TRACO POWER

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 wich fully regulated outputs. Apart from the standard 2:1 input voltage range, the low input voltage models feature an extened input voltage range from 4.5-13.2 VDC (3:1). Full load operation is reliable up tp 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	77 %
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	76 %
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	74 %
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)		EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A
	– Radiated immunity		EN 61000-4-3, 10 V/m, perf. criteria A
	– Fast transient / surge		EN 61000-4-4, ±2 kV, perf. criteria A
	(with external input capacitor)		EN 61000-4-5, ±1 kV perf. criteria A
			Nippon chemi-con KY 220 µF / 100 V
	– Conducted immunity		EN 61000-4-6, 10 Vrms, perf. criteria A
	– Magnetic field immunity		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		0.2 % max.
	– Load variation 0 – 100 %		1 % max.
	– Cross regulation - dual output		5 % max. (asymmetrical load 25 % / 100 %)
Temperature coefficient			±0.02 %/K typ.
Ripple and noise	– Without external components		15 mVp-p typ.
(20 MHz Bandwidth)	– With a 10µF capacitor on each output		10 mVp-p typ.
Start-up time			30 ms typ.
Transient response (25% load step change)			500 µs typ.
Short circuit protection			continuous, automatic recovery
Capacitive load	– Single output	3.3 VDC models:	4‘400 µF max.
		5.0 VDC models:	2‘200 µF max.
		9.0 VDC models:	1‘300 µF max.
		12 VDC models:	1‘000 µF max.
		15 VDC models:	820 µF max.
		24 VDC models:	470 µF max.
	– Dual output	±5.0 VDC models:	1‘200 µF max. (each output)
		±12 VDC models:	520 µF max. (each output)
		+15 VDC models:	440 µF max. (each output)

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

General Specifications

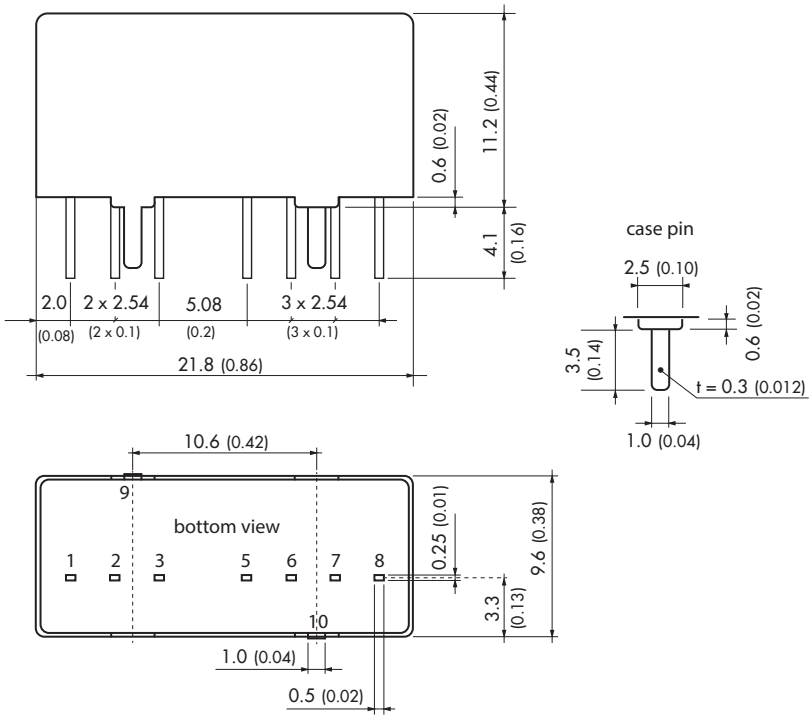
Temperature ranges	– Operating (natural convection: 20 LFM, 0.1m/s) – Case temperature – Storage temperature	–40°C to +90°C +105°C max. –55°C to +125°C
Derating		3.3%/K above 75°C
Humidity (non condensing)		5 – 95 % rel H max.
Isolation voltage	– I/O isolation voltage (60 sec.) – Input/Case isolation 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)

Supporting Documents: www.tracopower.com/overview/tvn3

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)

Specifications can be changed without notice!