DC/DC Converters

THN 15 Series, 15 Watt

CB Scheme UL 60950-1 cULus UL 60950-1

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 and trimmable output. 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		3.3 VDC	4'000 mA	84 %
THN 15-1211		5.0 VDC	3'000 mA	86 %
THN 15-1212	**9 – 18 VDC**	12 VDC	1'300 mA	85 %
THN 15-1213	(12 VDC nominal)	15 VDC	1'000 mA	87 %
THN 15-1221		±5 VDC	±1'500 mA	85 %
THN 15-1222		±12 VDC	±625 mA	87 %
THN 15-1223		±15 VDC	±500 mA	88 %
THN 15-2410		3.3 VDC	4'000 mA	86 %
THN 15-2411		5.0 VDC	3'000 mA	86 %
THN 15-2412	**18 – 36 VDC**	12 VDC	1'300 mA	87 %
THN 15-2413	(24 VDC nominal)	15 VDC	1'000 mA	88 %
THN 15-2421		±5 VDC	±1'500 mA	85 %
THN 15-2422		±12 VDC	±625 mA	88 %
THN 15-2423		±15 VDC	±500 mA	88 %
THN 15-4810		3.3 VDC	4'000 mA	86 %
THN 15-4811		5.0 VDC	3'000 mA	88 %
THN 15-4812	**36 – 75 VDC**	12 VDC	1'300 mA	88 %
THN 15-4813	(48 VDC nominal)	15 VDC	1'000 mA	88 %
THN 15-4821		±5 VDC	±1'500 mA	85 %
THN 15-4822		±12 VDC	±625 mA	89 %
THN 15-4823		±15 VDC	±500 mA	88 %

Input Specifications

Input current at no load	12 Vin; 3.3 VDC model:	120 mA typ.
	12 Vin 5 VDCmodel:	90 mA typ.
	12 Vin other models:	40 mA typ.
	24 Vin; 3.3 VDC model:	50 mA typ.
	24 Vin; 5 VDC model:	65 mA typ.
	24 Vin; other models:	20 mA typ
	48 Vin; 3.3 & 5 VDC models:	40 mA typ.
	48 Vin; other models:	15 mA typ.
Input current at full load (nominal input)	12 Vin; 3.3 VDC model:	1370 mA typ.
	12 Vin; other models:	1550 mA typ
	24 Vin; 3.3 VDC model:	670 mA typ.
	24 Vin; other models:	750 mA typ.
	48 Vin; 3.3 VDC model:	330 mA typ.
	48 Vin models:	380 mA typ.
Start-up voltage / under voltage shut down	12 Vin models:	9.0 VDC / 8.0 VDC
	24 Vin models:	17.0 VDC / 14.5 VDC
	48 Vin models:	33.0 VDC / 30.5 VDC
Surge voltage (100 msec. max.)	12 Vin models:	36 V max..
	24 Vin models:	50 V max.
	48 Vin models:	100 V max.
Reflected input ripple current		30 mA typ.
Conducted noise (input)		EN 55022 level A, FCC part 15, level A with external capacitor see application note.

Output Specifications

Voltage set accuracy			±1 %
Output voltage adj. range			±10 % only for single output models. see application note.
Regulation	– Input variation (Vmin – Vmax)	single output models:	0.2 % max.
		dual output models:	0.5 % max.
	– Load variation (0 – 100 %)	single output models:	0.2 % max.
		dual output models balanced load:	1.0 % max.
		dual output models unbalanced load (25% /100%):	5.0 % max.
Minimum load			not required
Ripple and noise (20 MHz bandwidth)			100 mVpk-pk max. with external capacitor see application note.
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:	3.7 – 5.4 Vout
		5 Vout models:	5.6 – 7.0 Vout
		12 Vout models:	13.5 – 19.6 Vout
		15 Vout models:	16.8 – 20.5 Vout
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 chang)			250 µs typ.
Max. capacitive load		3.3 & 5 VDC models:	1000 µF
		12 VDC models:	330 µF
		15 VDC models:	220 µF
		±5 VDC models:	±500 µF
		±12 VDC models:	±150 µF
		±15 VDC models:	±100 µF

Application note

Download: www.tracopower.com/products/thn15_application.pdf

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

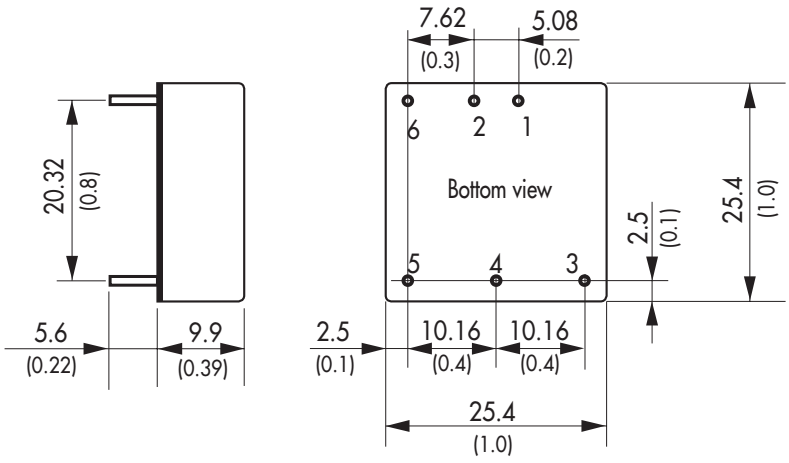
General Specifications

Temperature ranges	– Operating – Case temperature – Storage	–40°C to +85°C (with derating) +105°C max. –55°C to +125°C
Power derating		2.8 %/K above 70°C
Thermal inpedance	– Natural convection	18.2°C/W
Humidity (non condensing)		5 % to 95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, @ +25°C, ground benign)		>560'000 h
Isolation voltage (60sec)	– Input/Output	1'500 VDC
Isolation capacity	– Input/Output	1000 pF typ.
Isolation resistance	– Input/Output (500 VDC)	>1'000 MOhm
Remote On/Off	– On: – Off: – Off idle current:	3.0 ... 15 VDC or open circuit 0 ... 1.2 VDC or short circuit pin 6 and pin 2 2.5 mA
Switching frequency (fixed)		400 kHz typ. (pulse width modulation PWM)
Vibration and thermal shock		MIL-STD-810E
Safety standards		UL /cUL 60950-1, EN 60950-1, IEC 60950-1
Safety approvals	– UL/cUL	www.ul.com -> certifications -> File E188913

Physical Specifications

Casing material	nickel coated copper
Baseplate	non conductive FR4
Potting material	epoxy (UL 94V-0 rated)
Weight	15 g (0.53 oz)
Soldering temperature	max. 265°C / 10sec.

Outline Dimensions



Pin-Out

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

Dimensions in [mm], () = 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

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