DC/DC Converters

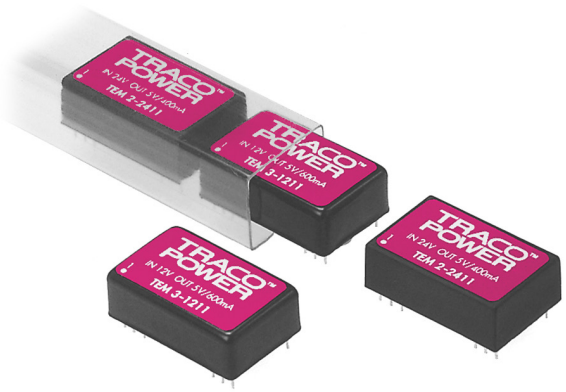
TEM 2 Series, 2 Watt

UL 60950-1

Features

- DIL-24 plastic package
- Tightly regulated output
- Very low output noise
- Short circuit protection
- Operating temperature range –25°C to +70°C
- I/O isolation 1'000 VDC
- Internal filter
- Industry standard pinout
- 3-year product warranty

End of life



The TEM 2 series is a family of isolated dc/dc converters in a DIP-24 package. They offer tight line/load regulation and 1000 VDC I/O isolation. Standard features include an internal filter to reduce reflected input ripple currrent and to guarantee low output noise. This product series provides a cost effective solution by many industrial or consumer electronics appliactions.

Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEM 2-0511 *	5 VDC ±10%	5 VDC	400 mA	50 %
TEM 2-0512*		12 VDC	165 mA	54 %
TEM 2-0521 *		±12 VDC	±80 mA	53 %
TEM 2-0522*		±15 VDC	±65 mA	51 %
TEM 2-1211 *	12 VDC ±10%	5 VDC	400 mA	50 %
TEM 2-1212*		12 VDC	165 mA	56 %
TEM 2-1221 *		±12 VDC	±80 mA	59 %
TEM 2-1222*		±15 VDC	±65 mA	59 %
TEM 2-2411 *	24 VDC ±10%	5 VDC	400 mA	51 %
TEM 2-2412*		12 VDC	165 mA	61 %
TEM 2-2421 *		±12 VDC	±80 mA	61 %
TEM 2-2422*		±15 VDC	±65 mA	61 %

* = End of life

Input Specifications

Input current no load		5 Vin models:	**80 mA typ.**
		12 Vin models:	**40 mA typ.**
		24 Vin models:	**20 mA typ.**
Surge voltage (1 sec. max.)		5 Vin models:	**7.5 V max.**
		12 Vin models:	**15 V max.**
		24 Vin models:	**30 V 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:	**±1.0 % max.**
		dual output models unbalanced load:	**±3.0 % max.**
Ripple and noise (20 MHz Bandwidth)			**50 mVpk-pk max**
Temperature coefficient			**±0.02 %/K**
Current limitation			**>120 % of Iout max., constant current**
Short circuit protection			**indefinite**
Capacitive load		single output models:	**470 µF max.**
		dual output models:	**220 µF max.**

General Specifications

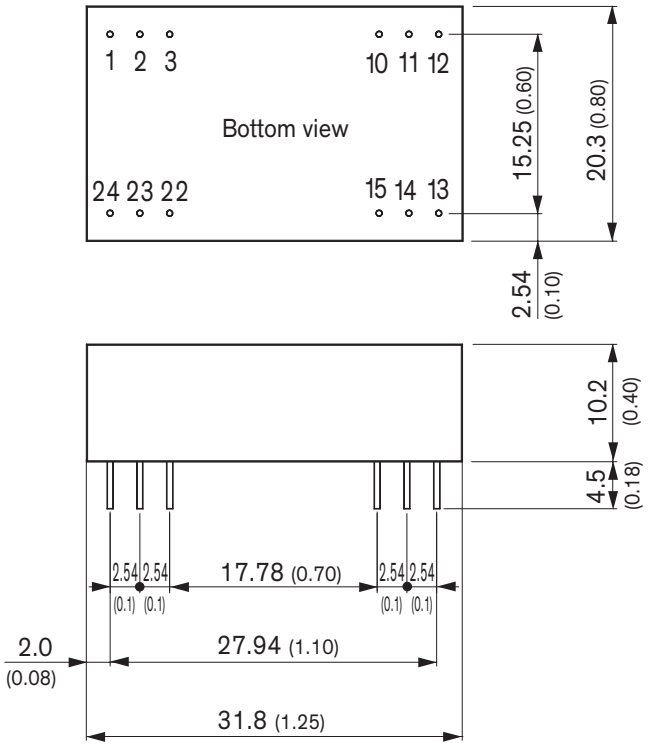
Temperature ranges	– Operating		**–25°C to +70°C**
		5 VDC output models:	**–25°C to +60°C**
	– Case temperature		**+95°C max.**
	– Storage		**–40°C to +125°C**
Derating			**3 %/K above +70°C**
Humidity (non condensing)			**95 % rel H max.**
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)			**>800'000 Mio. h**
Isolation voltage (60 sec.)	– Input/Output		**1'000 VDC**
Isolation capacitance	– Input/Output		**100 pF typ.**
Isolation resistance	– Input/Output (500 VDC)		**>1'000 M Ohm**
Switching frequency			**80 kHz typ.** (Pulse frequency modulation PFM)
Safety standards			**cUL/UL 60950-1, IEC/EN 60950-1**
Environmental compliance	– Reach		www.tracopower.com/info/reach-declaration.pdf
	– RoHS		directive 2011/65/EU

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 (UL94V-0 rated)
Weight	12 g (0.42 oz)
Soldering temperature	max. 260°C / 10 sec.

Outline Dimensions mm (inches)



Pin-Out		
Pin	**Single**	**Dual**
1	+Vin (Vcc)	+Vin (Vcc)
2	NC	–Vout
3	NC	Common
10	–Vout	Common
11	+Vout	+Vout
12	–Vin (GND)	–Vin (GND)
13	–Vin (GND)	–Vin (GND)
14	+Vout	+Vout
15	–Vout	Common
22	NC	Common
23	NC	–Vout
24	+Vin (Vcc)	+Vin (Vcc)

NC = not connected

Pin diameter ø 0.5 ±0.05 (0.02) ±0.002
Tolerances ±0.5 (±0.02)

Specifications can be changed any time without notice.