



**THE DATASHEET OF  
TDN 5-0912WI**



- Ultra compact DIP package  
13.2 x 9.1 x 10.2 mm
- I/O-isolation 1'600 VDC
- Fully regulated outputs
- Operating temperature range  
-40°C to +75°C
- Short circuit protection
- Remote On/Off
- Designed to meet IEC/EN/UL 62368-1  
(not certified)
- 3-year product warranty



The TDN 5WI Series redefines the power density of high performance DC/DC converters. The cubical package of only 1.23 cm<sup>3</sup> encloses a sophisticated circuit which provides 5 Watt output power without any compromise regarding reliability and functionality. They operate up to 50°C environment temperature at full load or up to 70°C with a 50% load de-rating. With 1'600 VDC I/O-isolation voltage, external On/Off and short current protection, they cover a wide range of application when space is limited. The input of the converters is designed for a wide voltage range (4:1) and minimum load is not required. The functional I/O-isolation system is designed to meet IEC/EN/UL 62368-1 (not certified) with a test voltage (60 s) of 1'600 VDC.

Models						
Order Code	Input Voltage Range	Output 1		Output 2		Efficiency typ.
		Vnom	I <sub>max</sub>	Vnom	I <sub>max</sub>	
TDN 5-0910WI	4.5 - 13.2 VDC (9 VDC nom.)	3.3 VDC	1'000 mA			76 %
TDN 5-0911WI		5 VDC	1'000 mA			80 %
TDN 5-0919WI		9 VDC	555 mA			81 %
TDN 5-0912WI		12 VDC	420 mA			83 %
TDN 5-0913WI		15 VDC	333 mA			83 %
TDN 5-0915WI		24 VDC	210 mA			83 %
TDN 5-0921WI		+5 VDC	500 mA	-5 VDC	500 mA	80 %
TDN 5-0922WI		+12 VDC	210 mA	-12 VDC	210 mA	83 %
TDN 5-0923WI		+15 VDC	168 mA	-15 VDC	168 mA	83 %
TDN 5-2410WI		9 - 36 VDC (24 VDC nom.)	3.3 VDC	1'000 mA		
TDN 5-2411WI	5 VDC		1'000 mA			80 %
TDN 5-2419WI	9 VDC		555 mA			81 %
TDN 5-2412WI	12 VDC		420 mA			83 %
TDN 5-2413WI	15 VDC		333 mA			83 %
TDN 5-2415WI	24 VDC		210 mA			83 %
TDN 5-2421WI	+5 VDC		500 mA	-5 VDC	500 mA	80 %
TDN 5-2422WI	+12 VDC		210 mA	-12 VDC	210 mA	83 %
TDN 5-2423WI	+15 VDC		168 mA	-15 VDC	168 mA	84 %
TDN 5-4810WI	18 - 75 VDC (48 VDC nom.)		3.3 VDC	1'000 mA		
TDN 5-4811WI		5 VDC	1'000 mA			81 %
TDN 5-4819WI		9 VDC	555 mA			81 %
TDN 5-4812WI		12 VDC	420 mA			83 %
TDN 5-4813WI		15 VDC	333 mA			83 %
TDN 5-4815WI		24 VDC	210 mA			83 %
TDN 5-4821WI		+5 VDC	500 mA	-5 VDC	500 mA	80 %
TDN 5-4822WI		+12 VDC	210 mA	-12 VDC	210 mA	83 %
TDN 5-4823WI		+15 VDC	168 mA	-15 VDC	168 mA	84 %

### Input Specifications

Input Current	- At no load	9 Vin models: <b>80 mA typ.</b> 24 Vin models: <b>30 mA typ.</b> 48 Vin models: <b>15 mA typ.</b>
Surge Voltage		9 Vin models: <b>15 VDC max.</b> (1 s max.) 24 Vin models: <b>50 VDC max.</b> (1 s max.) 48 Vin models: <b>100 VDC max.</b> (1 s max.)
Reflected Ripple Current		9 Vin models: <b>40 mA<sub>p-p</sub> typ.</b> 24 Vin models: <b>20 mA<sub>p-p</sub> typ.</b> 48 Vin models: <b>15 mA<sub>p-p</sub> typ.</b>
Recommended Input Fuse		9 Vin models: <b>2'500 mA</b> (slow blow) 24 Vin models: <b>1'250 mA</b> (slow blow) 48 Vin models: <b>630 mA</b> (slow blow) (The need of an external fuse has to be assessed in the final application.)
Input Filter		<b>Internal Capacitor</b>

### Output Specifications

Voltage Set Accuracy		<b>±1% max.</b>
Regulation	- Input Variation (V <sub>min</sub> - V <sub>max</sub> )	single output models: <b>0.2% max.</b> dual output models: <b>0.2% max.</b>
	- Load Variation (0 - 100%)	single output models: <b>1% max.</b> dual output models: <b>1% max.</b> (Output 1) <b>1% max.</b> (Output 2)
	- Cross Regulation (25% / 100% asym. load)	dual output models: <b>5% max.</b>
Ripple and Noise	- 20 MHz Bandwidth	<b>75 mV<sub>p-p</sub> typ.</b>
Capacitive Load	- single output	3.3 V <sub>out</sub> models: <b>4'400 µF max.</b> 5 V <sub>out</sub> models: <b>2'200 µF max.</b> 9 V <sub>out</sub> models: <b>1'470 µF max.</b> 12 V <sub>out</sub> models: <b>1'220 µF max.</b> 15 V <sub>out</sub> models: <b>1'000 µF max.</b> 24 V <sub>out</sub> models: <b>470 µF max.</b>
	- dual output	5 / -5 V <sub>out</sub> models: <b>1'000 / 1'000 µF max.</b> 12 / -12 V <sub>out</sub> models: <b>680 / 680 µF max.</b> 15 / -15 V <sub>out</sub> models: <b>440 / 440 µF max.</b>
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±0.02 %/K max.</b>
Start-up Time		<b>10 ms typ. / 20 ms max.</b>
Short Circuit Protection		<b>Continuous, Automatic recovery</b>
Transient Response	- Response Time	<b>500 µs typ.</b> (25% Load Step)

