

- Continuous short circuit protection
- I/O isolation: 3'000 VDC
- Operating temperature range
-40 to +85 °C without derating
- Input voltage ranges ($\pm 10\%$):
5, 12, 24 VDC
- High efficiency up to 82%
- SIP-7 plastic package
- Unregulated outputs
- 3-year product warranty



The TBA 1HI is an elementary 1 Watt DC/DC SIP converter series which is specifically designed to offer a low-cost solution with no concession on quality and lifetime. The new design improves on the industry standard features and offers an integrated continuous short circuit protection circuit, an operating temperature range from -40°C to 85°C without derating and I/O-isolations of either 3'000 VDC. It offers a broad application range in any space and cost critical application.

Models				
Order code	Input voltage	Output voltage	Output current max.	Efficiency typ.
TBA 1-0511HI	4.5 – 5.5 VDC (5 VDC nominal)	5 VDC	200 mA	79 %
TBA 1-0519HI		9 VDC	111 mA	80 %
TBA 1-0512HI		12 VDC	84 mA	82 %
TBA 1-0513HI		15 VDC	66 mA	82 %
TBA 1-0521HI		± 5 VDC	± 100 mA	79 %
TBA 1-0522HI		± 12 VDC	± 41 mA	82 %
TBA 1-0523HI		± 15 VDC	± 33 mA	82 %
TBA 1-1211HI	10.8 – 13.2 VDC (12 VDC nominal)	5 VDC	200 mA	79 %
TBA 1-1219HI		9 VDC	111 mA	79 %
TBA 1-1212HI		12 VDC	84 mA	80 %
TBA 1-1213HI		15 VDC	66 mA	80 %
TBA 1-1221HI		± 5 VDC	± 100 mA	79 %
TBA 1-1222HI		± 12 VDC	± 41 mA	80 %
TBA 1-1223HI		± 15 VDC	± 33 mA	80 %
TBA 1-2411HI	21.6 – 26.4 VDC (24 VDC nominal)	5 VDC	200 mA	79 %
TBA 1-2419HI		9 VDC	111 mA	80 %
TBA 1-2412HI		12 VDC	84 mA	82 %
TBA 1-2413HI		15 VDC	66 mA	82 %
TBA 1-2421HI		± 5 VDC	± 100 mA	79 %
TBA 1-2422HI		± 12 VDC	± 41 mA	82 %
TBA 1-2423HI		± 15 VDC	± 33 mA	82 %

Input Specifications

Input current at no load	5 Vin models: 25 mA typ. 12 Vin models: 15 mA typ. 24 Vin models: 10 mA typ.
Surge voltage (1 s max.)	5 Vin models: 9 V max. 12 Vin models: 18 V max. 24 Vin models: 30 V max.
Input filter	Internal capacitor (external capacitor recommended)*
Recommended input fuse	5 Vin models: 0.5 A (slow blow type) 12 Vin models: 0.2 A (slow blow type) 24 Vin models: 0.1 A (slow blow type)

Output Specifications

Voltage set accuracy	5 & ±5 Vout models: ±3 % max. (at 60 % load) other output models: ±3 % max. (at 80 % load)
Regulation	– Input variation (at 1 % change of Vin) 1.5 % max. – Load variation See graphs on page 3 – Cross regulation (at full load) dual output models: 1 % max.
Temperature coefficient	±0.02 %/K max.
Ripple and noise (20 MHz Bandwidth)	100 mVp-p typ. / 150 mVp-p max. (for further reduction of ripple and noise, 10 µF capacitor on output is recommended)
Short circuit protection	continuous, automatic recovery
Start up time	10 ms max.
Minimum load	10 % load of full load
Capacitive load	– Single output models 5 Vout models: 2'200 µF max. 9 Vout models: 1'000 µF max. 12 Vout models: 470 µF max. 15 Vout models: 470 µF max. – Dual output models ±5 Vout models: 2'200 µF max. (each output) ±12 Vout models: 470 µF max. (each output) ±15 Vout models: 220 µF max. (each output)

General Specifications

Temperature ranges	– Operating (natural convection: 20 LFM, 0.1 m/s) – Case temperature – Storage temperature	–40°C to +95°C +105°C max. –55°C to +125°C
Derating		5.0 %/K above 85°C
Humidity (non condensing)		95 % rel H max.
Isolation voltage	– I/O isolation voltage (60 s)	3'000 VDC
Isolation resistance (input/output)		1 GOhm min.
Isolation capacitance (input/output)		10 pF max.
Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign)		2'000'000 h
Switching frequency		40 – 200 kHz (pulse width modulation)
Environmental compliance	– Reach – RoHS	www.tracopower.com/info/reach-declaration.pdf RoHS directive 2011/65/EU

*In case of long input lines or hot plug-in requirements, we recommended to use an external low ESR capacitor (22µF) close to the converter's input pins.

