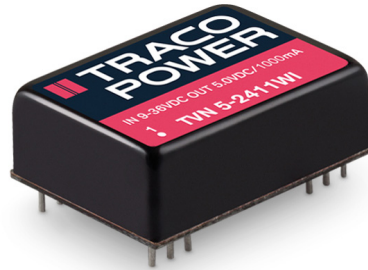


- Ultra low ripple and noise 10 mVp-p typ.
- 6-side shielded DIP-24 metal package
- Input filter to meet EN 55032, class B
- Ultra wide 4:1 input voltage range  
4.5-12, 9-36, 18-75 VDC
- Operating temperature range  
-40°C to +90°C
- Undervoltage lockout
- I/O isolation 1600 VDC
- Adjustable output voltage
- No minimum load required
- Remote On/Off
- 3-year product warranty



The TVN 5WI series is a ultra low ripple and noise 5 Watt DC/DC converter in six side shielded metal package. The conducted noise complies with EN 55032 class B and makes this converters the ideal solution for audio, measurement and detection circuits.

Standard features include remote On/Off, over voltage protection, under voltage shut down and short circuit protection.

Models				
Order code	Input voltage	Output voltage	Output current max.	Efficiency typ.
TVN 5-0910WI	4.5 – 12 VDC (9 VDC nominal)	3.3 VDC	1515 mA	79 %
TVN 5-0911WI		5.0 VDC	1000 mA	82 %
TVN 5-0912WI		12 VDC	416 mA	87 %
TVN 5-0913WI		15 VDC	333 mA	87 %
TVN 5-0915WI		24 VDC	208 mA	88 %
TVN 5-0921WI		±5.0 VDC	±500 mA	84 %
TVN 5-0922WI		±12 VDC	±208 mA	85 %
TVN 5-0923WI		±15 VDC	±166 mA	86 %
TVN 5-0925WI		±24 VDC	±104 mA	87 %
TVN 5-2410WI		9 – 36 VDC (24 VDC nominal)	3.3 VDC	1515 mA
TVN 5-2411WI	5.0 VDC		1000 mA	83 %
TVN 5-2412WI	12 VDC		416 mA	88 %
TVN 5-2413WI	15 VDC		333 mA	88 %
TVN 5-2415WI	24 VDC		208 mA	89 %
TVN 5-2421WI	±5.0 VDC		±500 mA	84 %
TVN 5-2422WI	±12 VDC		±208 mA	85 %
TVN 5-2423WI	±15 VDC		±166 mA	86 %
TVN 5-2425WI	±24 VDC		±104 mA	87 %
TVN 5-4810WI	18 – 75 VDC (48 VDC nominal)		3.3 VDC	1515 mA
TVN 5-4811WI		5.0 VDC	1000 mA	83 %
TVN 5-4812WI		12 VDC	416 mA	86 %
TVN 5-4813WI		15 VDC	333 mA	87 %
TVN 5-4815WI		24 VDC	208 mA	88 %
TVN 5-4821WI		±5.0 VDC	±500 mA	83 %
TVN 5-4822WI		±12 VDC	±208 mA	85 %
TVN 5-4823WI		±15 VDC	±166 mA	86 %
TVN 5-4825WI		±24 VDC	±104 mA	87 %

## Input Specifications

Input current no load	9 Vin models: 35 mA typ 24 Vin models: 8 mA typ. 48 Vin models: 5 mA typ.
Start-up voltage	9 Vin models: < 4.5 VDC 24 Vin models: < 9 VDC 48 Vin models: < 18 VDC
Undervoltage shutdown (lock-out circuit)	9 Vin models: 3 – 4.4 VDC 24 Vin models: 7 – 8.8 VDC 48 Vin models: 15 – 17.5 VDC
Surge voltage (1 s max.)	9 Vin models: 16 V max. 24 Vin models: 50 V max. 48 Vin models: 100 V max.
EMC emissions	9 & 24 Vin models: EN 55032 class B internal filter 48 Vin models: EN 55032 class A internal filter – Filter class B proposal for 48 Vin models: <a href="http://www.tracopower.com/overview/tvn5wi">www.tracopower.com/overview/tvn5wi</a>
EMC immunity	– ESD (electrostatic discharge) – Radiated immunity – Fast transient / surge (with external input capacitor) – Conducted immunity – Magnetic field immunity 9 & 24 Vin models: EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A EN 61000-4-3, 20 V/m, perf. criteria A EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±2 kV perf. criteria A Nippon chemi-con KY 220 µF, 100 V, ESR 48 mOhm and TVS 70V, 3000W peak (SMDJ70A) in parallel 48 Vin models: Nippon chemi-con KY 220 µF, 100 V, ESR 48 mOhm and TVS 120V, 3000W peak (SMDJ120A) in parallel 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	9 Vin models: Pi type 24 & 48 Vin models: common chock
External input fuse required (recommended values, slow blow type)	9 Vin models: 2.5 A 24 Vin models: 1.25 A 48 Vin models: 1.6 A

## Output Specifications

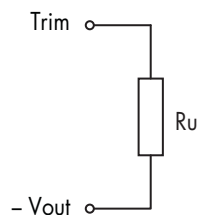
Voltage set accuracy	±1% max.
Voltage adjustment range	single output: –10%, +20% dual output: ±10%
Regulation	– Input variation – Load variation (0 – 100 %) – cross regulation - dual output: single output: 0.2% max. 0.5% max. dual output: 1% max. 3% max. (asymmetrical load 25% / 100%)
Temperature coefficient	±0.02 %/K typ.
Minimum load	not required
Ripple and noise (20 MHz Bandwidth)	– without external components – with a 10µF capacitor on each output 15 mVp-p max., 10 mVp-p typ. 10 mVp-p max., 5 mVp-p typ.
Start-up time	50 ms typ.
Transient response (25% load step change)	250 µs typ.
Short circuit protection	continuous, automatic recovery
Overload protection	at 170% of lout nom. hiccup mode
Overvoltage protection	at 135% of Vout nom.

