

#### 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 1500 VDC
- ◆ Remote On/Off control
- ◆ 3-year product warranty



The TMR-3E series is a family of isolated 3 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 3-0510E	4.5 – 9.0 VDC (5 VDC nominal)	3.3 VDC	700 mA	71 %
TMR 3-0511E		5.0 VDC	600 mA	73 %
TMR 3-0512E		12 VDC	250 mA	79 %
TMR 3-0513E		15 VDC	200 mA	79 %
TMR 3-0521E		$\pm 5.0$ VDC	$\pm 300$ mA	74 %
TMR 3-0522E		$\pm 12$ VDC	$\pm 125$ mA	79 %
TMR 3-0523E		$\pm 15$ VDC	$\pm 100$ mA	79 %
TMR 3-1210E	9.0 – 18 VDC (12 VDC nominal)	3.3 VDC	700 mA	75 %
TMR 3-1211E		5.0 VDC	600 mA	78 %
TMR 3-1212E		12 VDC	250 mA	83 %
TMR 3-1213E		15 VDC	200 mA	83 %
TMR 3-1221E		$\pm 5.0$ VDC	$\pm 300$ mA	79 %
TMR 3-1222E		$\pm 12$ VDC	$\pm 125$ mA	83 %
TMR 3-1223E		$\pm 15$ VDC	$\pm 100$ mA	83 %
TMR 3-2410E	18 – 36 VDC (24 VDC nominal)	3.3 VDC	700 mA	75 %
TMR 3-2411E		5.0 VDC	600 mA	78 %
TMR 3-2412E		12 VDC	250 mA	83 %
TMR 3-2413E		15 VDC	200 mA	83 %
TMR 3-2421E		$\pm 5.0$ VDC	$\pm 300$ mA	80 %
TMR 3-2422E		$\pm 12$ VDC	$\pm 125$ mA	83 %
TMR 3-2423E		$\pm 15$ VDC	$\pm 100$ mA	83 %
TMR 3-4810E	36 – 75 VDC (48 VDC nominal)	3.3 VDC	700 mA	75 %
TMR 3-4811E		5.0 VDC	600 mA	78 %
TMR 3-4812E		12 VDC	250 mA	83 %
TMR 3-4813E		15 VDC	200 mA	83 %
TMR 3-4821E		$\pm 5.0$ VDC	$\pm 300$ mA	80 %
TMR 3-4822E		$\pm 12$ VDC	$\pm 125$ mA	83 %
TMR 3-4823E		$\pm 15$ VDC	$\pm 100$ mA	83 %

### Input Specifications

Input current at no load (nominal input voltage)	5.0 V models: 70 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: 760 mA typ. 12 V models: 300 mA typ. 24 V models: 150 mA typ. 48 V models: 75 mA typ.
Surge voltage (1000 msec. max.)	5.0 V models: 11 V max. 12 V models: 25 V max. 24 V models: 50 V max. 48 V models: 100 V max.
Start-up voltage / under voltage lockout	5.0 V models: 4.5 VDC / 4 VDC or lower 12 V models: 9 VDC / 8.5 VDC or lower 24 V models: 18 VDC / 17 VDC or lower 48 V models: 36 VDC / 34 VDC or lower long term operation at undervoltage will damage the converter!
Reverse polarity input current	1.0 A max.
Conducted noise (input)	EN 55022 level A, FCC part 15, level A with external capacitor (tba)
Recommended input fuse (slow blow)	5 V models: 2000 mA 12 V models: 1000 mA 24 V models: 500 mA 48 V models: 250 mA

### Output Specifications

Voltage set accuracy	±1 % max.
Regulation	– Input variation $V_{in}$ min. to $V_{in}$ max.      0.5 % max. – Load variation 25 – 100%      1.0 % 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)	75 mVp-p max.
Transient response setting time (25% load step change)	300 $\mu$ s typ. (PFM)
Current limitation	>120 % of $I_{out}$ max.
Short circuit protection	continuous, automatic recovery
Capacitive load	3.3 VDC models: 1'760 $\mu$ F max. 5 VDC models: 1'000 $\mu$ F max. 12 VDC models: 170 $\mu$ F max. 15 VDC models: 110 $\mu$ F max. $\pm$ 5 VDC models: 470 $\mu$ F max. (each output) $\pm$ 12 VDC models: 100 $\mu$ F max. (each output) $\pm$ 5 VDC models: 47 $\mu$ F max. (each output)

