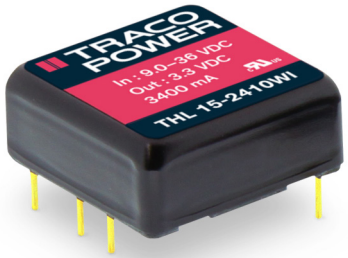
TRACO POWER

## DC/DC Converter

## THL 15WI Series, 15 Watt

- **15 Watt converter in a 1” x 1” metal package**
- **Cost efficient design**
- **Ultra wide 4:1 input voltage range: 9-36 and 18-75 VDC**
- **Operating temperature range -40 to +70 °C without derating**
- **Internal EN 55032 class A filter**
- **1500 VDC I/O-isolation**
- **Protection against overload, overvoltage and short circuit**
- **Remote On/Off and Trim function**
- **Optional heatsink for increased temperature capabilities**
- **3-year product warranty**




CB Scheme
IEC/EN 62368-1

The THL 15WI series is Traco Power’s latest addition to the existing 15 Watt DC/DC converter range. With the focus on combining cost efficiency and quality this isolated high performance 15 Watt DC/DC converter is suitable for many different applications. The series comes in an encapsulated, shielded 1” x 1” x 0.4” metal package and has a fully integrated EN 55032 class A filter. High efficiency up to 91% enables the converter to operate from –40°C to +70°C without derating. All models have an ultra wide 4:1 input voltage range and precisely regulated, isolated outputs. The series meets the latest IT safety certifications (UL 62368-1) and is thus eligible for uses in mobile equipment, instrumentation, distributed power architectures in communication and industrial electronics and everywhere where cost efficiency and quality are critical factors.

### Models

| Order code | Input voltage range | Output voltage | Output current max. | Efficiency typ. |
|---|---|---|---|---|
| **THL 15-2410WI** | 9 – 36 VDC (24 VDC nominal) | 3.3 VDC | 3400 mA | 86 % |
| **THL 15-2411WI** | | 5.0 VDC | 3000 mA | 88 % |
| **THL 15-2412WI** | | 12 VDC | 1250 mA | 88 % |
| **THL 15-2413WI** | | 15 VDC | 1000 mA | 89 % |
| **THL 15-2415WI** | | 24 VDC | 625 mA | 91 % |
| **THL 15-2422WI** | | ±12 VDC | ±625 mA | 89 % |
| **THL 15-2423WI** | | ±15 VDC | ±500 mA | 89 % |
| **THL 15-4810WI** | 18 – 75 VDC (48 VDC nominal) | 3.3 VDC | 3400 mA | 86 % |
| **THL 15-4811WI** | | 5.0 VDC | 3000 mA | 88 % |
| **THL 15-4812WI** | | 12 VDC | 1250 mA | 88 % |
| **THL 15-4813WI** | | 15 VDC | 1000 mA | 89 % |
| **THL 15-4815WI** | | 24 VDC | 625 mA | 91 % |
| **THL 15-4822WI** | | ±12 VDC | ±625 mA | 90 % |
| **THL 15-4823WI** | | ±15 VDC | ±500 mA | 89 % |

## Input Specifications

| | | | |
|---|---|---|---|
| Input current no load | | single output models: | 10 mA typ. |
| | | dual output models: | 15 mA typ. |
| Surge voltage (1 s max.) | | 24 Vin models: | –0.7 to 50 V max. |
| | | 48 Vin models: | –0.7 to 100 V max. |
| Start-up voltage | | 24 Vin models: | 9 VDC (or lower) |
| | | 48 Vin models: | 18 VDC (or lower) |
| Startup time | | | 30 ms max. |
| Under voltage shut down | | 24 Vin models: | 7.5 VDC typ. |
| | | 48 Vin models: | 16 VDC typ. |
| Input filter | | | Internal LC Type |
| Recommended input fuse | | 24 Vin models: | 4 A (slow blow type) |
| | | 48 Vin models: | 2 A (slow blow type) |
| EMC emissions | – Conducted input suppression | | EN 55032, class A (internal filter) |
| | | | EN 55032, class B (with external components) |
| | – Radiated input suppression | | EN 55032, class B (with external components) |
| | – Filter proposal | | www.tracopower.com/overview/thl15wi |
| EMC immunity | | | EN 55024 |
| | – ESD (electrostatic discharge) | | EN 61000-4-2, air ±8 kV, perf. criteria A |
| | | | EN 61000-4-2, contact ±6 kV, perf. criteria A |
| | – Radiated immunity | | EN 61000-4-3, 10 V/m, perf. criteria A |
| | – Fast transient / surge | | EN 61000-4-4, ±2 kV, perf. criteria A |
| | (with external input capacitor) | | EN 61000-4-5, ±1 kV perf. criteria A |
| | | 3.3 & 5 Vout models: | 470 µF CHEMI-CON KY across input pins |
| | | other output models | 220 µF CHEMI-CON KY across input pins |
| | – Conducted immunity | | EN 61000-4-6, 10 Vrms, perf. criteria A |
| | – Magnetic field immunity | | EN 61000-4-8, 100 A/m, perf. criteria A |

