

Features

- ◆ Highest power density 30W converter!
Ultra compact size: 1.0" x 1.0" x 0.4"
- ◆ Shielded metal case with isolated baseplate
- ◆ Wide 2:1 input voltage range
- ◆ Very high efficiency across full load range up to 92%
- ◆ Over temperature protection
- ◆ Operating temp. range -40°C to $+80^{\circ}\text{C}$ and up to 85°C with heat-sink
- ◆ Ultra low no load input current
- ◆ Remote On/Off control
- ◆ Output voltage adjustable
- ◆ I/O isolation voltage 1500 VDC
- ◆ RoHS 2011/65/EU compliant
- ◆ 3-year product warranty



The THN-30WI series is the latest generation of high performance DC/DC converter modules with highest power density. The product achieves 30W 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 wide 2:1 input voltage range and precisely regulated output voltages, even under no load conditions. Highest efficiency across load range makes this product very reliable and applicable in temperature ranges of up to 85°C . With a low input current at no load and remote On/Off control these converters are the ideal solution for battery-operated systems. 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. |
|-------------|--|--|---------------------|-----------------|
| THN 30-1210 | 9 – 18 VDC (12 VDC nominal) | 3.3 VDC | 7000 mA | 86 % |
| THN 30-1211 | | 5.0 VDC | 6000 mA | 89 % |
| THN 30-1212 | | 12 VDC | 2500 mA | 89 % |
| THN 30-1213 | | 15 VDC | 2000 mA | 89 % |
| THN 30-1215 | | 24 VDC | 1250 mA | 89 % |
| THN 30-1222 | | ± 12 VDC | ± 1250 mA | 89 % |
| THN 30-1223 | | ± 15 VDC | ± 1000 mA | 90 % |
| THN 30-2410 | | 18 – 36 VDC (24 VDC nominal) | 3.3 VDC | 7000 mA |
| THN 30-2411 | 5.0 VDC | | 6000 mA | 90 % |
| THN 30-2412 | 12 VDC | | 2500 mA | 91 % |
| THN 30-2413 | 15 VDC | | 2000 mA | 91 % |
| THN 30-2415 | 24 VDC | | 1250 mA | 91 % |
| THN 30-2422 | ± 12 VDC | | ± 1250 mA | 91 % |
| THN 30-2423 | ± 15 VDC | | ± 1000 mA | 91 % |
| THN 30-4810 | 36 – 75 VDC (48 VDC nominal) | | 3.3 VDC | 7000 mA |
| THN 30-4811 | | 5.0 VDC | 6000 mA | 89 % |
| THN 30-4812 | | 12 VDC | 2500 mA | 90 % |
| THN 30-4813 | | 15 VDC | 2000 mA | 91 % |
| THN 30-4815 | | 24 VDC | 1250 mA | 91 % |
| THN 30-4822 | | ± 12 VDC | ± 1250 mA | 91 % |
| THN 30-4823 | | ± 15 VDC | ± 1000 mA | 92 % |

Input Specifications

| | |
|---|--|
| Input current at no load (at nominal input voltage) | 12 V models: 12 mA typ 24 V models: 10 mA typ. 48 V models: 8 mA typ. |
| Start-up voltage | 12 V models: < 9.0 VDC 24 V models: < 18 VDC 48 V models: < 36 VDC |
| Under voltage shut down (lock-out circuit) | 12 V models: 8.0 VDC typ. 24 V models: 16 VDC typ. 48 V models: 33 VDC typ. |
| Surge voltage (1 sec. max.) | 12 V models: 25 V max 24 V models: 50 V max. 48 V models: 100 V max. |
| Reflected input ripple current | 30 mA _{p-p} typ. |
| Conducted noise (input) | EN 55022 level A, FCC part 15, level A with external capacitor see: application note |
| ESD (electrostatic discharge) | EN 61000-4-2, air ±8 kV, 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 EN 61000-4-5, ±2 kV perf. criteria A With external input capacitor e.g. Nippon chemi-con KY 220 µF, 100 V, ESR 48 mOhm |
| Conducted immunity | EN 61000-4-6, 10 V _{rms} , perf. criteria A |
| Recommended input fuse (slow blow) | 12 V models: 6300 A 24 V models: 3150 mA 48 V models: 1600 mA |

Output Specifications

| | |
|--|--|
| Voltage set accuracy | ±1 % |
| Output voltage adjustment range (see application note) | 15 & 24 VDC models: +20 / -10 % other single output models: ±10 % |
| Regulation | – Input variation (V _{min} – V _{max}) single output models: 0.2 % max. dual output models: 0.5 % max. – Load variation (0 – 100 %) single output models: 0.2 % max. dual output models balanced load: 1.0 % max. dual output models unbalanced load (25% /100%): 5.0 % max. |
| Minimum load | not required |
| Ripple and noise (measured with output capacitor) (20 MHz bandwidth) | 3.3 & 5.0 VDC models: 75 mV _{p-p} with (22µF/25V X7R 1812 MLCC) 12 & 15 VDC models: 75 mV _{p-p} with (2x 22µF/25V X7R 1812 MLCC) 24 VDC models: 75 mV _{p-p} with (2x 6.8µF/50V X7R 1812 MLCC) dual output models: 60 mV _{p-p} with (10µF/50V X7R 1812 MLCC) |
| Temperature coefficient | ±0.02 %/K |
| Output current limitation | at 140 % of I _{out} max. |
| Short circuit protection | hiccup, automatic recovery |
| Over voltage protection | 3.3 VDC models: 3.7 – 5.4 V _{out} 5 VDC models: 5.6 – 7.0 V _{out} 12 VDC models: 13.5 – 19.6 V _{out} 15 VDC models: 18.3 – 22.0 V _{out} 24 VDC models: 29.1 – 32.5 V _{out} |
| Start up time (nominal V _{in} and constant resistive load) | 30 ms max. (for power on and remote on) |
| Transient response setting time | 250 µs typ. (25% load step change) |

