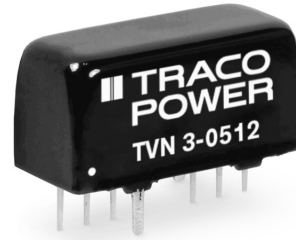


DC/DC Converter

TVN 3 Series, 3 Watt

- Ultra low ripple and noise 10 mVp-p typ.
- Compact SIP-8 package
- Fully regulated outputs
- Input Voltage range
4.5-13.2, 9-18, 18-36, 36-75 VDC
- I/O-isolation 1'600 VDC
- Operating temperature range
-40°C to +90°C
- Short circuit protection
- No minimum load required
- 3-year product warranty



The TVN 3 Series comprises ultra low ripple and noise 3 Watt DC/DC converters. They come in a compact SIP-8 package with fully regulated outputs. Apart from the standard 2:1 input voltage range, the low input voltage models feature an extended input voltage range from 4.5-13.2 VDC (3:1). Full load operation is reliable up to 75°C environment temperature without derating and up to 90°C with 50% derating. With 1'600 VDC I/O-isolation voltage, and short current protection they cover a wide range of applications when space is limited.

| Models | | | | |
|------------|-----------------------------------|---------------------------------|---------------------|-----------------|
| Order code | Input voltage | Output voltage | Output current max. | Efficiency typ. |
| TVN 3-0910 | 4.5 – 13.2 VDC (9 VDC nominal) | 3.3 VDC | 700 mA | 75 % |
| TVN 3-0911 | | 5.0 VDC | 600 mA | 79 % |
| TVN 3-0919 | | 9.0 VDC | 333 mA | 80 % |
| TVN 3-0912 | | 12 VDC | 250 mA | 83 % |
| TVN 3-0913 | | 15 VDC | 200 mA | 83 % |
| TVN 3-0915 | | 24 VDC | 125 mA | 82 % |
| TVN 3-0921 | | ± 5.0 VDC | ±300 mA | 78 % |
| TVN 3-0922 | | ±12 VDC | ±125 mA | 82 % |
| TVN 3-0923 | | ±15 VDC | ±100 mA | 81 % |
| TVN 3-1210 | | 9 – 18 VDC (12 VDC nominal) | 3.3 VDC | 700 mA |
| TVN 3-1211 | 5.0 VDC | | 600 mA | 81 % |
| TVN 3-1219 | 9.0 VDC | | 333 mA | 80 % |
| TVN 3-1212 | 12 VDC | | 250 mA | 85 % |
| TVN 3-1213 | 15 VDC | | 200 mA | 84 % |
| TVN 3-1215 | 24 VDC | | 125 mA | 84 % |
| TVN 3-1221 | ± 5.0 VDC | | ±300 mA | 82 % |
| TVN 3-1222 | ±12 VDC | | ±125 mA | 84 % |
| TVN 3-1223 | ±15 VDC | | ±100 mA | 83 % |
| TVN 3-2410 | 18 – 36 VDC (24 VDC nominal) | | 3.3 VDC | 700 mA |
| TVN 3-2411 | | 5.0 VDC | 600 mA | 82 % |
| TVN 3-2419 | | 9.0 VDC | 333 mA | 82 % |
| TVN 3-2412 | | 12 VDC | 250 mA | 85 % |
| TVN 3-2413 | | 15 VDC | 200 mA | 85 % |
| TVN 3-2415 | | 24 VDC | 125 mA | 84 % |
| TVN 3-2421 | | ± 5.0 VDC | ±300 mA | 80 % |
| TVN 3-2422 | | ±12 VDC | ±125 mA | 84 % |
| TVN 3-2423 | | ±15 VDC | ±100 mA | 85 % |
| TVN 3-4810 | | 36 – 75 VDC (48 VDC nominal) | 3.3 VDC | 700 mA |
| TVN 3-4811 | 5.0 VDC | | 600 mA | 80 % |
| TVN 3-4819 | 9.0 VDC | | 333 mA | 80 % |
| TVN 3-4812 | 12 VDC | | 250 mA | 84 % |
| TVN 3-4813 | 15 VDC | | 200 mA | 84 % |
| TVN 3-4815 | 24 VDC | | 125 mA | 84 % |
| TVN 3-4821 | ± 5.0 VDC | | ±300 mA | 79 % |
| TVN 3-4822 | ±12 VDC | | ±125 mA | 84 % |
| TVN 3-4823 | ±15 VDC | | ±100 mA | 83 % |

Input Specifications

| | | |
|--------------------------|---|--|
| Input current no load | | 9 Vin models: 55 mA typ. 12 Vin models: 30 mA typ. 24 Vin models: 16 mA typ. 48 Vin models: 12 mA typ. |
| Start-up voltage | | 9 Vin models: < 4.5 VDC 12 Vin models: < 9 VDC 24 Vin models: < 18 VDC 48 Vin models: < 36 VDC |
| Undervoltage shutdown | | 9 Vin models: 3.5 VDC typ. 12 Vin models: 7 V typ. 24 Vin models: 15 V typ. 48 Vin models: 33 V typ. |
| Surge voltage (1 s max.) | | 9 Vin models: 15 V max. 12 Vin models: 25 V max. 24 Vin models: 50 V max. 48 Vin models: 100 V max. |
| Conducted noise | – Conducted input emission | EN 55032 class A or B with external components |
| EMC immunity | – ESD (electrostatic discharge) – Radiated immunity – Fast transient / surge (with external input capacitor) – Conducted immunity – Magnetic field immunity | EN 61000-4-2, air ± 8 kV, contact ± 6 kV, perf. criteria A EN 61000-4-3, 10 V/m, perf. criteria A EN 61000-4-4, ± 2 kV, perf. criteria A EN 61000-4-5, ± 1 kV perf. criteria A Nippon chemi-con KY 220 μ F / 100 V EN 61000-4-6, 10 Vrms, perf. criteria A EN 61000-4-8 100 A/m, continuous, perf. criteria A 1000 A/m, 1 sec., perf. criteria A |
| Input filter | | capacitor type |