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

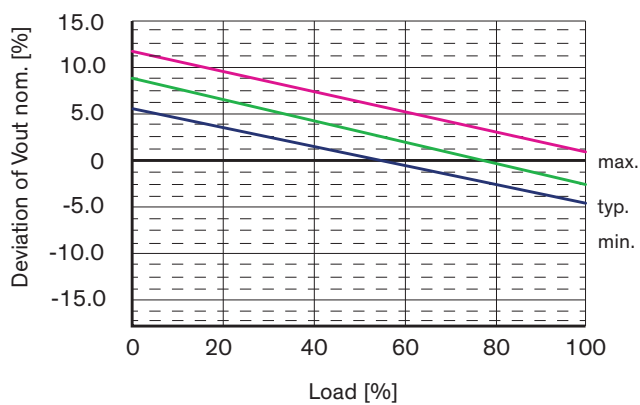
Physical Specifications

Casing material	Plastic (UL 94V-0 rated)
Potting material	Epoxy (UL 94V-0 rated)
Pin material	Tinned copper
Package weight	2.3 g (0.08 oz)

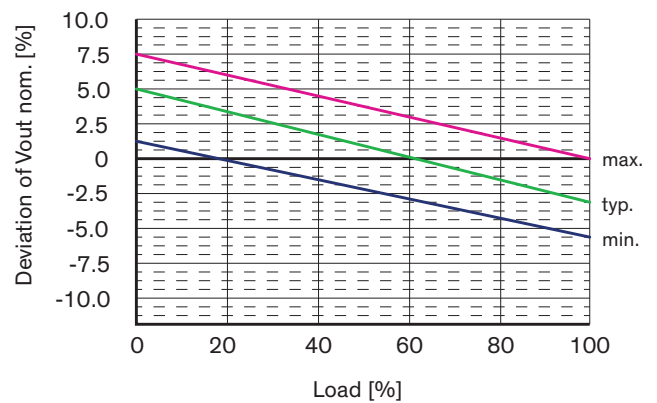
Supporting Documents: www.tracopower.com/overview/tba1hi

Load Variation

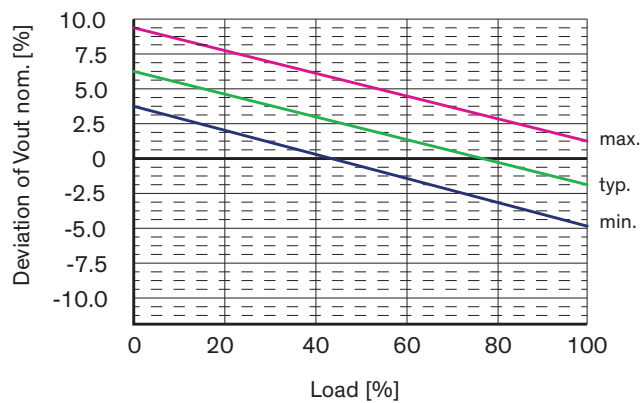
3.3 Vout models



5 Vout models

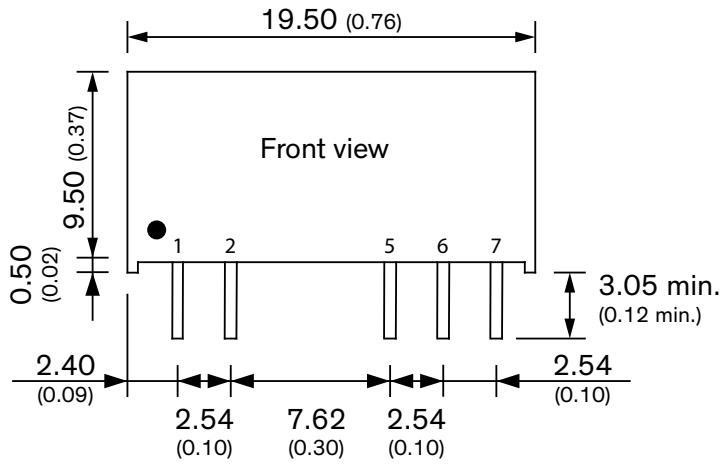


Other output models

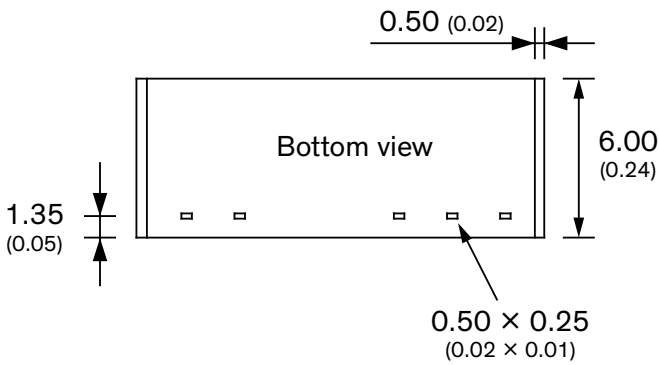


All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Outline Dimensions



Pin-Out		
Pin	Single	Dual
1	+Vin (Vcc)	+Vin (Vcc)
2	-Vin (GND)	-Vin (GND)
5	-Vout	-Vout
6	No Pin	Common
7	+Vout	+Vout



Dimensions in mm (Inch)
Tolerances: x.xx ±0.35 (±0.01)