



Features

- ◆ Smallest encapsulated 15W Converter!
Ultra compact size: 1.0" x 1.0" x 0.4"
- ◆ Shielded metal case with isolated baseplate
- ◆ Wide 2:1 input ranges
- ◆ Output voltage Trim
- ◆ I/O-isolation voltage 1500 VDC
- ◆ Very high efficiency up to 88%
- ◆ Operating temp. range : -40°C to +85°C
- ◆ Remote On/Off control
- ◆ Industry standard pinout
- ◆ 3-year product warranty



The THN-15 series is the latest generation of high performance dc-dc converter modules setting new standards concerning power density. This product with 15W comes in a encapsulated, shielded metal package with dimensions of only 1.0"x1.0"x 0.4" and occupies 50%(!) less board space. All models have wide 2:1 input voltage range and precisely regulated, isolated output voltages. Advanced circuit design provides high efficiency up to 88% which allows a operating temperature range of -40°C to +85°C (with derating) Further features include remote On/Off, trimable output and Basic Insulation. This product is fully compliant to RoHS directive. 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.
THN 15-1210	9 – 18 VDC (12 VDC nominal)	3.3 VDC	4'000 mA	84 %
THN 15-1211		5.0 VDC	3'000 mA	86 %
THN 15-1212		12 VDC	1'300 mA	85 %
THN 15-1213		15 VDC	1'000 mA	87 %
THN 15-2410	18 – 36 VDC (24 VDC nominal)	3.3 VDC	4'000 mA	86 %
THN 15-2411		5.0 VDC	3'000 mA	86 %
THN 15-2412		12 VDC	1'300 mA	86 %
THN 15-2413		15 VDC	1'000 mA	88 %
THN 15-4810	36 – 75 VDC (48 VDC nominal)	3.3 VDC	4'000 mA	86 %
THN 15-4811		5.0 VDC	3'000 mA	88 %
THN 15-4812		12 VDC	1'300 mA	88 %
THN 15-4813		15 VDC	1'000 mA	88 %

Input Specifications

Input current at no load (nominal input)	12 Vin; 3.3 & 5Vin models: 12 Vin models: 24 Vin; 3.3 & 5 VDC models: 24 Vin; other models: 48 Vin; 3.3 & 5 VDC models: 48 Vin; other models:	100 mA typ. 40 mA typ. 60 mA typ. 20 mA typ. 40 mA typ. 15 mA typ.
Input current at full load (nominal input)	12 Vin models: 24 Vin models: 48 Vin models:	1550 mA typ. 750 mA typ. 370 mA typ.
Input voltage variation (dv/dt)		5 V/ms, max. (complies with ETS300 132 part 4.4)
Start-up voltage / under voltage shut down	12 Vin models: 24 Vin models: 48 Vin models:	9.0 VDC /8.0 VDC 17.0 VDC /14.5 VDC 33.0 VDC /30.5 VDC
Surge voltage (100 msec. max.)	12 Vin models: 24 Vin models: 48 Vin models:	36 V max.. 50 V max. 100 V max.
Conducted noise (input)		EN 55022 level A, FCC part 15, level A with external capacitor (see Note 1)

Output Specifications

Voltage set accuracy		± 1 %
Regulation	– Input variation Vin min. to Vin max – Load variation (0 – 100 %)	0.2% max. 0.2% max.
Minimum load		0% of rated max. load
Ripple and noise (20 MHz bandwidth)		100 mVpk-pk max. with external capacitor (see Note 1)
Temperature coefficient		± 0.02 %/K
Output current limitation		at 150 % of Iout max., foldback
Short circuit protection		indefinite (automatic recovery)
Over voltage protection	3.3 Vout models: 5 Vout models: 12 Vout models: 15 Vout models:	3.7 – 5.4 Vout 5.6 – 7.0 Vout 13.5 – 19.6 Vout 16.8 – 20.5 Vout
Start-up time		30ms max. (at power on and remote on)
Transient response setting time (25% load step chang)		250 µs typ.
Max. capacitive load	3.3 & 5 VDC models: 12 VDC models: 15 VDC models:	1000 µF 330 µF 220 µF

