

### Features

- ◆ Cost optimized design in DIP-24 package
- ◆ Fully regulated output
- ◆ Output ripple & noise 30 mVp-p typ.
- ◆ Short circuit protection
- ◆ Operating temperature range  $-40^{\circ}\text{C}$  to  $+75^{\circ}\text{C}$  at full load
- ◆ I/O isolation 1'500 VDC
- ◆ Input filter meet EN 55022, class A
- ◆ No minimum load required
- ◆ Industry standard pinout
- ◆ 3-year product warranty



The TEM 3N series is a range of isolated dc/dc converters in a DIP-24 package. They offer tight output regulation and very low output noise. Operating temperature range is  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ . This product series provides a cost effective solution for many industrial or consumer electronics applications.

Models				
Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEM 3-0511N	5 VDC $\pm 10\%$	5 VDC	600 mA	70 %
TEM 3-0512N		12 VDC	250 mA	78 %
TEM 3-0513N		15 VDC	200 mA	78 %
TEM 3-0522N		$\pm 12$ VDC	$\pm 125$ mA	78 %
TEM 3-0523N		$\pm 15$ VDC	$\pm 100$ mA	78 %
TEM 3-1211N	12 VDC $\pm 10\%$	5 VDC	600 mA	74 %
TEM 3-1212N		12 VDC	250 mA	80 %
TEM 3-1213N		15 VDC	200 mA	80 %
TEM 3-1222N		$\pm 12$ VDC	$\pm 125$ mA	81 %
TEM 3-1223N		$\pm 15$ VDC	$\pm 100$ mA	82 %
TEM 3-2411N	24 VDC $\pm 10\%$	5 VDC	600 mA	75 %
TEM 3-2412N		12 VDC	250 mA	80 %
TEM 3-2413N		15 VDC	200 mA	80 %
TEM 3-2422N		$\pm 12$ VDC	$\pm 125$ mA	81 %
TEM 3-2423N		$\pm 15$ VDC	$\pm 100$ mA	82 %

### Input Specifications

Input current no load / full load	5 Vin models:	90 mA / 800 mA typ.
	12 Vin models:	45 mA / 320 mA typ.
	24 Vin models:	22 mA / 160 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.

### Output Specifications

Voltage set accuracy		±2 %
Regulation	– Input variation Vin min. to Vin max.	±0.5 % max.
	– Load variation 10 – 100 %	
	single output models:	±0.5 % max.
	dual output models balanced load:	±3.0 % max.
Ripple and noise (20 MHz Bandwidth)		60 mVp-p max. (30 mVp-p typ.)
Temperature coefficient		±0.02 %/K
Current limitation		>120 % of Iout max., constant current
Short circuit protection		continuous
Capacitive load	5 VDC models:	470 µF max.
	other models:	100 µF max.

### General Specifications

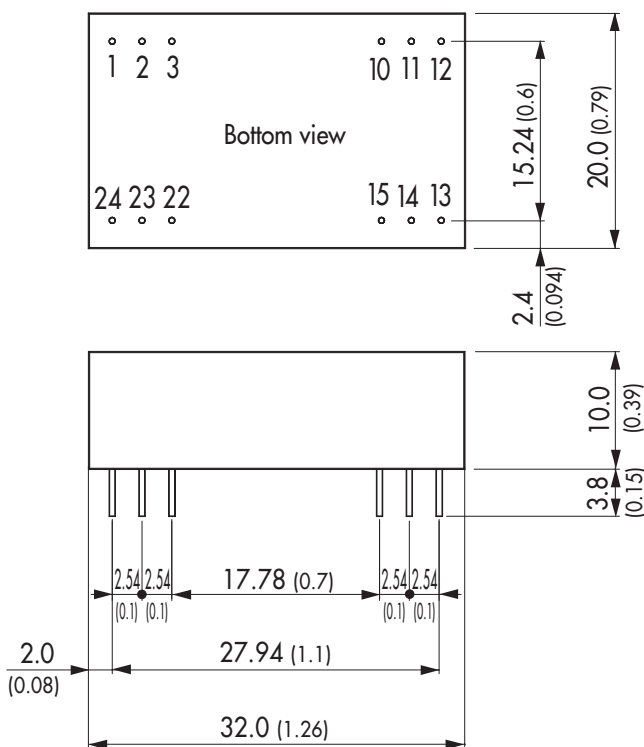
Temperature ranges	– Operating	–40°C to +85°C
	– Case	+95°C max.
	– Storage	–50°C to +125°C
Derating		5 %/K above +75°C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		>700'000 Mio. h
Isolation voltage (60 sec.)	– Input/Output	1'500 VDC
Isolation capacitance	– Input/Output	300 pF typ.
Isolation resistance	– Input/Output (500 VDC)	>1'000 M Ohm
Switching frequency		300 kHz typ. (Pulse frequency modulation PFM)
Safety standards		cUL/UL 60950-1, IEC/EN 60950-1
Safety approval		CSA File No. 226037 <a href="http://directories.csa-international.org">http://directories.csa-international.org</a>
Environmental compliance	– Reach	<a href="http://www.tracopower.com/products/reach-declaration.pdf">www.tracopower.com/products/reach-declaration.pdf</a>
	– RoHS	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 black plastic (UL 94V-0)
Weight	12.4 g (0.43 oz)
Soldering temperature	max. 260°C / 10 sec.

**Outline Dimensions mm (inches)**



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

ntc. = not to connect

Pin diameter  $\varnothing 0.5 \pm 0.05$  (0.02)  $\pm 0.002$   
Tolerances  $\pm 0.5$  ( $\pm 0.02$ )

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at [www.tracopower.com](http://www.tracopower.com)