

#### Features

- ◆ 10 Watt in 1" x 1" package
- ◆ Shielded metal case with isolated baseplate
- ◆ Ultrawide 4:1 input voltage ranges
- ◆ Remote On/Off control
- ◆ Operating temp. range  $-40^{\circ}\text{C}$  to  $+75^{\circ}\text{C}$  and up to  $+85^{\circ}\text{C}$  with heat-sink
- ◆ I/O isolation voltage 1500 VDC
- ◆ Input filter meets EN 55022 class A without external components
- ◆ Cost optimized design
- ◆ Industry standard pinout
- ◆ 3-year product warranty



The THL 10WI is a series of general purpose 10 Watt dc/dc-converters packed in the compact 1" x 1" case and is a pin to pin replacement for the popular 1" x 2" size products. The industrial standard pinout, the ultra wide 4:1 input voltage range and the input filter that meets EN 55022 Class A without external components make these converters easy to design in and suitable for to cost optimize many existing and new applications.

The models have a remote On/Off control, short circuit and overvoltage protection and are applicable in temperature ranges of up to  $+75^{\circ}\text{C}$  or  $+85^{\circ}\text{C}$  with optional mounted heat sink. Typical applications are instrumentation, distributed power architectures in communication and industrial electronics.

#### Models

| Order code    | Input voltage range             | Output voltage | Output current max. | Efficiency typ. |
|---------------|---------------------------------|----------------|---------------------|-----------------|
| THL 10-2410WI | 9 – 36 VDC<br>(24 VDC nominal)  | 3.3 VDC        | 2200 mA             | 86 %            |
| THL 10-2411WI |                                 | 5.1 VDC        | 2000 mA             | 84 %            |
| THL 10-2412WI |                                 | 12 VDC         | 830 mA              | 86 %            |
| THL 10-2413WI |                                 | 15 VDC         | 660 mA              | 87 %            |
| THL 10-2415WI |                                 | 24 VDC         | 410 mA              | 86 %            |
| THL 10-2421WI |                                 | $\pm 5.0$ VDC  | $\pm 1000$ mA       | 84 %            |
| THL 10-2422WI |                                 | $\pm 12$ VDC   | $\pm 410$ mA        | 86 %            |
| THL 10-2423WI |                                 | $\pm 15$ VDC   | $\pm 330$ mA        | 87 %            |
| THL 10-4810WI | 18 – 75 VDC<br>(48 VDC nominal) | 3.3 VDC        | 2200 mA             | 85 %            |
| THL 10-4811WI |                                 | 5.1 VDC        | 2000 mA             | 84 %            |
| THL 10-4812WI |                                 | 12 VDC         | 830 mA              | 86 %            |
| THL 10-4813WI |                                 | 15 VDC         | 660 mA              | 87 %            |
| THL 10-4815WI |                                 | 24 VDC         | 410 mA              | 86 %            |
| THL 10-4821WI |                                 | $\pm 5.0$ VDC  | $\pm 1000$ mA       | 84 %            |
| THL 10-4822WI |                                 | $\pm 12$ VDC   | $\pm 410$ mA        | 86 %            |
| THL 10-4823WI |                                 | $\pm 15$ VDC   | $\pm 330$ mA        | 87 %            |

### Input Specifications

|  |  |
|--|--|
| Input current at no load (at nominal input voltage)                    | 24 V models: 30 mA typ.<br>48 V models: 20 mA typ.   |
| Input current at full load (at nominal input voltage)                  | 24 V; 3.3 VDC models: 400 mA typ.<br>24 V; other models: 500 mA typ..<br>48 V; 3.3 VDC models: 200 mA typ.<br>48 V; other models: 250 mA typ.          |
| Start-up voltage / under voltage lockout (hysteresis for assertive on) | 24 V models: 9 VDC / 8.5 VDC (or lower)<br>48 V models: 18 VDC / 17 VDC (or lower)<br>(long term operation at undervoltage will damage the converter!) |
| Surge voltage (1 sec. max.)  | 24 Vin models: 50 V max.<br>48 Vin models: 100 V max.  |
| Conducted noise (input)  | EN 55022 class A, FCC part 15, level A without external components   |
| Recommended input fuse (slow blow)                                     | 24 V models: 2000 mA<br>48 V models: 1000 mA   |

### Output Specifications

|                                     |   |
|-------------------------------------|---|
| Voltage set accuracy                | ±2 %  |
| Regulation                          | – Input variation (Vmin – Vmax) 1.0 % max.<br>– Load variation single output models: 1.2 % max. (15 – 100 % load)<br>dual output models: 2.0 % max. (15 – 100 % balanced load)  |
| Minimum load                        | 15 %  |
| Ripple and noise (20 MHz bandwidth) | 60 mVp-p typ.   |
| Temperature coefficient             | ±0.02 %/K   |
| Output current limitation           | >110 % of Iout max.   |
| Short circuit protection            | indefinite, automatic recovery  |
| Transient response setting time     | 300 µs typ. (25 % load step change)   |
| Maximum capacitive load             | 3.3 VDC models: 560 µF<br>5 VDC models: 560 µF<br>12 VDC models: 150 µF<br>15 VDC models: 150 µF<br>24 VDC models: 68 µF<br>±5.0 VDC models: 220 µF (each output)<br>±12 VDC models: 100 µF (each output)<br>±15 VDC models: 100 µF (each output) |

