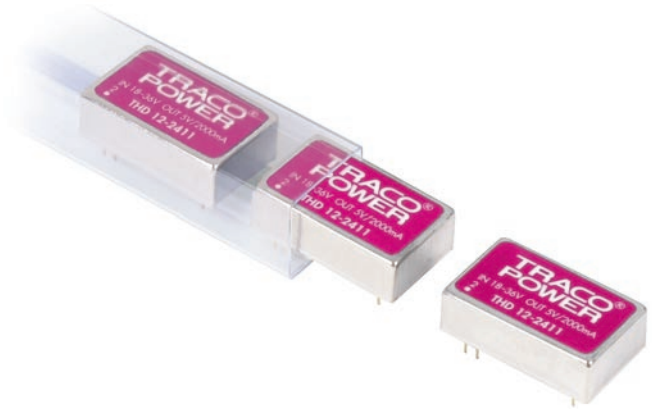
DC/DC Converters

THD 12 Series, 12 Watt

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°C to +85°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		±12 VDC	±500 mA	87 %
THD 12-1223		±15 VDC	±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		±12 VDC	±500 mA	88 %
THD 12-2423		±15 VDC	±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		±12 VDC	±500 mA	88 %
THD 12-4823		±15 VDC	±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.

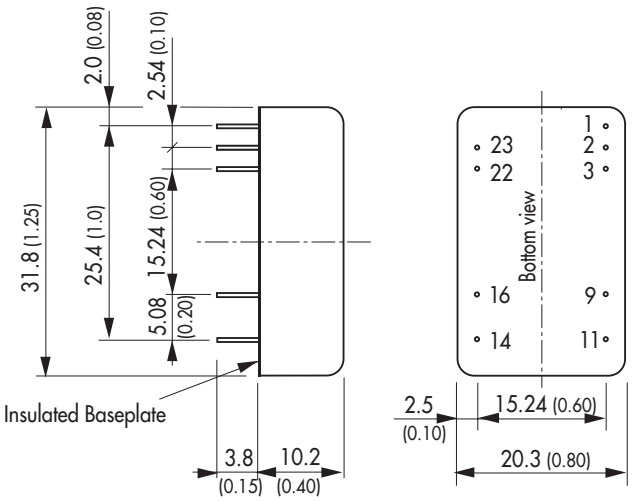
General Specifications

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: – Off: – Off idle current:	3.0 ... 12 VDC or open circuit (referenced to -Vin) 0 ... 1.2 VDC or short circuit pin 1 and pin 2/3 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 ø 0.5 ±0.05 (0.02 ±0.002)
Tolerances ±0.5 (±0.02)
Pin pich tolerances ±0.35 (±0.014)

Specifications can be changed any time without notice.

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