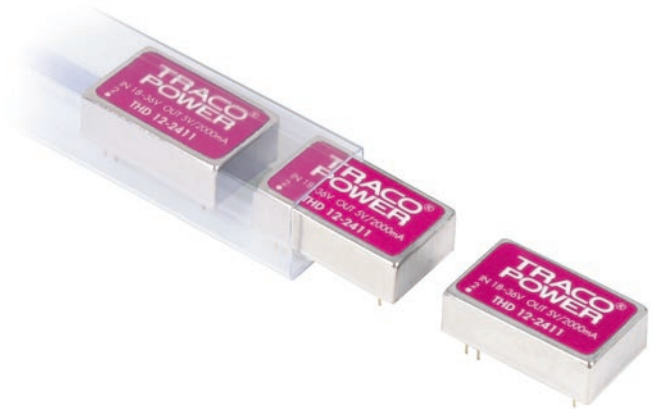


### Features

- ◆ Highest power density
- ◆ DIP-24 metal package
- ◆ Wide 2:1 input range
- ◆ Very high efficiency up to 88%
- ◆ I/O isolation 1500V
- ◆ Input filter to meet EN 55022, class A without ext. components
- ◆ Remote On/Off
- ◆ Shielded metal case with insulated Baseplate
- ◆ Continuous short-circuit protection
- ◆ Operating temp. range  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  (with derating)
- ◆ Lead free design, RoHS compliant
- ◆ 3-year product warranty



The THD-12 series is a range of high performance, isolated 12W dc/dc converters. They come in a low profile, DIP-24 package with standard industry pin-out. Overload and overvoltage protection as well as remote On/Off are included as standard. Built-in filters for both input and output minimizes the need of external filtering. Full SMD-design with exclusive use of ceramic capacitors guarantees a high reliability and long product lifetime. Typical applications for these converters are industrial electronics, instrumentation, data communication systems and battery operated equipment with limited space available on the PCB.

### Models

Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.
THD 12-1209	9 – 18 VDC (nominal 12 VDC)	2.5 VDC	3'500 mA	82 %
THD 12-1210		3.3 VDC	3'500 mA	84 %
THD 12-1211		5.1 VDC	2'400 mA	86 %
THD 12-1212		12 VDC	1'000 mA	86 %
THD 12-1222		$\pm 12$ VDC	$\pm 500$ mA	87 %
THD 12-1223		$\pm 15$ VDC	$\pm 400$ mA	87 %
THD 12-2409	18 – 36 VDC (nominal 24 VDC)	2.5 VDC	3'500 mA	83 %
THD 12-2410		3.3 VDC	3'500 mA	85 %
THD 12-2411		5.1 VDC	2'400 mA	87 %
THD 12-2412		12 VDC	1'000 mA	87 %
THD 12-2422		$\pm 12$ VDC	$\pm 500$ mA	88 %
THD 12-2423		$\pm 15$ VDC	$\pm 400$ mA	88 %
THD 12-4809	36 – 75 VDC (nominal 48 VDC)	2.5 VDC	3'500 mA	83 %
THD 12-4810		3.3 VDC	3'500 mA	85 %
THD 12-4811		5.1 VDC	2'400 mA	87 %
THD 12-4812		12 VDC	1'000 mA	87 %
THD 12-4822		$\pm 12$ VDC	$\pm 500$ mA	88 %
THD 12-4823		$\pm 15$ VDC	$\pm 400$ mA	88 %

## Input Specifications

Input current (no load)	12 Vin models: t.b.a. 24 Vin models: t.b.a. 48 Vin models: t.b.a.
Input current (full load)	12 Vin; 2.5/ 3.3 Vout models: 1'670 mA typ. 12 Vin; other single output models: 1'605 mA typ. 12 Vin; other dual output models: 1'630 mA typ. 24 Vin; 2.5/ 3.3 Vout models: 840 mA typ. 24 Vin; other single output models: 800 mA typ. 24 Vin; other dual output models: 810 mA typ. 48 Vin; 2.5/ 3.3 Vout models: 420 mA typ. 48 Vin; other single output models: 400 mA typ. 48 Vin; other dual output models: 405 mA typ.
Input voltage variation (dv/dt)	5 V / ms, max. (complies ETS 300 132 part. 4.4)
Start-up voltage / under voltage lockout	12 Vin models: 9 VDC / 8 VDC typ. 24 Vin models: 18 VDC / 16 VDC typ. 48 Vin models: 36 VDC / 33 VDC typ.
Surge voltage (100 msec. max.)	12 Vin models: 36 V max. 24 Vin models: 50 V max. 48 Vin models: 100 V max.
Conducted noise (input)	EN 55022 level A, FCC part 15, level A
ESD (input)	EN 61000-4-2, Perf. Criteria B
Fast Transient (input)	EN 61000-4-4, Perf. Criteria B
Surge (input)	EN 61000-4-5, Perf. Criteria B

