



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!



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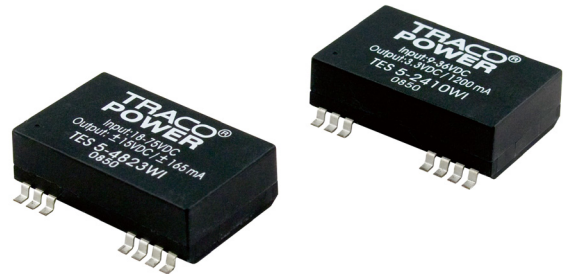
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Features

- ◆ Compact SMD package
- ◆ 33.4 x 25.6 mm footprint
- ◆ Ultra-wide 4:1 input voltage range
- ◆ I/O isolation 1500 VDC
- ◆ Operating temp. range -40°C to $+71^{\circ}\text{C}$
- ◆ Short circuit protection
- ◆ Input filter to meet EN 55022, class A
- ◆ Remote On/Off
- ◆ High accuracy of pin co-planarity
- ◆ 3-year product warranty



The TES-5WI series is a family of high performance 5W dc/dc-converter modules in a low profile SMD package with compact dimensions. The 14 modules feature ultra-wide 4:1 input ranges with tightly regulated output voltage. High efficiency allows an operating temperature range of -40 to $+71^{\circ}\text{C}$ at full load.

Further features are built-in EMI-filter to meet EN 55022 class A without external components and remote On/Off control. The products comply with IPC J-STD-020D and are qualified for high temperature lead-free reflow solder process.

Models				
Order code	Input voltage	Output voltage	Output current max.	Efficiency typ.
TES 5-2410WI	9 – 36 VDC (24 VDC nominal)	3.3 VDC	1'200 mA	76 %
TES 5-2411WI		5 VDC	1'000 mA	80 %
TES 5-2412WI		12 VDC	420 mA	83 %
TES 5-2413WI		15 VDC	335 mA	83 %
TES 5-2421WI		± 5 VDC	± 500 mA	80 %
TES 5-2422WI		± 12 VDC	± 210 mA	83 %
TES 5-2423WI		± 15 VDC	± 165 mA	83 %
TES 5-4810WI		18 – 75 VDC (48 VDC nominal)	3.3 VDC	1'200 mA
TES 5-4811WI	5 VDC		1'000 mA	80 %
TES 5-4812WI	12 VDC		420 mA	83 %
TES 5-4813WI	15 VDC		335 mA	83 %
TES 5-4821WI	± 5 VDC		± 500 mA	80 %
TES 5-4822WI	± 12 VDC		± 210 mA	83 %
TES 5-4823WI	± 15 VDC		± 165 mA	83 %

Input Specifications

Input current (full load)	24 V models: 250 mA typ. 48 V models: 125 mA typ.
Input current (no load)	24 V models: 20 mA typ. 48 V models: 10 mA typ.
Start-up voltage / under voltage shut down	24 V models: 9 VDC / 8 VDC typ. 48 V models: 18 VDC / 16 VDC typ
Surge voltage (1 sec. max.)	24 V models: 50 V max. 48 V models: 100 V max.
Reverse voltage protection	1.0 A max.
Reflected input ripple current	24 V models: 10 mA typ. 48 V models: 5 mA typ.
Input filter	EN 55022 class A, FCC part 15, level A

Output Specifications

Voltage set accuracy	±2 %
Regulation	– Input variation $V_{in \text{ min.}}$ to $V_{in \text{ max.}}$: 1.0 % max. – Load variation 10 – 100 % single output models: 1.0 % max. dual output models balanced load: 3.0 % max.
Minimum load	10 % of rated max current (operation at lower load condition is safe but a higher output ripple will be experienced)
Temperature coefficient	±0.02 %/°C max.
Ripple and noise	85 mVpk-pk max.
Dynamic load response (25% load change)	6 % max. peak variation 500 μ S max. response time
Transient response (25% load step change)	200 μ s typ.
Current limitation	>115 % of $I_{out \text{ max.}}$
Short circuit protection	indefinite, automatic recovery
Capacitive load	3.3 & 5 VDC models: 2000 μ F 12 VDC models: 470 μ F 15 VDC models: 330 μ F \pm 5 VDC models: \pm 680 μ F \pm 12 VDC models: \pm 330 μ F \pm 15 VDC models: \pm 220 μ F
Remote On/Off	– On: 2.5 to 5.5 V or open circuit – Off: –0.7 to 0.8 V or short circuit pin 3 and pin 1/2 – Off idle current: 10 mA

