DC/DC Converters

THB 10 Series, 10 Watt

CB Scheme IEC 60950-1 IEC 60601-1

cULus UL 60950-1 ES 60601-1

Features

- Supplementary and reinforced insulation
- I/O isolation 4000 VACrms rated for 300 Vrms working voltage
- 2 x MOOP Medical safety according to AAMI/ANSI ES 60601-1:2005(R) and IEC/EN 60601-1 3rd edition
- Industrial safety to UL/IEC/EN 60950-1
- Wide 2:1 input voltage ranges
- Extended operating temperature range –40°C to 75°C max.
- Input filter meets EN55022, class A
- Continuous short-circuit protection
- High reliability
- 3-year product warranty

The THB 10 series is a range of high performance DC/DC converter modules with double reinforced insulation system. It complies to latest medical safety standard IEC 60950-1 3rd edition for MOOP (Means of Operator Protection). The product comes in a 2"x1" industry standard package. All 12 models features wide 2:1 input voltage range and fully regulated output voltage. The converters offer an economical solution for demanding applications in industrial and medical instrumentation.

Models

Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.
THB 10-1211	9 - 18 VDC (12 VDC nominal)	5.1 VDC	1600 mA	75 %
THB 10-1212		12.0 VDC	835 mA	80 %
THB 10-1222		±12.0 VDC	±417 mA	80 %
THB 10-1223		±15.0 VDC	±333 mA	81 %
THB 10-2411	18 - 36 VDC (24 VDC nominal)	5.1 VDC	2000 mA	76 %
THB 10-2412		12.0 VDC	835 mA	81 %
THB 10-2422		±12.0 VDC	±417 mA	81 %
THB 10-2423		±15.0 VDC	±333 mA	82 %
THB 10-4811	36 - 75 VDC (48 VDC nominal)	5.1 VDC	2000 mA	76 %
THB 10-4812		12.0 VDC	835 mA	81 %
THB 10-4822		±12.0 VDC	±417 mA	81 %
THB 10-4823		±15.0 VDC	±333 mA	82 %

Input Specifications

Input current at no load	12 V models:	30 mA typ.
	24 V models:	20 mA typ.
	48 V models:	10 mA typ.
Start up voltage / under voltage shutdown (hysteresis) long term operation with under-voltage may cause demage	12 Vin models:	9.0 / 8.5 VDC (or lower)
	24 Vin models:	18 / 16 VDC (or lower)
	48 Vin models:	36 / 34 VDC (or lower)
Recommanded external input fuse (slow blow)	12 Vin models:	3 A
	24 Vin models:	1.5 A
	48 Vin models:	0.75 A
Surge voltage (1 sec. max.)	12 Vin models:	25 VDC max.
	24 Vin models:	50 VDC max.
	48 Vin models:	100 VDC max.
Input filter		EN 55022 class A and FCC, level A

Output Specifications

Voltage set accuracy		±1.0 %
Regulation	– Input variation Vin min. to Vin max.	0.5 % max.
	– Load variation 15 – 100 %: single output models:	1.0 % max.
	dual output models:	2.0 % max. balanced load
Minimum load		no minimum load required
Ripple and noise (20 MHz bandwidth)	5 VDC models:	100 mVp-p max.
	other models:	150 mVp-p max.
Transient Response (25% load step change)		600 µs max.
Current limitation		>120 % Iout max.
Short circuit protection		continuous
Capacitive load	5 VDC output models:	1000 µF max.
	12 VDC output models:	470 µF max.
	dual output models:	220 µF max. (each output)

Isolation / Safety Standards

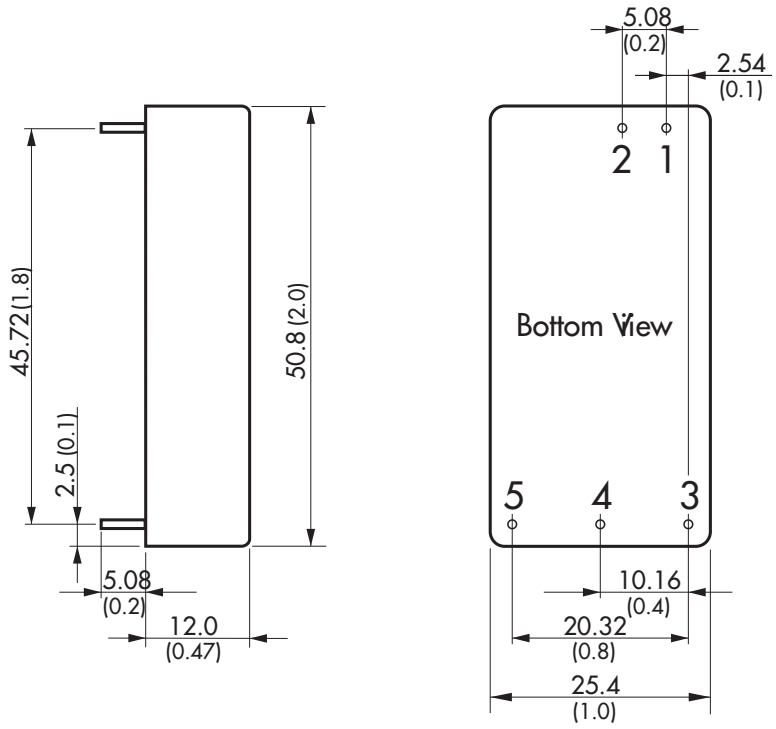
Isolation test voltage (flash tested 1 sec.)		6000 Vpk
I/O isolation voltage (50Hz, 60sec.)		4000 VAC
Leakage current (at 240VAC, 60Hz)		10 µA
I/O isolation capacity (at 100KHz, 1V)		60 pF typ.
I/O isolation resistance (at 500VDC)		>10 Gohm
Safety standards		IEC/EN 60950-1, IEC/EN 60601-1 3rd Edition, ANSI/AAMI ES60601-1 and CAN/CSA-C22.2 No. 60601-1, Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance
Safety approvals	– CB test certificate according IEC 60950-1	www.tracopower.com/products/thb10-cb60950.pdf
	– CB test certificate according IEC 60601-1	www.tracopower.com/products/thb10-cb60601.pdf
	– UL online certification to UL 60950-1 (entry pending)	www.ul.com/database File: e188913 - QQGQ2
	– UL online certification to ES 60601-1 (entry pending)	www.ul.com/database File: e188913 - QQHM2

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 +75°C
	– Case	+95°C max.
	– Storage	–50°C to +125°C
Derating		2.5 %/K above 55°C
Humidity (non condensing)		95 % rel H max.
Altitude during operation		4000 m
Temperature coefficient		±0.02 %/K typ.
Reliability, calculated MTBF (MIL-HDBK-217F @ 25°C, ground benign)		>1'000'000 h
Switching frequency		150 kHz typ. (puls width modulation)
Casing material		non conductive plastic (UL 94V-0-rated)
Pin Material		copper alloy with gold plate over nickel subplate
Weight		24.5 g (0.86 oz)
Soldering temperature		max. 260°C / 10 sec.

Outline Dimensions



Pin-Out		
Pin	**Single**	**Dual**
1	+Vin (Vcc)	+Vin (Vcc)
2	-Vin(GND)	-Vin(GND)
3	+Vout	+Vout
4	No pin	Common
5	-Vout	-Vout

Dimensions in [mm], () = Inch
Pin diameter ⌀ 1.0 ±0.05 (0.04 ±0.002)
Tolerances ±0.25 (±0.01)
Pin pich tolerances ±0.13 (±0.005)