DC/DC Converters

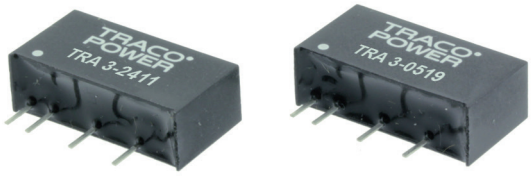
TRA 3 Series, 3 Watt

CB Scheme

UL 60950-1

Features

- Semi-regulated output (load)
- Highest power density 3W SIP-Converter
- Industry standard pinout
- High efficiency up to 89%
- I/O isolation voltage 1000 VDC
- Operating temperature range –40°C to +95°C
- 3-year product warranty



The TRA 3 series are miniature, I/O-isolated 3W DC/DC converters with a semi load regulation. They are the ideal solution to power drivers and circuits where unregulated DC/DC converters do not meet the input voltage range at load change.

Models

Order code	Input voltage	Output voltage	Output current max.	Load regulation max.	Efficiency typ.
TRA 3- 0511	5 VDC ±10%	5 VDC	600 mA	8 %	83 %
TRA 3- 0519		9 VDC	333 mA	7 %	87 %
TRA 3- 0512		12 VDC	250 mA	7 %	85.5 %
TRA 3- 0513		15 VDC	200 mA	6 %	87.5 %
TRA 3- 1211	12 VDC ±10%	5 VDC	600 mA	6 %	84 %
TRA 3- 1219		9 VDC	333 mA	5 %	87.5 %
TRA 3- 1212		12 VDC	250 mA	4.5 %	88 %
TRA 3- 1213		15 VDC	200 mA	4 %	89 %
TRA 3- 2411	24 VDC ±10%	5 VDC	600 mA	5.8 %	82 %
TRA 3- 2419		9 VDC	333 mA	4.8 %	85 %
TRA 3- 2412		12 VDC	250 mA	4.3 %	85.5 %
TRA 3- 2413		15 VDC	200 mA	3.5 %	85 %

Input Specifications

Input current no load / full load	5 Vin models	50 mA / 700 mA typ.
	12 Vin models	40 mA / 285 mA typ.
	24 Vin models	30 mA / 150 mA typ.
Surge voltage (1 s max.)	5 Vin models	9 V max.
	12 Vin models	18 V max.
	24 Vin models	30 V max.
Input filter		internal capacitor
Reverse polarity input current		0.5 A max.
Recommended input fuse (slow blow type)	5 Vin models:	2000 mA
	12 Vin models:	1000 mA
	24 Vin models:	500 mA

Output Specifications

Regulation	– Input variation (1 % change of Vin)	1.01 % typ. / 1.2 % max.
	– Load variation	see model table and graph 1 on page 3
Ripple and noise (20 MHz Bandwidth)		100 mVp-p max.
Temperature coefficient		±0.01 %/K typ. / ±0.02 %/K max.
Short circuit protection		limited 0.5 s max.
Capacitive load		220 µF max.

General Specifications

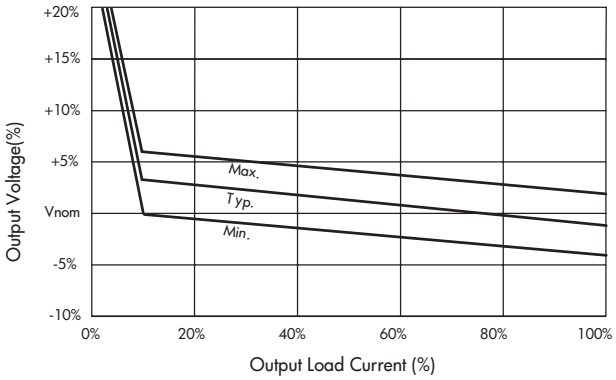
Temperature ranges	– Operating	–40°C to +95°C
	– Case temperature	+100°C max.
	– Storage	–50°C to +125°C
Derating		5.7 %/K above +85°C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		>2'000'000 h
Isolation voltage (60 s)	– Input/Output	1'000 VDC
Isolation capacitance	– Input/Output	60 pF typ. / 120 pF max.
Isolation resistance	– Input/Output	>1'000 Mohm
Switching frequency		60 kHz typ. (frequency modulation)
Safety standards		IEC 60950-1:2005 (2nd edition) + Am 1:2009 EN 60950-1:2006 + Am 1:2010 + Am 11:2009
	– Certification documents	www.tracopower.com/overview/tra3
Environmental compliance	– Reach	www.tracopower.com/products/reach-declaration.pdf
	– RoHS	RoHS directive 2011/65/EU

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

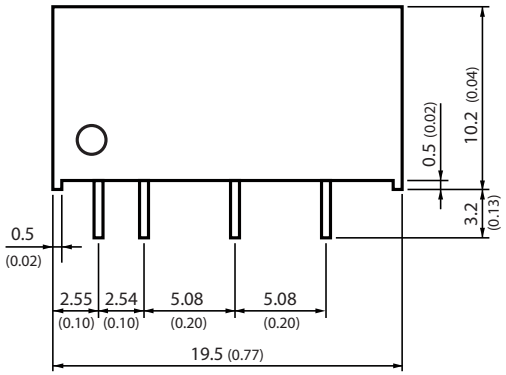
Physical Specifications

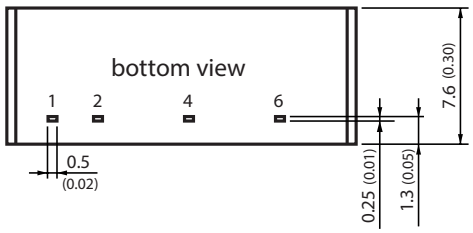
Casing material	non conductive plastic (UL 94V-0 rated)
Weight	2.2 g (0.07 oz)
Soldering temperature	max. 260°C, 10 s (1.5 mm from case)

Graph 1: Load regulation (i.g. TRA 3-1211)



Outline Dimensions





Pin-Out	
Pin	**Function**
1	+Vin (Vcc)
2	–Vin (GND)
4	–Vout
6	+Vout

Dimensions in [mm], () = Inch
Pin pitch tolerances: ±0.13 (±0.005)
Case tolerances: ±0.25 (±0.01)