

#### Features

- ◆ Wide 2:1 input voltage range
- ◆ Compact SIP-8 package
- ◆ Cost optimized design
- ◆ Temperature range  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- ◆ I/O isolation 1000VDC
- ◆ Remote On/Off control
- ◆ Fully RoHS compliant
- ◆ 3-year product warranty



The TMR-2E series is a family of isolated 2 W 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 cm<sup>2</sup> (0.3 square in.) 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 voltage	Output current max.	Efficiency typ.
TMR 2-0510E	<b>4.5 – 9.0 VDC</b> (5 VDC nominal)	3.3 VDC	500 mA	70 %
TMR 2-0511E		5 VDC	400 mA	73 %
TMR 2-0512E		12 VDC	167 mA	75 %
TMR 2-1210E	<b>9 – 18 VDC</b> (12 VDC nominal)	3.3 VDC	500 mA	73 %
TMR 2-1211E		5 VDC	400 mA	77 %
TMR 2-1212E		12 VDC	167 mA	80 %
TMR 2-2410E	<b>18 – 36 VDC</b> (24 VDC nominal)	3.3 VDC	500 mA	72 %
TMR 2-2411E		5 VDC	400 mA	77 %
TMR 2-2412E		12 VDC	167 mA	81 %
TMR 2-4810E	<b>36 – 75 VDC</b> (48 VDC nominal)	3.3 VDC	500 mA	71 %
TMR 2-4811E		5 VDC	400 mA	73 %
TMR 2-4812E		12 VDC	167 mA	79 %

### Input Specifications

Input current at no load (nominal input voltage)	5.0 V models: 40 mA typ. 12 V models: 20 mA typ. 24 V models: 10 mA typ. 48 V models: 8 mA typ.
Input current at full load (nominal input voltage)	5.0 V models: 520 mA typ. 12 V models: 200 mA typ. 24 V models: 100 mA typ. 48 V models: 50 mA typ.
Surge voltage (1000 msec. max.)	5.0 V models: 15 V max. 12 V models: 25 V max. 24 V models: 50 V max. 48 V models: 100 V max.
Reverse voltage protection	1.0 A max.
Input voltage variation (dv/dt)	5 V/ms, max. (complies with ETS300 132 part 4.4)
Reflected input ripple current	5.0 V models: 400 mA typ. 12 V models: 300 mA typ. 24 V models: 200 mA typ. 48 V models: 500 mA typ.
Conducted noise (input)	EN 55022 level A, FCC part 15, level A with external capacitor (tba)

### Output Specifications

Voltage set accuracy	±2 % max.
Regulation	– Input variation Vin min. to Vin max.      0.5 % max. – Load variation 25 – 100%                      0.75 % max.
Minimum load	25 % of rated max. load (operation at lower load condition is safe but a higher output ripple will be experienced)
Temperature coefficient	0.02 %/K
Ripple and noise (20 MHz bandwidth)	50 mVpk-pk max.
Transient response setting time (25 % load step change)	100 µs typ.
Current limitation	>120 % of Iout max. constant current
Short circuit protection	continuous, automatic recovery
Capacitive load	3.3 VDC models: 2'200 µF max. 5 VDC models: 1'000 µF max. 12 VDC models: 170 µF max.

### General Specifications

Temperature ranges	– Operating    –40°C to +85°C (with derating) – Case temperature                                   +90°C max. – Storage     –55°C to +105°C
Load derating	1.5 %/K above 65°C
Humidity (non condensing)	95 % rel. H max.
Reliability, calculated MTF (MIL-HDBK-217F, @ +25°C, ground benign)	>1 Mio h
Isolation voltage (60 sec.)	– Input/Output    1'000 VDC
Isolation capacity	– Input/Output    120 pF max.
Isolation resistance	– Input/Output (500 VDC)                                   >1 GOhm
Switching frequency	100 – 650 kHz (FM)
Remote On/Off	– On:    < 0.6 VDC (ref. to –Vin) or open circuit – Off:    2.7 to 15 VDC (ref. to –Vin) – Off control input current                                   1 mA max. – Off idle current:    0.2 mA max.

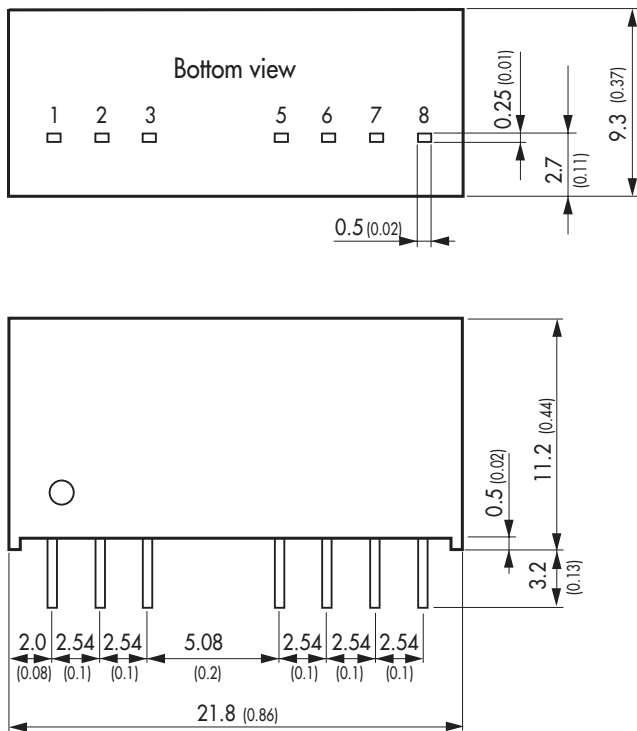
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

**Physical Specifications**

Casing material	non-conductive plastic
Potting material	epoxy, UL 94V-0 rated
Weight	4.8g (0.17 oz)
Soldering temperature	max. 260°C / 10 sec.

**Application note:** [www.tracopower.com/products/tmr2e-application.pdf](http://www.tracopower.com/products/tmr2e-application.pdf)

**Outline Dimensions**



Pin-Out	
Pin	
1	-Vin (GND)
2	+Vin (Vcc)
3	Remote On/Off
5	No con.
6	+Vout
7	-Vout
8	No con.

No con. = Pin to be isolated from circuitry

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