General Specifications

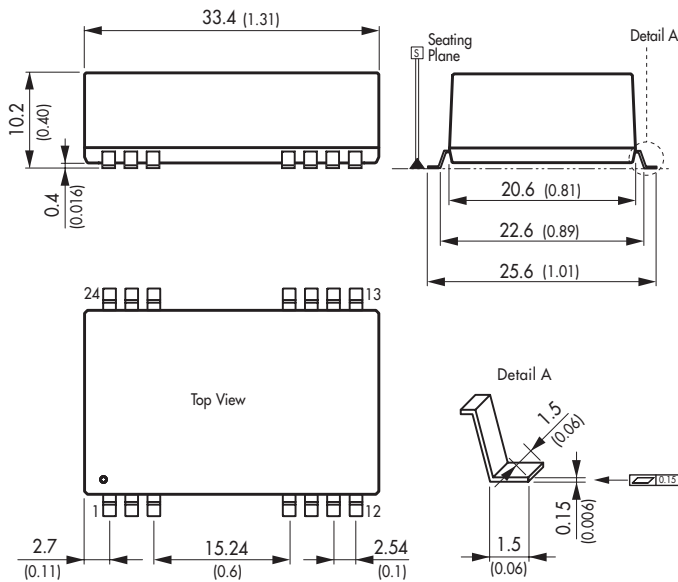
Temperature ranges	– Operating: –40°C to +71°C – Case temperature: +100°C max. – Storage: –40°C to +125°C
Humidity (non condensing)	95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)	>1'000'000 h
Isolation voltage (60 sec.)	– Input/Output: 1'500 VDC
Isolation capacitance	– Input/Output: 750 pF max.
Isolation resistance	– Input/Output: >1'000 Mohm
Switching frequency	340 kHz typ. (frequency modulation PFM)
Safety standards	UL 60950-1, IEC/EN 60950-1

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

Physical Specifications

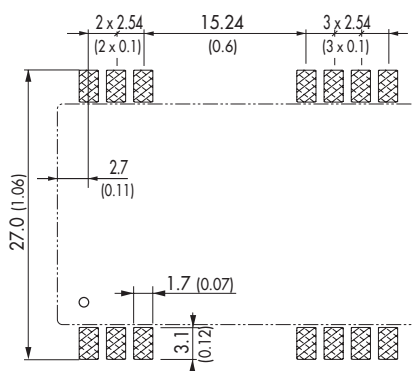
Casing material	non conductive plastic (UL 94V-0 rated)
Package weight	14 g (0.49 oz)
Moisture sensivity level (MSL)	level 2 as per J-STD-020D.1 (to find at: www.jedec.org - free registration required)
Packaging	www.tracopower.com/products/tes5wi-pack.pdf
Environmental compliance	- Reach - RoHS www.tracopower.com/products/tes5wi-reach.pdf RoHS directive 2011/65/EU

Outline Dimensions



Pin-Out		
Pin	Single	Dual
1	Remote On/Off	Remote On/Off
2	-Vin (GND)	-Vin (GND)
3	-Vin (GND)	-Vin (GND)
9	No con.	Common
10	No con.	No con.
11	No con.	-Vout
12	No con.	No con.
13	No con.	No con.
14	+Vout	+Vout
15	No con.	No con.
16	-Vout	Common
22	+Vin (Vcc)	+Vin (Vcc)
23	+Vin (Vcc)	+Vin (Vcc)
24	No con.	No con.

Pin Patterns:



Dimensions in [mm], () = Inch
Tolerances ±0.25 (±0.02)
Pin pitch tolerances ±0.13 (±0.005)

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at www.tracopower.com