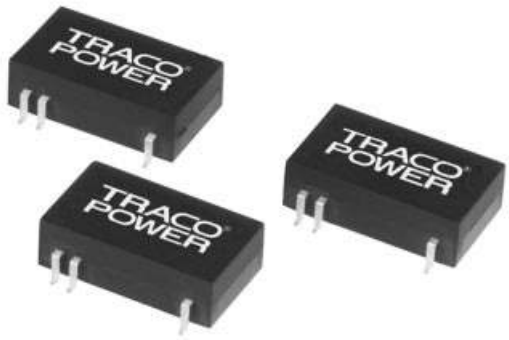
DC/DC Converter

TES 2N Series 2 Watt

Features

- Ultracompact SMD-Package
- Wide 2:1 Input Range
- I/O-Isolation 1500 VDC
- Input Filter meets EN55022, Class A
- Low Ripple and Noise
- Shortcircuit Protection
- Operating Temperature Range -40°C to +75°C
- 3 Year Product Warranty



The TES 2N converter series, comprising 28 models, is intended for all applications where PCB's are assembled on an automated SMD production line. With its ultra compact package, this regulated 2 Watt converter requires only 3cm² of PCB space. They offer a 1500 VDC I/O-isolation and internal filters to reduce reflected input ripple current and to guarantee low output noise. With a temperature range of -40°C - +75°C without power derating, these converters are the state-of-the-art solution for many applications in telecommunication, control units and industrial equipments.

Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TES 2N-0510	4.5 – 9.0 VDC	3.3 VDC	500 mA	70 %
TEL 2N-0511		5 VDC	400 mA	73 %
TES 2N-0512		12 VDC	165 mA	75 %
TES 2N-0513		15 VDC	135 mA	73 %
TES 2N-0521		± 5 VDC	± 200 mA	64 %
TES 2N-0522		± 12 VDC	± 85 mA	69 %
TES 2N-0523		± 15 VDC	± 65 mA	71 %
TES 2N-1210	9 – 18 VDC	3.3 VDC	500 mA	73 %
TES 2N-1211		5 VDC	400 mA	77 %
TES 2N-1212		12 VDC	165 mA	80 %
TES 2N-1213		15 VDC	135 mA	80 %
TES 2N-1221		± 5 VDC	± 200 mA	73 %
TES 2N-1222		± 12 VDC	± 85 mA	78 %
TES 2N-1223		± 15 VDC	± 65 mA	78 %
TES 2N-2410	18 – 36 VDC	3.3 VDC	500 mA	72 %
TES 2N-2411		5 VDC	400 mA	77 %
TES 2N-2412		12 VDC	165 mA	80 %
TES 2N-2413		15 VDC	135 mA	81 %
TES 2N-2421		± 5 VDC	± 200 mA	74 %
TES 2N-2422		± 12 VDC	± 85 mA	78 %
TES 2N-2423		± 15 VDC	± 65 mA	80 %
TES 2N-4810	36 – 72 VDC	3.3 VDC	500 mA	71 %
TES 2N-4811		5 VDC	400 mA	73 %
TES 2N-4812		12 VDC	165 mA	79 %
TES 2N-4813		15 VDC	135 mA	79 %
TES 2N-4821		± 5 VDC	± 200 mA	71 %
TES 2N-4822		± 12 VDC	± 85 mA	77 %
TES 2N-4823		± 15 VDC	± 65 mA	77 %

Input Specifications

Input current at full load (nominal input)	5 Vin models:	930 mA typ.
	12 Vin models:	420 mA typ.
	24 Vin models:	205 mA typ.
	48 Vin models:	100 mA typ.
Surge voltage (100 msec. max.)	5 Vin models:	11 V max.
	12 Vin models:	25 V max.
	24 Vin models:	50 V max.
	48 Vin models:	100 V max.
Conducted noise (input)		EN 55022 level A, FCC part 15, level A

