



**THE DATASHEET OF
THN 15-2425N**



- 15 Watt converter in a compact 1.0" x 1.0" metal package
- Wide 2:1 input voltage: 9-18, 18-36, 36-75 VDC
- Internal EN 55032 class A filter
- Operating temperature range -40 to +70 °C without derating
- Low no-load power consumption 96-336 mW
- High efficiency up to 91%
- I/O-isolation voltage 1600 VDC
- Protection against overload, overvoltage and short circuit
- Remote On/Off and Trim function
- 3-year product warranty



The THN 15N series is the latest generation of high performance 15 W DC/DC converters and comes in an encapsulated, shielded 1.0" x 1.0" x 0.4" metal package. The new and improved design allows to fully integrate an EN 55032 class A filter and greatly reduces the no-load power consumption (96-336 mW). Advanced circuit design and a high efficiency of up to 91% enable the THN 15N to operate in a temperature range of -40°C to +70°C without derating. All models have a wide 2:1 input voltage range and precisely regulated, isolated output voltages. Further features include remote On/Off and trimmable outputs. Together with the latest IT safety certifications (UL 62368-1) 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 15-1210N | 9 - 18 VDC (12 VDC nom.) | 3.3 VDC | 4'500 mA | | | 88 % |
| THN 15-1211N | | 5 VDC | 3'000 mA | | | 90 % |
| THN 15-1212N | | 12 VDC | 1'300 mA | | | 89 % |
| THN 15-1213N | | 15 VDC | 1'000 mA | | | 90 % |
| THN 15-1215N | | 24 VDC | 625 mA | | | 91 % |
| THN 15-1221N | | +5 VDC | 1'500 mA | -5 VDC | 1'500 mA | 86 % |
| THN 15-1222N | | +12 VDC | 625 mA | -12 VDC | 625 mA | 90 % |
| THN 15-1223N | | +15 VDC | 500 mA | -15 VDC | 500 mA | 90 % |
| THN 15-1225N | | +24 VDC | 315 mA | -24 VDC | 315 mA | 90 % |
| THN 15-2410N | 18 - 36 VDC (24 VDC nom.) | 3.3 VDC | 4'500 mA | | | 88 % |
| THN 15-2411N | | 5 VDC | 3'000 mA | | | 90 % |
| THN 15-2412N | | 12 VDC | 1'300 mA | | | 89 % |
| THN 15-2413N | | 15 VDC | 1'000 mA | | | 90 % |
| THN 15-2415N | | 24 VDC | 625 mA | | | 91 % |
| THN 15-2421N | | +5 VDC | 1'500 mA | -5 VDC | 1'500 mA | 86 % |
| THN 15-2422N | | +12 VDC | 625 mA | -12 VDC | 625 mA | 90 % |
| THN 15-2423N | | +15 VDC | 500 mA | -15 VDC | 500 mA | 90 % |
| THN 15-2425N | | +24 VDC | 315 mA | -24 VDC | 315 mA | 90 % |
| THN 15-4810N | 36 - 75 VDC (48 VDC nom.) | 3.3 VDC | 4'500 mA | | | 87 % |
| THN 15-4811N | | 5 VDC | 3'000 mA | | | 89 % |
| THN 15-4812N | | 12 VDC | 1'300 mA | | | 89 % |
| THN 15-4813N | | 15 VDC | 1'000 mA | | | 89 % |
| THN 15-4815N | | 24 VDC | 625 mA | | | 90 % |
| THN 15-4821N | | +5 VDC | 1'500 mA | -5 VDC | 1'500 mA | 85 % |
| THN 15-4822N | | +12 VDC | 625 mA | -12 VDC | 625 mA | 89 % |
| THN 15-4823N | | +15 VDC | 500 mA | -15 VDC | 500 mA | 89 % |
| THN 15-4825N | | +24 VDC | 315 mA | -24 VDC | 315 mA | 89 % |

| Options | |
|--|--|
| THN-HS1 | - Optional Heat Sink: www.tracopower.com/products/thn-hs1.pdf |
| THN-HS2 | - Optional Heat Sink: www.tracopower.com/products/thn-hs2.pdf |
| on demand (backorder with MOQ non stocking item) | - Optional Heat Sink: www.tracopower.com/products/thn-hs3.pdf |
| | - Optional Heat Sink: www.tracopower.com/products/thn-hs4.pdf |