General Specifications

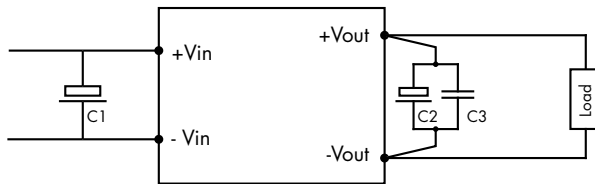
Temperature ranges	– Operating – Case temperature – Storage	–40 °C ... +85 °C (with derating) +105 °C max. –55 °C ... +125 °C
Power derating		3 %/K above 70°C
Reliability, calculated MTBF (MIL-HDBK-217F ground benign)		>560'000h @ +25°C
Isolation voltage (60sec)	– Input/Output	1'500 VDC
Isolation capacity	– Input/Output	1000 pF typ.
Isolation resistance	– Input/Output (500 VDC)	>10 GOhm

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

Physical Specifications

Switching frequency (fixed)	400 kHz typ. (pulse width modulation PWM)
Safety standards	UL 60950-1, EN 60950-1, IEC 60950-1
Safety approvals	CSA File No.: pending
Remote On/Off	- On: 3.0 ... 12 VDC or open circuit - Off: 0 ... 1.2 VDC or short circuit pin 1 and pin 2/3 - Off idle current: 2.5 mA
Case material	nickel coated copper
Baseplate	non conductive FR4
Potting material	silicon (UL94V-0 rated)
Weight	15 g (0.53 oz)
Soldering temperature	max. 265 °C / 10sec.

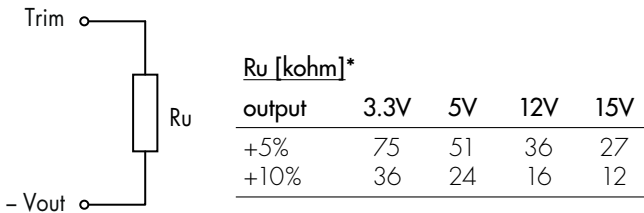
Note 1 Recommended circuit to reduce conducted noise and output ripple & noise:



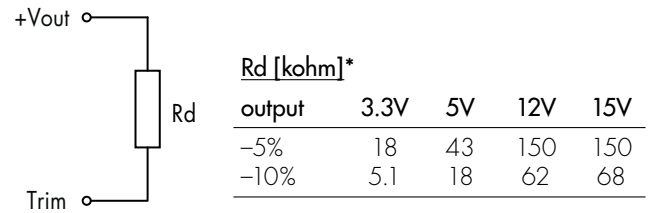
- C1: low ESR electrolytic capacitor
12 Vin models: 10 µF/25 VDC.
24 Vin models: 6.8 µF/50 VDC.
48 Vin models: 2.2 µF/100 VDC
- C2: 10µF low ESR electrolytic capacitor
- C3: 1µF film capacitor

Output Voltage Adjustment

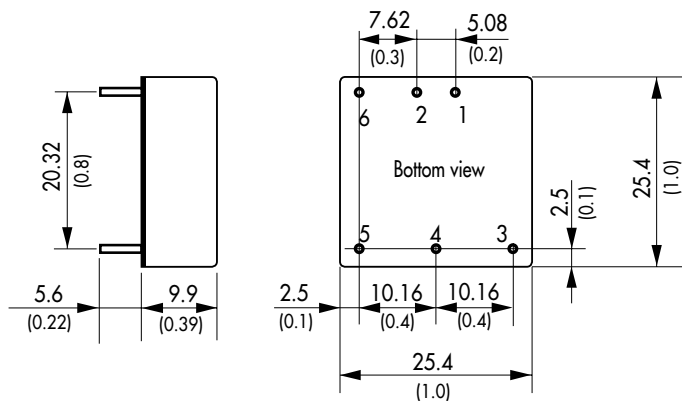
Trim up



Trim down



Outline Dimensions mm



Pin-Out	
Pin	Single
1	+Vin (Vcc)
2	-Vin (GND)
3	+Vout
4	Trim
5	-Vout
6	Remote On/Off

() = Inch
Pin diameter ø 1.0 (0.04)
Pin pitch tolerances: ±0.35 (0.014)
Tolerances: ±0.5 (0.02)

Specifications can be changed any time without notice