chanhvinh.com

TRACO POWER®

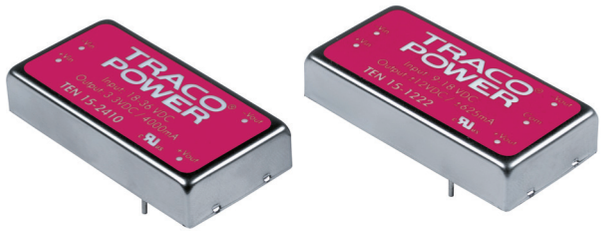
DC/DC Converters

TEN 15 Series, 15 Watt

not recommended for new design in

Features

- Wide 2:1 input range
- High efficiency up to 88%
- Extended operating temperature range –40°C to +85°C
- Indefinite short circuit protection
- I/O isolation 1500 VDC
- Input filter to meet EN 55022, Class A and FCC, level A without external components
- Industry standard footprint
- Shielded metal case with insulated baseplate
- 3-year product warranty



The TEN 15 series is a family of high performance 15W DC/DC converters in a compact 2" x 1" low profile package with industry standard footprint. A high efficiency allows a wide operating temperature range of –40°C to +85°C. A built-in EMI filter is built in to meet EN 55022, class A without any external components.
Further standard features include over voltage protection and short-circuit protection. Typical applications for these converters are battery operated equipment, instrumentation, distributed power architectures in communication and industrial electronics, everywhere where isolated, tightly regulated voltages are required.

Models

Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEN 15-1210	**9 – 18 VDC** (12 VDC nominal)	3.3 VDC	4'000 mA	79 %
TEN 15-1211		5 VDC	3'000 mA	82 %
TEN 15-1212		12 VDC	1'250 mA	86 %
TEN 15-1213		15 VDC	1'000 mA	86 %
TEN 15-1221		±5 VDC	±1500 mA	83 %
TEN 15-1222		±12 VDC	±625 mA	86 %
TEN 15-1223		±15 VDC	±500 mA	84 %
TEN 15-2410	**18 – 36 VDC** (24 VDC nominal)	3.3 VDC	4'000 mA	80 %
TEN 15-2411		5 VDC	3'000 mA	84 %
TEN 15-2412		12 VDC	1'250 mA	85 %
TEN 15-2413		15 VDC	1'000 mA	85 %
TEN 15-2421		±5 VDC	±1'500 mA	84 %
TEN 15-2422		±12 VDC	±625 mA	86 %
TEN 15-2423		±15 VDC	±500 mA	86 %
TEN 15-4810	**36 – 75 VDC** (48 VDC nomial)	3.3 VDC	4'000 mA	81 %
TEN 15-4811		5 VDC	3'000 mA	83 %
TEN 15-4812		12 VDC	1'250 mA	87 %
TEN 15-4813		15 VDC	1'000 mA	86 %
TEN 15-4821		±5 VDC	±1'500 mA	85 %
TEN 15-4822		±12 VDC	±625 mA	88 %
TEN 15-4823		±15 VDC	±500 mA	87 %

chanhvinh.com

Input Specifications

Input current at no load	12 Vin models:	30 mA typ.
	24 Vin models:	20 mA typ.
	48 Vin models:	15 mA typ.
Input current at full load	12 Vin; 3.3 VDC models:	1470 mA typ.
	12 Vin; other models:	1550 mA typ.
	24 Vin; 3.3 VDC models:	730 mA typ.
	24 Vin; other models:	780 mA typ.
	48 Vin; 3.3 VDC models:	360 mA typ.
	48 Vin; other models:	380 mA typ.
Surge voltage (100 msec. max.)	12 Vin models:	36 V max.
	24 Vin models:	50 V max.
	48 Vin models:	100 V max.
Conducted noise (input)		EN 55022 level A, FCC part 15, level A

Output Specifications

Voltage set accuracy		±1 %
Regulation	– Input variation Vin min. to Vin max.	0.5 % max.
	– Load variation 2 % – 100 % single output models:	0.5 % max.
	dual output models:	1 % max. (balanced load)
		5 % max. (load cross variation 25 % / 100 %)
Minimum load		2 % of rated max. output current. (Operation at lower load is safe but major deviations to specifyed data may occur)
Ripple and noise (20 MHz Bandwidth)	single output models:	50 mVpk-pk max.
	dual output models:	75 mVpk-pk max.
Temperature coefficient		±0.02 %/K
Start up time (nominal Vin and constant resistive load)		20 ms typ.
Transient response (25 % load step change)		250 µs typ.
Short circuit protection		continiuous (automatic recovery)
Over load protection		150 % of Iout max typ. foldback
Over voltage protection	3.3 VDC models:	3.9 V
	5.0 VDC models:	6.2 V
	12 VDC models:	15 V
	15 VDC models:	18 V
Capacitive load	3.3 VDC models:	10'200 µF max.
	5 VDC models:	7'050 µF max.
	12 VDC models:	1'035 µF max.
	15 VDC models:	750 µF max.
	±5 VDC models:	±1'020 µF max.
	±12 VDC models:	±495 µF max.
	±15 VDC models:	±165 µF max.

