DC/DC Converter

TES 2 Series **2 Watt**

Features

- Surface Mount DIL-Package
- 16 Standard Models
- Regulated Output Voltage
- I/O-isolation 1'000 VDC
- Very low Output Noise
- Indefinite Short-Circuit Protection
- High Accuracy of Pin Co-Planarity
- High Reliability, MTBF >800'000 h
- Reflow Soldering to CECC 00 802, Issue 2
- 2 Year Product Warranty

The TES 2 converter series is intended for all applications where PCB's are assembled on an automated SMD production line.The small size DIL-package and the light weight allows easy handling by pick-and-place machines.
They offer a 1000 VDC I/O-isolation and internal filters to reduce reflected input ripple current and to guarantee low output noise.This product series provides an economical solution for many cost critical applications in industrial and consumer electronics.

Models

Ordercode	Input voltage	Output voltage	Output current max.	Efficiency typ.
TES 2-0511	5 VDC ±10%	5 VDC	400 mA	60 %
TES 2-0512		12 VDC	165 mA	60 %
TES 2-0522		± 12 VDC	± 85 mA	60 %
TES 2-0523		± 15 VDC	± 65 mA	60 %
TES 2-1211	12 VDC ±10%	5 VDC	400 mA	60 %
TES 2-1212		12 VDC	165 mA	60 %
TES 2-1222		± 12 VDC	± 85 mA	60 %
TES 2-1223		± 15 VDC	± 65 mA	60 %
TES 2-2411	24 VDC ±10%	5 VDC	400 mA	60 %
TES 2-2412		12 VDC	165 mA	60 %
TES 2-2422		± 12 VDC	± 85 mA	60 %
TES 2-2423		± 15 VDC	± 65 mA	60 %
TES 2-4811	48 VDC ±10%	5 VDC	400 mA	60 %
TES 2-4812		12 VDC	165 mA	60 %
TES 2-4822		± 12 VDC	± 85 mA	60 %
TES 2-4823		± 15 VDC	± 65 mA	60 %

Input Specifications

Input current no load / full load	5 Vin models	80 mA / 665 mA typ.
	12 Vin models	35 mA / 280 mA typ.
	24 Vin models	17 mA / 140 mA typ.
	48 Vin models	10 mA / 70 mA typ.
Surge voltage (1 sec. max.)	5 Vin models	7.5 VDC max.
	12 Vin models	15 VDC max.
	24 Vin models	30 VDC max.
	48 Vin models	55 VDC max.
Reverse voltage protection		500 mA max.
Input Filter		Pi-Filter

Output Specifications

Voltage set accuracy		± 3 %
Regulation	– Input variation Vin min. to Vin max.	± 0.3 % max.
	– Load variation 10 – 100 %	
	– single output models	± 0.5 % max.
	– dual output models balanced load	± 3 % max.
Ripple and noise (20 MHz Bandwidth)		50 mVpk-pk max.
Temperature coefficient		± 0.02 % / °C
Output current limitation		>120 % of Iout max., constant current
Short circuit protection		indefinite (automatic recovery)
Capacitive load	– single output models	470 µF max.
	– dual output models	220 µF max.

