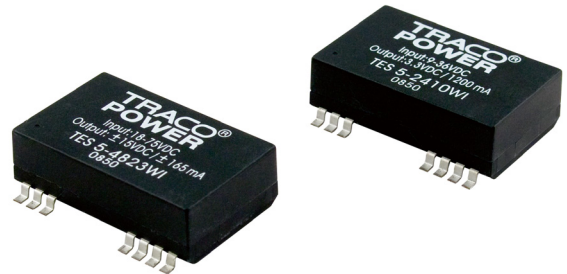


#### Features

- ◆ 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  $-40^{\circ}\text{C}$  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		$\pm 5$ VDC	$\pm 500$ mA	80 %
TES 5-2422WI		$\pm 12$ VDC	$\pm 210$ mA	83 %
TES 5-2423WI		$\pm 15$ VDC	$\pm 165$ 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	$\pm 5$ VDC		$\pm 500$ mA	80 %
TES 5-4822WI	$\pm 12$ VDC		$\pm 210$ mA	83 %
TES 5-4823WI	$\pm 15$ VDC		$\pm 165$ 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	<ul style="list-style-type: none"> <li>- Input variation <math>V_{in \text{ min.}}</math> to <math>V_{in \text{ max.}}</math>: 1.0 % max.</li> <li>- Load variation 10 – 100 % single output models: 1.0 % max.</li> <li style="padding-left: 20px;">dual output models balanced load: 3.0 % max.</li> </ul>
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 µS max. response time
Transient response (25% load step change)	200 µs typ.
Current limitation	>115 % of I <sub>out</sub> max.
Short circuit protection	indefinite, automatic recovery
Capacitive load	3.3 & 5 VDC models: 2000 µF 12 VDC models: 470 µF 15 VDC models: 330 µF ±5 VDC models: ±680 µF ±12 VDC models: ±330 µF ±15 VDC models: ±220 µF
Remote On/Off	<ul style="list-style-type: none"> <li>- On: 2.5 to 5.5 V or open circuit</li> <li>- Off: -0.7 to 0.8 V or short circuit pin 3 and pin 1/2</li> <li>- Off idle current: 10 mA</li> </ul>

### General Specifications

Temperature ranges	<ul style="list-style-type: none"> <li>- Operating: -40°C to +71°C</li> <li>- Case temperature: +100°C max.</li> <li>- Storage: -40°C to +125°C</li> </ul>
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.)	<ul style="list-style-type: none"> <li>- Input/Output: 1'500 VDC</li> </ul>
Isolation capacitance	<ul style="list-style-type: none"> <li>- Input/Output: 750 pF max.</li> </ul>
Isolation resistance	<ul style="list-style-type: none"> <li>- Input/Output: &gt;1'000 Mohm</li> </ul>
Switching frequency	340 kHz typ. (frequency modulation PFM)
Safety standards	UL 60950-1, IEC/EN 60950-1

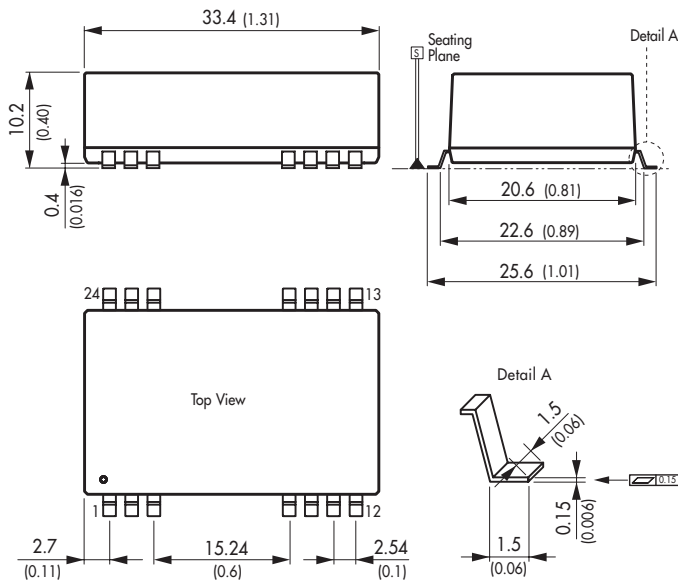
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

**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: <a href="http://www.jedec.org">www.jedec.org</a> - free registration required)
Environmental compliance	- Reach - RoHS <a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a> RoHS directive 2011/65/EU

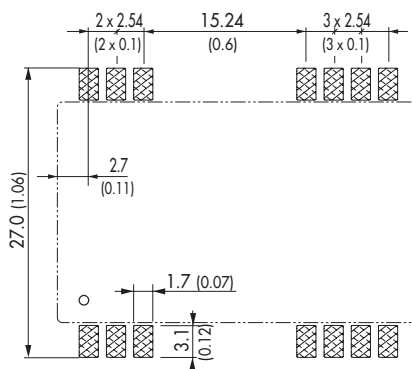
**Supporting documents:** [www.tracopower.com/overview/tes5wi](http://www.tracopower.com/overview/tes5wi)

**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  $\pm 0.25$  ( $\pm 0.02$ )  
Pin pitch tolerances  $\pm 0.13$  ( $\pm 0.005$ )

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at [www.tracopower.com](http://www.tracopower.com)

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [Isolated DC/DC Converters](#) category:*

*Click to view products by [TRACO Power](#) manufacturer:*

Other Similar products are found below :

[PSL486-7LR](#) [Q48T30020-NBB0](#) [JAHW100Y1](#) [SPB05C-12](#) [SQ24S15033-PS0S](#) [CE-1003](#) [CE-1004](#) [MAU228](#) [J80-0041NL](#) [DFC15U48D15](#)  
[XGS-1205](#) [06322](#) [SPB05B-15](#) [L-DA20](#) [DCG40-5G](#) [XKS-2405](#) [DPA423R](#) [vi-m13-cw-03](#) [VI-L53-CV](#) [24IBX15-50-0ZG](#) [HZZ01204-G](#)  
[SPU02L-09](#) [SPU02M-09](#) [SPU02N-09](#) [QUINT4-BUFFER/24DC/40](#) [QUINT4-CAP/24DC/5/4KJ](#) [73-551-5039I](#) [DFC15U48D15G](#) [SEN-6471-](#)  
[1EM](#) [AHV2815DF/HBB](#) [MI-LC21-IX](#) [PAH-48/8.5-D48NB1-C](#) [BM3020-7A](#) [QRS2050P025K00](#) [CM2320-9EG](#) [SKMW15F-05](#)  
[V300A28H400BF3](#) [TEN 15-1223](#) [TEQ 100-2418WIR](#) [TEQ 160-7218WIR](#) [R05C05TE05S-R](#) [HQA2W085W033V-N07-S](#) [AM1SS-2405SJZ](#)  
[AM2DS-1224SJZ](#) [AM2DS-2405DJZ](#) [AM10SBO-4824SNZ-B](#) [AM15E-2405S-NZ](#) [AM2DS-1212SJZ](#) [AM30SBO-4805SNZ-B](#)  
[LT8301ES5#WTRPBF](#)