Output Specifications

| | | |
|---|---|--|
| Voltage set accuracy | | ± 1 % max. |
| Regulation | – Input variation – Load variation 0 – 100 % – Cross regulation - dual output | 0.2 % max. 1 % max. 5 % max. (asymmetrical load 25 % / 100 %) |
| Temperature coefficient | | ± 0.02 %/K typ. |
| Ripple and noise (20 MHz Bandwidth) | – Without external components – With a 10 μ F capacitor on each output | 15 mVp-p typ. 10 mVp-p typ. |
| Start-up time | | 30 ms typ. |
| Transient response (25% load step change) | | 500 μ s typ. |
| Short circuit protection | | continuous, automatic recovery |
| Capacitive load | – Single output – Dual output | 3.3 VDC models: 4'400 μ F max. 5.0 VDC models: 2'200 μ F max. 9.0 VDC models: 1'300 μ F max. 12 VDC models: 1'000 μ F max. 15 VDC models: 820 μ F max. 24 VDC models: 470 μ F max. ± 5.0 VDC models: 1'200 μ F max. (each output) ± 12 VDC models: 520 μ F max. (each output) +15 VDC models: 440 μ F max. (each output) |

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

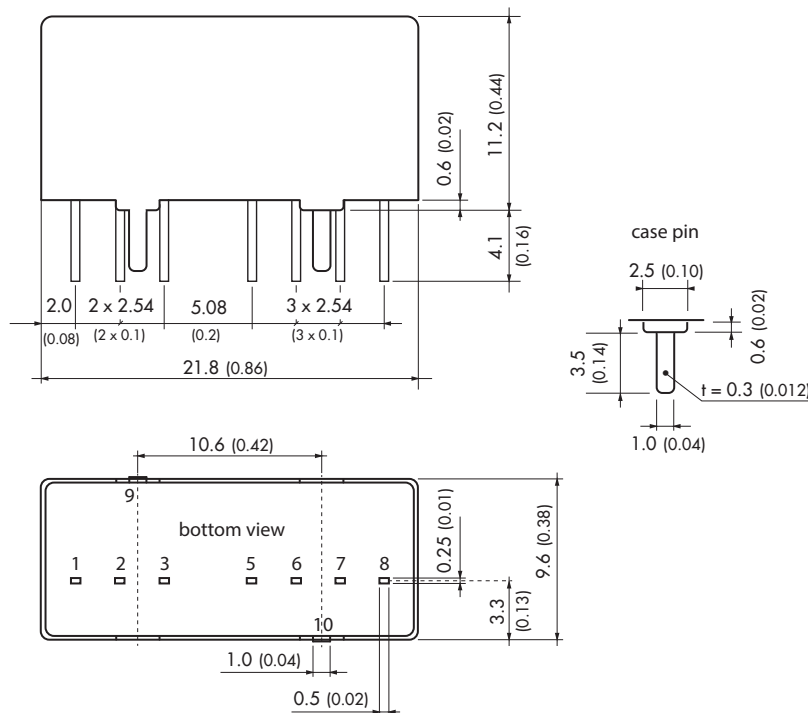
General Specifications

| | | |
|--|---|---|
| Temperature ranges | – Operating (natural convection: 20 LFM, 0.1m/s) – Case temperature – Storage temperature | –40°C to +90°C +105°C max. –55°C to +125°C |
| Derating | | 3.3%/K above 75°C |
| Humidity (non condensing) | | 5 – 95 % rel H max. |
| Isolation voltage | – I/O isolation voltage (60 sec.) – Input/Case isolation voltage (60 sec.) | 1'600 VDC 1'000 VDC |
| Isolation capacitance | | 1'500 pF max. |
| Isolation resistance (@ 500 VDC) | | >1 GOhm |
| Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign) | | 5'600'000 h |
| Switching frequency | | 100 kHz min. Pulse frequency modulation. |
| Thermal shock & vibration | | MIL-STD-810F |
| Remote On/Off | – On – Off – Off idle current | open circuit or high impedance 2 - 4 mA current applied via 1kOhm resistor 2.5 mA max. |
| Safety standards | – Information technology | IEC/EN 60950-1, UL 60950-1 |
| Environmental compliance | – Reach – RoHS | www.tracopower.com/products/reach-declaration.pdf RoHS directive 2011/65/EU |

Physical Specifications

| | |
|------------------|---------------------------|
| Casing material | copper |
| Potting material | silicone (UL 94V-0 rated) |
| Package weight | 5.9 g (0.21 oz) |

Outline Dimensions



| Pin-Out | | |
|---------|------------|------------|
| Pin | Single | Dual |
| 1 | –Vin (GND) | –Vin (GND) |
| 2 | +Vin (Vcc) | +Vin (Vcc) |
| 3 | On/Off | On/Off |
| 5 | NC | NC |
| 6 | +Vout | +Vout |
| 7 | –Vout | Common |
| 8 | NC | –Vout |
| 9/10 | Case | Case |

Dimensions in [mm], () = Inch

Tolerances: x.x ±0.5 (±0.02)

x.xx ±0.25 (±0.01)

Pin pitch tolerances ±0.25 (±0.01)

Pin dimension tolerance ±0.1 (±0.004)