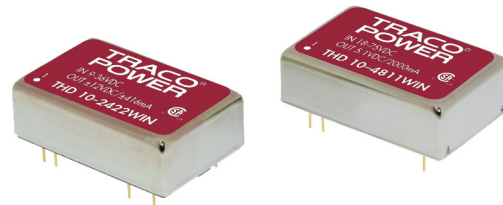


#### Features

- ◆ Wide 2:1 input voltage range
- ◆ Internal EMI-filter meets EN 55022, class A without external components
- ◆ High efficiency up to 87%
- ◆ Operating temperature range -40°C to +85°C
- ◆ No minimum load required
- ◆ I/O isolation 1'500 VDC
- ◆ Overload protection
- ◆ 3-year product warranty



The THD 10N series is designed for an optimized cost/performance ratio of DC/DC converters with output power of 10 Watt.

They come with an internal EMI-filter to meet EN55022, class A without external components. General features like no minimum load requirement, overload protection and high efficiency make these converters easy to design in. With the popular DIP-24 standard package they are also a drop in replacement for many cost critical applications.

| Models       |                                 |                |                     |                 |
|--------------|---------------------------------|----------------|---------------------|-----------------|
| Order code   | Input voltage range             | Output voltage | Output current max. | Efficiency typ. |
| THD 10-1210N | 9 – 18 VDC<br>(12 VDC nominal)  | 3.3 VDC        | 2700 mA             | 86 %            |
| THD 10-1211N |                                 | 5.1 VDC        | 2000 mA             | 85 %            |
| THD 10-1212N |                                 | 12 VDC         | 833 mA              | 87 %            |
| THD 10-1213N |                                 | 15 VDC         | 666 mA              | 87 %            |
| THD 10-1222N |                                 | ±12 VDC        | ±416 mA             | 87 %            |
| THD 10-1223N |                                 | ±15 VDC        | ±333 mA             | 87 %            |
| THD 10-2410N | 18 – 36 VDC<br>(24 VDC nominal) | 3.3 VDC        | 2700 mA             | 86 %            |
| THD 10-2411N |                                 | 5.1 VDC        | 2000 mA             | 85 %            |
| THD 10-2412N |                                 | 12 VDC         | 833 mA              | 87 %            |
| THD 10-2413N |                                 | 15 VDC         | 666 mA              | 87 %            |
| THD 10-2422N |                                 | ±12 VDC        | ±416 mA             | 87 %            |
| THD 10-2423N |                                 | ±15 VDC        | ±333 mA             | 87 %            |
| THD 10-4810N | 36 – 75 VDC<br>(48 VDC nominal) | 3.3 VDC        | 2700 mA             | 86 %            |
| THD 10-4811N |                                 | 5.1 VDC        | 2000 mA             | 85 %            |
| THD 10-4812N |                                 | 12 VDC         | 833 mA              | 87 %            |
| THD 10-4813N |                                 | 15 VDC         | 666 mA              | 87 %            |
| THD 10-4822N |                                 | ±12 VDC        | ±416 mA             | 87 %            |
| THD 10-4823N |                                 | ±15 VDC        | ±333 mA             | 87 %            |

### Input Specifications

|  |  |
|--|--|
| Input current at no load                   | 12 Vin models: 20 mA typ.<br>24 Vin models: 15 mA typ.<br>48 Vin models: 10 mA typ.  |
| Start-up voltage / under voltage shut down | 12 Vin models: 9 VDC / 8.5 VDC (or lower)<br>24 Vin models: 18 VDC / 17 VDC (or lower)<br>48 Vin models: 36 VDC / 34 VDC (or lower)                |
| Surge voltage (1 sec. max.)                | 12 Vin models: 25 V max.<br>24 Vin models: 50 V max.<br>48 Vin models: 100 V max.  |
| Conducted noise                            | EN 55022 class A without external components   |
| ESD (electrostatic discharge)              | EN 61000-4-2, air $\pm 8$ kV, contact $\pm 6$ kV, perf. criteria A   |
| Radiated immunity                          | EN 61000-4-3, 10 V/m, perf. criteria A   |
| Fast transient / surge                     | EN 61000-4-4, $\pm 2$ kV, perf. criteria A<br>EN 61000-4-5, $\pm 1$ kV perf. criteria A<br>with external capacitor chemi-con KY 220 $\mu$ F, 100 V |
| Conducted immunity                         | EN 61000-4-6, 10 Vrms, perf. criteria A  |

