

Features

- ◆ Wide 2:1 input voltage range
- ◆ Compact SIP-8 package
- ◆ Cost optimized design
- ◆ Temperature range -40°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 cm² (0.3 square in.) of board space.

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 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		± 5.0 VDC	± 300 mA	74 %
TMR 3-0522E		± 12 VDC	± 125 mA	79 %
TMR 3-0523E		± 15 VDC	± 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		± 5.0 VDC	± 300 mA	79 %
TMR 3-1222E		± 12 VDC	± 125 mA	83 %
TMR 3-1223E		± 15 VDC	± 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		± 5.0 VDC	± 300 mA	80 %
TMR 3-2422E		± 12 VDC	± 125 mA	83 %
TMR 3-2423E		± 15 VDC	± 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		± 5.0 VDC	± 300 mA	80 %
TMR 3-4822E		± 12 VDC	± 125 mA	83 %
TMR 3-4823E		± 15 VDC	± 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 $V_{in \text{ min.}}$ to $V_{in \text{ max.}}$ – Load variation 25 – 100% 0.5 % max. 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 μ s typ. (PFM)
Current limitation	>120 % of $I_{out \text{ max.}}$
Short circuit protection	continuous, automatic recovery
Capacitive load	3.3 VDC models: 1'760 μ F max. 5 VDC models: 1'000 μ F max. 12 VDC models: 170 μ F max. 15 VDC models: 110 μ F max. \pm 5 VDC models: 470 μ F max. (each output) \pm 12 VDC models: 100 μ F max. (each output) \pm 5 VDC models: 47 μ F max. (each output)

General Specifications

Temperature ranges	– Operating – Case temperature – Storage –40°C to +85°C (with derating) +100°C max. –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

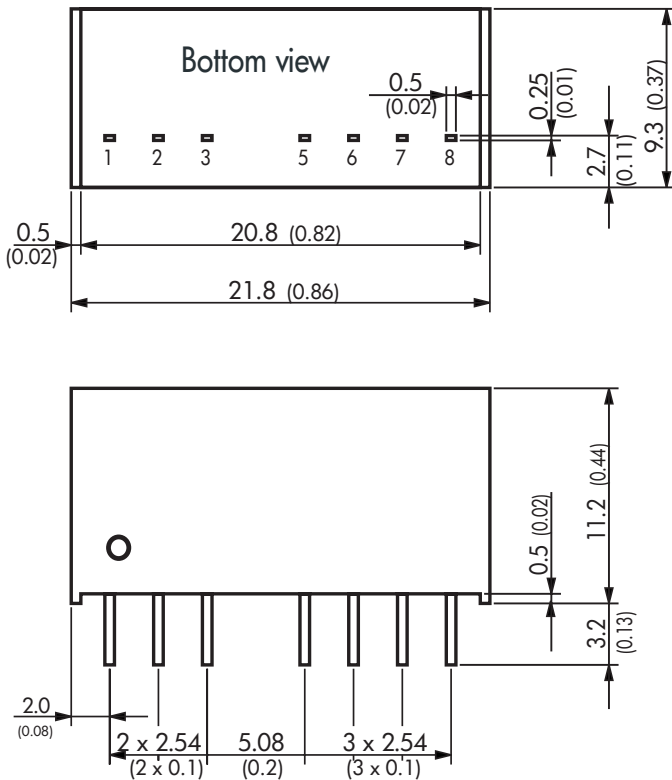
Isolation voltage (60 sec.)	- Input/Output	1'500 VDC
Isolation capacitance	- Input/Output	200 pF max.
Isolation resistance	- Input/Output (500 VDC)	>1 GOhm
Switching frequency		200 - 300 kHz (PFM)
Altitude during operation		5'000 m max. (16'400 ft) approved
Safety standards (designed to meet)		UL 60950-1, IEC/EN 60950-1
Safety approvals	- CB test certificate according IEC 60950-1 - CSA certificate for UL/cUL 60950-1	www.tracopower.com/products/tmr3e-cb.pdf www.tracopower.com/products/tmr3e-csa.pdf
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

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 any time without notice.