Output Specifications

| | | |
|----------------------|----------------------|---------------------------|
| Max. capacitive load | 3.3 VDC models: | 10'000 μ F |
| | 5 VDC models: | 7'200 μ F |
| | 12 VDC models: | 1'200 μ F |
| | 15 VDC models: | 1'000 μ F |
| | 24 VDC models: | 375 μ F |
| | \pm 12 VDC models: | 750 μ F (each output) |
| | \pm 15 VDC models: | 500 μ F (each output) |

General Specifications

| | | |
|---|-------------------------------------|--|
| Temperature ranges | - Operating without heat sink | -40°C to +80°C (with derating) |
| | - Operating with heat sink | -40°C to +85°C (with derating) |
| | - Case temperature | +105°C max. |
| | - Storage | -55°C to +125°C |
| Power derating | - Operating without heat sink | 2.2 %/K above 55°C |
| | - Operating with heat sink | 2.5 %/K above 60°C |
| Thermal impedance | - Natural convection | 15.0°C/W |
| | - Natural convection with heat sink | 13.8°C/W |
| Thermal protection | | shutdown at 115°C |
| Humidity (non condensing) | | 5 % to 95 % rel H max. |
| Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign) | | 337'000 h |
| Isolation voltage (60sec.) | - Input/Output | 1'500 VDC |
| | - Input, Output/Case | 1'000 VDC |
| Isolation capacitance | - Input/Output | 1'500 pF max. |
| Isolation resistance | - Input/Output (500 VDC) | >1 GOhm |
| Remote On/Off | - On: | 3.0 to 15 VDC or open circuit |
| | - Off: | 0 to 1.2 VDC or short circuit pin 6 and pin 2 |
| | - Off idle current: | 2.0 mA |
| Switching frequency (fixed, pulse width modulation) | 3.3 & 5.0 Vout models: | 275 kHz \pm 10% |
| | other models: | 330 kHz \pm 10% |
| Vibration and thermal shock | | MIL-STD-810E |
| Safety standards | | UL/cUL 60950-1, IEC/EN 60950-1 |
| Safety approvals | - UL/cUL | www.ul.com -> certifications -> File e188913 (entry pending) |

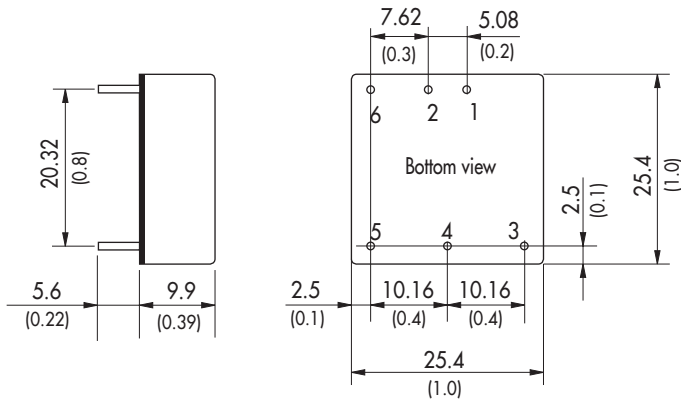
Physical Specifications

| | | |
|--------------------------|---------|--|
| Casing material | | copper |
| Baseplate | | non conductive FR4 |
| Potting material | | silicon (UL 94V-0 rated) |
| Weight | | 16.5 g (0.58 oz) |
| Soldering temperature | | max. 265°C / 10sec. |
| Environmental compliance | - Reach | www.tracopower.com/products/ten30-reach.pdf |
| | - RoHS | RoHS directive 2011/65/EU |

Application note: www.tracopower.com/products/thn30-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 | Trim | Common |
| 5 | -Vout | -Vout |
| 6 | Remote On/Off | |

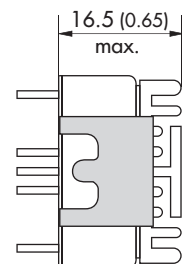
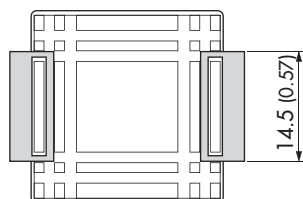
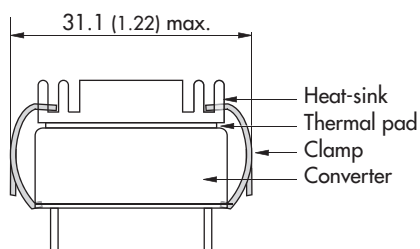
Dimensions in [mm], () = Inch
 Pin diameter \varnothing 1.0 (0.04)
 Pin pitch tolerances: ± 0.25 (± 0.01)
 Tolerances: ± 0.5 (± 0.02)

Heat-Sink (Option)

Order code: THN-HS1
 (cont.: heat-sink, thermal pad, 2 clamps)
Material: Aluminum
Finish: Anodic treatment (black)
Weight: 8 g (0.28 oz) without converter
 Thermal impedance after assembling: 14.8 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 any time without notice.