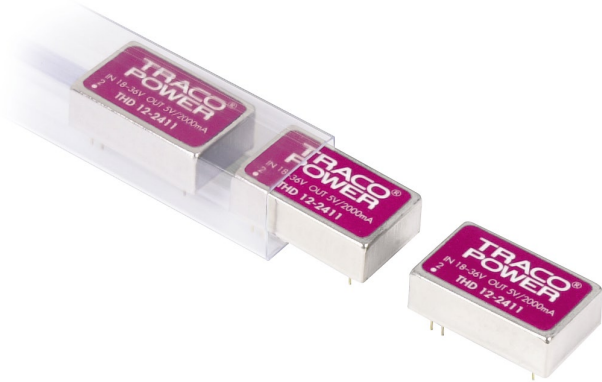




Features

- ◆ Highest Power Density: 12W in DIL-24 Package!
- ◆ Wide 2:1 Input Range
- ◆ Very high Efficiency up to 88%
- ◆ I/O-Isolation 1500V
- ◆ Input Filter meets EN 55022A 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, DIL-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 | 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 12-1213 | | 15 VDC | 800 mA | 86 % |
| THD 12-1221 | | ±5 VDC | ±1'200 mA | 82 % |
| THD 12-1222 | | ±12 VDC | ±500 mA | 87 % |
| THD 12-1223 | | ±15 VDC | ±400 mA | 87 % |
| THD 12-2409 | 18 – 36 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 12-2413 | | 15 VDC | 800 mA | 87 % |
| THD 12-2421 | | ±5 VDC | ±1'200 mA | 83 % |
| THD 12-2422 | | ±12 VDC | ±500 mA | 88 % |
| THD 12-2423 | | ±15 VDC | ±400 mA | 88 % |
| THD 12-2409 | 36 – 75 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 12-2413 | | 15 VDC | 800 mA | 87 % |
| THD 12-2421 | | ±5 VDC | ±1'200 mA | 83 % |
| THD 12-2422 | | ±12 VDC | ±500 mA | 88 % |
| THD 12-2423 | | ±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 & ±5 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 & ±5 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 & ±5 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 Vout & 3.3 Vout models: 2000 µF max. 5 Vout / ± 5 Vout models: 2000 µF max. / ± 1250 µF max. 12 Vout / ±12 Vout models: 430 µF max. / ± 200 µF max. 15 Vout / ±15 Vout models: 300 µF max. / ± 120 µF max. |

General Specifications

| | |
|---------------------------|--|
| Temperature ranges | – Operating –40 °C ... +85 °C – Case temperature +100 °C max. – Storage –55 °C ... +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.

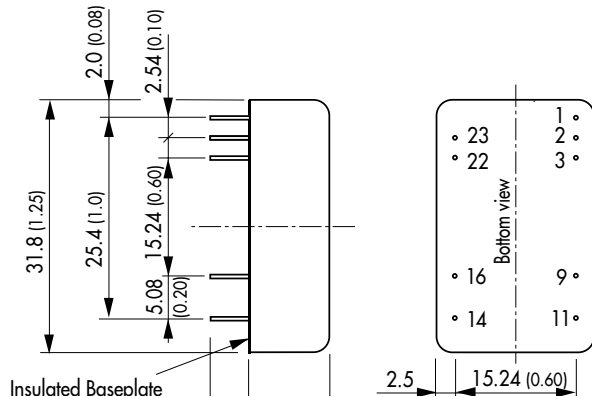
General Specifications

| | |
|---|--|
| Reliability, calculated MTBF | >2.75 Mio. h @ 40 °C (BELLCORE TR-MWVT-000332 Case I: 50% Stress) |
| Thermal shock | MIL-STB-810D |
| 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, EN 60950, IEC 60950 |
| 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

| | |
|-----------------------|-----------------------|
| Case 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], (I) = Inch
 Pin diameter $\varnothing 0.5 \pm 0.05$ (0.02 \pm 0.002)
 Tolerances ± 0.5 (0.02)
 Pin pitch tolerances ± 0.35 (0.014)

Specifications can be changed without notice