Input Specifications

| | | |
|------------------------|--------------|---|
| Input Current | - At no load | 12 Vin models: 10 mA typ. 24 Vin models: 8 mA typ. 48 Vin models: 7 mA typ. |
| Surge Voltage | | 12 Vin models: 25 VDC max. (1 s max.) 24 Vin models: 50 VDC max. (1 s max.) 48 Vin models: 100 VDC max. (1 s max.) |
| Under Voltage Lockout | | 12 Vin models: 7.5 VDC min. / 8 VDC typ. / 8.8 VDC max. 24 Vin models: 15.5 VDC min. / 16 VDC typ. / 17.5 VDC max. 48 Vin models: 32.5 VDC min. / 33 VDC typ. / 35.5 VDC max. |
| Recommended Input Fuse | | 12 Vin models: 3'150 mA (slow blow) 24 Vin models: 1'600 mA (slow blow) 48 Vin models: 800 mA (slow blow) (The need of an external fuse has to be assessed in the final application.) |
| Input Filter | | Internal Pi-Type |

Output Specifications

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|-------------------------------------|--|---|
| Output Voltage Adjustment | | -10% to +20% (15 & 24 Vout models) ±10% (other models) (single output models only) (By external trim resistor) See application note: www.tracopower.com/overview/thn15n Output power must not exceed rated power! |
| Voltage Set Accuracy | | ±1% max. |
| 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/ 10 µF, 6.3 V X7R) 5 Vout models: 75 mVp-p typ. (w/ 10 µF, 6.3 V X7R) 12 Vout models: 100 mVp-p typ. (w/ 1 µF, 25 V X7R) 15 Vout models: 100 mVp-p typ. (w/ 1 µF, 25 V X7R) 24 Vout models: 125 mVp-p typ. (w/ 2.2 µF, 50 V X7R) |
| | - dual output | 5 / -5 Vout models: 75 / 75 mVp-p typ. (w/ 10 µF, 6.3 V X7R) 12 / -12 Vout models: 100 / 100 mVp-p typ. (w/ 1 µF, 25 V X7R) 15 / -15 Vout models: 100 / 100 mVp-p typ. (w/ 1 µF, 25 V X7R) 24 / -24 Vout models: 125 / 125 mVp-p typ. (w/ 2.2 µF, 50 V X7R) |

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

| | | |
|---------------------------|-----------------|--|
| Capacitive Load | - single output | 3.3 Vout models: 5'200 µF max. 5 Vout models: 3'600 µF max. 12 Vout models: 600 µF max. 15 Vout models: 500 µF max. 24 Vout models: 200 µF max. |
| | - dual output | 5 / -5 Vout models: 1'500 / 1'500 µF max. 12 / -12 Vout models: 360 / 360 µF max. 15 / -15 Vout models: 250 / 250 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 typ. / 40 ms max. |
| Short Circuit Protection | | Continuous, Automatic recovery |
| Output Current Limitation | | 120 - 190% of Iout max. 150% typ. of Iout max. |
| Oversvoltage Protection | | 112 - 164% of Vout nom. |
| Transient Response | - Response Time | 250 µs typ. (25% Load Step) |

Safety Specifications

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|------------------|-----------------------------|--|
| Standards | - IT / Multimedia Equipment | EN 62368-1 IEC 62368-1 UL 62368-1 |
| | - Certification Documents | www.tracopower.com/overview/thn15n |
| Pollution Degree | | PD 2 |

EMC Specifications

| | | |
|---------------|-----------------------------|---|
| EMI Emissions | - Conducted Emissions | EN 55011 class A (internal filter) EN 55011 class B (with external filter) EN 55032 class A (internal filter) EN 55032 class B (with external filter) |
| | - Radiated Emissions | EN 55011 class A (internal filter) EN 55011 class B (with external filter) EN 55032 class A (internal filter) EN 55032 class B (with external filter) |
| | External filter proposal: | www.tracopower.com/overview/thn15n |
| EMS Immunity | - Electrostatic Discharge | EN 55024 (IT Equipment) EN 55035 (Multimedia) Air: EN 61000-4-2, ±8 kV, perf. criteria A Contact: EN 61000-4-2, ±6 kV, perf. criteria A |
| | - RF Electromagnetic Field | EN 61000-4-3, 10 V/m, perf. criteria A |
| | - EFT (Burst) / Surge | EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±1 kV, perf. criteria A |
| | - Conducted RF Disturbances | Ext. input component: 12 Vin models: 470 µF, 50 V TVS SMDJ58A 24 Vin models: 470 µF, 50 V TVS SMDJ70A 48 Vin models: 470 µF, 100 V TVS SMDJ100A EN 61000-4-6, 10 Vrms, perf. criteria A |
| | - 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 +88°C |
| | - Case Temperature | +105°C max. |
| | - Storage Temperature | -55°C to +125°C |
| Power Derating | - High Temperature | Depending on model |
| | See application note: | www.tracopower.com/overview/thn15n |

