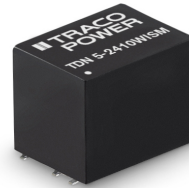


- Ultra compact SMD package  
13.2 x 9.1 x 10.2 mm
- I/O-isolation 1'600 VDC
- Fully regulated outputs
- Operating temperature range  
-40°C to +75°C
- Short circuit protection
- Remote On/Off
- Designed to meet IEC/EN/UL 62368-1  
(not certified)
- 3-year product warranty



The TDN 5WISM 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 5-0910WISM	4.5 - 13.2 VDC (9 VDC nom.)	3.3 VDC	1'000 mA			76 %
TDN 5-0911WISM		5 VDC	1'000 mA			80 %
TDN 5-0919WISM		9 VDC	555 mA			81 %
TDN 5-0912WISM		12 VDC	420 mA			83 %
TDN 5-0913WISM		15 VDC	333 mA			83 %
TDN 5-0915WISM		24 VDC	210 mA			83 %
TDN 5-0921WISM		+5 VDC	500 mA	-5 VDC	500 mA	80 %
TDN 5-0922WISM		+12 VDC	210 mA	-12 VDC	210 mA	83 %
TDN 5-0923WISM		+15 VDC	168 mA	-15 VDC	168 mA	83 %
TDN 5-2410WISM		9 - 36 VDC (24 VDC nom.)	3.3 VDC	1'000 mA		
TDN 5-2411WISM	5 VDC		1'000 mA			80 %
TDN 5-2419WISM	9 VDC		555 mA			81 %
TDN 5-2412WISM	12 VDC		420 mA			83 %
TDN 5-2413WISM	15 VDC		333 mA			83 %
TDN 5-2415WISM	24 VDC		210 mA			83 %
TDN 5-2421WISM	+5 VDC		500 mA	-5 VDC	500 mA	80 %
TDN 5-2422WISM	+12 VDC		210 mA	-12 VDC	210 mA	83 %
TDN 5-2423WISM	+15 VDC		168 mA	-15 VDC	168 mA	84 %
TDN 5-4810WISM	18 - 75 VDC (48 VDC nom.)		3.3 VDC	1'000 mA		
TDN 5-4811WISM		5 VDC	1'000 mA			81 %
TDN 5-4819WISM		9 VDC	555 mA			81 %
TDN 5-4812WISM		12 VDC	420 mA			83 %
TDN 5-4813WISM		15 VDC	333 mA			83 %
TDN 5-4815WISM		24 VDC	210 mA			83 %
TDN 5-4821WISM		+5 VDC	500 mA	-5 VDC	500 mA	80 %
TDN 5-4822WISM		+12 VDC	210 mA	-12 VDC	210 mA	83 %
TDN 5-4823WISM		+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 mAp-p typ.</b> 24 Vin models: <b>20 mAp-p typ.</b> 48 Vin models: <b>15 mAp-p 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 (Vmin - Vmax) - Load Variation (0 - 100%) - Cross Regulation (25% / 100% asym. load)	single output models: <b>0.2% max.</b> dual output models: <b>0.2% max.</b> single output models: <b>1% max.</b> dual output models: <b>1% max.</b> (Output 1) <b>1% max.</b> (Output 2) dual output models: <b>5% max.</b>
Ripple and Noise	- 20 MHz Bandwidth	<b>75 mVp-p typ.</b>
Capacitive Load	- single output          - dual output	3.3 Vout models: <b>4'400 µF max.</b> 5 Vout models: <b>2'200 µF max.</b> 9 Vout models: <b>1'470 µF max.</b> 12 Vout models: <b>1'220 µF max.</b> 15 Vout models: <b>1'000 µF max.</b> 24 Vout models: <b>470 µF max.</b> 5 / -5 Vout models: <b>1'000 / 1'000 µF max.</b> 12 / -12 Vout models: <b>680 / 680 µF max.</b> 15 / -15 Vout 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/tdn5wism">www.tracopower.com/overview/tdn5wism</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, $\pm 8$ kV, perf. criteria A
	- RF Electromagnetic Field	Contact: EN 61000-4-2, $\pm 6$ kV, perf. criteria A
	- EFT (Burst) / Surge	EN 61000-4-3, 10 V/m, perf. criteria A
		EN 61000-4-4, $\pm 2$ kV, perf. criteria A
		EN 61000-4-5, $\pm 1$ kV, perf. criteria A
	- Conducted RF Disturbances	Ext. input component: KY 220 $\mu$ F, 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/tdn5wism">www.tracopower.com/overview/tdn5wism</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
	External circuit proposal:	<a href="http://www.tracopower.com/info/current-remote.pdf">www.tracopower.com/info/current-remote.pdf</a>
	- Off Idle Input Current	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 M $\Omega$ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	50 pF max.
Reliability	- Calculated MTBF	2'960'000 h (9 Vin models)
		2'280'000 h (other models)
		(MIL-HDBK-217F, ground benign)
Moisture Sensitivity (MSL)		Level 2 (J-STD-033C)
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 FR4 (UL 94 V-0 rated)
Potting Material		Silicone (UL 94 V-0 rated)
Pin Material		Copper
Pin Foundation Plating		Nickel (2 - 3 $\mu$ m)
Pin Surface Plating		Tin (3 - 5 $\mu$ m), matte
Housing Type		Plastic Case
Mounting Type		PCB Mount
Connection Type		SMD (Surface-Mount Device)
Footprint Type		SMD8
Soldering Profile		Lead-Free Reflow Soldering (acc. J-STD-020E)
		245°C max. (Tp)
		10 s max. (tp, at Tp - 5°C)
		90 s max. (tL, time above 217°C)
	See application note:	<a href="http://www.tracopower.com/info/reflow-soldering.pdf">www.tracopower.com/info/reflow-soldering.pdf</a>
Weight		2.7 g

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



### Recommended Solder Pad Layout

