

- 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) - Load Variation | 1.2% max. 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 - Case Temperature - Storage Temperature | -40°C to +95°C +100°C max. -50°C to +125°C |
| Power Derating | - High Temperature | 5 %/K above 85°C |
| 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 - Input to Output, 1 s | 1'000 VDC 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 | See Cleaning Guideline: | Allowed (hermetical product) 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 - RoHS Declaration | www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant 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.) |

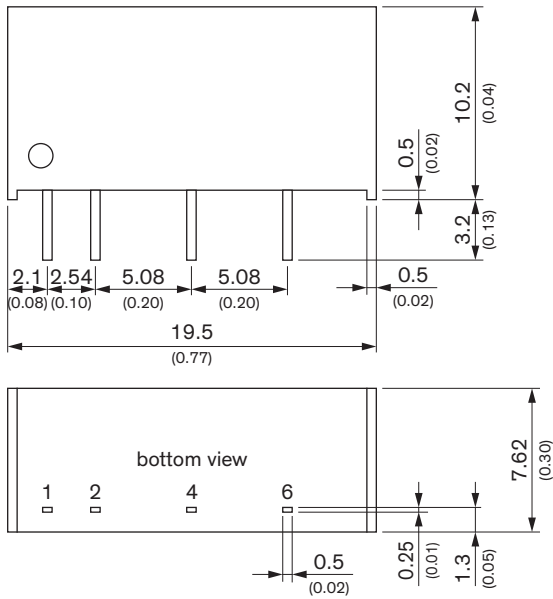
Supporting Documents

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



| Pinout | |
|--------|------------|
| Pin | Function |
| 1 | +Vin (Vcc) |
| 2 | -Vin (GND) |
| 4 | -Vout |
| 6 | +Vout |

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)