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

chanhvinh.com

General Specifications

Temperature ranges	– Operating	– 40°C to +85°C
	– Casing temperature	+100°C max.
	– Storage	–55°C to +105°C
Derating	3.3 / 5.0 VDC models:	2.5 %/K above 60°C
	other models:	3.3 %/K above 70°C
Thermal impedance	– Natural convection	12°C/W
	– Natural convection with heatsink	10°C/W
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		>2.3 Mio h
Isolation Test Voltage (Input/Output, 60s)		1'600 VDC
Insulation System		Functional
Isolation Capacitance (Input/Output)		300 pF max.
Isolation Resistance (Input/Output)		>1 G Ohm
Switching frequency	single output models:	500 kHz typ. (pulse width modulation)
	dual output models:	300 kHz typ. (pulse width modulation)
EMC immunity	– Electrostatic discharge ESD	EN 61000-4-2 8 kV / 6 kV, criteria B
	– RF field susceptibility	EN 61000-4-3 10 V/m, criteria A
	– Electrical fast transient / burst immunity input	EN 61000-4-4 ±2 kV, criteria B
	– Surge immunity	EN 61000-4-5 ±1 kV, criteria B
	– Immunity to conducted RF disturbances	EN 61000-4-6 10 Vrms, criteria A
Vibration		acc. MIL-STD-810F
Thermal shock		acc. MIL-STD-810F
Safety standards		UL 60950-1, EN 60950-1, IEC 60950-1 UL 62368-1
Safety approvals	– UL/cUL	www.ul.com -> certifications -> File e188913
Environmental compliance	– Reach	www.tracopower.com/info/reach-declaration.pdf
	– RoHS	RoHS directive 2011/65/EU

Physical Specifications

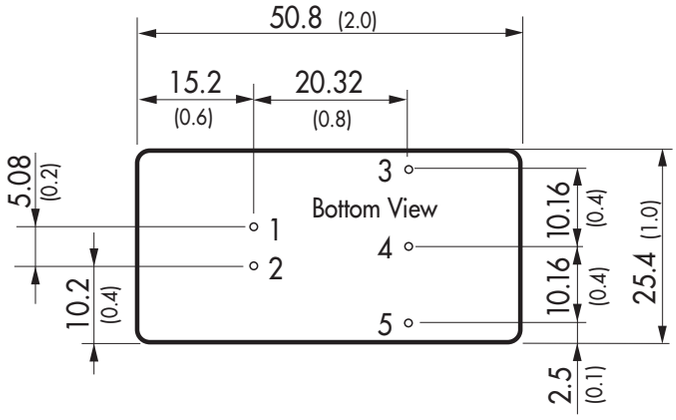
Casing material	copper, nickel plated
Baseplate material	non conductive FR4
Potting material	epoxy (UL 94V-0 rated)
Weight	27 g (09.5oz)
Soldering temperature	max. +265°C / 10 sec.

Supporting documents : www.tracopower.com/overview/ten15

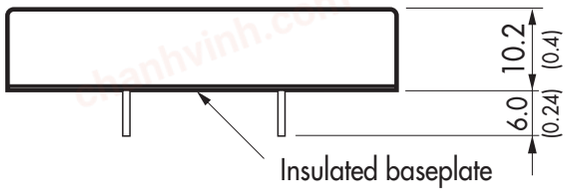
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

chanhvinh.com

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 (0.02 ±0.002)
Pin pitch tolerances: ±0.25 (±0.01)
Casing tolerances: ±0.5 (±0.02)

Heat-Sink (Option)

Order code: **TEN-HS1**
(cont.: heat-sink, thermal pad, 2 clamps)
Material: Aluminum
Finish: Anodic treatment (black)
Weight: 17g (0.60oz) without converter
Thermal impedance after assembling: 10 K/W



Note:
The product label on converter has to be removed before mounting the heat-sink.
For volume orders converters will be supplied with heat-sinks already mounted. Please contact factory for quotation.
Separate heat-sinks are only available for prototypes and small quantity orders.