## Output Specifications

| | | | |
|---|---|---|---|
| Voltage set accuracy | | | ±1 % max. |
| Output voltage adjustment range | | | ±10 % (single output models only) |
| | | Application note: | www.tracopower.com/overview/thl15wi |
| Regulation | – Input variation (Vin min. to max.) | single output: | 0.2 % max. |
| | | dual output: | 0.5 % max. |
| | – Load variation (0 – 100 %) | single output: | 0.5 % max. (3.3 & 5 Vout models) |
| | | | 0.2 % max. (other output models) |
| | | dual output: | 1.0 % max. |
| | – Cross regulation (balanced load) | dual output: | 2.0 % max. |
| | – Cross regulation (asym. load 25/100 %) | dual output: | 5.0 % max. |
| Temperature coefficient | | | ±0.02 %/K typ. |
| Minimum load | | | not required |
| Ripple and noise | | 3.3 & 5 VDC models: | 75 mVp-p typ. (with 1 µF MLCC) |
| (20 MHz Bandwidth) | | (±)12 & (±)15 VDC models: | 100 mVp-p typ. (with 1 µF MLCC) |
| | | 24 VDC models: | 150 mVp-p typ. (with 1 µF MLCC) |
| Transient response | – Recovery time (25% load step change) | | 300 µs typ. |
| | – Response Deviation (25% load step change) | | ±5% max. |

## Output Specifications (continued)

| | | | |
|---|---|---|---|
| Over current limitation | | | at 150 – 180 % of Iout rated |
| Short-circuit protection | | | Continuous, automatic recovery |
| Over voltage protection | | 3.3 VDC models: | 3.9 VDC |
| | | 5.0 VDC models: | 6.2 VDC |
| | | 12 VDC models: | 15 VDC |
| | | 15 VDC models: | 18 VDC |
| | | 24 VDC models: | 30 VDC |
| | | ±12 VDC models: | ±15 VDC |
| | | ±15 VDC models: | ±18 VDC |
| Capacitive load | – Single output | 3.3 VDC models: | 5‘800 µF max. |
| | | 5.0 VDC models: | 5‘100 µF max. |
| | | 12 VDC models: | 870 µF max. |
| | | 15 VDC models: | 560 µF max. |
| | | 24 VDC models: | 220 µF max. |
| | – Dual output | ±12 VDC models: | 440 µF max. (each output) |
| | | ±15 VDC models: | 280 µF max. (each output) |

## General Specifications

| | | |
|---|---|---|
| Temperature ranges | – Operating (at 20 LFM) | –40°C to +90°C |
| | – Case temperature | +105°C max. |
| | – Storage temperature | –50°C to +125°C |
| Derating | | Refer to application note<br>www.tracopower.com/overview/thl15wi |
| Cooling | | Natural convection (20 LFM) |
| Thermal impedance | | 18.2 K/W min. (at 20 LFM) |
| Humidity (non condensing) | | 95 % rel H max. |
| Isolation voltage | – Input to Output, 60 s | 1500 VDC |
| | – Input to Output, 1 s | 1800 VDC |
| | – Input/Output to Case | 1000 VDC |
| Isolation resistance | – Input to Output, 500 VDC | 1 GOhm min. |
| Isolation capacitance | – Input to Output, 100 kHz / 1 V | 1‘500 pF max. |
| Altitude during operation | | 5000 m |
| Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign) | | 1‘374‘700 h |
| Switching frequency | | 310 –385 kHz (pulse width modulation) |
| Remote On/Off | | Off: short circuit or 0 – 1.2 VDC (referred to -Vin pin)<br>On: open circuit or 3.5 – 12 VDC (referred to -Vin pin) |
| | – Off idle current | 3 mA typ. |
| | – Remote pin input current | ±0.5 mA max. |
| Safety standards | – CB report | IEC 62368-1 |
| | – Certification documents | www.tracopower.com/overview/thl15wi |
| Environmental compliance | – Reach | www.tracopower.com/info/reach-declaration.pdf |
| | – RoHS | RoHS directive 2011/65/EU |

