

- Highest power density in DIP 24 package
- Shielded metal case with isolated Baseplate
- Very high efficiency up to 91%
- Wide 2:1 input ranges
- No minimum load required
- Input filter meets EN 55022 class A without external components
- I/O isolation voltage 1500 VDC
- Operating temp. range : -40°C to +85°C
- Remote On/Off control
- Industry standard pinout



The THD 15N series models provide 15 Watt output power out of a very compact shielded metal case that occupies only 1 inch² of board space. The converters work with a high efficiency over the full load range and draw a very low input current at no load conditions. All models have a wide 2:1 input voltage range and a precisely regulated output voltage. 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} | |
| THD 15-1210N | 9 - 18 VDC (12 VDC nom.) | 3.3 VDC | 4'000 mA | | | 87 % |
| THD 15-1211N | | 5.1 VDC | 3'000 mA | | | 90 % |
| THD 15-1212N | | 12 VDC | 1'250 mA | | | 90 % |
| THD 15-1213N | | 15 VDC | 1'000 mA | | | 90 % |
| THD 15-1221N | | +5 VDC | 1'500 mA | -5 VDC | 1'500 mA | 86 % |
| THD 15-1222N | | +12 VDC | 625 mA | -12 VDC | 625 mA | 90 % |
| THD 15-1223N | | +15 VDC | 500 mA | -15 VDC | 500 mA | 90 % |
| THD 15-2410N | 18 - 36 VDC (24 VDC nom.) | 3.3 VDC | 4'000 mA | | | 88 % |
| THD 15-2411N | | 5.1 VDC | 3'000 mA | | | 90 % |
| THD 15-2412N | | 12 VDC | 1'250 mA | | | 91 % |
| THD 15-2413N | | 15 VDC | 1'000 mA | | | 91 % |
| THD 15-2421N | | +5 VDC | 1'500 mA | -5 VDC | 1'500 mA | 87 % |
| THD 15-2422N | | +12 VDC | 625 mA | -12 VDC | 625 mA | 90 % |
| THD 15-2423N | | +15 VDC | 500 mA | -15 VDC | 500 mA | 90 % |
| THD 15-4810N | 36 - 75 VDC (48 VDC nom.) | 3.3 VDC | 4'000 mA | | | 88 % |
| THD 15-4811N | | 5.1 VDC | 3'000 mA | | | 90 % |
| THD 15-4812N | | 12 VDC | 1'250 mA | | | 90 % |
| THD 15-4813N | | 15 VDC | 1'000 mA | | | 91 % |
| THD 15-4821N | | +5 VDC | 1'500 mA | -5 VDC | 1'500 mA | 87 % |
| THD 15-4822N | | +12 VDC | 625 mA | -12 VDC | 625 mA | 90 % |
| THD 15-4823N | | +15 VDC | 500 mA | -15 VDC | 500 mA | 90 % |

Input Specifications

| | | |
|--------------------------|----------------|---|
| Input Current | - At no load | 12 Vin models: 8 mA typ. 24 Vin models: 5 mA typ. 48 Vin models: 4 mA typ. |
| | - At full load | 12 Vin models: 1'450 mA max. 24 Vin models: 720 mA max. 48 Vin models: 360 mA max. |
| Surge Voltage | | 12 Vin models: 36 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 VDC min. / 8 VDC typ. / 8.8 VDC max. 24 Vin models: 15 VDC min. / 16 VDC typ. / 17.5 VDC max. 48 Vin models: 32 VDC min. / 33.5 VDC typ. / 35 VDC max. |
| Reflected Ripple Current | | 20 mAp-p typ. |
| 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

| | | |
|---------------------------|--|--|
| 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: 0.5% 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 | 60 mVp-p typ. (w/ 1 μ F, 25 V, X7R, MLCC) |
| Capacitive Load | - single output | 3.3 Vout models: 4'700 μF max. 5.1 Vout models: 3'300 μF max. 12 Vout models: 600 μF max. 15 Vout models: 400 μF max. |
| | - dual output | 5 / -5 Vout models: 1'500 / 1'500 μF max. 12 / -12 Vout models: 288 / 288 μF max. 15 / -15 Vout models: 200 / 200 μF max. |
| Minimum Load | | Not required |
| Temperature Coefficient | | ±0.02 %/K max. |
| Start-up Time | | 60 ms max. (Power On) 60 ms max. (Remote On) |
| Short Circuit Protection | | Continuous, Automatic recovery |
| Output Current Limitation | | 150% typ. of Iout max. |
| Overvoltage Protection | | 118 - 125% of Vout nom. (depending on model) 3.9 VDC typ. (3.3 Vout models) 6.2 VDC typ. (5.1 Vout models) 15 VDC typ. (12 Vout models) 18 VDC typ. (15 Vout models) |
| Transient Response | - Response Deviation | 8% max. (25% Load Step) |
| | - Response Time | 250 μs typ. (25% Load Step) |

