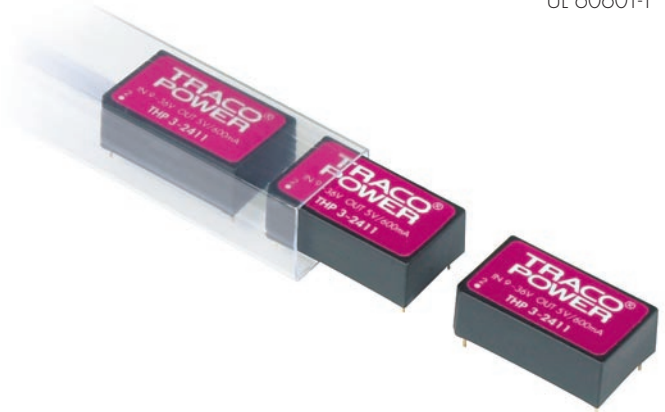


#### Features

- ◆ Supplementary and reinforced insulation for working voltages up to 300VAC
- ◆ I/O isolation voltage of 4000VACrms
- ◆ Industrial & medical safety approvals
- ◆ 9-40 VDC, 18-80 VDC and 36-160 VDC
- ◆ Extended operating temperature range -40°C to 85°C max.
- ◆ Input filter meets EN55022A without ext. components
- ◆ Continuous short circuit protection
- ◆ High reliability, MTBF >1 Mio. hours
- ◆ Lead free design, RoHS compliant
- ◆ 3-year product warranty



The THP-3 series is a new range of high performance 3W DC/DC converters in a low profile DIL-24 package with standard industry pin-out. The very high I/O-isolation system of these converters and input voltages up to 160 VDC make this product the best choice for many demanding applications in railroad and transportation systems, medical equipment, instrumentation, everywhere where high basic-, supplementary- or reinforced insulation is requested to meet specific safety standards. A high efficiency allows safe operation in a temperature range of -40°C to +75°C at full load. Full SMD-design with exclusive use of ceramic capacitors ensure a very high reliability and a long product lifetime.

#### Models

Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.
THP 3-2411	9 – 40 VDC (24 VDC nominal)	5 VDC	600 mA	78 %
THP 3-2412		12 VDC	250 mA	83 %
THP 3-2422		±12 VDC	± 125 mA	83 %
THP 3-2423		±15 VDC	± 100 mA	83 %
THP 3-4811	18 – 80 VDC (48 VDC nominal)	5 VDC	600 mA	78 %
THP 3-4812		12 VDC	250 mA	83 %
THP 3-4822		±12 VDC	± 125 mA	83 %
THP 3-4823		±15 VDC	± 100 mA	83 %
THP 3-7211	36 – 160 VDC (72 VDC nominal)	5 VDC	600 mA	78 %
THP 3-7212		12 VDC	250 mA	83 %
THP 3-7222		±12 VDC	± 125 mA	83 %
THP 3-7223		±15 VDC	± 100 mA	83 %

### Input Specifications

Input current at no load / full load	24 Vin models: 20 mA typ. / 160 mA typ. 48 Vin models: 10 mA typ. / 80 mA typ. 72 Vin models: 5 mA typ. / 35 mA typ.
Start-up voltage / under voltage shut down	24 Vin models: 9 VDC / 8.5 VDC 48 Vin models: 17 VDC / 16 VDC 72 Vin models: 34 VDC / 32 VDC
Recommended input fuse (slow blow)	24 Vin models: 1.0 A 48 Vin models: 0.5 A 72 Vin models: 0.3 A
Surge voltage (1 sec. max.)	24 Vin models: 50 V max. 48 Vin models: 100 V max. 72 Vin models: 180 V max.
Reverse voltage protection	0.3 A max.
Input filter	EN 55022 class A, FCC part 15, class A

### Output Specifications

Voltage set accuracy	±1 %
Voltage balance (dual output models)	2 % max.
Regulation	– Input variation Vin min. to Vin max.      0.5 % max. – Load variation 25 – 100 %:                      1.0 % max.
Minimum load	15 % of rated max. output current. (Operation at lower load is safe but major deviations to specified data may occur)
Ripple and noise (20 MHz Bandwidth)	150 mVpk-pk typ.
Temperature coefficient	±0.02 %/K typ.
Current limitation	>120 % Iout max.
Short circuit protection	indefinite (automatic recovery)
Capacitive load	5 VDC models: 1000 µF max. 12 VDC models: 470 µF max. Dual output models: 220 µF max. (each output)

### Isolation / Safety

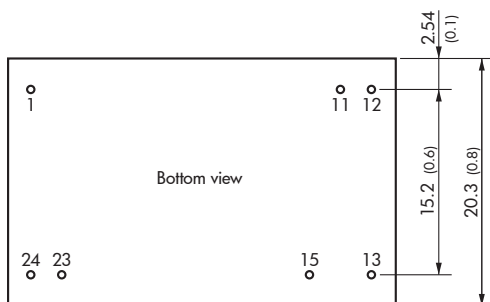
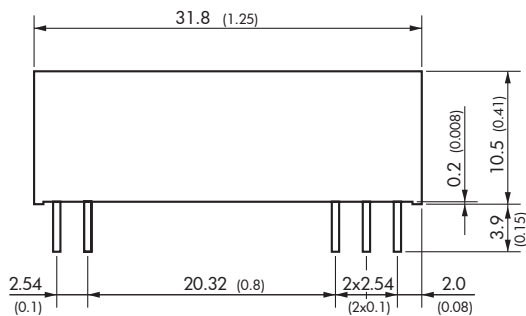
Isolation test voltage (flash tested 1 sec.)	6000 Vpk
I/O isolation voltage (50Hz, 60sec)	4000 VACrms
Leakage current	2 µA (at 240VAC, 60Hz)
Isolation capacity	– Input/Output      7 pF typ. (at 100KHz, 1V)
Isolation resistance	– Input/Output      >1000 Mohm (at 500VDC)
Safety standards	IEC/EN 60950-1, UL 60950-1 CSA C22.2 No. 60950-1-03 IEC/EN 60601-1, EN 50124-1&2 UL 60601-1, CSA C22.2 No. 601-1
Safety approvals	CB-report, CSA File No. 226037

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

**General Specifications**

Temperature ranges	<ul style="list-style-type: none"> <li>- Operating</li> <li>- Casing</li> <li>- Storage</li> </ul>	<ul style="list-style-type: none"> <li>-40°C to +85°C</li> <li>+95°C max.</li> <li>-40°C to +125°C</li> </ul>
Derating		4 %/K above 75°C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F ground benign)		>1 Mio. h @ 25°C
Switching frequency		150 kHz typ. (puls width modulation)
Casing material		non conductive plastic (UL 94V-0-rated)
Potting material		Silicon TSE 3331 (UL 94V-0-rated)
Weight		16.2 g (0.57 oz)
Soldering temperature		max. 265°C / 10 sec

**Outline Dimensions**



Pin-Out		
Pin	Single	Dual
1	+Vin (Vcc)	+Vin (Vcc)
11	No pin	Common
12	-Vout	No pin
13	+Vout	-Vout
15	No pin	+Vout
23	-Vin (GND)	-Vin (GND)
24	-Vin (GND)	-Vin (GND)

Dimensions in [mm], ( ) = Inch  
 Pin diameter  $\varnothing 0.6 \pm 0.05$  (0.024  $\pm$  0.002)  
 Tolerances  $\pm 0.5$  ( $\pm 0.02$ )  
 Pin pitch tolerances  $\pm 0.2$  ( $\pm 0.01$ )

Specifications can be changed any time without notice