



**THE DATASHEET OF
THN 15-4810**



- **Smallest encapsulated 15 W Converter!**
Ultra compact size: 1.0" x 1.0" x 0.4"
- **Shielded metal case with isolated baseplate**
- **Wide 2:1 input ranges:**
9-18, 18-36 or 36-75 VDC
- **Output voltage Trim**
- **I/O isolation voltage 1600 VDC**
- **Very high efficiency up to 88%**
- **Operating temp. range:**
-40°C to +85°C
- **Remote On/Off control**
- **Industry standard pinout**
- **3-year product warranty**



The THN 15 series is the latest generation of high performance DC/DC converter modules setting new standards concerning power density. This product with 15 W comes in a encapsulated, shielded metal package with dimensions of only 1.0" x 1.0" x 0.4" and occupies 50% (!) less board space. All models have wide 2:1 input voltage range and precisely regulated, isolated output voltages. Advanced circuit design provides high efficiency up to 88% which allows an operating temperature range of -40°C to +85°C (with derating). Further features include remote On/Off and trimmable output. Typical applications for these converters are mobile equipment, instrumentation, distributed power architectures in communication and industrial electronics and everywhere where space on PCB is critical.

| Models | | | | | | |
|-------------|------------------------------|----------|------------------|----------|------------------|-----------------|
| Order Code | Input Voltage Range | Output 1 | | Output 2 | | Efficiency typ. |
| | | Vnom | I _{max} | Vnom | I _{max} | |
| THN 15-1210 | 9 - 18 VDC (12 VDC nom.) | 3.3 VDC | 4'000 mA | | | 84 % |
| THN 15-1211 | | 5 VDC | 3'000 mA | | | 88 % |
| THN 15-1212 | | 12 VDC | 1'300 mA | | | 86 % |
| THN 15-1213 | | 15 VDC | 1'000 mA | | | 88 % |
| THN 15-1215 | | 24 VDC | 625 mA | | | 90 % |
| THN 15-1221 | | +5 VDC | 1'500 mA | -5 VDC | 1'500 mA | 85 % |
| THN 15-1222 | | +12 VDC | 625 mA | -12 VDC | 625 mA | 87 % |
| THN 15-1223 | | +15 VDC | 500 mA | -15 VDC | 500 mA | 88 % |
| THN 15-1225 | | +24 VDC | 315 mA | -24 VDC | 315 mA | 90 % |
| THN 15-2410 | 18 - 36 VDC (24 VDC nom.) | 3.3 VDC | 4'000 mA | | | 86 % |
| THN 15-2411 | | 5 VDC | 3'000 mA | | | 88 % |
| THN 15-2412 | | 12 VDC | 1'300 mA | | | 87 % |
| THN 15-2413 | | 15 VDC | 1'000 mA | | | 88 % |
| THN 15-2415 | | 24 VDC | 625 mA | | | 90 % |
| THN 15-2421 | | +5 VDC | 1'500 mA | -5 VDC | 1'500 mA | 85 % |
| THN 15-2422 | | +12 VDC | 625 mA | -12 VDC | 625 mA | 88 % |
| THN 15-2423 | | +15 VDC | 500 mA | -15 VDC | 500 mA | 88 % |
| THN 15-2425 | | +24 VDC | 315 mA | -24 VDC | 315 mA | 90 % |
| THN 15-4810 | 36 - 75 VDC (48 VDC nom.) | 3.3 VDC | 4'000 mA | | | 86 % |
| THN 15-4811 | | 5 VDC | 3'000 mA | | | 88 % |
| THN 15-4812 | | 12 VDC | 1'300 mA | | | 88 % |
| THN 15-4813 | | 15 VDC | 1'000 mA | | | 88 % |
| THN 15-4815 | | 24 VDC | 625 mA | | | 91 % |
| THN 15-4821 | | +5 VDC | 1'500 mA | -5 VDC | 1'500 mA | 85 % |
| THN 15-4822 | | +12 VDC | 625 mA | -12 VDC | 625 mA | 89 % |
| THN 15-4823 | | +15 VDC | 500 mA | -15 VDC | 500 mA | 88 % |
| THN 15-4825 | | +24 VDC | 315 mA | -24 VDC | 315 mA | 91 % |

Options

| | |
|--|--|
| THN-HS1 | - Optional Heat Sink: www.tracopower.com/products/thn-hs1.pdf |
| on demand (backorder with MOQ non stocking item) | - Optional models without remote and trim pins - Optional models without remote pin - Optional models without trim pin |