## Output Specifications

Voltage set accuracy	±1.2 %
Regulation	– Input variation Vin min. to Vin max. ±0.5 % max. – Load variation 10 – 100 % single output models: 1.0 % max. (1.5% max. for 2.5 Vout models) dual output models balanced load: 1.2 % max. dual output models unbalanced load: 5.0 % max.
Transient response setting time (25% load step change)	300 µs
Ripple and noise (20 MHz Bandwidth)	85 mVpk-pk max.
Temperature coefficient	±0.02 %/K
Output current limitation	150 % typ. of Iout max., constant current
Short circuit protection	indefinite (automatic recovery)
Minimum load	10 % of rated max current (operation at lower load condition will not damage these converters, however, they may not meet all listed specifications)
Capacitive load	2.5, 3.3, 5.1 Vout models: 2000 µF max. 5 / ± 5 Vout models: 2000 µF max. / ±1250 µF max. 12 / ±12 Vout models: 430 µF max. / ±200 µF max. 15 / ±15 Vout models: 300 µF max. / ±120 µF max.

## General Specifications

Temperature ranges	– Operating –40°C to +85°C – Case temperature +100°C max. – Storage –55°C to +105°C
Derating	2.5 %/K above 60°C
Humidity (non condensing)	95 % rel H max.

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

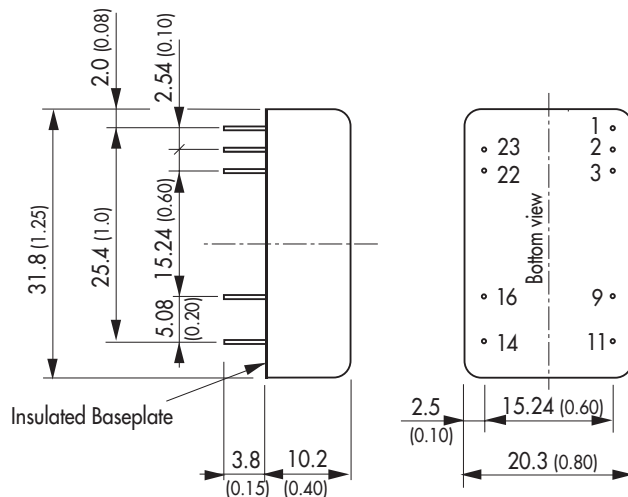
**General Specifications**

Reliability, calculated MTBF (MIL-HDBK-217F, @ 25°C, ground benign)	>2.75 Mio. h (BELLCORE TR-MWT-000332 Case I: 50% Stress)
Thermal shock	MIL-STD-810F
Isolation voltage Input/Output	1'500 VDC
Isolation capacity Input/Output	1'200 pF max.
Switching frequency (fixed)	400 kHz typ. (pulse width modulation PWM)
Safety standards (operational Insulation)	UL 60950-1, EN 60950-1, IEC 60950-1
Safety approvals	UL/cUL File: E188913
Remote On/Off	- On: 3.0 ... 12 VDC or open circuit (referenced to -Vin) - Off: 0 ... 1.2 VDC or short circuit pin 1 and pin 2/3 - Off idle current: 2.5 mA

**Physical Specifications**

Casing material	copper, nickel plated
Baseplate material	non conductive FR4
Potting material	epoxy (UL94V-0 rated)
Weight	18 g (0.62 oz)
Soldering temperature	max. 265°C / 10 sec.

**Outline Dimensions**



Pin-Out		
Pin	Single	Dual
1	Remote On/Off	Remote On/Off
2	-Vin (GND)	-Vin (GND)
3	-Vin (GND)	-Vin (GND)
9	No pin	Common
11	No con.	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin (Vcc)	+Vin (Vcc)
23	+Vin (Vcc)	+Vin (Vcc)

Dimensions in [mm], ( ) = Inch  
 Pin diameter  $\varnothing 0.5 \pm 0.05$  (0.02  $\pm 0.002$ )  
 Tolerances  $\pm 0.5$  ( $\pm 0.02$ )  
 Pin pitch tolerances  $\pm 0.35$  ( $\pm 0.014$ )

Specifications can be changed any time without notice.