### General Specifications

Temperature ranges	– Operating      –40°C to +85°C (with derating) – Case temperature      +100°C max. – Storage      –55°C to +105°C
Load derating	3.3 %/K above +70°C
Humidity (non condensing)	95 % rel. H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)	>1 Mio h

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

**General Specifications**

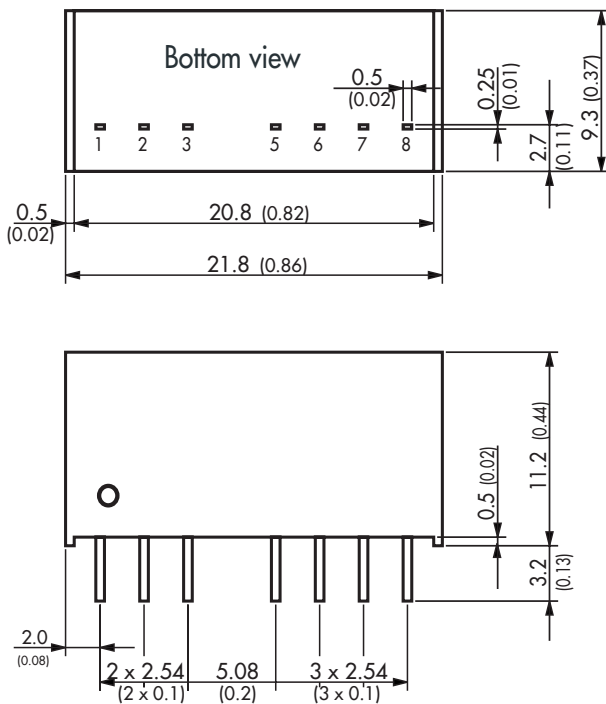
Isolation voltage (60 sec.)	- Input/Output	1'500 VDC
Isolation capacitance	- Input/Output	200 pF max.
Isolation resistance	- Input/Output (500 VDC)	>1 GOhm
Switching frequency		200 - 300 kHz (PFM)
Altitude during operation		5'000 m max. (16'400 ft) approved
Safety standards		UL 60950-1, IEC/EN 60950-1
Safety approvals	- CB test certificate according IEC 60950-1 - CSA certificate for UL/cUL 60950-1	<a href="http://www.tracopower.com/products/tmr3e-cb.pdf">www.tracopower.com/products/tmr3e-cb.pdf</a> <a href="http://www.tracopower.com/products/tmr3e-csa.pdf">www.tracopower.com/products/tmr3e-csa.pdf</a>
Remote On/Off	- On: - Off: - Off standby current: - Off control input current:	< 0.6 VDC or open circuit 2.7 to 15 VDC (ref. to -Vin) 2.5 mA max. 1 mA max.

**Physical Specifications**

Casing material	non-conductive plastic (UL94V-0 rated)
Potting material	epoxy, (UL 94V-0 rated)
Weight	4.8 g (0.17 oz)
Soldering temperature	max. 260°C / 10 sec.

**Application note:** [www.tracopower.com/products/tmr3e-application.pdf](http://www.tracopower.com/products/tmr3e-application.pdf)

**Outline Dimensions**



Pinout		
Pin	single output	dual output
1	-Vin (GND)	-Vin (GND)
2	+Vin (Vcc)	+Vin (Vcc)
3	Remote On/Off	Remote On/Off
5	ntc.	ntc.
6	+Vout	+Vout
7	-Vout	Common
8	ntc.	-Vout

ntc. = Not to connect

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

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at [www.tracopower.com](http://www.tracopower.com)