch]

Looking for pricing, stock, or lifecycle information?

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