Features

◆ 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
◆ 3-year product warranty

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

<table>
<thead>
<tr>
<th>Order code</th>
<th>Input voltage range</th>
<th>Output voltage</th>
<th>Output current max.</th>
<th>Efficiency typ.</th>
</tr>
</thead>
<tbody>
<tr>
<td>THD 15-1210N</td>
<td>9 – 18 VDC (12 VDC nominal)</td>
<td>3.3 VDC</td>
<td>4'000 mA</td>
<td>87 %</td>
</tr>
<tr>
<td>THD 15-1211N</td>
<td>3.3 VDC</td>
<td>5.1 VDC</td>
<td>3'000 mA</td>
<td>90 %</td>
</tr>
<tr>
<td>THD 15-1212N</td>
<td>12 VDC</td>
<td>1'250 mA</td>
<td>90 %</td>
<td></td>
</tr>
<tr>
<td>THD 15-1213N</td>
<td>15 VDC</td>
<td>1'000 mA</td>
<td>90 %</td>
<td></td>
</tr>
<tr>
<td>THD 15-1221N</td>
<td>±5 VDC</td>
<td>±1'500 mA</td>
<td>80 %</td>
<td></td>
</tr>
<tr>
<td>THD 15-1222N</td>
<td>±12 VDC</td>
<td>±625 mA</td>
<td>90 %</td>
<td></td>
</tr>
<tr>
<td>THD 15-1223N</td>
<td>±15 VDC</td>
<td>±500 mA</td>
<td>90 %</td>
<td></td>
</tr>
<tr>
<td>THD 15-2410N</td>
<td>18 – 36 VDC (24 VDC nominal)</td>
<td>3.3 VDC</td>
<td>4'000 mA</td>
<td>88 %</td>
</tr>
<tr>
<td>THD 15-2411N</td>
<td>5.1 VDC</td>
<td>3'000 mA</td>
<td>90 %</td>
<td></td>
</tr>
<tr>
<td>THD 15-2412N</td>
<td>12 VDC</td>
<td>1'250 mA</td>
<td>91 %</td>
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<td>THD 15-2413N</td>
<td>15 VDC</td>
<td>1'000 mA</td>
<td>91 %</td>
<td></td>
</tr>
<tr>
<td>THD 15-2421N</td>
<td>±5 VDC</td>
<td>±1'500 mA</td>
<td>87 %</td>
<td></td>
</tr>
<tr>
<td>THD 15-2422N</td>
<td>±12 VDC</td>
<td>±625 mA</td>
<td>90 %</td>
<td></td>
</tr>
<tr>
<td>THD 15-2423N</td>
<td>±15 VDC</td>
<td>±500 mA</td>
<td>90 %</td>
<td></td>
</tr>
<tr>
<td>THD 15-4810N</td>
<td>36 – 75 VDC (48 VDC nominal)</td>
<td>3.3 VDC</td>
<td>4'000 mA</td>
<td>88 %</td>
</tr>
<tr>
<td>THD 15-4811N</td>
<td>5.1 VDC</td>
<td>3'000 mA</td>
<td>90 %</td>
<td></td>
</tr>
<tr>
<td>THD 15-4812N</td>
<td>12 VDC</td>
<td>1'250 mA</td>
<td>90 %</td>
<td></td>
</tr>
<tr>
<td>THD 15-4813N</td>
<td>15 VDC</td>
<td>1'000 mA</td>
<td>91 %</td>
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</tr>
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<td>THD 15-4821N</td>
<td>±5 VDC</td>
<td>±1'500 mA</td>
<td>87 %</td>
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</tr>
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<td>THD 15-4822N</td>
<td>±12 VDC</td>
<td>±625 mA</td>
<td>90 %</td>
<td></td>
</tr>
<tr>
<td>THD 15-4823N</td>
<td>±15 VDC</td>
<td>±500 mA</td>
<td>90 %</td>
<td></td>
</tr>
</tbody>
</table>
### Input Specifications

<table>
<thead>
<tr>
<th>Input current at no load</th>
<th>12 Vin models</th>
<th>24 Vin models</th>
<th>48 Vin models</th>
</tr>
</thead>
<tbody>
<tr>
<td>(nominal input voltage)</td>
<td>8 mA typ.</td>
<td>5 mA typ.</td>
<td>4 mA typ.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input current at full load</th>
<th>12 Vin models</th>
<th>24 Vin models</th>
<th>48 Vin models</th>
</tr>
</thead>
<tbody>
<tr>
<td>(nominal input voltage)</td>
<td>1450 mA typ.</td>
<td>720 mA typ.</td>
<td>360 mA typ.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Start-up voltage / under voltage shut down</th>
<th>12 Vin models</th>
<th>24 Vin models</th>
<th>48 Vin models</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.0 VDC / 8.0 VDC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Surge voltage (1 sec. max.)</th>
<th>12 Vin models</th>
<th>24 Vin models</th>
<th>48 Vin models</th>
</tr>
</thead>
<tbody>
<tr>
<td>36 V max.</td>
<td>50 V max.</td>
<td>100 V max.</td>
<td></td>
</tr>
</tbody>
</table>

### Conducted noise (input)

- EN 55022 level A, FCC part 15, level A (without external components)

### 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

### Conducted immunity

- EN 61000-4-6, 10 Vrms, perf. criteria A

### Reflected ripple current

- 20 mAp-p typ.