### General Specifications

|   |  |   |
|---|--|---|
| Temperature ranges  | <ul style="list-style-type: none"> <li>- Operating without heat sink</li> <li>- Operating with heat sink</li> <li>- Case temperature</li> <li>- Storage</li> </ul> | <ul style="list-style-type: none"> <li>-40°C to +75°C (with derating)</li> <li>-40°C to +85°C (with derating)</li> <li>+100°C max.</li> <li>-40°C to +125°C</li> </ul>  |
| Power derating  | <ul style="list-style-type: none"> <li>- Operating without heat sink</li> <li>- Operating with heat sink</li> </ul>  | <ul style="list-style-type: none"> <li>2.5 %/K above +60°C</li> <li>3.5 %/K above +70°C</li> </ul>  |
| Thermal impedance   | <ul style="list-style-type: none"> <li>- Natural convection</li> <li>- Natural convection with heat sink</li> </ul>  | <ul style="list-style-type: none"> <li>18.2°C/W</li> <li>15.8°C/W</li> </ul>  |
| Humidity (non condensing)   |  | 95 % rel H max.   |
| Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign) |  | >350'000 h  |
| Isolation voltage (60 sec.)   | - Input/Output   | 1'500 VDC   |
| Isolation capacitance   | - Input/Output   | 1200 pF max.  |
| Isolation resistance  | - Input/Output (500 VDC)   | >1'000 MOhm   |
| Remote On/Off   | <ul style="list-style-type: none"> <li>- On:</li> <li>- Off:</li> <li>- Off idle current:</li> </ul>   | <ul style="list-style-type: none"> <li>2.5 ... 50 VDC or open circuit</li> <li>0 ... +1.0 VDC or short circuit pin 6 and pin 2</li> <li>10 mA max.</li> </ul>   |
| Switching frequency (fixed)   |  | 400 kHz typ. (pulse width modulation PWM)   |
| Altitude during operation   |  | 5'000 m max. (16'400 ft) approved   |
| Safety standards  |  | UL/cUL 60950-1, IEC/EN 60950-1  |
| Safety approvals  | <ul style="list-style-type: none"> <li>- UL/cUL</li> <li>- CB test certificate according IEC 60950-1</li> <li>- CSA certificate for UL/cUL 60950-1</li> </ul>      | <ul style="list-style-type: none"> <li><a href="http://www.ul.com">www.ul.com</a> -&gt; File no. e188913 (entry pending)</li> <li><a href="http://www.tracopower.com/products/thl10wi-cb.pdf">www.tracopower.com/products/thl10wi-cb.pdf</a></li> <li><a href="http://www.tracopower.com/products/thl10wi-csa.pdf">www.tracopower.com/products/thl10wi-csa.pdf</a></li> </ul> |
| Environmental compliance  | <ul style="list-style-type: none"> <li>- Reach</li> <li>- RoHS</li> </ul>  | <ul style="list-style-type: none"> <li><a href="http://www.tracopower.com/products/thl10wi-reach.pdf">www.tracopower.com/products/thl10wi-reach.pdf</a></li> <li>RoHS directive 2011/65/EU</li> </ul>   |

### Physical Specifications

|                       |                        |
|-----------------------|------------------------|
| Casing material       | metal                  |
| Baseplate             | non conductive FR4     |
| Potting material      | epoxy (UL 94V-0 rated) |
| Weight                | 15 g (0.53oz)          |
| Soldering temperature | max. +260°C / 10sec.   |

**Application note :** [www.tracopower.com/products/thl10wi-application.pdf](http://www.tracopower.com/products/thl10wi-application.pdf)

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

**Outline Dimensions**



| Pin-Out |               |            |
|---------|---------------|------------|
| Pin     | Single        | Dual       |
| 1       | +Vin (Vcc)    | +Vin (Vcc) |
| 2       | -Vin (GND)    | -Vin (GND) |
| 3       | + Vout        | + Vout     |
| 4       | No pin        | Common     |
| 5       | -Vout         | -Vout      |
| 6       | Remote On/Off |            |

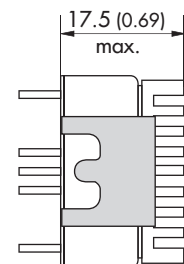
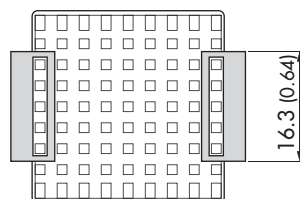
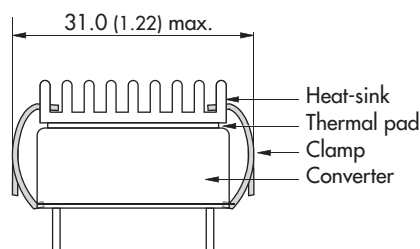
Dimensions in [mm], ( ) = Inch  
 Pin diameter  $\varnothing$  1.0 (0.04)  
 Pin pitch tolerances:  $\pm 0.25$  ( $\pm 0.01$ )  
 Tolerances:  $\pm 0.5$  ( $\pm 0.02$ )

**Heat-Sink (Option)**

**Order code:** THL-HS1  
 (cont.: heat-sink, thermal pad, 2 clamps)  
**Material:** Aluminum  
**Finish:** Anodic treatment (black)  
**Weight:** 4.0 g (0.14oz) without converter  
 Thermal impedance after assembling: 15.8 K/W



**Note:**  
 The product label on converter has to be removed before mounting the heat-sink.  
 For volume orders converters will be supplied with heat-sink already mounted. Please contact factory for quotation.  
 Separate heat-sinks are only available for prototypes and small quantity orders.



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



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.