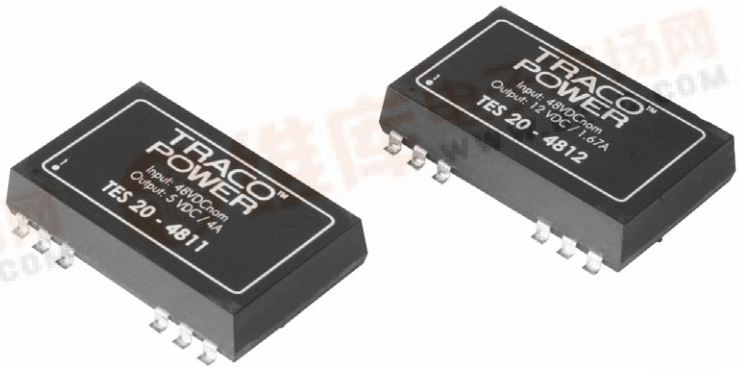
DC/DC Converters

TES 20 Series, 20 Watt

Features

- Wide 2 : 1 Input Range
- Highest Power Density
- Operating Temp. Range – 25°C to +71°C
- Indefinite Short-Circuit Protection
- I/O-Isolation 1500 VDC
- Remote on/off
- Input Filter meets EN 55022, Class A and FCC, Level A
- Industry Standard Pinout
- 3 Year Product Warranty



The TES 20 converter series is intended for all applications where PCB's are assembled on an automated SMD production line. The light weight DIL-package allows easy handling by pick and place machines. High efficiency allows an operating temperature range of -40°C to +71°C without derating. I/O-isolation of 1'500 VDC together with conducted noise complianceto EN 55022-A and FCC, level A makes these converters ideal for a wide range of applications in communications, mobile battery powered equipments and industrial systems.

Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TES 20-4809	36 – 75 VDC	2.0 VDC	4'000 mA	81 %
TES 20-4810		3.3 VDC	4'000 mA	84 %
TES 20-4811		5.0 VDC	4'000 mA	87 %
TES 20-4812		12.0 VDC	1'670 mA	87 %
TES 20-4813		15.0 VDC	1'330 mA	87 %

Input Specifications

Input current no load	48 Vin;		35 mA typ.
Input current full load	48 Vin;	2.0 Vout models:	205 mA typ.
	48 Vin;	3.3 Vout models:	330 mA typ.
	48 Vin;	other models:	480 mA typ.
Surge voltage (100ms max.)			100 V max.
Conducted noise (input)		3.3µF..100µF capacitor on the input (low ESR type or MLCC for SMD)	EN 55022 Class A and FCC part 15, level A

Output Specifications

Voltage set accuracy			± 1 % max.
Regulation	– Input variation Vin min. to Vin max.		0.5 % max.
	– Load variation 10 – 100 %		1.0 % max.
Ripple and noise (20 MHz Bandwidth)		2.0Vout, 3.3Vout:	50 mVpk-pk max. (with C out= 100nF/50V)
		5Vout, 12Vout, 15Vout:	75 mVpk-pk max (with C out= 100nF/50V)
Temperature coefficient			± 0.02 % /K
Output current limitation			120% to 140% of Iout, foldback
Short circuit protection			indefinite, automatic recovery
Capacitive load		2.0 Vout models:	1'500 µF max.
		3.3 Vout models:	1'500 µF max.
		5 Vout models:	1'500 µF max.
		12 Vout models:	330 µF max.
		15 Vout models:	330 µF max.

General Specifications

Temperature ranges	– Operating		– 40°C ... + 71°C (–40...–25°C need Iout min.10%)
	– Case temperature		+ 100 °C max.
	– Storage		– 55 °C ... + 125 °C
Derating			3.5%/K above 71°C
Humidity (non condensing)			95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217 F)			340'000 h @ + 25 °C
Isolation voltage	– Input/Output		1'500 VDC
Isolation capacity	– Input/Output		500 pF max.
Isolation resistance	– Input/Output (500 VDC)		> 1'000 MOhm
Switching frequency (fixed)			300 kHz typ. (Pulse width modulation PWM)
Remote ON/OFF		ON:	3.5 ... 12.0 VDC or open circuit (Isource = max. 200 µA)
		OFF:	0 ... 1.2 VDC or short circuit Pin 8 & Pin 11 (Isink = max. 100 µA)
		OFF stand by current:	16 mA max.
Safety standards	compliance up to 60VDC input voltage (SELV limit)		UL 1950, EN 60950, IEC 60950
Savety approvals			UL /cUL E188913

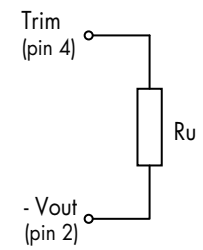
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Physical Specifications

Case material	Epoxy
Baseplate	Epoxy
Potting material	Epoxy (UL 94V-0 rated)
Weight	32g (1.13oz)
Soldering temperature	max. 250 °C / 10 sec.

Output Voltage Adjustment

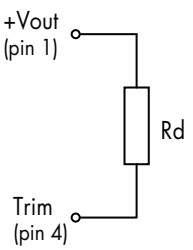
Trim up



Ru [kohm]*

output	2.0V	3.3V	5.0V	12V	15V
+5%	1.8	8.2	6.8	10	22
+10%	0.047	0.82	1.5	0.0	2.7

Trim down

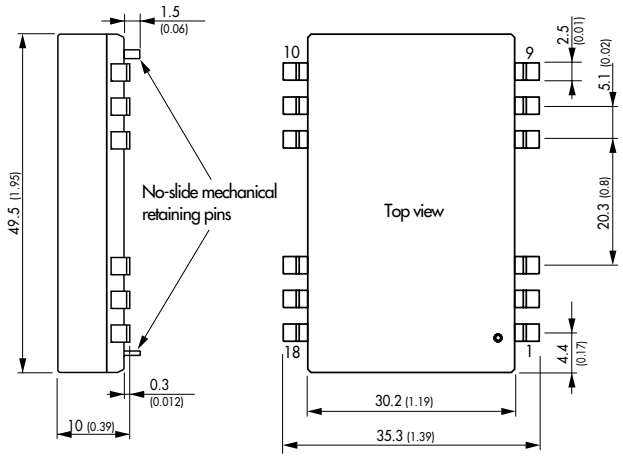


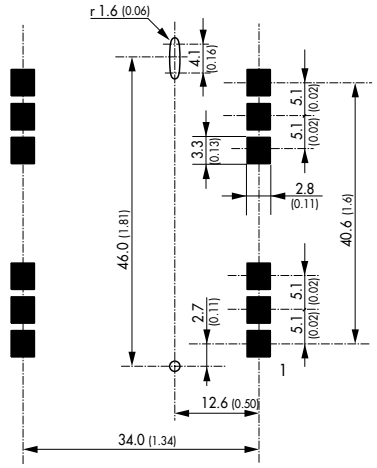
Rd [kohm]*

output	2.0V	3.3V	5.0V	12V	15V
–5%	2.7	8.2	5.6	22	18
–10%	0.15	0.56	0.39	2.7	1.5

* approximate values

Outline Dimensions mm (inches)





Tolerances: ±0.1mm (0.04 Inches)

Pin-Out	
Pin	**Single**
1	+ Vout
2	– Vout
3	NC
4	TRIM
5	NC
6	NC
7	NC
8	Remote on/off
9	SYNC (optional)
10	NC
11	– Vin
12	+ Vin

Specifications can be changed without notice

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