

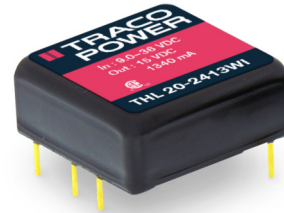


**THE DATASHEET OF
THL 20-4813WI**



Features

- **Smallest encapsulated 20W converter!**
Ultra compact size: 1.0" x 1.0" x 0.4"
- Shielded metal case with isolated baseplate
- Ultrawide 4:1 input voltage ranges
- Very high efficiency up to 90%
- Output voltage adjustable
- Remote On/Off control
- Operating temp. range -40°C to $+75^{\circ}\text{C}$ and up to $+85^{\circ}\text{C}$ with heat-sink
- I/O isolation voltage 1500 VDC
- Lead free design, RoHS compliant
- 3-year product warranty



The THL 20WI series is the latest generation of dc-dc converter modules with highest power density. The product achieves 20 Watt output power while it comes in a metal case with dimensions of only 1.0" x 1.0" x 0.4".

All models have an ultra wide 4:1 input voltage range and precisely regulated output voltages. Highest efficiency of up to 90% makes this product very reliable and applicable in temperature ranges of up to $+75^{\circ}\text{C}$ or $+85^{\circ}\text{C}$ with optional mounted heat sink. Typical applications are in mobile equipments, instrumentation, distributed power architectures in communication and industrial electronics and everywhere where space on the PCB is critical.

Models

| Order code | Input voltage range | Output voltage | Output current max. | Efficiency typ. |
|---------------|---------------------------------|----------------|---------------------|-----------------|
| THL 20-2410WI | 9 – 36 VDC (24 VDC nominal) | 3.3 VDC | 4500 mA | 87 % |
| THL 20-2411WI | | 5.0 VDC | 4000 mA | 89 % |
| THL 20-2412WI | | 12 VDC | 1670 mA | 89 % |
| THL 20-2413WI | | 15 VDC | 1340 mA | 89 % |
| THL 20-2415WI | | 24 VDC | 835 mA | 88 % |
| THL 20-2422WI | | ± 12 VDC | ± 835 mA | 89 % |
| THL 20-2423WI | | ± 15 VDC | ± 670 mA | 89 % |
| THL 20-4810WI | 18 – 75 VDC (48 VDC nominal) | 3.3 VDC | 4500 mA | 88 % |
| THL 20-4811WI | | 5.0 VDC | 4000 mA | 89 % |
| THL 20-4812WI | | 12 VDC | 1670 mA | 89 % |
| THL 20-4813WI | | 15 VDC | 1340 mA | 89 % |
| THL 20-4815WI | | 24 VDC | 835 mA | 88 % |
| THL 20-4822WI | | ± 12 VDC | ± 835 mA | 89 % |
| THL 20-4823WI | | ± 15 VDC | ± 670 mA | 89 % |

Input Specifications

| | | |
|---|----------------|---|
| Input current at no load (at nominal input voltage) | - 24 Vin | 3.3 VDC models: 80 mA typ. 5.0 VDC models: 90 mA Typ. all other models: 40 mA typ. |
| | - 48 Vin | 3.3 VDC models: 40 mA typ. 5.0 VDC models: 45 mA typ. all other models: 25 mA typ. |
| Input current at full load (at nominal input voltage) | - 24 Vin | 3.3 VDC models: 700 mA typ. other models: 940 mA typ.. |
| | - 48 Vin | 3.3 VDC models: 350 mA typ. other models: 470 mA typ. |
| Start-up voltage | | 24 V models: 9 VDC (or lower) 48 V models: 18 VDC (or lower) |
| Surge voltage (1 s max.) | | 24 Vin models: 50 V max. 48 Vin models: 100 V max. |
| Reflected input ripple current | 24 Vin models: | 50 mAp-p typ. |
| | 48 Vin models: | 30 mAp-p typ. |
| Conducted noise (input) | | EN 55032 class A, FCC part 15, level A with ext. components (see application note) |
| ESD (electrostatic discharge) | | EN 61000-4-2, air ±8 kV, contact ±4 kV, perf. criteria B |
| Radiated immunity | | EN 61000-4-3, 10 V/m, perf. criteria A |
| Recommended input fuse (slow blow) | 24 Vin models: | 5000 mA |
| | 48 Vin models: | 2500 mA |