Input Specifications

| | | |
|------------------------|--------------|---|
| Input Current | - At no load | 12 Vin models: 120 mA typ. (3.3 Vout model) 90 mA typ. (5 Vout model) 30 mA typ. (12 Vout model) 30 mA typ. (15 Vout model) 12 mA typ. (24 Vout model) 30 mA typ. (5 / -5 Vout model) 30 mA typ. (12 / -12 Vout model) 30 mA typ. (15 / -15 Vout model) 17 mA typ. (24 / -24 Vout model) 24 Vin models: 50 mA typ. (3.3 Vout model) 65 mA typ. (5 Vout model) 20 mA typ. (12 Vout model) 20 mA typ. (15 Vout model) 10 mA typ. (24 Vout model) 15 mA typ. (5 / -5 Vout model) 15 mA typ. (12 / -12 Vout model) 25 mA typ. (15 / -15 Vout model) 12 mA typ. (24 / -24 Vout model) 48 Vin models: 25 mA typ. (3.3 Vout model) 35 mA typ. (5 Vout model) 12 mA typ. (12 Vout model) 12 mA typ. (15 Vout model) 10 mA typ. (24 Vout model) 12 mA typ. (5 / -5 Vout model) 15 mA typ. (12 / -12 Vout model) 20 mA typ. (15 / -15 Vout model) 10 mA typ. (24 / -24 Vout model) |
| Surge Voltage | | 12 Vin models: 36 VDC max. (100 ms max.) 24 Vin models: 50 VDC max. (100 ms max.) 48 Vin models: 100 VDC max. (100 ms max.) |
| Under Voltage Lockout | | 12 Vin models: 7 VDC min. / 8 VDC typ. / 8.8 VDC max. 24 Vin models: 14.5 VDC min. / 15.5 VDC typ. / 17.5 VDC max. 48 Vin models: 32 VDC min. / 33.5 VDC typ. / 35 VDC max. |
| Recommended Input Fuse | | 12 Vin models: 3'150 mA (slow blow) 24 Vin models: 1'600 mA (slow blow) 48 Vin models: 1'000 mA (slow blow) (The need of an external fuse has to be assessed in the final application.) |
| Input Filter | | Internal Pi-Type |

Output Specifications

| | | |
|---------------------------|--|---|
| Output Voltage Adjustment | | -10% to +20% (24 Vout models) $\pm 10\%$ (other models) (single output models only) (By external trim resistor) See application note: www.tracopower.com/overview/thn15 Output power must not exceed rated power! |
| Voltage Set Accuracy | | $\pm 1\%$ max. |

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

| | | |
|--|--|---|
| Regulation | - Input Variation (Vmin - Vmax) | 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: 1% max. (Output 1) 1% max. (Output 2) |
| | - Cross Regulation (25% / 100% asym. load) | dual output models: 5% max. |
| Ripple and Noise (20 MHz Bandwidth) | - single output | 3.3 Vout models: 75 mVp-p typ. (w/ 1 μ F MC 10 μ F TC) 5 Vout models: 75 mVp-p typ. (w/ 1 μ F MC 10 μ F TC) 12 Vout models: 100 mVp-p typ. (w/ 1 μ F MC 10 μ F TC) 15 Vout models: 100 mVp-p typ. (w/ 1 μ F MC 10 μ F TC) 24 Vout models: 100 mVp-p typ. (w/ 6.8 μ F MC) |
| | - dual output | 5 / -5 Vout models: 100 / 100 mVp-p typ. (w/ 1 μ F MC 10 μ F TC) 12 / -12 Vout models: 100 / 100 mVp-p typ. (w/ 1 μ F MC 10 μ F TC) 15 / -15 Vout models: 100 / 100 mVp-p typ. (w/ 1 μ F MC 10 μ F TC) 24 / -24 Vout models: 100 / 100 mVp-p typ. (w/ 4.7 μ F MC) |
| Capacitive Load | - single output | 3.3 Vout models: 12'000 μF max. 5 Vout models: 6'000 μF max. 12 Vout models: 1'000 μF max. 15 Vout models: 660 μF max. 24 Vout models: 200 μF max. |
| | - dual output | 5 / -5 Vout models: 3'000 / 3'000 μF max. 12 / -12 Vout models: 520 / 520 μF max. 15 / -15 Vout models: 330 / 330 μF max. 24 / -24 Vout models: 100 / 100 μF max. |
| Minimum Load | | Not required |
| Temperature Coefficient | | ± 0.02 %/K max. |
| Start-up Time | | 30 ms max. |
| Short Circuit Protection | | Continuous, Automatic recovery |
| Output Current Limitation | | 120 - 175% of Iout max. 150% typ. of Iout max. |
| Overvoltage Protection | | 112 - 164% of Vout nom. |
| Transient Response | - Response Time | 250 μ s typ. (25% Load Step) |

Safety Specifications

| | | |
|-----------------------|-----------------------------|--|
| Standards | - IT / Multimedia Equipment | EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1 |
| | - Certification Documents | www.tracopower.com/overview/thn15 |
| Pollution Degree | | PD 2 |
| Over Voltage Category | | OVC I |