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

Safety Specifications

| | | |
|-----------------------|-----------------------------|--|
| Safety 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/thd15n |
| Pollution Degree | | PD 2 |
| Over Voltage Category | | OVC I |

EMC Specifications

| | | |
|---------------|-----------------------------|---|
| EMI Emissions | - Conducted Emissions | EN 55032 class A (internal filter) EN 55032 class B (with external filter) FCC Part 15 class A (internal filter) |
| | - Radiated Emissions | EN 55032 class A (internal filter) EN 55032 class B (with external filter) FCC Part 15 class A (internal filter) |
| | External filter proposal: | www.tracopower.com/overview/thd15n |
| EMS Immunity | - Electrostatic Discharge | EN 55024 (IT Equipment) 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, ± 2 kV, perf. criteria A |
| | - Conducted RF Disturbances | Ext. input component: Nippon chemi-con KY 220 μ F, 100 V 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 +85°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/thd15n |
| Cooling System | | Natural convection (20 LFM) |
| Remote Control | - Voltage Controlled Remote | On: 3.0 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin |
| | - Off Idle Input Current | 2.5 mA typ. |
| | - Remote Pin Input Current | -0.5 to 0.5 mA |
| Altitude During Operation | | 5'000 m max. |
| Switching Frequency | | 297 - 363 kHz (PWM) 330 kHz typ. (PWM) |
| Insulation System | | Functional Insulation |
| Isolation Test Voltage | - Input to Output, 60 s | 1'600 VDC |
| | - Input to Case, 60 s | 1'600 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 typ. |
| Reliability | - Calculated MTBF | 1'800'000 h (MIL-HDBK-217F, ground benign) |
| Washing Process | | Allowed (hermetical product) |
| | See Cleaning Guideline: | www.tracopower.com/info/cleaning.pdf |
| Environment | - Vibration | MIL-STD-810F |
| | - Thermal Shock | MIL-STD-810F |

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

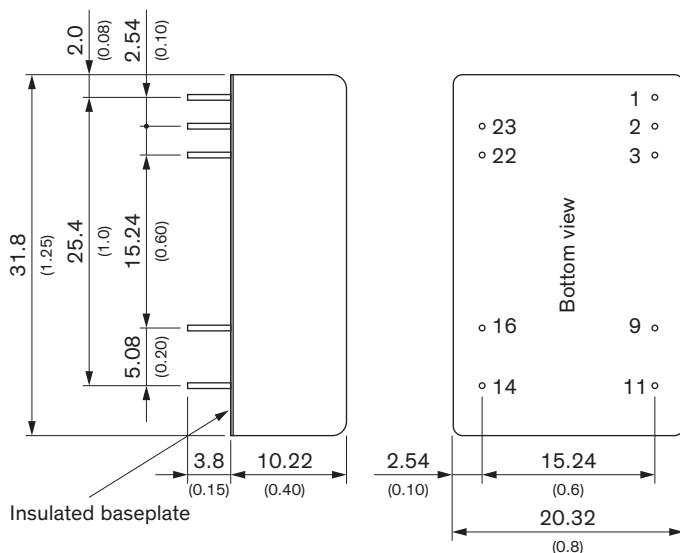
| | |
|--|--|
| Housing Material | Copper, Nickel plated |
| Base Material | Non-conductive FR4 (UL 94 V-0 rated) |
| Potting Material | Silicone (UL 94 V-0 rated) |
| Pin Material | Copper |
| Pin Foundation Plating | Nickel (2 - 3 μm) |
| Pin Surface Plating | Tin (3 - 5 μm), matte |
| Housing Type | Metal Case |
| Mounting Type | PCB Mount |
| Connection Type | THD (Through-Hole Device) |
| Footprint Type | DIP24 |
| Soldering Profile | Wave Soldering 265°C / 10 s max. |
| Weight | 16.2 g |
| Thermal Impedance - Case to Ambient | 20 K/W typ. |
| Environmental Compliance - REACH Declaration | www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant |
| - RoHS Declaration | 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). The SCIP number is provided on request.) |

Supporting Documents

Overview Link (for additional Documents)

www.tracopower.com/overview/thd15n

Outline Dimensions



| Pinout | | |
|--------|---------------|---------------|
| Pin | Single | Dual |
| 1 | Remote On/Off | Remote On/Off |
| 2 | -Vin (GND) | -Vin (GND) |
| 3 | -Vin (GND) | -Vin (GND) |
| 9 | NC | Common |
| 11 | NC | -Vout |
| 14 | +Vout | +Vout |
| 16 | -Vout | Common |
| 22 | +Vin (Vcc) | +Vin (Vcc) |
| 23 | +Vin (Vcc) | +Vin (Vcc) |

NC: Not Connected

Dimensions in mm (inch)
 Tolerances: x.x ±0.5 (x.xx ±0.02)
 x.xx ±0.25 (x.xxx ±0.01)
 Pin \varnothing 0.5 ±0.1 (0.02 ±0.004)