Output Specifications

Voltage set accuracy		± 2 %
Regulation	– Input variation Vin min. to Vin max.	± 0.5 % max.
	– Load variation 25 – 100 %	± 0.75 % max.
	dual output models:	± 2.0% (balanced load)
Ripple and noise (20 MHz Bandwidth)		50 mVpk-pk max
Temperature coefficient		± 0.02 %/K
Short circuit protection		indefinite, automatic recovery
Minimum load		25% of rated max current (operation at lower load condition is safe but a higher output ripple will be experienced)
Capacitive load	3.3 VDC output models:	2'200 µF max.
	5 VDC output models:	1'000 µF max.
	12 VDC output models:	170 µF max.
	15 VDC output models:	110 µF max.
	± 5 VDC output models:	470 µF max.
	± 12 VDC output models:	100 µF max.
	± 15 VDC output models:	47 µF max.

General Specifications

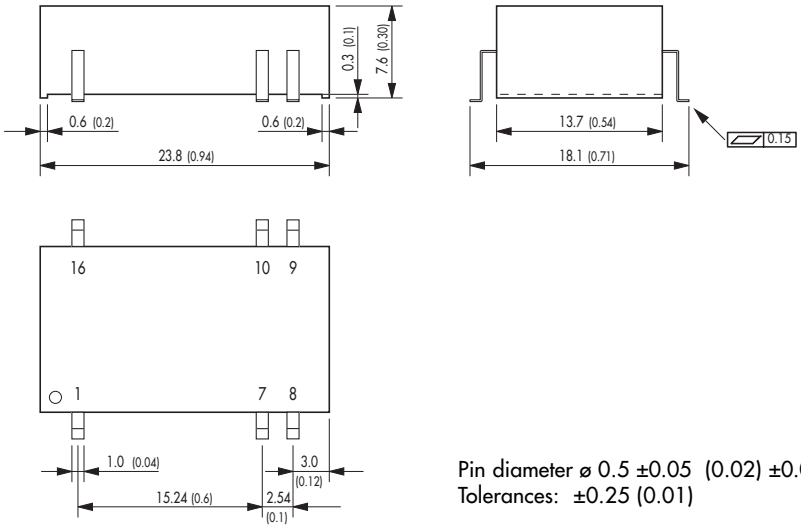
Temperature ranges	– Operating	– 40 °C ... + 75 °C (no derating)
	– Storage	– 40 °C ... + 125 °C
Humidity (non condensing)		95 % rel. H max.
Reliability, calculated MTBF (MIL-HDBK-217 F)		> 1.0 Mio h @ 25°C
Isolation voltage	Input/Output	1'500 VDC
Isolation capacity	Input/Output	250 pF
Isolation resistance	Input/Output (500 VDC)	> 1'000 M Ohm
Switching frequency		300 kHz (PFM)

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

General Specifications

Case material	Non-conductive plastic
Potting material	Epoxy, UL94V-0 - rated
Weight	5.1 g (0.17oz)
Reflow soldering profile	Peak temp. 230°C (10 sec max.) 185°C for 90 sec max. Convection reflow solder process is recommended

Outline Dimensions mm (inches)

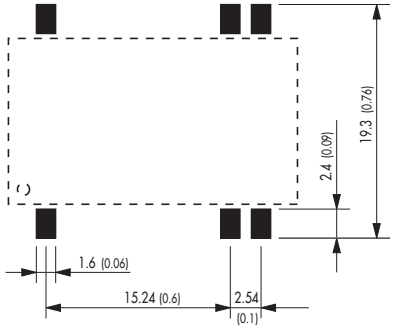


Pin diameter ø 0.5 ±0.05 (0.02) ±0.002
Tolerances: ±0.25 (0.01)

Pin-Out

Pin	Single	Dual
1	–Vin (GND)	–Vin (GND)
7	No con.	No con.
8	No con.	Common
9	+Vout	+Vout
10	–Vout	–Vout
16	+Vin	+Vin

Solder Pad Dimensions mm (inches)



Specifications can be changed without notice