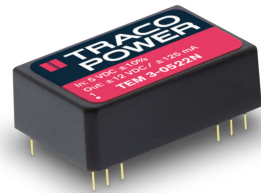


DC/DC Converter

TEM 3N Series, 3 Watt

- Cost optimized design in DIP-24 package
- Fully regulated output
- Output ripple & noise 30 mVp-p typ.
- Short circuit protection
- Operating temperature range
–40°C to +75°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



UL 62368-1 IEC 62368-1

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°C to +85°C. This product series provides a cost effective solution for many industrial or consumer electronics applications.

Models						
Order Code	Input Voltage Range	Output 1		Output 2		Efficiency typ.
		Vnom	I _{max}	Vnom	I _{max}	
TEM 3-0511N	4.5 - 5.5 VDC (5 VDC nom.)	5 VDC	600 mA			70 %
TEM 3-0512N		12 VDC	250 mA			78 %
TEM 3-0513N		15 VDC	200 mA			78 %
TEM 3-0522N		+12 VDC	125 mA	–12 VDC	125 mA	78 %
TEM 3-0523N		+15 VDC	100 mA	–15 VDC	100 mA	78 %
TEM 3-1211N	10.8 - 13.2 VDC (12 VDC nom.)	5 VDC	600 mA			74 %
TEM 3-1212N		12 VDC	250 mA			80 %
TEM 3-1213N		15 VDC	200 mA			80 %
TEM 3-1222N		+12 VDC	125 mA	–12 VDC	125 mA	81 %
TEM 3-1223N		+15 VDC	100 mA	–15 VDC	100 mA	82 %
TEM 3-2411N	21.6 - 26.4 VDC (24 VDC nom.)	5 VDC	600 mA			75 %
TEM 3-2412N		12 VDC	250 mA			80 %
TEM 3-2413N		15 VDC	200 mA			80 %
TEM 3-2422N		+12 VDC	125 mA	–12 VDC	125 mA	81 %
TEM 3-2423N		+15 VDC	100 mA	–15 VDC	100 mA	82 %

Input Specifications

Input Current	- At no load	5 Vin models: 90 mA typ. 12 Vin models: 45 mA typ. 24 Vin models: 22 mA typ.
	- At full load	5 Vin models: 800 mA typ. 12 Vin models: 320 mA typ. 24 Vin models: 160 mA typ.
Surge Voltage		5 Vin models: 7.5 VDC max. (1 s max.) 12 Vin models: 15 VDC max. (1 s max.) 24 Vin models: 30 VDC max. (1 s max.)
Recommended Input Fuse		(The need of an external fuse has to be assessed in the final application.)
Input Filter		Internal Pi-Type
Short Circuit Input Power		2 W max.

Output Specifications

Voltage Set Accuracy		±2% max.
Regulation	- Input Variation (Vmin - Vmax)	single output models: 0.5% max. dual output models: 0.5% max.
	- Load Variation (10 - 100%)	single output models: 0.5% max. dual output models: 0.5% max. (Output 1) 0.5% max. (Output 2)
	- Voltage Balance (symmetrical load)	dual output models: 3% max.
Ripple and Noise	- 20 MHz Bandwidth	30 mVp-p typ. 60 mVp-p max.
Capacitive Load	- single output	5 Vout models: 470 µF max. 12 Vout models: 100 µF max. 15 Vout models: 100 µF max.
	- dual output	12 / -12 Vout models: 100 / 100 µF max. 15 / -15 Vout models: 100 / 100 µF max.
Minimum Load		Not required
Temperature Coefficient		±0.02 %/K max.
Short Circuit Protection		Continuous, Automatic recovery
Output Current Limitation		120% max. of Iout max.

Safety Specifications

Safety Standards	- IT / Multimedia Equipment	CSA-C22.2, No. 60950-1 EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1
	- Certification Documents	www.tracopower.com/overview/tem3n
Pollution Degree		PD 2

EMC Specifications

EMI Emissions	- Conducted Emissions	EN 55032 class A (internal filter) FCC Part 15 class A (internal filter)
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General Specifications

Relative Humidity		95% max. (non condensing)
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All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

Temperature Ranges	- Operating Temperature - Case Temperature - Storage Temperature	-40°C to +85°C +95°C max. -50°C to +125°C
Power Derating	- High Temperature	5 %/K above 75°C
Cooling System		Natural convection (20 LFM)
Altitude During Operation		6'000 m max.
Switching Frequency		300 kHz typ. (PFM)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s - Input to Output, 1 s	1'500 VDC 1'800 VDC
Isolation Resistance	- Input to Output, 500 VDC	1'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	300 pF typ.
Reliability	- Calculated MTBF	700'000 h (MIL-HDBK-217F, ground benign)
Washing Process		Allowed (hermetical product)
	See Cleaning Guideline:	www.tracopower.com/info/cleaning.pdf
Housing Material		Non-conductive Plastic (UL 94 V-0 rated)
Potting Material		Epoxy (UL 94 V-0 rated)
Pin Material		Phosphor Bronze (C5191)
Pin Foundation Plating		Nickel (2 - 4 μm)
Pin Surface Plating		Gold (75 - 125 nm), glossy
Housing Type		Plastic Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		DIP24
Soldering Profile		Wave Soldering 260°C / 10 s max.
Weight		12.4 g
Environmental Compliance	- REACH Declaration - RoHS Declaration	www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7a (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule). The SCIP number is provided on request.)

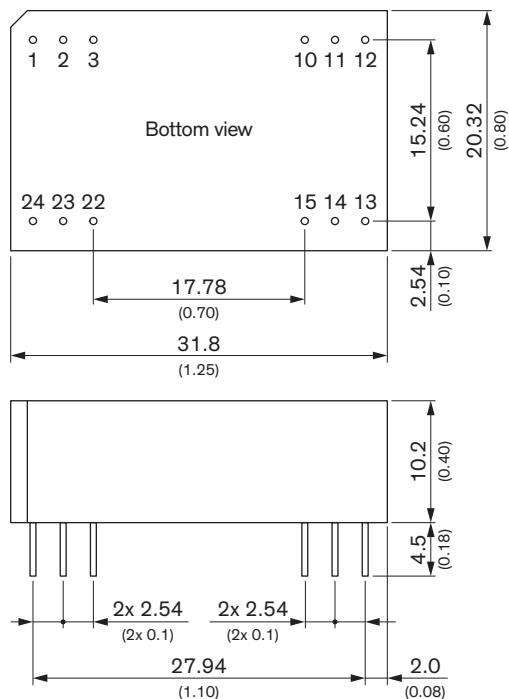
Supporting Documents

Overview Link (for additional Documents)

www.tracopower.com/overview/item3n

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

Outline Dimensions



Dimensions in mm (inch)
Tolerances: x.x ± 0.5 (x.xx ± 0.02)
x.xx ± 0.25 (x.xxx ± 0.01)
Pin diameter $\varnothing 0.5 \pm 0.05$ ($\varnothing 0.02 \pm 0.002$)

Pinout		
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