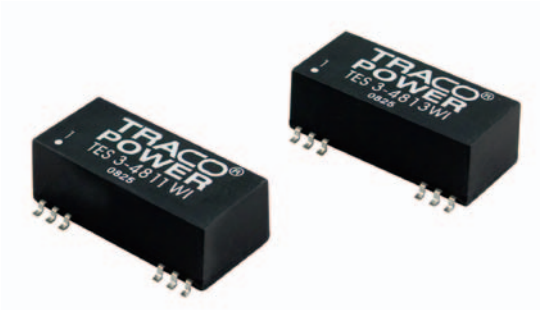
DC/DC Converters

TES 3WI Series, 3 Watt

UL 60950-1 pending

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 ultra-wide 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	9 – 36 VDC (nominal 24 VDC)	3.3 VDC	750 mA	75 %
TES 3-2411WI		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	18 – 75 VDC (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 (full load)	24 V models: 48 V models:	150 mA typ. 75 mA typ.
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: 48 V models:	8.5 VDC / 8 VDC typ. 17 VDC / 16 VDC typ
Surge voltage (1 sec. max.)	24 V models: 48 V models:	50 V max. 100 V max.
Reverse voltage protection		1.0 A max.
Reflected input ripple current	24 V models: 48 V models:	10 mA typ. 5 mA typ.
Input filter		EN 55022 class A, FCC part 15, level A

Output Specifications

Voltage set accuracy		±1 %
Regulation	– Input variation Vin min. to Vin max. – Load variation 10 – 100 % single output models: dual output models balanced load:	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		75 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		>120 % of Iout max.
Short circuit protection		continuous, automatic recovery
Capacitive load	single output models: dual output models:	3000 µF ±180 µF
Remote On/Off	– On: – Off: – Off idle current:	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

General Specifications

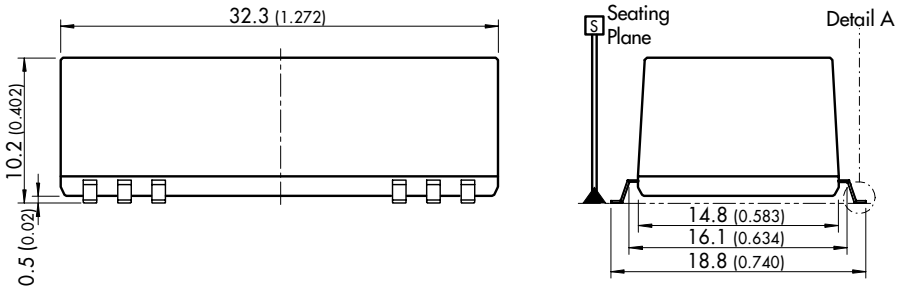
Temperature ranges	– Operating – Case temperature – Storage	–40°C to +71°C +100°C max. –40°C to +125°C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTTF (MIL-HDBK-217F, @+25°C, ground benign)		>1'000'000 h
Isolation voltage (60 sec.)	– Input/Output	1'500 VDC
Isolation capacitance	– Input/Output	500 pF max.
Isolation resistance	– Input/Output	>1'000 Mohm
Switching frequency		300 kHz typ. (frequency modulation PFM)
Safety standards		UL 60950-1, IEC/EN 60950-1
Safety approvals		CSA File No. 226037 http://directories.csa-international.org (entry pending)

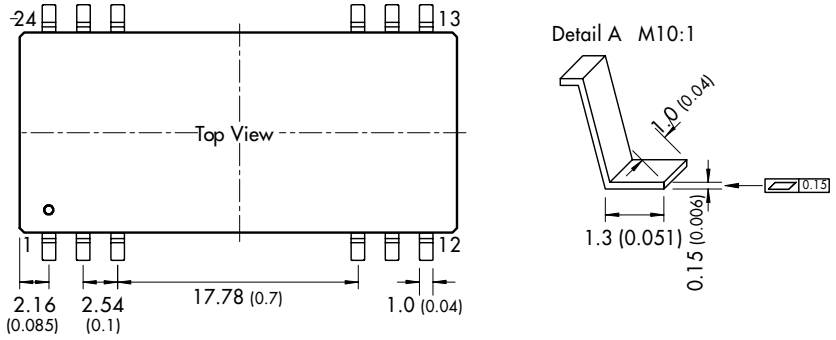
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Physical Specifications

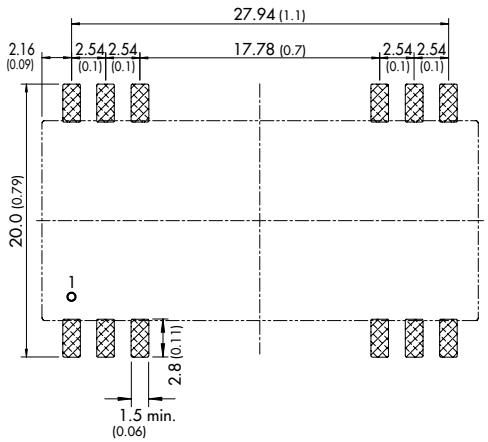
Casing material	non conductive plastic (UL 94V-0 rated)
Package weight	8.8 g (0.31oz)
Lead-free reflow solder process	as per J-STD-020D.01 (to find at: www.jedec.org - free registration required)
Moisture sensivity level (MSL)	level 2 as per J-STD-033B.01 (to find at: www.jedec.org - free registration required)
Washing process	www.tracopower.com/products/smd-wash.pdf
Packaging	www.tracopower.com/products/tes3wi-pack.pdf

Outline Dimensions





Solder Pad Dimension



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], () = Inch
Tolerances ±0.25 (±0.01)
Pin pitch tolerances ±0.13 (±0.005)

Specifications can be changed any time without notice.

TRACO ELECTRONIC AG
Jenatschstrasse 1 · CH-8002 Zurich · Switzerland
Tel. +41 43 311 45 11 · Fax +41 43 311 45 45 · info@traco.ch · www.tracopower.com