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

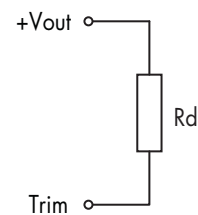
### General Specifications

Capacitive load	-Single output	3.3 VDC models: <b>2'200 <math>\mu</math>F max.</b> 5.0 VDC models: <b>1'000 <math>\mu</math>F max.</b> 12 VDC models: <b>220 <math>\mu</math>F max.</b> 15 VDC models: <b>150 <math>\mu</math>F max.</b> 24 VDC models: <b>100 <math>\mu</math>F max.</b>
	-Dual output	$\pm$ 5.0 VDC models: <b>680 <math>\mu</math>F max. (each output)</b> $\pm$ 12 VDC models: <b>150 <math>\mu</math>F max. (each output)</b> $\pm$ 15 VDC models: <b>150 <math>\mu</math>F max. (each output)</b> +24 VDC models: <b>100 <math>\mu</math>F max. (each output)</b>
Temperature ranges	- Operating (natural convection: 20 LFM, 0.1m/s) - Case temperature - Storage temperature	<b>-40°C to +90°C</b> <b>+105°C max.</b> <b>-55°C to +125°C</b>
Derating	Please refer to Application note:	<b>6.67 %/K above 85°C (depending on model)</b> <a href="http://www.tracopower.com/overview/tvn5wi">www.tracopower.com/overview/tvn5wi</a>
Thermal impedance	- Natural convection	<b>20°C/W</b>
Humidity (non condensing)		<b>5 – 95 % rel H max.</b>
Isolation voltage	- I/O isolation voltage (60 s) - Input/Case isolation voltage (60 s)	<b>1'600 VDC</b> <b>1'600 VDC</b>
Isolation capacitance		<b>1'200 pF max.</b>
Isolation resistance (@ 500 VDC)		<b>&gt;1 Gohm</b>
Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign)		<b>4'400'000 h</b>
Switching frequency		<b>300 kHz typ. (Pulse width modulation - PWM)</b>
Thermal shock & vibration		<b>MIL-STD-810F</b>
Remote On/Off	- On: - Off: - Off idle current:	<b>3.0 ... 12 VDC or open circuit</b> <b>0 ... 1.2 VDC or short circuit pin 23 and pin 22</b> <b>3.0 mA</b>
Safety standards	- Information technology	<b>IEC/EN 60950-1, UL 60950-1</b>
Environmental compliance	- Reach - RoHS	<a href="http://www.tracopower.com/products/reach-declaration.pdf">www.tracopower.com/products/reach-declaration.pdf</a> <b>RoHS directive 2011/65/EU</b>

#### Trim up



#### Trim down



Nominal output voltage at open Trim input  
Ru, Rd for adjustment to be advised

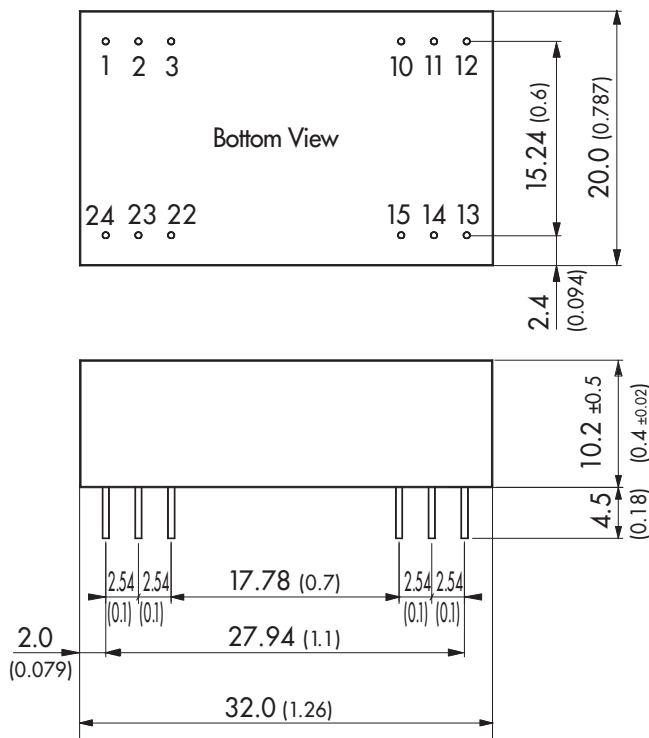
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

### Physical Specifications

Casing material	copper
Base material	non conductive FR4
Potting material	epoxy (UL 94V-0 rated)
Package weight	15.3 g (0.54 oz)
Soldering temperature	265°C / 10 s max.

**Supporting Documents:** [www.tracopower.com/overview/tvn5wi](http://www.tracopower.com/overview/tvn5wi)

### Outline Dimensions



### Pin-Out

Pin	Single	Dual
1	+Vin (Vcc)	
2	+Vin (Vcc)	
3	Case	
10	No pin	Common
11	No pin	+Vout 1
12	Case	
13	TRIM	
14	-Vout	-Vout 2
15	+Vout	Common
22	Remote On / Off	
23	-Vin	
24	-Vin	

Dimensions in [mm], ( ) = Inch

Pin diameter:	0.6 (0.024)
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)