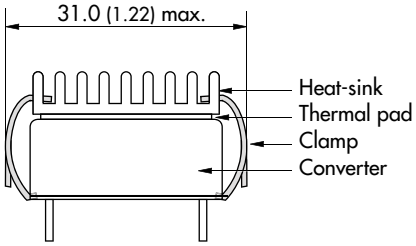
## Physical Specifications

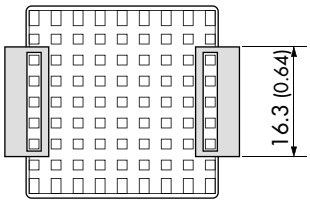
| | |
|---|---|
| Casing material | Aluminium Alloy, Black anodized coating |
| Base material | FR4 PCB (UL 94V-0 rated) |
| Potting material | silicone (UL 94V-0 rated) |
| Pin material | Copper alloy<br>with Gold plate over nickel subplate |
| Package weight | 15 g |
| Soldering temperature | max. 260°C / 10 s |

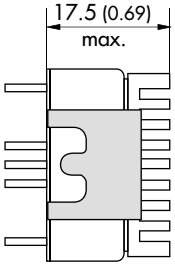
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

## Heat-Sink (optional)

Order code: THL-HS1
(cont.: heat-sink, thermal pad, 2 clamps)
Material: Aluminum
Finish: Anodic treatment (black)
Weight: 2 g (without converter
Thermal impedance after assembling: 15.3 K/W

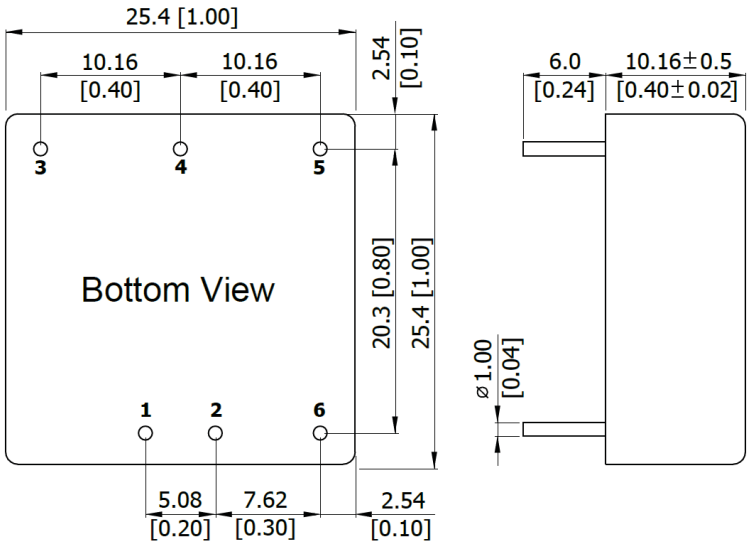



Note:
The product label on converter has to be removed before mounting the heat-sink.
For volume orders converters will be supplied with mounted heat-sink. Please contact factory for quotation.
Separate heat-sinks are only available for prototypes and small quantity orders.

## Outline Dimensions




| Pinout | | |
|---|---|---|
| **Pin** | **Single** | **Dual** |
| 1 | +Vin (Vcc) | +Vin (Vcc) |
| 2 | –Vin (GND) | –Vin (GND) |
| 3 | +Vout | +Vout |
| 4 | Trim | Common |
| 5 | -Vout | –Vout |
| 6 | Remote On/Off | Remote On/Off |

Dimensions in [mm], () = Inch
Tolerances ±0.5 (±0.02)
±0.25 (±0.01)
Pin pitch tolerances ±0.25 (±0.01)
Pin ø 1.0 ±0.05 (0.04 ±0.002)

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