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

| | | |
|---------------------------|--|---|
| Cooling System | | Natural convection (20 LFM) |
| Remote Control | - Voltage Controlled Remote (passive = on) - Off Idle Input Current - Remote Pin Input Current | On: 3.0 to 15 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin 1.5 mA typ. -0.5 to 1.0 mA |
| Altitude During Operation | | 5'000 m max. |
| Regulator Topology | | Flyback Converter |
| Switching Frequency | | 245 kHz typ. (PWM) ($\pm 10\%$, 3.3 & 5 Vout model) 300 kHz typ. (PWM) ($\pm 10\%$, other models) |
| Insulation System | | Functional Insulation |
| Isolation Test Voltage | - Input to Output, 60 s - Input to Case, 60 s - Output to Case, 60 s | 1'600 VDC 1'000 VDC 1'000 VDC |
| Isolation Resistance | - Input to Output, 500 VDC | 1'000 M Ω min. |
| Isolation Capacitance | - Input to Output, 100 kHz, 1 V | 2'000 pF max. |
| Reliability | - Calculated MTBF | 1'670'000 h (MIL-HDBK-217F, ground benign) |
| Washing Process | | According to Cleaning Guideline www.tracopower.com/info/cleaning.pdf |
| Environment | - Vibration - Mechanical Shock - Thermal Shock | MIL-STD-810F MIL-STD-810F MIL-STD-810F |
| Housing Material | | Copper |
| Base Material | | Non-conductive FR4 (UL 94 V-0 rated) |
| Potting Material | | Silicone (UL 94 V-0 rated) |
| Pin Material | | Copper |
| Pin Foundation Plating | | Nickel (2 - 3 μ m) |
| Pin Surface Plating | | Tin (3 - 5 μ m), matte |
| Housing Type | | Metal Case |
| Mounting Type | | PCB Mount |
| Connection Type | | THD (Through-Hole Device) |
| Footprint Type | | 1" x 1" |
| Soldering Profile | | Lead-Free Wave Soldering 260°C / 6 s max. |
| Weight | | 16.5 g |
| Thermal Impedance | - Case to Ambient | 17 K/W typ. (without heatsink) 15.3 K/W typ. (with heatsink THN-HS1) 12.9 K/W typ. (with heatsink THN-HS2) 10.9 K/W typ. (with heatsink THN-HS3) 9.3 K/W typ. (with heatsink THN-HS4) |
| Environmental Compliance | - REACH Declaration - RoHS Declaration - SCIP Reference Number | www.tracopower.com/info/reach-declaration.pdf 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).) 187f3fa6-6464-4f99-8090-1b7af24fa720 |

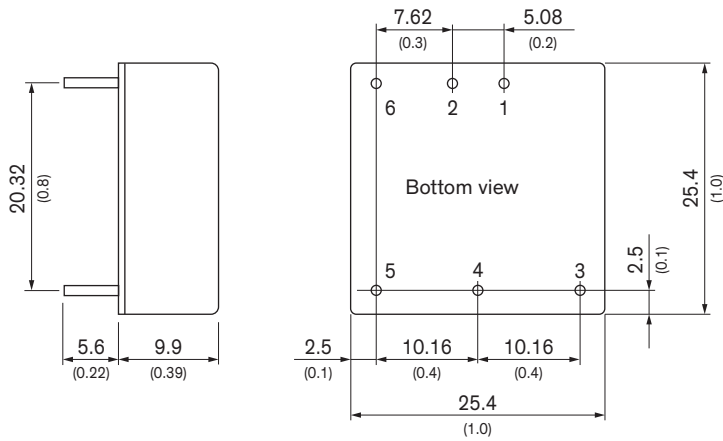
Supporting Documents

Overview Link (for additional Documents)

www.tracopower.com/overview/thn15n

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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?

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