Output Specifications

| | | |
|--|--|--|
| Voltage set accuracy | | ±1 % |
| Output voltage adj. range | | ±10 % for single output models only |
| | - For further information see application note | www.tracopower.com/overview/thl20wi |
| Regulation | - Input variation (Vmin – Vmax) | single output models: 0.2 % max. dual output models: 0.5 % max. |
| | - Load variation | single output models: 0.5 % max. (0 – 100 % load) dual output models: 1.0 % max. (8 – 100 % balanced load) |
| Minimum load | single output models: | not required |
| | dual output models: | 8 % of rated max current (operation at lower load condition will not damage the converters. However, they may not meet all listed specifications) |
| Ripple and noise (20 MHz bandwidth) | 3.3 & 5.0 VDC models: | 75 mVp-p typ. |
| | 12 & 15 VDC models: | 100 mVp-p typ. |
| | 24 VDC models: | 150 mVp-p typ. Measured with a 1µF M/C and a 10µF T/C |
| Temperature coefficient | | ±0.02 %/K |
| Output current limitation | | at 150 % of Iout max., foldback |
| Short circuit protection | | indefinite, automatic recovery |
| Transient response setting time | | 300 µs typ. (25% load step change) |
| Max. capacitive load | 3.3 VDC models: | 10'300 µF |
| | 5 VDC models: | 6'800 µF |
| | 12 VDC models: | 1'200 µF |
| | 15 VDC models: | 750 µF |
| | 24 VDC models: | 300 µF |
| | ±12 VDC models: | 680 µF (each output) |
| | ±15 VDC models: | 380 µF (each output) |

General Specifications

| | | |
|--|--|---|
| Temperature ranges | <ul style="list-style-type: none"> - Operating (convection cooling 50 LFM, 0.25 m/s) - Operating with heat sink (natural convection 20 LFM) - Case temperature - Storage | <ul style="list-style-type: none"> -40°C to +75°C (with derating) -40°C to +85°C (with derating) +105°C max. -50°C to +125°C |
| Load derating (convection cooling 50 LFM, 0.25 m/s) | <ul style="list-style-type: none"> - without heat sink - with heat sink | <ul style="list-style-type: none"> 24 Vin; 3.3 VDC models: 2.5 %/K above +64°C 48 Vin; 3.3 VDC models: 2.7 %/K above +68°C 5, 12 & 15 VDC single output models: 2.2 %/K above +60°C 24 VDC output models: 2.0 %/K above +55°C dual output models: 2.2 %/K above +60°C 24 V; 3.3 VDC models: 3.3 %/K above +70°C 48 V; 3.3 VDC models: 3.2 %/K above +74°C 5, 12 & 15 VDC output models: 3.1 %/K above +67°C 24 VDC output models: 2.7 %/K above +63°C dual output models: 3.1 %/K above +67°C |
| Thermal impedance | <ul style="list-style-type: none"> - Natural convection - Natural convection with heat sink | <ul style="list-style-type: none"> 18.2°C/W 15.3°C/W |
| Humidity (non condensing) | | 95 % rel H max. |
| Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign) | | >451'600 h |
| Isolation voltage (60 s) | - Input/Output | 1500 VDC |
| Isolation capacitance | <ul style="list-style-type: none"> - Input/Output (100 kHz, 1 V) - Input/Case - Output/Case | <ul style="list-style-type: none"> 1500 pF max. 1000 VDC 1000 VDC |
| Isolation resistance | - Input/Output (500 VDC) | >1000 MOhm |
| Remote On/Off | <ul style="list-style-type: none"> - On: - Off: - Off idle current: | <ul style="list-style-type: none"> 3.5 ... 12 VDC or open circuit 0 ... 1.2 VDC or short circuit pin 6 and pin 2 10 mA |
| Switching frequency (fixed) | | 330 kHz typ. (pulse width modulation PWM) |
| Altitude during operation | | 5'000 m max. (16'400 ft) approved |
| Safety standards (designed to meet) | | UL/cUL 60950-1, IEC/EN 60950-1 |
| Safety approvals | <ul style="list-style-type: none"> - CSA certificate of compliance - CB test certificate - Certification documents | <ul style="list-style-type: none"> CAN/CSA-C22.2 No 60950-1-07, Am 1:2011 ANSI/UL Std No 60950-1, 2nd Ed, AM 1:2011 IEC 60950-1:2005 2nd Ed, Am 1:2009 www.tracopower.com/overview/thl20wi |
| Environmental compliance | <ul style="list-style-type: none"> - Reach - RoHS | <ul style="list-style-type: none"> www.tracopower.com/info/reach-declaration.pdf RoHS directive 2011/65/EU |

