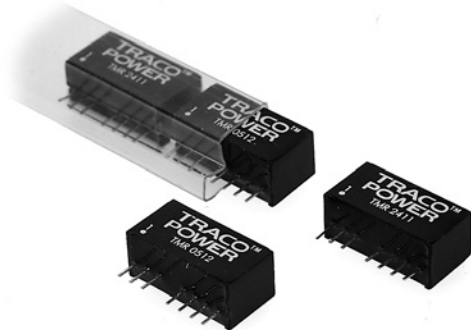


Features

- ◆ Wide 2:1 input voltage range
- ◆ Compact SIP-8 package
- ◆ Small footprint
- ◆ Full SMD design
- ◆ Temperature range -40° to $+85^{\circ}\text{C}$
- ◆ High efficiency
- ◆ Excellent load and line regulation
- ◆ Indefinite short-circuit protection
- ◆ I/O isolation 1000VDC
- ◆ Remote On/Off control
- ◆ Fully RoHS compliant
- ◆ 3-year product warranty



The TMR-2 series is a family of isolated 2W dc-dc converter modules with regulated output, featuring wide 2:1 input voltage ranges. The product comes in a compact SIP-8 plastic package with small footprint occupying only 2.0 cm² (0.3 square in.) of board space.

An excellent efficiency allows -40° to $+85^{\circ}\text{C}$ operation temperatures. Further features include remote On/Off control and continuous short circuit protection. The ultra-compact dimensions of these converters make them an ideal solution for many space critical applications in communication equipment, instrumentation and industrial electronics.

Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TMR 0510	4.5 – 9.0 VDC (5 VDC nominal)	3.3 VDC	500 mA	76 %
TMR 0511		5 VDC	400 mA	80 %
TMR 0512		12 VDC	165 mA	81 %
TMR 0521		± 5 VDC	± 200 mA	79 %
TMR 0522		± 12 VDC	± 85 mA	82 %
TMR 0523		± 15 VDC	± 65 mA	81 %
TMR 1210	9 – 18 VDC (12 VDC nominal)	3.3 VDC	500 mA	77 %
TMR 1211		5 VDC	400 mA	81 %
TMR 1212		12 VDC	165 mA	83 %
TMR 1221		± 5 VDC	± 200 mA	81 %
TMR 1222		± 12 VDC	± 85 mA	83 %
TMR 1223		± 15 VDC	± 65 mA	84 %
TMR 2410	18 – 36 VDC (24 VDC nominal)	3.3 VDC	500 mA	78 %
TMR 2411		5 VDC	400 mA	81 %
TMR 2412		12 VDC	165 mA	83 %
TMR 2421		± 5 VDC	± 200 mA	80 %
TMR 2422		± 12 VDC	± 85 mA	83 %
TMR 2423		± 15 VDC	± 65 mA	82 %
TMR 4810	36 – 75 VDC (48 VDC nominal)	3.3 VDC	500 mA	76 %
TMR 4811		5 VDC	400 mA	78 %
TMR 4812		12 VDC	165 mA	83 %
TMR 4821		± 5 VDC	± 200 mA	80 %
TMR 4822		± 12 VDC	± 85 mA	81 %
TMR 4823		± 15 VDC	± 65 mA	81 %

Input Specifications

Input current at full load (nominal input)	5 Vin models: 645 mA max. 12 Vin models: 242 mA max. 24 Vin models: 117 mA max. 48 Vin models: 62 mA max.
Surge voltage (100 msec. max.)	5 Vin models: 15 V max. 12 Vin models: 36 V max. 24 Vin models: 50 V max. 48 Vin models: 100 V max.
Input voltage variation (dv/dt)	5 V/ms, max. (complies to ETS 300 132 part. 4.4)
Input Filter	capacitor type
Start up time	5 ms typ. (at nominal input and resistive load)
ESD (electrostatic discharge)	EN 61000-4-2, air ± 8 kV, contact ± 6 kV, perf. criteria A
Radiated immunity	EN 61000-4-3, 10 V/m, perf. criteria A
Fast transient / surge (with external input capacitor)	EN 61000-4-4, ± 2 kV, perf. criteria A EN 61000-4-5, ± 1 kV perf. criteria A Nippon chemi-con KY 220 μ F, 100 V, ESR 48 mOhm
	– external input capacitor
Conducted immunity	EN 61000-4-6, 10 Vrms, perf. criteria A

