



**THE DATASHEET OF
THD 10-4822N**



- Wide 2:1 input voltage range
- Internal EMI-filter meets EN 55032, Class A without external components
- High efficiency up to 89%
- Operating temperature range -40°C to +85°C
- I/O isolation 1'500 VDC
- Overload protection
- 3-year product warranty



UL 62368-1 IEC 62368-1

The THD 10N series is a range of isolated high performance 10W DC/DC converters in a low profile DIL-24 package with standard industry pin-out. Other features of this product are built-in overvoltage protection and internal EMI-filter to meet EN 55032, class A. Full SMD-design with exclusive use of ceramic capacitors guarantees a high reliability and long product lifetime. Typical applications for these converters are industrial electronics, instrumentation, data communication systems and battery operated equipment with limited space available on the PCB.

| Models | | | | | | |
|--------------|------------------------------|----------|------------------|----------|------------------|-----------------|
| Order Code | Input Voltage Range | Output 1 | | Output 2 | | Efficiency typ. |
| | | Vnom | I _{max} | Vnom | I _{max} | |
| THD 10-1210N | 9 - 18 VDC (12 VDC nom.) | 3.3 VDC | 2'700 mA | | | 86 % |
| THD 10-1211N | | 5.1 VDC | 2'000 mA | | | 85 % |
| THD 10-1212N | | 12 VDC | 833 mA | | | 88 % |
| THD 10-1213N | | 15 VDC | 666 mA | | | 89 % |
| THD 10-1222N | | +12 VDC | 416 mA | -12 VDC | 416 mA | 88 % |
| THD 10-1223N | | +15 VDC | 333 mA | -15 VDC | 333 mA | 89 % |
| THD 10-2410N | 18 - 36 VDC (24 VDC nom.) | 3.3 VDC | 2'700 mA | | | 86 % |
| THD 10-2411N | | 5.1 VDC | 2'000 mA | | | 85 % |
| THD 10-2412N | | 12 VDC | 833 mA | | | 89 % |
| THD 10-2413N | | 15 VDC | 666 mA | | | 89 % |
| THD 10-2422N | | +12 VDC | 416 mA | -12 VDC | 416 mA | 88 % |
| THD 10-2423N | | +15 VDC | 333 mA | -15 VDC | 333 mA | 89 % |
| THD 10-4810N | 36 - 75 VDC (48 VDC nom.) | 3.3 VDC | 2'700 mA | | | 86 % |
| THD 10-4811N | | 5.1 VDC | 2'000 mA | | | 85 % |
| THD 10-4812N | | 12 VDC | 833 mA | | | 87 % |
| THD 10-4813N | | 15 VDC | 666 mA | | | 88 % |
| THD 10-4822N | | +12 VDC | 416 mA | -12 VDC | 416 mA | 87 % |
| THD 10-4823N | | +15 VDC | 333 mA | -15 VDC | 333 mA | 88 % |

Input Specifications

| | | |
|------------------------|----------------|---|
| Input Current | - At no load | 12 Vin models: 20 mA typ. 24 Vin models: 15 mA typ. 48 Vin models: 10 mA typ. |
| | - At full load | 12 Vin models: 940 mA typ. 24 Vin models: 470 mA typ. 48 Vin models: 240 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: 8.5 VDC max. 24 Vin models: 17 VDC max. 48 Vin models: 34 VDC max. |
| Recommended Input Fuse | | (The need of an external fuse has to be assessed in the final application.) |
| Input Filter | | Internal Pi-Type |

Output Specifications

| | | |
|--|--------------------------------------|--|
| Voltage Set Accuracy | | ±2% max. |
| Regulation | - Input Variation (Vmin - Vmax) | single output models: 1% max. dual output models: 1% max. |
| | - Load Variation (0 - 100%) | single output models: 1.2% max. dual output models: 1.2% max. (Output 1) 1.2% max. (Output 2) |
| | - Voltage Balance (symmetrical load) | dual output models: 2% max. |
| Ripple and Noise (20 MHz Bandwidth) | - single output | 3.3 Vout models: 80 mVp-p typ. 5.1 Vout models: 80 mVp-p typ. 12 Vout models: 100 mVp-p typ. 15 Vout models: 100 mVp-p typ. |
| | - dual output | 12 / -12 Vout models: 100 / 100 mVp-p typ. 15 / -15 Vout models: 100 / 100 mVp-p typ. |
| Capacitive Load | - single output | 3.3 Vout models: 1'000 µF max. 5.1 Vout models: 1'000 µF max. 12 Vout models: 470 µF max. 15 Vout models: 330 µF max. |
| | - dual output | 12 / -12 Vout models: 220 / 220 µF max. 15 / -15 Vout models: 150 / 150 µF max. |
| Minimum Load | | Not required |
| Temperature Coefficient | | ±0.02 %/K max. |
| Short Circuit Protection | | Continuous, Automatic recovery |
| Output Current Limitation | | 110% min. of Iout max. 150% typ. of Iout max. |
| Transient Response | - Response Deviation | 3% typ. / 5% max. (75% to 100% Load Step) |
| | - Response Time | 300 µs typ. / 600 µs max. (75% to 100% Load Step) |

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

Safety Specifications

| | | |
|------------------|-----------------------------|--|
| Standards | - IT / Multimedia Equipment | CSA-C22.2, No. 60950-1 EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1 |
| | - Certification Documents | www.tracopower.com/overview/thd10n |
| Pollution Degree | | PD 2 |

