TRACO POWER

DC/DC Converter

TRA 3 Series, 3 Watt

- **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**

UL 62368-1 IEC 62368-1

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 Range	Output Voltage nom.	Output Current max.	Efficiency typ.
TRA 3-0511	4.5 - 5.5 VDC (5 VDC nom.)	5 VDC	600 mA	83 %
TRA 3-0519		9 VDC	333 mA	87 %
TRA 3-0512		12 VDC	250 mA	86 %
TRA 3-0513		15 VDC	200 mA	88 %
TRA 3-1211	10.8 - 13.2 VDC (12 VDC nom.)	5 VDC	600 mA	84 %
TRA 3-1219		9 VDC	333 mA	88 %
TRA 3-1212		12 VDC	250 mA	88 %
TRA 3-1213		15 VDC	200 mA	89 %
TRA 3-2411	21.6 - 26.4 VDC (24 VDC nom.)	5 VDC	600 mA	82 %
TRA 3-2419		9 VDC	333 mA	85 %
TRA 3-2412		12 VDC	250 mA	86 %
TRA 3-2413		15 VDC	200 mA	85 %

Input Specifications

Input Current	- At no load	5 Vin models:	50 mA typ.
		12 Vin models:	40 mA typ.
		24 Vin models:	30 mA typ.
	- At full load	5 Vin models:	700 mA max.
		12 Vin models:	285 mA max.
		24 Vin models:	150 mA max.
Surge Voltage		5 Vin models:	9 VDC max. (1 s max.)
		12 Vin models:	18 VDC max. (1 s max.)
		24 Vin models:	30 VDC max. (1 s max.)
Recommended Input Fuse		5 Vin models:	2'000 mA (slow blow)
		12 Vin models:	1'000 mA (slow blow)
		24 Vin models:	500 mA (slow blow)
			(The need of an external fuse has to be assessed in the final application.)
Input Filter			Internal Capacitor

Output Specifications

Voltage Set Accuracy			±3% max. (at 80% load)
Regulation	- Input Variation (1% Vin step)		1.2% max.
	- Load Variation	See application note:	www.tracopower.com/overview/tra3
Ripple and Noise	- 20 MHz Bandwidth		100 mVp-p max.
Capacitive Load			220 µF max.
Minimum Load			2 % of Iout max.
			(Operation at lower load will not damage the converter, but it may not meet all specifications)
Temperature Coefficient			±0.02 %/K max.
Short Circuit Protection			Limited 0.5 s max., Automatic recovery

Safety Specifications

Safety Standards	- IT / Multimedia Equipment	CSA-C22.2, No. 60950-1 EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1
	- Certification Documents	www.tracopower.com/overview/tra3
Pollution Degree		PD 3
Over Voltage Category		Not mains connected

General Specifications

Relative Humidity			95% max. (non condensing)
Temperature Ranges	- Operating Temperature		–40°C to +95°C
	- Case Temperature		+100°C max.
	- Storage Temperature		–50°C to +125°C
Power Derating	- High Temperature		5 %/K above 85°C
		See application note:	www.tracopower.com/overview/tra3
Cooling System			Natural convection (20 LFM)
Altitude During Operation			6'000 m max.
Switching Frequency			60 kHz min. (PWM)
Insulation System			Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s		1'000 VDC
	- Input to Output, 1 s		1'200 VDC
Isolation Resistance	- Input to Output, 500 VDC		1'000 MΩ min.

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

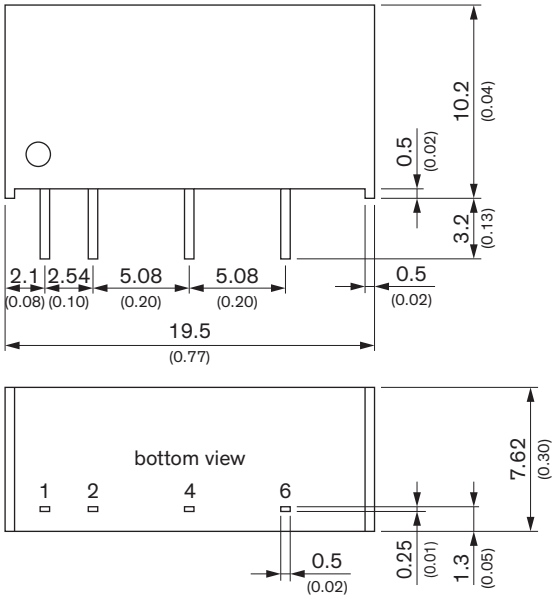
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	60 pF typ. 120 pF max.
Reliability	- Calculated MTBF	2'000'000 h (MIL-HDBK-217F, ground benign)
Washing Process		Allowed (hermetical product)
	See Cleaning Guideline:	www.tracopower.com/info/cleaning.pdf
Housing Material		Non-conductive Plastic (UL 94 V-0 rated)
Potting Material		Silicone (UL 94 V-0 rated)
Pin Material		Nickel-Iron (Alloy 42)
Pin Foundation Plating		Nickel (1 µm min.)
Pin Surface Plating		Tin (3 - 5 µm), matte
Housing Type		Plastic Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		SIP7
Soldering Profile		Wave Soldering 260°C / 10 s max.
Weight		2.2 g
Environmental Compliance	- REACH Declaration	www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant
	- RoHS Declaration	www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7a, 7c-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule). The SCIP number is provided on request.)

Supporting Documents

Overview Link (for additional Documents)	www.tracopower.com/overview/tra3

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

Outline Dimensions



Dimensions in mm (inch)
Tolerance: x.x ±0.25 (x.xx ±0.01)
x.xx ±0.13 (x.xxx ±0.005)
Pins: ±0.05 (±0.002)

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