### Output Specifications

<table>
<thead>
<tr>
<th>Voltage set accuracy</th>
<th>±1 % max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation</td>
<td></td>
</tr>
<tr>
<td>Input variation</td>
<td></td>
</tr>
<tr>
<td>single output models</td>
<td>0.2 % max. (Vin min to Vin max.)</td>
</tr>
<tr>
<td>dual output models</td>
<td>0.5 % max. (Vin min to Vin max.)</td>
</tr>
<tr>
<td>Load variation 0 – 100%</td>
<td></td>
</tr>
<tr>
<td>single output models</td>
<td>0.5 % max.</td>
</tr>
<tr>
<td>dual output models</td>
<td>1.0 % max. balanced load</td>
</tr>
<tr>
<td>Load variation 10 – 90%</td>
<td></td>
</tr>
<tr>
<td>single output models</td>
<td>0.3 % max.</td>
</tr>
<tr>
<td>dual output models</td>
<td>0.8 % max. balanced load</td>
</tr>
<tr>
<td>Load cross regulation 25/100%</td>
<td>5.0 % max. [dual output models]</td>
</tr>
</tbody>
</table>

### Minimum load

- 0 % of rated max. load

### Temperature coefficient

- ±0.02 %/K

### Ripple and noise (20 MHz bandwidth)

- 60 mVp-p typ. (with 1µF / 25 V)

### Output current limitation

- at 150 % of Iout max. foldback

### Short circuit protection

- indefinite, automatic recovery

### Over voltage protection [single output models only]

- 3.3 VDC models: 3.9 VDC
- 5.1 VDC models: 6.2 VDC
- 12 VDC models: 15 VDC
- 15 VDC models: 18 VDC

### Start up time [nominal Vin and constant resistive load]

- 30 ms typ. (for power on and remote on)

### Transient response setting time (25% load step change)

- 250 µs typ.

### Capacitive load

- 3.3 VDC models: 4700 µF max.
- 5.1 VDC models: 3300 µF max.
- 12 VDC models: 600 µF max.
- 15 VDC models: 400 µF max.
- ±5 VDC models: ±1500 µF max.
- ±12 VDC models: ±288 µF max.
- ±15 VDC models: ±200 µF max.

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

Temperature ranges
- Operating: -40°C to +85°C (with derating)
- Case temperature: +105°C max.
- Storage: -55°C to +105°C

Power derating
- High Temperature: See application note: www.tracopower.com/overview/thd15n
- Natural convection: 20°C/W

Humidity (non-condensing)
5% to 95% rel. H max.

Reliability, calculated MTBF
(MIL-HDBK-217F, at +25°C, ground benign) >1.8 Mio h

Isolation voltage (60sec)
- Input/Output: 1'500 VDC

Isolation capacitance

Isolation resistance
- Input/Output (500 VDC): >1'000 MOhm

Remote On/Off
- On: 3.0 ... 12 VDC or open circuit
- Off: 0 ... 1.2 VDC or short circuit pin 1 and pin 2
- Off idle current: 2.5 mA

Altitude during operation
5’000 m max.

Switching frequency
330 kHz typ. (pulse width modulation PWM)

Thermal shock, mechanical shock & vibration
EN 61373, MIL-STD-810F

Safety standards
UL/cUL 60950-1, EN 60950-1, IEC 60950-1
UL 62368-1, IEC/EN 62368-1
- Certification documents: www.tracopower.com/overview/thd15n

Environmental compliance
- Reach: www.tracopower.com/overview/thd15n
- RoHS: RoHS directive 2011/65/EU

Physical Specifications

Casing material
nickel coated copper

Baseplate
non conductive FR4

Potting material
silicone (UL 94V-0 rated)

Weight
14.4 g (0.51 oz)

Soldering temperature
max. 265°C / 10 sec.

Outline Dimensions

Dimensions in [mm], ( ) = Inch
Pin diameter ø 0.5 (0.02) Pin pitch tolerances: ±0.35 (±0.014)
Tolerances: ±0.5 (±0.02)

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at www.tracopower.com