

Non-Isolated DC/DC Converter (POL)

TSR 1E Series, 1 A

- Highly cost efficient design
- Pin compatible with LMxx linear regulators
- Operation temperature. range -40°C to +85°C
- Efficiency up to 92%
- Wide input operating range 6-36 VDC
- Short circuit protection
- Excellent line / load regulation
- 3-year product warranty



The TSR 1E is a 1 Ampere step-down switching regulator series and a drop-in replacement for inefficient 78xx linear regulators. This series comes in a standard plastic SIP-3 case and complements our existing POL portfolio with a series focusing strongly on a cost efficient design while maintaining our quality standards. The effective design allows full load operation up to +60°C ambient temperature without the need of any heat sink or forced cooling. The TSR 1E switching regulators provide other significant features over linear regulators, i.e. better output accuracy, lower standby current and no requirement of external capacitors. The TSR 1E series offers a broad application range in many environments and is especially suited for high volume projects where the series will help to reduce production cost by delivering not only a highly cost efficient but also reliable solution.

Models				
Order Code	Output Current	Input Voltage	Output Voltage	Efficiency
	max.	Range	nom.	typ.
TSR 1-2433E	1'000 mA	6 - 36 VDC (24 VDC nom.)	3.3 VDC	88 %
TSR 1-2450E	1 000 111A	7 - 36 VDC (24 VDC nom.)	5 VDC	92 %



Input Specifications	
Recommended Input Fuse	(The need of an external fuse has to be assessed
	in the final application.)
Input Filter	Internal Capacitor

Voltage Set Accuracy		±4% max.	
Regulation	- Input Variation (Vmin - Vmax)	0.75% max.	
	- Load Variation (10 - 100%)	1.5% max.	
Ripple and Noise	- 20 MHz Bandwidth	80 mVp-p typ.	
Capacitive Load		1'000 μF max.	
Minimum Load		Not required	
Temperature Coefficie	nt	±0.03 %/K max.	
Short Circuit Protection		Continuous, Automatic recovery	
Output Current Limitation		350% max. of lout max.	

EMC Specifications		
EMI Emissions	- Conducted Emissions	EN 55032 class B (with external filter)
	- Radiated Emissions	EN 55032 class B (with external filter)
		External filter proposal: www.tracopower.com/overview/tsr1e

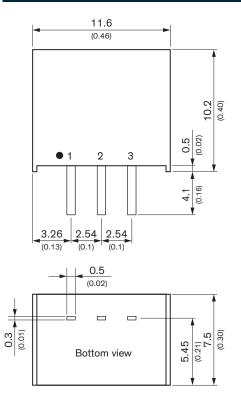
95% max. (non condensing)
emperature -40°C to +61°C
erature +105°C max.
nperature -50°C to +125°C
erature 4.17 %/K above 61°C
Mode 150°C typ. (Latch off)
Natural convection (20 LFM)
520 kHz typ. (PWM)
Non-isolated
MTBF 1'000'000 h (MIL-HDBK-217F, ground benign)
Plastic (UL 94 V-0 rated)
Phosphor Bronze (C5191)
Nickel (1 µm min.)
Tin (3 μm min.) , bright
THD (Through-Hole Device)
1.6 g
www.tracopower.com/info/reach-declaration.pdf
www.tracopower.com/info/rohs-declaration.pdf

Supporting Documents	
Overview Link (for additional Documents)	www.tracopower.com/overview/tsr1e

All specifications valid at nominal voltage, full load and $\pm 25^{\circ}\text{C}$ after warm-up time unless otherwise stated.



Outline Dimensions



Pinout		
Pin Function		
1	+Vin	
2	GND	
3	+Vout	

Dimensions in mm (inch)
Tolerances: x.x ± 0.5 (± 0.02)
x.xx ± 0.25 (± 0.01)

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