### Output Specifications

|   |   |
|---|---|
| Voltage set accuracy                                | $\pm 2$ % max.  |
| Regulation  | – Input variation Vin min. to Vin max. 1.0 % max.<br>– Load variation 0 – 100 % single output models: 1.2 % max.<br>dual output models balanced load: 2.0 % max.  |
| Minimum load  | not required  |
| Temperature coefficient                             | $\pm 0.02$ %/K  |
| Ripple and noise (20 MHz Bandwidth)                 | 100 mVp-p typ.  |
| Transient recovery time (25% load step change)      | 300 $\mu$ s response time typ.  |
| Transient response deviation (25% load step change) | $\pm 5$ % max.  |
| Short circuit protection                            | hiccup, automatic recovery  |
| Over load protection                                | 150 % of lout max. typ.   |
| Capacitive load                                     | 3.3 & 5.1 VDC models: 1000 $\mu$ F max.<br>12 VDC models: 470 $\mu$ F max.<br>15 VDC models: 330 $\mu$ F max.<br>$\pm 12$ VDC models: 220 $\mu$ F max. (each output)<br>$\pm 15$ VDC models: 150 $\mu$ F max. (each output) |

### General Specifications

|   |   |
|---|---|
| Temperature ranges  | – Operating (natural convection 20 LFM) –40°C to +85°C<br>– Case temperature +105°C max.<br>– Storage –50°C to +125°C |
| Derating  | 2.9 %/K above +70°C   |
| Humidity (non condensing)   | 95 % rel H max.   |
| Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign) | tba.  |
| Isolation voltage (input/output 60 sec., rated)                       | 1'500 VDC   |
| Isolation capacitance (input/output, 100 KHz, 1 V)                    | 1'500 pF max.   |
| Isolation resistance (input/output, 500 VDC)                          | >1'000 M Ohm  |

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

**General Specifications**

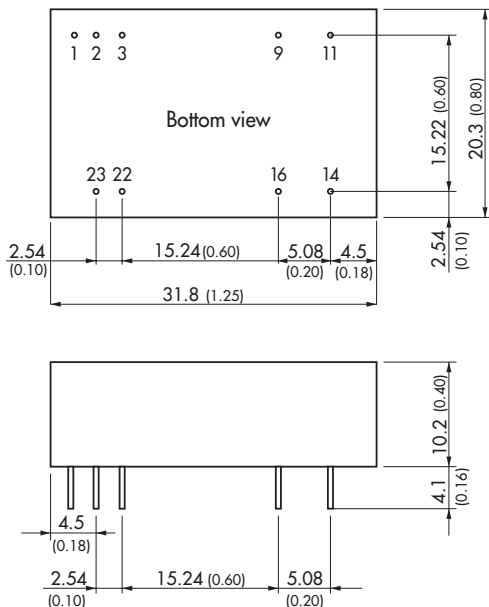
|                          |  |   |
|--------------------------|--|---|
| Remote On/Off            | - On:<br>- Off:<br>- Off idle current: | 3.5 ... 12 VDC or open circuit<br>0 ... +1.2 VDC or short circuit pin 1 and pin 2<br>10 mA max.   |
| Switching frequency      |  | 330 kHz typ.  |
| Safety standards         |  | UL/cUL 60950-1, IEC/EN 60950-1  |
| Safety approvals         | - CSA certificate according UL 60950-1 | <i>pending</i> <a href="http://www.tracopower.com/products/thd10n-csa.pdf">www.tracopower.com/products/thd10n-csa.pdf</a>                             |
| Environmental compliance | - Reach<br>- RoHS                      | <a href="http://www.tracopower.com/products/reach-declaration.pdf">www.tracopower.com/products/reach-declaration.pdf</a><br>RoHS directive 2011/65/EU |

**Physical Specifications**

|   |  |   |
|---|--|---|
| Casing  |  | metal with non conductive baseplate           |
| Pin   |  | copper alloy with gold plated nickel subplate |
| Weight  |  | 17.3 g (0.61 oz)                              |
| Soldering temperature (1.5mm from case for 10 sec.) |  | max. 260°C                                    |

**Application note:** [www.tracopower.com/products/thd10n-application.pdf](http://www.tracopower.com/products/thd10n-application.pdf) *pending*

**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 function   | -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  $\pm 0.25$  ( $\pm 0.01$ )

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at [www.tracopower.com](http://www.tracopower.com)