



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

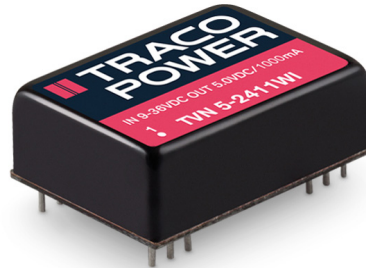
Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



- 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<br>(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<br>(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<br>(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<br>24 Vin models: 8 mA typ.<br>48 Vin models: 5 mA typ.   |
| Start-up voltage   | 9 Vin models: < 4.5 VDC<br>24 Vin models: < 9 VDC<br>48 Vin models: < 18 VDC  |
| Undervoltage shutdown (lock-out circuit)                             | 9 Vin models: 3 – 4.4 VDC<br>24 Vin models: 7 – 8.8 VDC<br>48 Vin models: 15 – 17.5 VDC   |
| Surge voltage (1 s max.)   | 9 Vin models: 16 V max.<br>24 Vin models: 50 V max.<br>48 Vin models: 100 V max.  |
| EMC emissions  | 9 & 24 Vin models: EN 55032 class B internal filter<br>48 Vin models: EN 55032 class A internal filter<br>– 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) EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A<br>– Radiated immunity EN 61000-4-3, 20 V/m, perf. criteria A<br>– Fast transient / surge EN 61000-4-4, ±2 kV, perf. criteria A<br>(with external input capacitor) EN 61000-4-5, ±2 kV perf. criteria A<br>9 & 24 Vin models: Nippon chemi-con KY 220 µF, 100 V, ESR 48 mOhm and TVS 70V, 3000W peak (SMDJ70A) in parallel<br>48 Vin models: Nippon chemi-con KY 220 µF, 100 V, ESR 48 mOhm and TVS 120V, 3000W peak (SMDJ120A) in parallel<br>– Conducted immunity EN 61000-4-6, 10 Vrms, perf. criteria A<br>– Magnetic field immunity EN 61000-4-8<br>100 A/m, continuous, perf. criteria A<br>1000 A/m, 1 sec., perf. criteria A |
| Input filter   | 9 Vin models: Pi type<br>24 & 48 Vin models: common chock   |
| External input fuse required<br>(recommended values, slow blow type) | 9 Vin models: 2.5 A<br>24 Vin models: 1.25 A<br>48 Vin models: 1.6 A  |

## Output Specifications

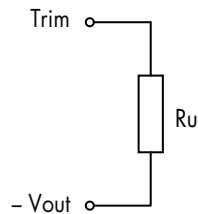
|   |  |
|---|--|
| Voltage set accuracy                      | ±1% max.   |
| Voltage adjustment range                  | single output: –10%, +20%<br>dual output: ±10%   |
| Regulation                                | – Input variation 0.2% max.<br>– Load variation (0 – 100 %) single output: 0.5% max.<br>dual output: 1% max.<br>– cross regulation - dual output: 3% max. (asymmetrical load 25% / 100%) |
| Temperature coefficient                   | ±0.02 %/K typ.   |
| Minimum load                              | not required   |
| Ripple and noise<br>(20 MHz Bandwidth)    | – without external components 15 mVp-p max., 10 mVp-p typ.<br>– with a 10µF capacitor on each output 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.

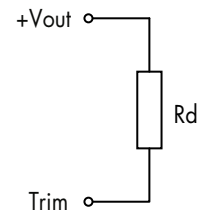
### General Specifications

|  |   |  |
|--|---|--|
| Capacitive load  | -Single output  | 3.3 VDC models: <b>2'200 <math>\mu</math>F max.</b><br>5.0 VDC models: <b>1'000 <math>\mu</math>F max.</b><br>9.0 VDC models: <b>220 <math>\mu</math>F max.</b><br>12 VDC models: <b>150 <math>\mu</math>F max.</b><br>15 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><br>$\pm$ 12 VDC models: <b>150 <math>\mu</math>F max. (each output)</b><br>$\pm$ 15 VDC models: <b>150 <math>\mu</math>F max. (each output)</b><br>+24 VDC models: <b>100 <math>\mu</math>F max. (each output)</b> |
| Temperature ranges   | - Operating (natural convection: 20 LFM, 0.1m/s)<br>- Case temperature<br>- Storage temperature | <b>-40°C to +90°C</b><br><b>+105°C max.</b><br><b>-55°C to +125°C</b>  |
| Derating   |   | <b>6.67 %/K above 85°C</b>   |
| 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)  | <b>1'600 VDC</b>   |
|  | - Input/Case isolation voltage (60 s)   | <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:   | <b>3.0 ... 12 VDC or open circuit</b>  |
|  | - Off:  | <b>0 ... 1.2 VDC or short circuit pin 23 and pin 22</b>  |
|  | - Off idle current:   | <b>3.0 mA</b>  |
| Safety standards   | - Information technology  | <b>IEC/EN 60950-1, UL 60950-1</b>  |
| Environmental compliance   | - Reach   | <a href="http://www.tracopower.com/products/reach-declaration.pdf">www.tracopower.com/products/reach-declaration.pdf</a>   |
|  | - RoHS  | <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

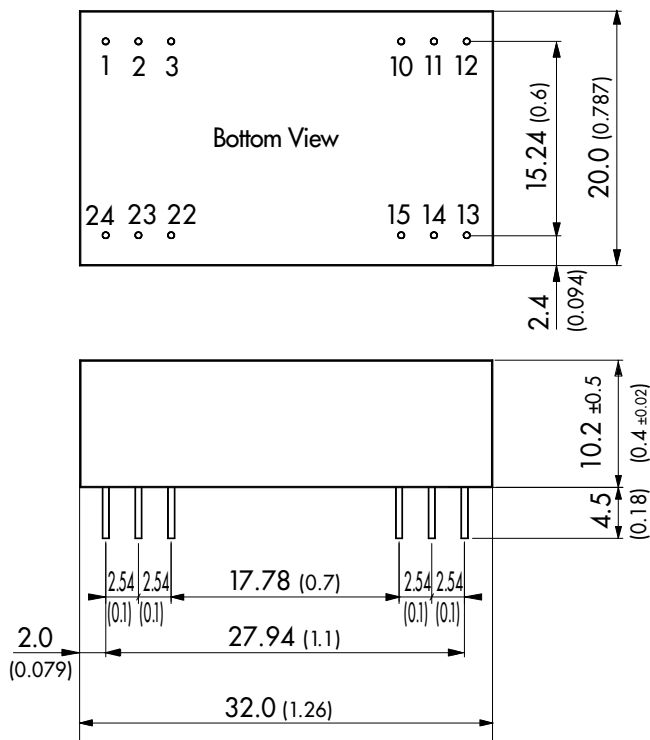
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

### 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) |