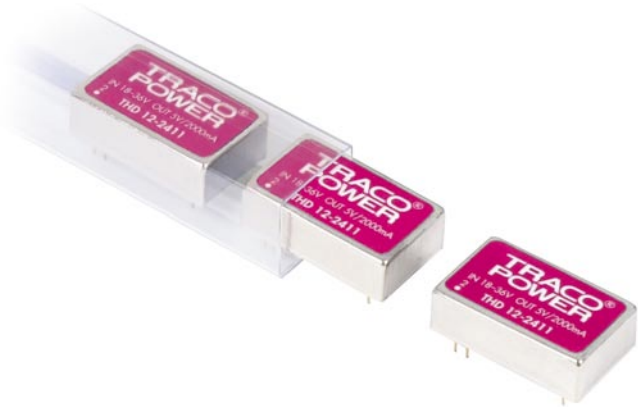




### Features

- ◆ 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 12-1222 |                     | ±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        |
| 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 12-2422 | ±12 VDC             |                | ±500 mA             | 88 %            |
| THD 12-2423 | ±15 VDC             |                | ±400 mA             | 88 %            |
| THD 12-4809 | 36 – 75 VDC         |                | 2.5 VDC             | 3'500 mA        |
| 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 12-4813 |                     | 15 VDC         | 800 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.<br>24 Vin models: t.b.a.<br>48 Vin models: t.b.a.   |
| Input current (full load)                | 12 Vin; 2.5/ 3.3 Vout models: 1'670 mA typ.<br>12 Vin; other single output models: 1'605 mA typ.<br>12 Vin; other dual output models: 1'630 mA typ.<br>24 Vin; 2.5/ 3.3 Vout models: 840 mA typ.<br>24 Vin; other single output models: 800 mA typ.<br>24 Vin; other dual output models: 810 mA typ.<br>48 Vin; 2.5/ 3.3 Vout models: 420 mA typ.<br>48 Vin; other single output models: 400 mA typ.<br>48 Vin; other dual output models: 405 mA typ. |
| Input voltage variation (dv/dt)          | 5 V / ms, max.<br>(complies ETS 300 132 part. 4.4)  |
| Start-up voltage / under voltage lockout | 12 Vin models: 9 VDC / 8 VDC typ.<br>24 Vin models: 18 VDC / 16 VDC typ.<br>48 Vin models: 36 VDC / 33 VDC typ.   |
| Surge voltage (100 msec. max.)           | 12 Vin models: 36 V max.<br>24 Vin models: 50 V max.<br>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.<br>– Load variation 10 – 100 %<br>single output models: 1.0 % max. (1.5% max. for 2.5 Vout models)<br>dual output models balanced load: 1.2 % max.<br>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.<br>5 / ± 5 Vout models: 2000 µF max. / ± 1250 µF max.<br>12 / ±12 Vout models: 430 µF max. / ± 200 µF max.<br>15 / ±15 Vout models: 300 µF max. / ± 120 µF max.  |

## General Specifications

|                           |  |
|---------------------------|--|
| Temperature ranges        | – Operating –40 °C ... +85 °C<br>– Case temperature +100 °C max.<br>– 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.

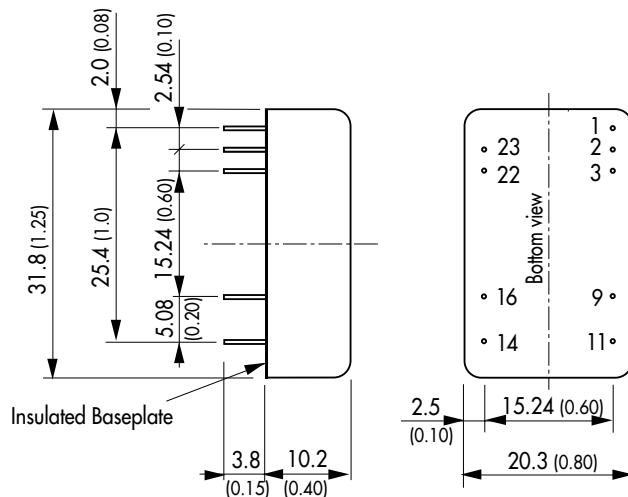
**General Specifications**

|   |  |
|---|--|
| Reliability, calculated MTBF              | >2.75 Mio. h @ 40 °C<br>(BELLCORE TR-MWT-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)<br>- Off: 0 ... 1.2 VDC or short circuit pin 1 and pin 2/3<br>- 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], ( ) = Inch  
 Pin diameter  $\varnothing 0.5 \pm 0.05$  (0.02  $\pm 0.002$ )  
 Tolerances  $\pm 0.5$  (0.02)  
 Pin pitch tolerances  $\pm 0.35$  (0.014)

Specifications can be changed any time without notice