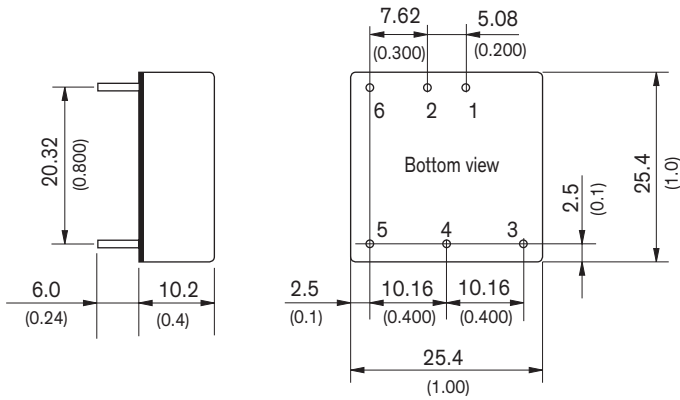
Physical Specifications

| | |
|------------------------------|--|
| Casing material | aluminium alloy |
| Pin material | copper alloy with gold plating nickel subplate |
| Baseplate | non conductive FR4 |
| Potting material | epoxy (UL 94V-0 rated) |
| Weight | 15 g (0.53 oz) |
| Soldering temperature | 260°C / 10 s max. |

Application note : www.tracopower.com/overview/thl20wi

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 | Trim | Common |
| 5 | -Vout | -Vout |
| 6 | Remote On/Off | |

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

Heat-Sink (Option)

Order code: THL-HS1

(cont.: heat-sink, thermal pad, 2 clamps)

Material: Aluminum

Finish: Anodic treatment (black)

Weight: 4 g (0.14 oz) without converter

Thermal impedance after assembling: 15.8 K/W

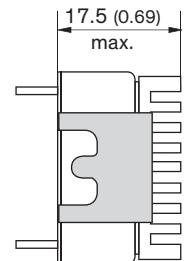
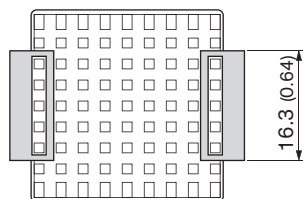
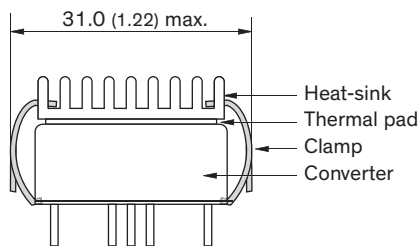


Note:

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

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View THL 20-4813WI on WIN SOURCE](#)
-  [Traco Power Information](#)

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