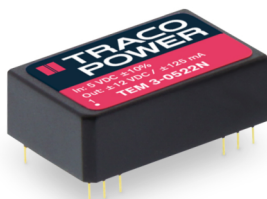


DC/DC Converter

TEM 3N Series, 3 Watt

Not recommended for new designs

- 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 $+75^{\circ}\text{C}$ 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



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 $+85^{\circ}\text{C}$. 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 %

Note * Not recommended for new designs

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	60 mVp-p max. 30 mVp-p typ.
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

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/tem3n-safety-cert
Energy Source	- Output, acc. to 62368-1	ES1
Power Source	- Output, acc. to 62368-1	PS3
Pollution Degree		PD 2
Over Voltage Category		Not mains connected

EMC Specifications

EMI (Emissions)	- Conducted Emissions	EN 55032 class A (internal filter) FCC 47 Part 15 class A (internal filter)
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All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

General Specifications

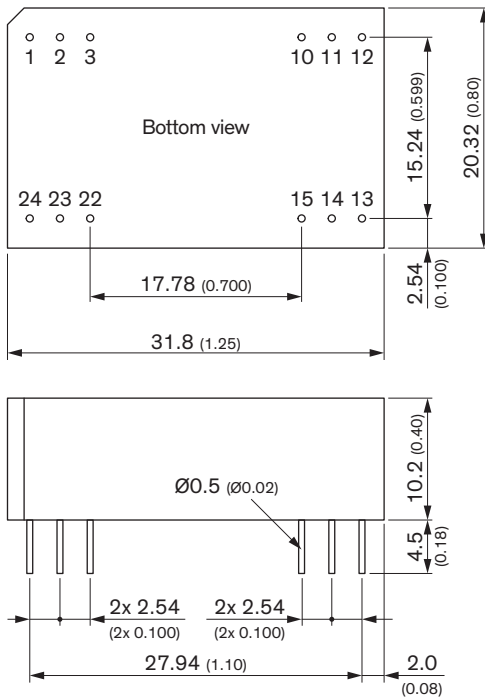
Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature - Case Temperature - Storage Temperature	-40°C to +85°C +95°C max. -50°C to +125°C
Power Derating	- High Temperature	5.0 %/K above 75°C
	See application note: www.tracopower.com/tem3n-cc	
Cooling System		Natural convection (20 LFM)
Altitude During Operation		6'000 m max.
Regulator Topology		RCC Converter
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		According to 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		Lead-Free Wave Soldering 260°C / 10 s max.
Weight		12.4 g
Environmental Compliance	- REACH Declaration - RoHS Declaration - SCIP Reference Number	www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7(a) (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).) 20bfc99c-f356-463f-8b8e-bfc6183456c5

Additional Information

Supporting Documents	www.tracopower.com/overview/tem3n
Frequently Asked Questions	www.tracopower.com/glossary-faq
Glossary	www.tracopower.com/info/glossary.pdf

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

Outline Dimensions

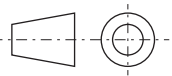


Dimensions in mm (inch)

Tolerances: $x.x \pm 0.5$ ($x.xx \pm 0.02$)

$$x.xx \pm 0.25 \text{ (} x.xxx \pm 0.01 \text{)}$$

Pin tolerance: $x.x \pm 0.05$ ($x.xx \pm 0.002$)



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