

DC/DC Converter

TDN 5WISM Series, 5 Watt

- 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 cm³ 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 _{max}	Vnom	I _{max}	
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			76 %
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			76 %
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: 80 mA typ. 24 Vin models: 30 mA typ. 48 Vin models: 15 mA typ.
Surge Voltage		9 Vin models: 15 VDC max. (1 s max.) 24 Vin models: 50 VDC max. (1 s max.) 48 Vin models: 100 VDC max. (1 s max.)
Reflected Ripple Current		9 Vin models: 40 mAp-p typ. 24 Vin models: 20 mAp-p typ. 48 Vin models: 15 mAp-p typ.
Recommended Input Fuse		9 Vin models: 2'500 mA (slow blow) 24 Vin models: 1'250 mA (slow blow) 48 Vin models: 630 mA (slow blow) (The need of an external fuse has to be assessed in the final application.)
Input Filter		Internal Capacitor

Output Specifications

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

Safety Specifications

Standards	- IT / Multimedia Equipment	Designed for IEC/EN/UL 62368-1 (not certified)
-----------	-----------------------------	--

EMC Specifications

EMI (Emissions)	- Conducted Emissions	EN 55032 class A (with external filter) EN 55032 class B (with external filter)
	- Radiated Emissions	EN 55032 class A (with external filter) EN 55032 class B (with external filter)
External filter proposal:		www.tracopower.com/overview/tdn5wism

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
		Contact:	EN 61000-4-2, ± 6 kV, perf. criteria A
	- RF Electromagnetic Field		EN 61000-4-3, 10 V/m, perf. criteria A
	- EFT (Burst) / Surge		EN 61000-4-4, ± 2 kV, perf. criteria A
			EN 61000-4-5, ± 1 kV, perf. criteria A
		Ext. input component:	KY 220 μ F, 100 V
	- Conducted RF Disturbances		EN 61000-4-6, 10 Vrms, perf. criteria A
	- PF Magnetic Field	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:	www.tracopower.com/overview/tdn5wism
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:	www.tracopower.com/info/current-remote.pdf
	- 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 Ω 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
		www.tracopower.com/info/cleaning.pdf
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 μ m)
Pin Surface Plating		Tin (3 - 5 μ 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:	www.tracopower.com/info/reflow-soldering.pdf
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

- RoHS Declaration

REACH SVHC list compliant

REACH Annex XVII compliant

www.tracopower.com/info/rohs-declaration.pdf

Exemptions: 7(a), 7(c)-I

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

- SCIP Reference Number

8fc743ba-ed28-4846-8011-e1e97ccb7dc7

Additional Information

Supporting Documents

www.tracopower.com/overview/tdn5wism

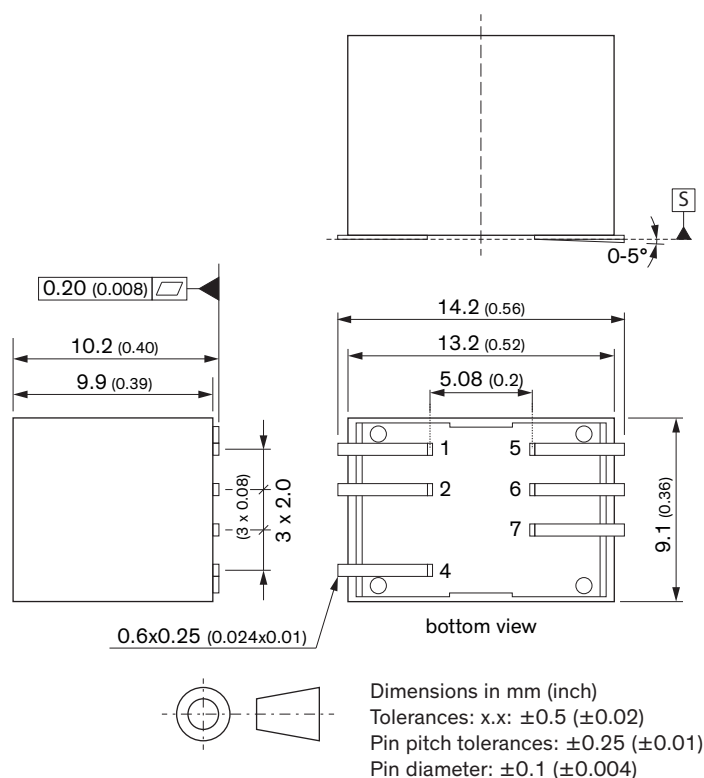
Frequently Asked Questions

www.tracopower.com/glossary-faq

Glossary

www.tracopower.com/info/glossary.pdf

Outline Dimensions



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

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

Technical drawing of a rectangular plate with dimensions in mm and inches. The plate is divided into two main sections by a vertical dashed line. The left section contains three horizontal rectangular features labeled 5, 6, and 7. The right section contains three horizontal rectangular features labeled 1, 2, and 4. The overall dimensions are as follows:

- Overall width: 16.2 (0.64)
- Overall height: 10.1 (0.4)
- Distance from top edge to the top of feature 5: 1.40 (0.055)
- Distance from the left edge of feature 5 to the left edge of feature 1: 3.8 (0.15)
- Distance from the top edge of feature 1 to the top edge of feature 2: 2.1 (0.08)
- Distance from the top edge of feature 2 to the top edge of feature 4: 2.00 (0.079)
- Distance from the left edge of feature 1 to the left edge of feature 4: 5.70 (0.224)
- Distance from the top edge of feature 4 to the bottom edge of the plate: 6.00 (0.236)