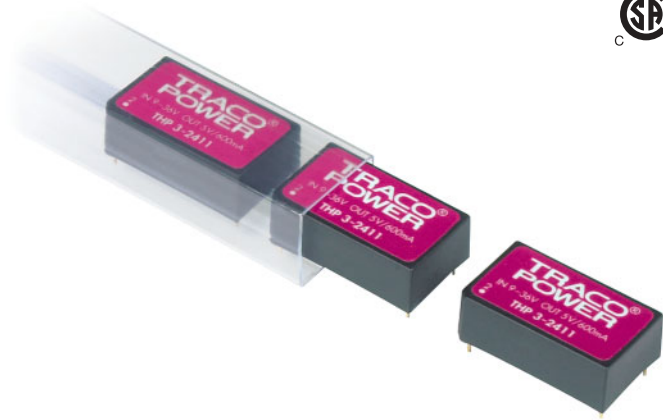


## High Isolation

### Features

- I/O-Isolation Voltage of 4000VAC
- Clearance and Creeping Distances min. 2.0mm
- Basic-, Supplementary- and Reinforced Insulation for Working Voltages up to 420VDC / 300VAC
- Ultra wide 4:1 Input Ranges:  
9-40VDC, 18-80VDC and 36-160VDC
- Extended Operating Temp. Range -40°C to 85°C
- Input Filter meets EN55022A without ext. Components
- Continuous Short Circuit Protection
- High Reliability, MTBF > 1 Mio. Hours
- 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 +85°C at full load without derating. Full SMD-design with exclusive use of ceramic capacitors ensure a very high reliability and a long product life-time.

### Models

Ordercode	Input voltage	Output voltage	Output current max.	Efficiency typ.
THP 3-2411 THP 3-2412 THP 3-2422 THP 3-2423	9 – 40 VDC	5 VDC 12 VDC ±12 VDC ±15 VDC	600 mA 250 mA ± 125 mA ± 100 mA	78 % 83 % 83 % 83 %
THP 3-4811 THP 3-4812 THP 3-4822 THP 3-4823	18 – 80 VDC	5 VDC 12 VDC ±12 VDC ±15 VDC	600 mA 250 mA ± 125 mA ± 100 mA	78 % 83 % 83 % 83 %
THP 3-7211 THP 3-7212 THP 3-7222 THP 3-7223	36 – 160 VDC	5 VDC 12 VDC ±12 VDC ±15 VDC	600 mA 250 mA ± 125 mA ± 100 mA	78 % 83 % 83 % 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:	8.5 VDC / 8.5 VDC (typ.)
	48 Vin models:	15 VDC / 16 VDC (typ.)
	72 Vin models:	30 VDC / 32 VDC (typ.)
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.
Input filter	EN 55022, level A (without external components)	

### 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.
Ripple and noise (20 MHz Bandwidth)	100 mVpk-pk typ.	
Temperature coefficient	± 0.02 % / °C typ.	
Current limitation	> 120 % Iout max.	
Short circuit protection	indefinite (automatic recovery)	
Capacitive load	– 5 VDC output models:	1000 µF max.
	– 12 VDC output models:	470 µF max.
	– Dual output models:	220 µF max. (each output)

### Isolation /Safety

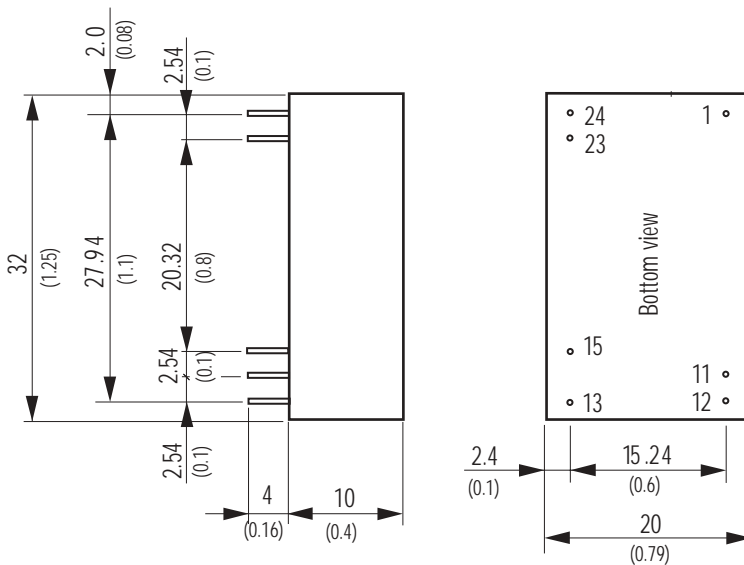
Isolation test voltage (1 sec.)	5700 VDC	
I/O isolation voltage (50Hz, 60sec)	4000 VAC	
I/O clearance and creepage	2.0mm min.	
Leakage current	2 µA (at 240VAC, 60Hz)	
Isolation capacity	input/output	7 pF typ. (at 100KHz, 1V)
Isolation resistance	input/output	>1000 Mohm (at 500VDC)
Safety standards	IEC/EN 60950, 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	– Operating – Case – Storage	– 40 °C ... +85 °C + 95 °C max. – 40 °C ... +125 °C
Derating		4 % /°K above 75°C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217 F)		> 1 Mio. h @ 25 °C, ground benign
Switching frequency		150 kHz typ. (puls width modulation)
Case 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. 260°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, ( ) = inches  
 Pin diameter: 0.6 mm ± 0.05 (0.024 ± 0.002)  
 Tolerances: ±0.25mm (± 0.01)

Specifications can be changed without notice