

## **DC/DC Converters**

TES 3WI Series, 3 Watt



## **Features**

- Compact SMD package
- 33.4 x 18.8 mm footprint
- Ultra-wide 4:1 input voltage range
- ◆ I/O isolation 1500 VDC
- ◆ Operating temp. range -40°C to +71°C
- Short circuit protection
- Input filter to meet EN 55022, class A
- Remote On/Off
- High accuracy of pin co-planarity
- Qualified for leadfree reflow solder process according IPC/JEDEC J-STD-020D
- Available in tape & reel package
- 3-year product warranty



The TES-3WI series is a family of high performance 3W dc/dc-converter modules in a low profile SMD package with compact dimensions. The 14 modules feature ultrawide 4:1 input ranges with tightly regulated output voltage. High efficiency allows an operating temperature range of -40°C to +71°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				
Ordercode	Input voltage	Output voltage	Output current max.	Efficiency typ.
TES 3-2410WI		3.3 VDC	750 mA	75 %
TES 3-2411WI	<b>9 – 36 VDC</b> (nominal 24 VDC)	5 VDC	600 mA	79 %
TES 3-2412WI		12 VDC	250 mA	81 %
TES 3-2413WI		15 VDC	200 mA	81 %
TES 3-2421WI		±5 VDC	±300 mA	78 %
TES 3-2422WI		±12 VDC	±125 mA	81 %
TES 3-2423WI		±15 VDC	±100 mA	81 %
TES 3-4810WI	<b>18 - 75 VDC</b> (nominal 48 VDC)	3.3 VDC	750 mA	76 %
TES 3-4811WI		5 VDC	600 mA	80 %
TES 3-4812WI		12 VDC	250 mA	83 %
TES 3-4813WI		15 VDC	200 mA	83 %
TES 3-4821WI		±5 VDC	±300 mA	80 %
TES 3-4822WI		±12 VDC	±125 mA	83 %
TES 3-4823WI		±15 VDC	±100 mA	83 %



Input Specifications			
Input current (no load)		24 V models: 48 V models:	20 mA typ. 10 mA typ.
Start-up voltage / under voltage shut down 24 V models:			8.5 VDC / 8 VDC typ. 17 VDC / 16 VDC typ
Surge voltage (1 sec. max.)		24 V models: 48 V models:	
Reverse voltage protection			1.0 A max.
Reflected input ripple curre	nt	24 V models: 48 V models:	, i
Input filter			EN 55022 class A, FCC part 15, level A
<b>Output Specification</b>	S		
Voltage set accuracy			±1 %
Regulation	– Input variation Vin min – Load variation 10 – 10 dual		0.5 % max. 1.0 % max. 2.0 % 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			50 mVpk-pk max.
Transient Response (25% la	oad step change) – Recovery time – Deviation		500 μs max. 6 % max.
Current limitation			>120 % of lout max.
Short circuit protection			continuous, automatic recovery
Capacitive load		single output models: dual output models:	3000 μF 180 μF (each output)
Remote On/Off	<ul><li>On:</li><li>Off:</li><li>Off idle current:</li></ul>		2.5 to 5.5 V or open circuit -0.7 to 0.8 V or short circuit pin 3 and pin 1/2 5 mA
<b>General Specificatio</b>	ns		
Temperature ranges	<ul><li>Operating</li><li>Case temperature</li><li>Storage</li></ul>		-40°C to +71°C +100°C max. -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		500 pF max.
Isolation resistance	- Input/Output		>1′000 Mohm
Switching frequency			300 kHz typ. (frequency modulation PFM)
Environmental compliance	– Reach – RoHS		www.tracopower.com/info/reach-declaration.pc RoHS Directive 2011/65/EU

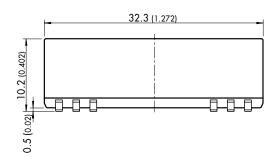
Supporting documents: www.tracopower.com/overview/tes3wi

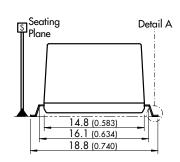
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

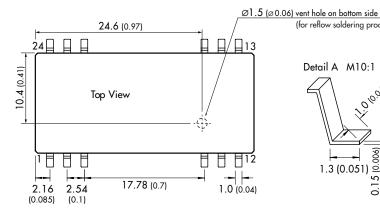


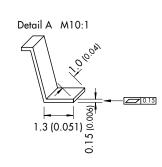
Physical Specifications	
Casing material	non conductive plastic (UL 94V-0 rated)
Package weight	<b>8.8 g</b> (0.31oz)
Lead-free reflow solder process	as per J-STD-020D.1 (to find at: www.jedec.org - free registration required)
Moisture sensivity level (MSL)	level 2 as per J-STD-033B.1 (to find at: www.jedec.org - free registration required)
Washing process	not recommended. Product non-hermetical.

## **Outline Dimensions**



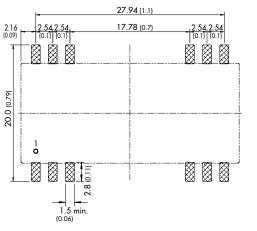






(for reflow soldering process)

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

No con. = Pin to be isolated from circuitry

Dimensions in [mm], () = InchTolerances  $\pm 0.25 (\pm 0.01)$ 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