### Safety Specifications

Standards	- IT / Multimedia Equipment	<b>Designed for IEC/EN/UL 62368-1</b> (not certified)
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### EMC Specifications

EMI Emissions	- Conducted Emissions	<b>EN 55032 class A</b> (with external filter) <b>EN 55032 class B</b> (with external filter)
	- Radiated Emissions	<b>EN 55032 class A</b> (with external filter) <b>EN 55032 class B</b> (with external filter)
		External filter proposal: <a href="http://www.tracopower.com/overview/tdn5wi">www.tracopower.com/overview/tdn5wi</a>

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

EMS Immunity	- Electrostatic Discharge	Air: EN 61000-4-2, ±8 kV, perf. criteria A
	- RF Electromagnetic Field	Contact: EN 61000-4-2, ±6 kV, perf. criteria A
	- EFT (Burst) / Surge	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
	- Conducted RF Disturbances	Ext. input component: KY 220 µF, 100 V
	- PF Magnetic Field	EN 61000-4-6, 10 Vrms, perf. criteria A
		Continuous: EN 61000-4-8, 100 A/m, perf. criteria A
		1 s: EN 61000-4-8, 1000 A/m, perf. criteria A

## General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +75°C
	- Case Temperature	+105°C max.
	- Storage Temperature	-55°C to +125°C
Power Derating	- High Temperature	Depending on model
	See application note:	<a href="http://www.tracopower.com/overview/tdn5wi">www.tracopower.com/overview/tdn5wi</a>
Cooling System		Natural convection (20 LFM)
Remote Control	- Current Controlled Remote (passive = on)	On: open circuit
		Off: 2 to 4 mA current (no internal resistor)
		Refers to 'Remote' and '-Vin' Pin
	- Off Idle Input Current	External circuit proposal: <a href="http://www.tracopower.com/info/current-remote.pdf">www.tracopower.com/info/current-remote.pdf</a>
		2.5 mA max.
Switching Frequency		100 kHz min. (PFM)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s	1'600 VDC
Isolation Resistance	- Input to Output, 500 VDC	1'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	50 pF max.
Reliability	- Calculated MTBF	2'960'000 h (Vin models)
		2'280'000 h (other models)
		(MIL-HDBK-217F, ground benign)
Washing Process		According to Cleaning Guideline
		<a href="http://www.tracopower.com/info/cleaning.pdf">www.tracopower.com/info/cleaning.pdf</a>
Environment	- Vibration	MIL-STD-810F
	- Thermal Shock	MIL-STD-810F
Housing Material		Non-conductive Plastic (UL 94 V-0 rated)
Base Material		Non-conductive Plastic (UL 94 V-0 rated)
Potting Material		Silicone (UL 94 V-0 rated)
Pin Material		Copper
Pin Foundation Plating		Nickel (2 - 3 µm)
Pin Surface Plating		Tin (3 - 5 µm), matte
Housing Type		Plastic Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		DIP8
Soldering Profile		Lead-Free Wave Soldering
		260°C / 6 s max.
Weight		2.7 g

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

Environmental Compliance - REACH Declaration

[www.tracopower.com/info/reach-declaration.pdf](http://www.tracopower.com/info/reach-declaration.pdf)

- RoHS Declaration

REACH SVHC list compliant

REACH Annex XVII compliant

[www.tracopower.com/info/rohs-declaration.pdf](http://www.tracopower.com/info/rohs-declaration.pdf)

Exemptions: 7a, 7c-1

(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule))

- SCIP Reference Number

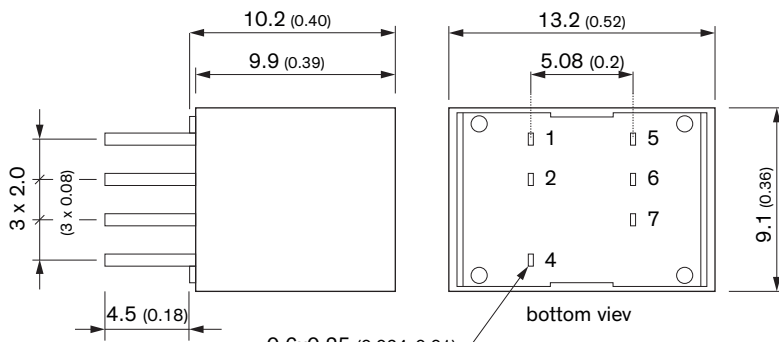
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### Supporting Documents

Overview Link (for additional Documents)

[www.tracopower.com/overview/tdn5wi](http://www.tracopower.com/overview/tdn5wi)

### Outline Dimensions





Dimensions in mm (inch)  
 Tolerances: x.x:  $\pm 0.5$  ( $\pm 0.02$ )  
 Pin pitch tolerances:  $\pm 0.25$  ( $\pm 0.01$ )  
 Pin diameter:  $\pm 0.1$  ( $\pm 0.004$ )

Pinout		
Pin	Single	Dual
1	+Vin (Vcc)	+Vin (Vcc)
2	-Vin (GND)	-Vin (GND)
4	Remote On/Off	Remote On/Off
5	NC	-Vout
6	-Vout	Common
7	+Vout	+Vout

NC: Not connected

## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View TDN 5-0912WI on WIN SOURCE](#)
-  [Traco Power Information](#)

## Optimize Your Supply Chain with WIN SOURCE Solutions

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