General Specifications

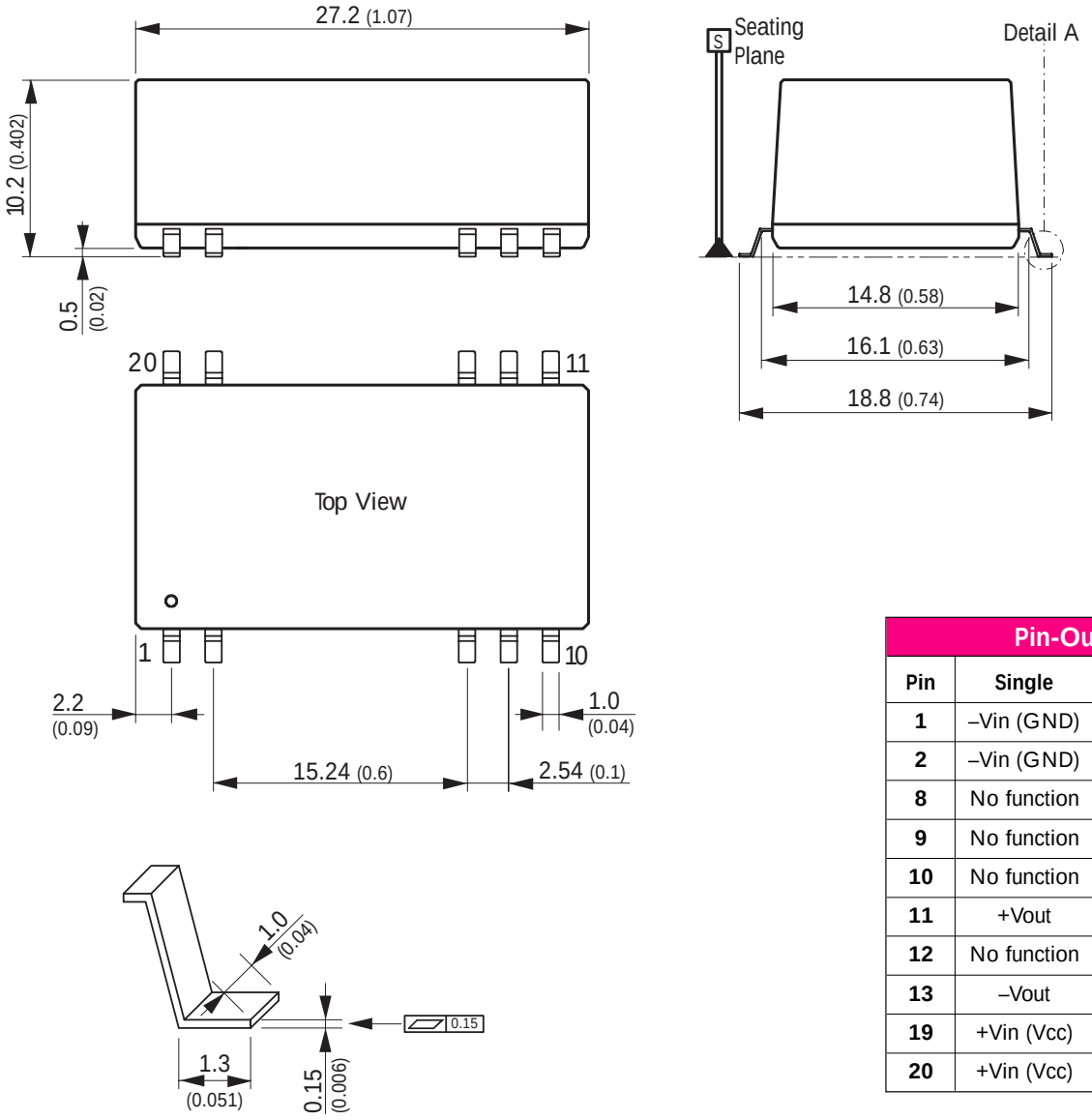
Temperature ranges	– Operating	– 40 °C ... + 60 °C (no derating)
	– Case temperature	+ 95 °C max.
	– Storage	– 40 °C ... + 125 °C
Derating		2.9% / °C above 60 °C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217 E)		>800'000h @ + 25 °C
Isolation voltage	Input / Output	1'000VDC
Isolation capacity	Input / Output	100 pF typ.
Isolation resistance	Input / Output (500 VDC)	> 1'000 M Ohm
Switching frequency		80 KHz typ. (depending on load)

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

Physical Specifications

Case material	non conductive black plastic
Weight	10 g (0.35 oz)
Reflow soldering profile	Peak temp. 230°C (10 sec max.) 185°C for 90 sec max. Convection reflow solder process is recommended

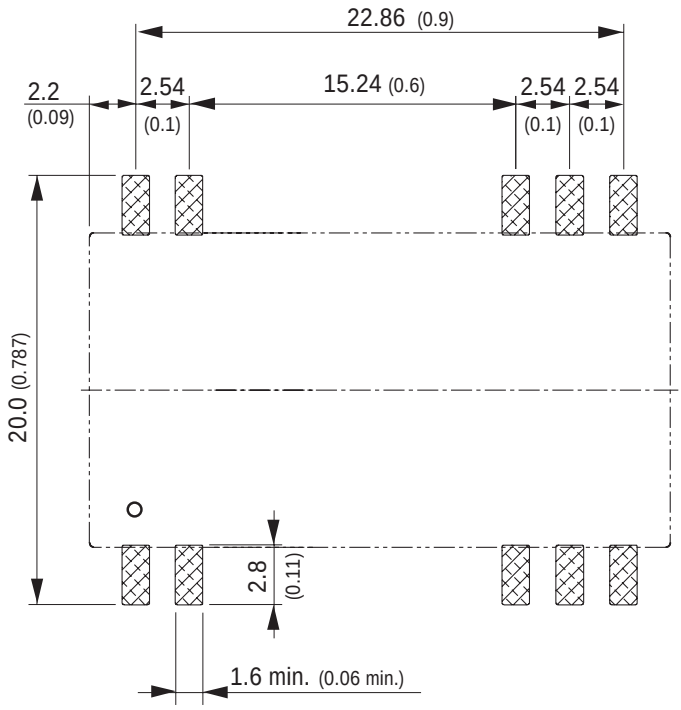
Outline Dimensions mm (inches)



Pin-Out		
Pin	**Single**	**Dual**
1	–Vin (GND)	–Vin (GND)
2	–Vin (GND)	–Vin (GND)
8	No function	Common
9	No function	No function
10	No function	–Vout
11	+Vout	+Vout
12	No function	No function
13	–Vout	Common
19	+Vin (Vcc)	+Vin (Vcc)
20	+Vin (Vcc)	+Vin (Vcc)

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

Solder Pad Dimensions mm (inches)



Specifications can be changed without notice

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