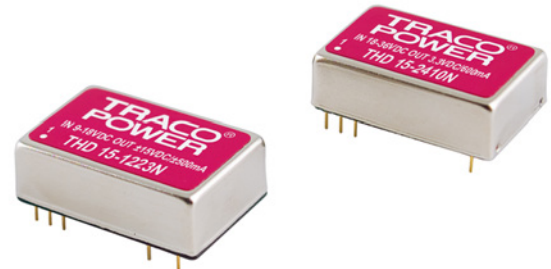


### Features

- ◆ 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 inch<sup>2</sup> 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 voltage	Output current max.	Efficiency typ.
THD 15-1210N	9 – 18 VDC (12 VDC nominal)	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	86 %
THD 15-1222N		±12 VDC	±625 mA	90 %
THD 15-1223N		±15 VDC	±500 mA	90 %
THD 15-2410N	18 – 36 VDC (24 VDC nominal)	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	87 %
THD 15-2422N		±12 VDC	±625 mA	90 %
THD 15-2423N		±15 VDC	±500 mA	90 %
THD 15-4810N	36 – 75 VDC (48 VDC nominal)	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	87 %
THD 15-4822N		±12 VDC	±625 mA	90 %
THD 15-4823N		±15 VDC	±500 mA	90 %

### Input Specifications

Input current at no load (nominal input voltage)	12 Vin models: <b>8 mA typ.</b> 24 Vin models: <b>5 mA typ.</b> 48 Vin models: <b>4 mA typ.</b>
Input current at full load (nominal input voltage)	12 Vin models: <b>1450 mA typ.</b> 24 Vin models: <b>720 mA typ.</b> 48 Vin models: <b>360 mA typ.</b>
Start-up voltage / under voltage shut down	12 Vin models: <b>9.0 VDC / 8.0 VDC</b> 24 Vin models: <b>18 VDC / 16 VDC</b> 48 Vin models: <b>36 VDC / 33 VDC</b>
Surge voltage (1 sec. max.)	12 Vin models: <b>36 V max.</b> 24 Vin models: <b>50 V max.</b> 48 Vin models: <b>100 V max.</b>
Conducted noise (input)	<b>EN 55022 level A, FCC part 15, level A</b> (without external components)
ESD (electrostatic discharge)	<b>EN 61000-4-2, air ±8 kV, contact ±6 kV,</b> <b>perf. criteria A</b>
Radiated immunity	<b>EN 61000-4-3 10 V/m, perf. criteriy A</b>
Fast transient / Surge	<b>EN 61000-4-4, ±2 kV, perf. criteria A</b> <b>EN 61000-4-5, ±2 kV perf. criteria A</b> with external input capacitor e.g. Nippon chemi-con KY 220 μF, 100 V, ESR 48 mOhm
Conducted immunity	<b>EN 61000-4-6, 10 Vrms, perf. criteria A</b>
Reflected ripple current	<b>20 mA<sub>p-p</sub> typ.</b>

### Output Specifications

Voltage set accuracy	<b>±1 % max</b>
Regulation	<ul style="list-style-type: none"> <li>- Input variation                  single output models: <b>0.2 % max.</b> (Vin min to Vin max.)    dual output models: <b>0.5 % max.</b> (Vin min to Vin max.)</li> <li>- Load variation 0 – 100%      single output models: <b>0.5 % max.</b>    dual output models: <b>1.0 % max.</b> balanced load</li> <li>- Load variation 10 – 90%      single output models: <b>0.3 % max.</b>    dual output models: <b>0.8 % max.</b> balanced load</li> <li>- Load cross regulation 25/100%      <b>5.0 % max.</b> (dual output models)</li> </ul>
Minimum load	<b>0 % of rated max. load</b>
Temperature coefficient	<b>±0.02 %/K</b>
Ripple and noise (20 MHz bandwidth)	<b>60 mV<sub>p-p</sub> typ.</b>
Output current limitation	<b>at 150 % of lout max. foldback</b>
Short circuit protection	<b>indefinite, automatic recovery</b>
Over voltage protection (single output models only)	3.3 VDC models: <b>3.9 VDC</b> 5.1 VDC models: <b>6.2 VDC</b> 12 VDC models: <b>15 VDC</b> 15 VDC models: <b>18 VDC</b>
Start up time (nominal Vin and constant resistive load)	<b>30 ms typ.</b> (for power on and remote on)
Transient response setting time (25% load step change)	<b>250 μs typ.</b>
Capacitive load	3.3 VDC models: <b>4700 μF max.</b> 5.1 VDC models: <b>3300 μF max.</b> 12 VDC models: <b>600 μF max.</b> 15 VDC models: <b>400 μF max.</b> ±5 VDC models: <b>±1500 μF max.</b> ±12 VDC models: <b>±288 μF max.</b> ±15 VDC models: <b>±200 μF max.</b>

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

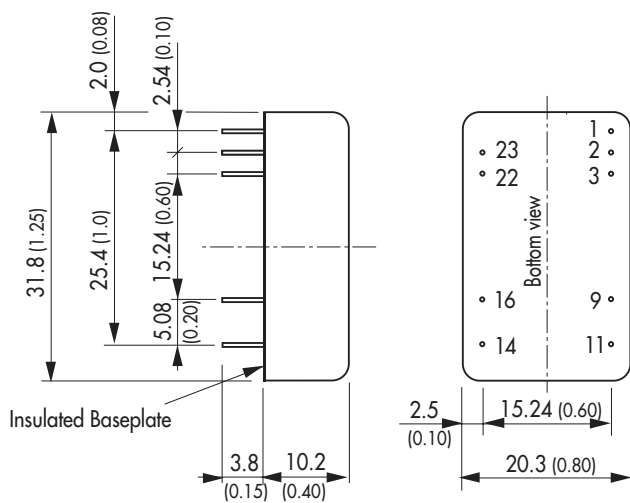
**General Specifications**

Temperature ranges	- Operating - Case temperature - Storage	-40°C to +85°C (with derating) +105°C max. -55°C to +105°C
Power derating		4 %/K above +70°C
Thermal inpedance	- 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	- Input/Output	2000 pF typ.
Isolation resistance	- Input/Output (500 VDC)	>1'000 MOhm
Remote On/Off	- On: - Off: - Off idle current:	3.0 ... 12 VDC or open circuit 0 ... 1.2 VDC or short circuit pin 1 and pin 2 2.5 mA
Switching frequency		330 kHz typ. (pulse width modulation PWM)
Thermal shock, mechanical shock & vibration	- Test conditions	EN 61373, MIL-STD-810F <a href="http://www.tracopower.com/products/mil810.pdf">www.tracopower.com/products/mil810.pdf</a>
Safety standards	- Certification documents	UL/cUL 60950-1, EN 60950-1, IEC 60950-1 <a href="http://www.tracopower.com/overview/thd15n">www.tracopower.com/overview/thd15n</a>
Environmental compliance	- Reach - RoHS	<a href="http://www.tracopower.com/overview/thd15n">www.tracopower.com/overview/thd15n</a> 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 (0.51oz)
Soldering temperature	max. 265°C / 10sec.

**Outline Dimensions**



**Pin-Out**

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)

Dimensions in [mm], ( ) = Inch  
Pin diameter  $\varnothing$  0.5 (0.02)  
Pin pitch tolerances:  $\pm 0.35$  ( $\pm 0.014$ )  
Tolerances:  $\pm 0.5$  ( $\pm 0.02$ )

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at [www.tracopower.com](http://www.tracopower.com)

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