EMC Specifications

| | | |
|---------------------------|-----------------------|--|
| EMI Emissions | - Conducted Emissions | EN 55032 class A (with external filter) EN 55032 class B (with external filter) |
| | - Radiated Emissions | EN 55032 class A (with external filter) EN 55032 class B (with external filter) |
| External filter proposal: | | www.tracopower.com/overview/thn15 |

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

| | | |
|--------------|-----------------------------|---|
| EMS Immunity | - Electrostatic Discharge | Air: EN 61000-4-2, ± 8 kV, perf. criteria A |
| | - RF Electromagnetic Field | Contact: EN 61000-4-2, ± 6 kV, perf. criteria A |
| | - EFT (Burst) / Surge | EN 61000-4-3, 10 V/m, perf. criteria A |
| | | EN 61000-4-4, ± 2 kV, perf. criteria A |
| | | EN 61000-4-5, ± 1 kV, perf. criteria A |
| | - Conducted RF Disturbances | Ext. input component: 220 μ F, 100 V |
| | - PF Magnetic Field | Continuous: EN 61000-4-8, 100 A/m, perf. criteria A |
| | | 1 s: EN 61000-4-8, 1000 A/m, perf. criteria A |

General Specifications

| | | |
|---------------------------|--|--|
| Relative Humidity | | 95% max. (non condensing) |
| Temperature Ranges | - Operating Temperature | -40°C to +85°C |
| | - Case Temperature | -40°C to +90°C (with Heat Sink) |
| | - Storage Temperature | +105°C max. |
| Power Derating | - High Temperature | -55°C to +125°C |
| | | 2.86 %/K above 70°C |
| | | 3.3 %/K above 75°C (with Heat Sink) |
| | | See application note: www.tracopower.com/overview/thn15 |
| Cooling System | | Natural convection (20 LFM) |
| Remote Control | - Voltage Controlled Remote (passive = on) | On: 3.0 to 15 VDC or open circuit |
| | - Off Idle Input Current | Off: 0 to 1.2 VDC or short circuit |
| | - Remote Pin Input Current | Refers to 'Remote' and '-Vin' Pin |
| Altitude During Operation | | 2.5 mA typ. |
| Regulator Topology | | -0.5 to 1.0 mA |
| Switching Frequency | | 5'000 m max. |
| Insulation System | | Flyback Converter |
| Isolation Test Voltage | - Input to Output, 60 s | 360 - 440 kHz (PWM) |
| | - Input to Case, 60 s | 400 kHz typ. (PWM) |
| | - Output to Case, 60 s | Functional Insulation |
| Isolation Resistance | - Input to Output, 500 VDC | 1'600 VDC |
| Isolation Capacitance | - Input to Output, 100 kHz, 1 V | 1'000 VDC |
| Reliability | - Calculated MTBF | 1'000 VDC |
| Washing Process | | 1'000 M Ω min. |
| Environment | - Vibration | 1'000 pF max. |
| | - Thermal Shock | 1'600'000 h (MIL-HDBK-217F, ground benign) |
| Housing Material | | According to Cleaning Guideline |
| Base Material | | www.tracopower.com/info/cleaning.pdf |
| Potting Material | | MIL-STD-810F |
| Pin Material | | EN 61373 |
| Pin Foundation Plating | | MIL-STD-810F |
| Pin Surface Plating | | Copper, Nickel plated |
| Housing Type | | Non-conductive FR4 (UL 94 V-0 rated) |
| Mounting Type | | Epoxy (UL 94 V-0 rated) |
| Connection Type | | Copper |
| Footprint Type | | Nickel (2 - 3 μ m) |
| Soldering Profile | | Tin (3 - 5 μ m), matte |
| Weight | | Metal Case |
| Thermal Impedance | - Case to Ambient | PCB Mount |
| | | THD (Through-Hole Device) |
| | | 1" x 1" |
| | | Lead-Free Wave Soldering |
| | | 265°C / 10 s max. |
| | | 15 g |
| | | 18.2 K/W typ. |
| | | 15.8 K/W typ. (with Heat Sink) |

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

Environmental Compliance - REACH Declaration

www.tracopower.com/info/reach-declaration.pdf

- RoHS Declaration

REACH SVHC list compliant

REACH Annex XVII compliant

www.tracopower.com/info/rohs-declaration.pdf

Exemptions: 7a, 7c-I

(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule))

- SCIP Reference Number

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Supporting Documents

Overview Link (for additional Documents)

www.tracopower.com/overview/thn15

Outline Dimensions





Dimensions in mm (inch)
 Tolerances: ± 0.5 (± 0.02)
 Pin pitch tolerances ± 0.25 (± 0.01)
 Pin diameter $\varnothing 1.0$ (0.04)

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 |

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

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-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management