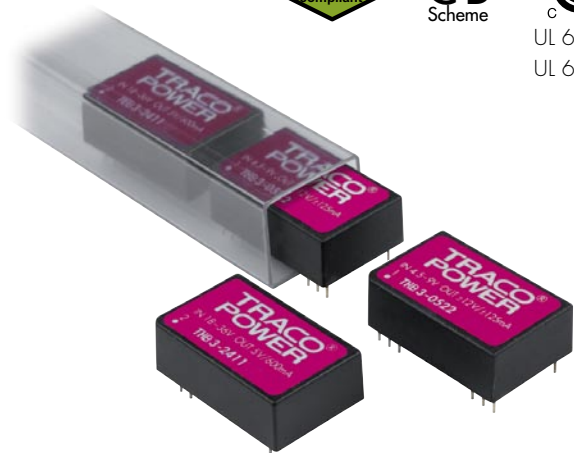




#### Features

- ◆ Supplementary and reinforced Insulation for working Voltages up to 300VAC
- ◆ I/O-Isolation 4000VACrms
- ◆ Isolation Test Voltage 6000 Vpk
- ◆ Wide 2:1 Input Voltage Ranges
- ◆ Extended Operating Temp. Range -40°C to 85°C max.
- ◆ Input Filter meets EN55022, Class A
- ◆ Continuous Shortcircuit Protection
- ◆ High Reliability, MTBF>1 Mio. Hours
- ◆ Industrial & Medical Safety Approvals
- ◆ Lead free Design, RoHS compliant
- ◆ 3 Year Product Warranty



The THB-3 series is a new range of high performance, regulated DC/DC converters in a DIP-24 plastic package. A reinforced I/O-isolation system and a wide 2:1 input voltage range make this product the best choice for many demanding applications like transportation systems, industrial controls, medical equipment, instrumentation, everywhere where high basic-,supplementary- or reinforced insulation is required to meet requested safety standards.

A high efficiency allows safe operation in a temperature range of -40°C to +70°C at full load. Other features of this product are over voltage protection and internal EMI-input filter to meet EN 55022,class A without additional components. 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.
THB 3-0511	4.5 – 9 VDC (5 VDC nominal)	5 VDC	600 mA	70 %
THB 3-0512		12 VDC	250 mA	75 %
THB 3-0515		24 VDC	125 mA	76 %
THB 3-0522		±12 VDC	±125 mA	75 %
THB 3-0523		±15 VDC	±100 mA	75 %
THB 3-1211	9 – 18 VDC (12 VDC nominal)	5 VDC	600 mA	74 %
THB 3-1212		12 VDC	250 mA	80 %
THB 3-1215		24 VDC	125 mA	81 %
THB 3-1222		±12 VDC	±125 mA	80 %
THB 3-1223		±15 VDC	±100 mA	80 %
THB 3-2411	18 – 36 VDC (24 VDC nominal)	5 VDC	600 mA	78 %
THB 3-2412		12 VDC	250 mA	83 %
THB 3-2415		24 VDC	125 mA	84 %
THB 3-2422		±12 VDC	±125 mA	83 %
THB 3-2423		±15 VDC	±100 mA	83 %
THB 3-4811	36 – 75 VDC (48 VDC nominal)	5 VDC	600 mA	78 %
THB 3-4812		12 VDC	250 mA	83 %
THB 3-4815		24 VDC	125 mA	84 %
THB 3-4822		±12 VDC	±125 mA	83 %
THB 3-4823		±15 VDC	±100 mA	83 %

### Input Specifications

Input current at no load / full load	5 Vin models: 40 mA typ. / 820 mA typ. 12 Vin models: 30 mA typ. / 320 mA typ. 24 Vin models: 20 mA typ. / 155 mA typ. 48 Vin models: 10 mA typ. / 80 mA typ.
Start-up voltage / under voltage shut down	5 Vin models: 4.5 VDC / 4 VDC typ. 12 Vin models: 9 VDC / 8.5 VDC typ. 24 Vin models: 18 VDC / 17 VDC typ. 48 Vin models: 36 VDC / 34 VDC typ.
Recommended input fuse (slow blow)	5 Vin models: 2.0 A 24 Vin models: 1.0 A 48 Vin models: 0.5 A 72 Vin models: 0.3 A
Surge voltage (1 sec. max.)	5 Vin models: 11 VDC max. 12 Vin models: 25 VDC max. 24 Vin models: 50 VDC max. 48 Vin models: 100 VDC max.
Reverse voltage protection	0.3 A max.
Input filter	EN 55022 level A, FCC part 15, level 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 %: single output models: 0.5 % max. dual output models: 1.0 % max. balanced load
Minimum load	25 % 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)	5 VDC models: 100 mVpk-pk max. other models: 150 mVpk-pk max.
Transient Response (25% load step change)	150 µs typ.
Current limitation	>120 % Iout max.
Short circuit protection	indefinite (automatic recovery)
Capacitive load	5 VDC output models: 1000 µF max. other single output models: 470 µF max. dual output models: 220 µF max. (each output)

### Isolation / Safety Standards

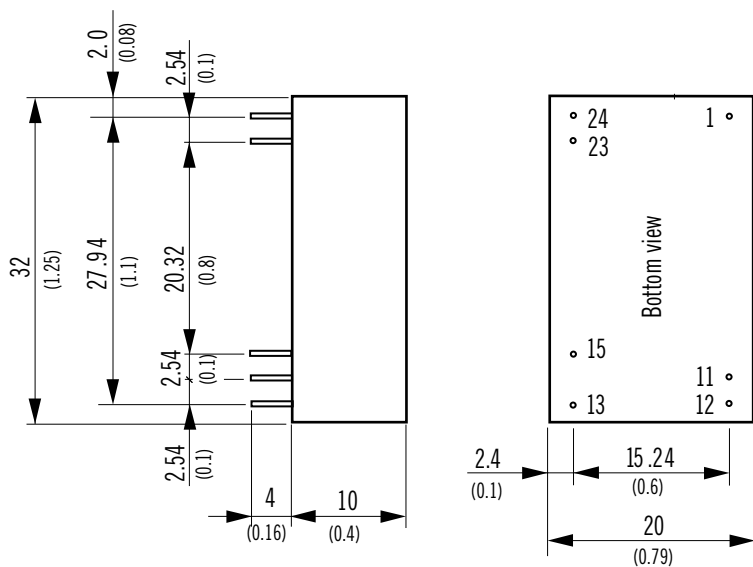
Isolation test voltage (flash tested 1 sec.)	6000 Vpk
I/O isolation voltage (50Hz, 60sec)	4000 VACrms
Leakage current	2 µA (at 240VAC, 60Hz)
Isolation capacity	– Input/Output 7 pF typ. (at 100KHz, 1V)
Isolation resistance	– Input/Output >1000 Mohm (at 500VDC)
Safety standards	IEC/EN 60950-1, UL 60950-1 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 (pending)

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		3.5 % /K above 70°C
Humidity (non condensing)		95 % rel H max.
Temperature coefficient		± 0.02 %/K typ.
Reliability, calculated MTBF (MIL-HDBK-217F)		>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. 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  $\pm 0.5$  (0.02)  
 Pin pitch tolerances  $\pm 0.2$  (0.01)

Specifications can be changed any time without notice