Output Specifications

Voltage set accuracy	± 1 %
Regulation	– Input variation Vin min. to Vin max. 0.2 % max. – No load to full load single output models: ± 1.0 % max. dual output models: ± 1.0 % max. – Load variation 10 – 90 % single output models: ± 0.5 % max. dual output models: ± 0.8 % max. dual output models asymmetric load: 5.0 % max. (25% / 100%)
Minimum load	0 %
Ripple and noise (20 MHz Bandwidth)	50 mVpk-pk max.
Temperature coefficient	± 0.02 %/°C
Transient response (25% load step change)	500 μ s typ.
Short circuit protection	continuous, automatic recovery
Capacitive load	3.3 VDC / 5 VDC output models: 2'200 μ F max. / 1'000 μ F max. 12 VDC / ± 5 VDC output models: 170 μ F max. / ± 470 μ F max. ± 12 VDC / ± 15 VDC output models: 100 μ F max. / ± 47 μ F max.

General Specifications

Temperature ranges	– Operating –40°C to +85°C (without derating) – Storage –55°C to +125°C
Humidity (non condensing)	95 % rel. H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)	4.9 Mio. h
Isolation voltage (60 sec.) – Input/Output	1'600 VDC
Isolation capacitance – Input/Output	200 pF max.
Isolation resistance – Input/Output (500 VDC)	>1'000 MOhm
Switching frequency	100 to 650 kHz (PFM)

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

General Specifications

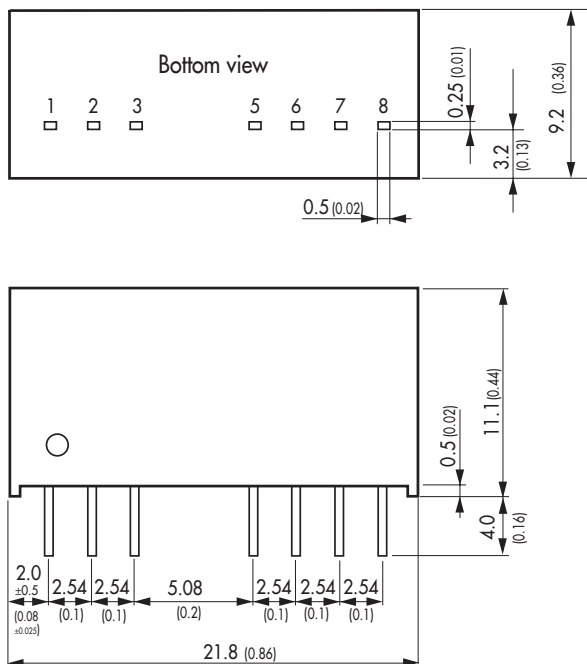
Remote On/Off	<ul style="list-style-type: none"> - On: - Off: - Off stand by input current 	<ul style="list-style-type: none"> open or high impedance 2...4 mA input current applied via 1KW resistor max. 2.5 mA
Safety standards		UL/cUL 60950-1, IEC/EN 60950-1
Safety approvals	- UL/cUL	www.ul.com -> certifications -> File e188913
Thermal shock, mechanical shock & vibration	- Test conditions	MIL-STD-810F www.tracopower.com/products/mil810.pdf
Environmental compliance	<ul style="list-style-type: none"> - Reach - RoHS 	www.tracopower.com/products/reach-declaration.pdf RoHS Directive 2011/65/EU
Altitude	<ul style="list-style-type: none"> - operation - non operation - test report 	<ul style="list-style-type: none"> < 40'000ft (12'000m) < 50'000ft (15'000m) www.tracopower.com/products/tmr-altitude.pdf

Physical Specifications

Casing material	non-conductive plastic
Potting material	silicone (UL 94V-0-rated)
Weight	4.8 g (0.17oz)

Application note: www.tracopower.com/products/tmr2-application.pdf

Outline Dimensions mm (inches)



Pin-Out		
Pin	Single	Dual
1	-Vin (GND)	-Vin (GND)
2	+Vin (Vcc)	+Vin (Vcc)
3	Remote On/Off	Remote On/Off
5	No function	No function
6	+Vout	+Vout
7	-Vout	Common
8	No function	-Vout

Dimensions in [mm], () = Inch
Pin pitch tolerances: ±0.25 (±0.01)
Tolerances: ±0.5 (±0.02)

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at www.tracopower.com