EMC Specifications

| | | |
|---------------|---|---|
| EMI Emissions | - Conducted Emissions - Radiated Emissions | EN 55032 class A (internal filter) EN 55032 class A (with external filter) External filter proposal: www.tracopower.com/overview/thd10n |
| EMS Immunity | - Electrostatic Discharge - RF Electromagnetic Field - EFT (Burst) / Surge - Conducted RF Disturbances | 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 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 Ext. input component: 220 μ F, 100 V EN 61000-4-6, 10 Vrms, perf. criteria A |

General Specifications

| | | |
|---------------------------|--|--|
| Relative Humidity | | 95% max. (non condensing) |
| Temperature Ranges | - Operating Temperature - Case Temperature - Storage Temperature | -40°C to +85°C +105°C max. -50°C to +125°C |
| Power Derating | - High Temperature | 2.86 %/K above 70°C See application note: www.tracopower.com/overview/thd10n |
| Cooling System | | Natural convection (20 LFM) |
| Remote Control | - Voltage Controlled Remote (passive = on) - Off Idle Input Current - Remote Pin Input Current | On: 3.5 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin 10 mA max. -0.5 to 0.5 mA |
| Altitude During Operation | | 6'000 m max. |
| Switching Frequency | | 330 kHz typ. (PWM) |
| Insulation System | | Functional Insulation |
| Isolation Test Voltage | - Input to Output, 60 s - Input to Output, 1 s | 1'500 VDC 1'800 VDC |
| Isolation Resistance | - Input to Output, 500 VDC | 1'000 M Ω min. |
| Isolation Capacitance | - Input to Output, 100 kHz, 1 V | 1'000 pF typ. 1'500 pF max. |
| Reliability | - Calculated MTBF | 1'000'000 h (MIL-HDBK-217F, ground benign) |
| Washing Process | | According to Cleaning Guideline www.tracopower.com/info/cleaning.pdf |
| Housing Material | | Metal |
| Base Material | | Non-conductive Plastic (UL 94 V-0 rated) |
| Potting Material | | Silicone (UL 94 V-0 rated) |
| Pin Material | | Copper Alloy (C6801) |
| Pin Foundation Plating | | Nickel (2 - 4 μ m) |
| Pin Surface Plating | | Tin (3 - 5 μ m), matte |
| Housing Type | | Metal Case |

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

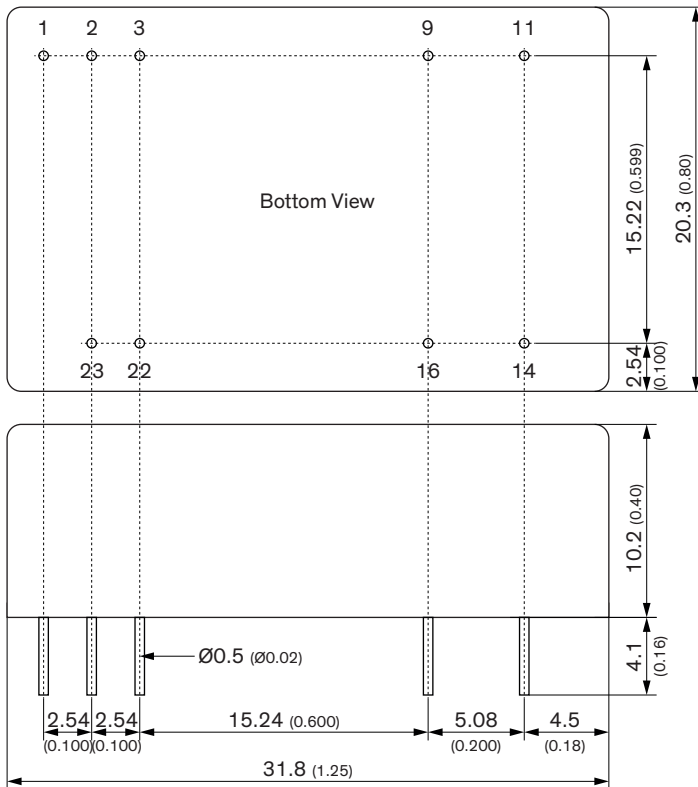
| | |
|--------------------------|--|
| Mounting Type | PCB Mount |
| Connection Type | THD (Through-Hole Device) |
| Footprint Type | DIP24 |
| Soldering Profile | Lead-Free Wave Soldering 260°C / 10 s max. |
| Weight | 17.3 g |
| Environmental Compliance | - REACH Declaration www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant - RoHS Declaration www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7a (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule)) - SCIP Reference Number Oe7ab114-c5ea-46b9-89dd-9cc326cfc9f0 |

Supporting Documents

Overview Link (for additional Documents)

www.tracopower.com/overview/thd10n

Outline Dimensions



| Pinout | | |
|--------|---------------|---------------|
| Pin | Single | Dual |
| 1 | Remote On/Off | Remote On/Off |
| 2 | -Vin (GND) | -Vin (GND) |
| 3 | -Vin (GND) | -Vin (GND) |
| 9 | No pin | 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: $x.x \pm 0.50$ ($x.xx \pm 0.02$)

Tolerances: $x.xx \pm 0.25$ ($x.xxx \pm 0.01$)

Pin diameter tolerance: $x.x \pm 0.05$ ($x.xx \pm 0.002$)

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