DC/DC Converter

TEN 10 Series 10 Watt

Features

- Wide 2 : 1 Input Range
- High Power Density
- Operating Temp. Range – 40°C to +71°C
- Indefinite Short-Circuit Protection
- I/O-Isolation 1500 VDC
- Input Filter meets EN 55022, Class A and FCC, Level A without external Components
- Industry Standard Pinout
- Shielded Metal Case with insulated Baseplate
- High Reliability, MTBF >1 Mio. h
- 3 Year Product Warranty

The TEN 10 series of DC/DC converters , comprising 24 different models, has been designed for a wide range of applications including communications, industrial systems and battery powered equipments. Full SMD-design with use of ceramic chip capacitors guarantees a high reliability and a long lifetime. Other features of this converters are internal filter to meet EN 55022, class A and FCC, level A and a high efficiency.

Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEN 10-1210	9 – 18 VDC	3,3 VDC	2'400 mA	72 %
TEN 10-1211		5 VDC	2'000 mA	77 %
TEN 10-1212		12 VDC	830 mA	80 %
TEN 10-1213		15 VDC	670 mA	80 %
TEN 10-1215		24 VDC	415 mA	81 %
TEN 10-1221		± 5 VDC	± 1'000 mA	78 %
TEN 10-1222		± 12 VDC	± 415 mA	81 %
TEN 10-1223		± 15 VDC	± 330 mA	80 %
TEN 10-2410	18 – 36 VDC	3,3 VDC	2'400 mA	76 %
TEN 10-2411		5 VDC	2'000 mA	78 %
TEN 10-2412		12 VDC	830 mA	82 %
TEN 10-2413		15 VDC	670 mA	82 %
TEN 10-2415		24 VDC	415 mA	83 %
TEN 10-2421		± 5 VDC	± 1'000 mA	80 %
TEN 10-2422		± 12 VDC	± 415 mA	82 %
TEN 10-2423		± 15 VDC	± 330 mA	82 %
TEN 10-4810	36 – 75 VDC	3,3 VDC	2'400 mA	76 %
TEN 10-4811		5 VDC	2'000 mA	80 %
TEN 10-4812		12 VDC	830 mA	82 %
TEN 10-4813		15 VDC	670 mA	83 %
TEN 10-4815		24 VDC	415 mA	83 %
TEN 10-4821		± 5 VDC	± 1'000 mA	81 %
TEN 10-4822		± 12 VDC	± 415 mA	83 %
TEN 10-4823		± 15 VDC	± 330 mA	83 %

Input Specifications

Input current (no load)	12 Vin models	30 mA typ.
	24 Vin models	20 mA typ.
	48 Vin models	10 mA typ.
Input current (full load)	12 Vin; 3.3 Vout models:	915 mA typ.
	12 Vin; 5 & ±5 Vout models:	1080 mA typ.
	12 Vin; other output models:	1045 mA typ.
	24 Vin; 3.3 Vout models:	435 mA typ.
	24 Vin; 5 & ±5 Vout models:	530 mA typ.
	24 Vin; other output models:	510 mA typ.
	48 Vin; 3.3 Vout models:	215 mA typ.
	48 Vin; 5 & ±5 Vout models:	260 mA typ.
	48 Vin; other output models:	250 mA typ.
Start-up voltage / under voltage shut down	12 Vin models	8.5 VDC / 8 VDC
	24 Vin models	16.5 VDC / 16 VDC
	48 Vin models	32.5 VDC / 32 VDC
Surge voltage (1 sec. max.)	12 Vin models	25 V max.
	24 Vin models	50 V max..
	48 Vin models	100 V max.
Reverse voltage protection		1.0 A 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.	± 0.3 % max.
	– Load variation 10 – 90 %	
	– single output models	± 0.5 % max.
	– dual output models balanced load	± 1 % max.
	– dual output models unbalanced load	± 3 % max.
Ripple and noise (20 MHz Bandwidth)		50 mVpk-pk max.
Temperature coefficient		± 0.02 % / K
Output current limitation		>110% of Iout max., constant current
Short circuit protection		indefinite (automatic recovery)
Capacitive load	– single output models	2200 µF max.
	– dual output models	470 µF max.

General Specifications

Temperature ranges	– Operating	– 40 °C ... + 71 °C (no derating)
	– Case temperature	+ 95 °C max.
	– Storage	– 40 °C ... + 125 °C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217 E)		>1 Mio. h @ + 25 °C
Isolation voltage	Input/Output	1'500 VDC
Isolation capacity	Input/Output	120 pF typ
Isolation resistance	Input/Output (500 VDC)	> 1'000 M Ohm

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

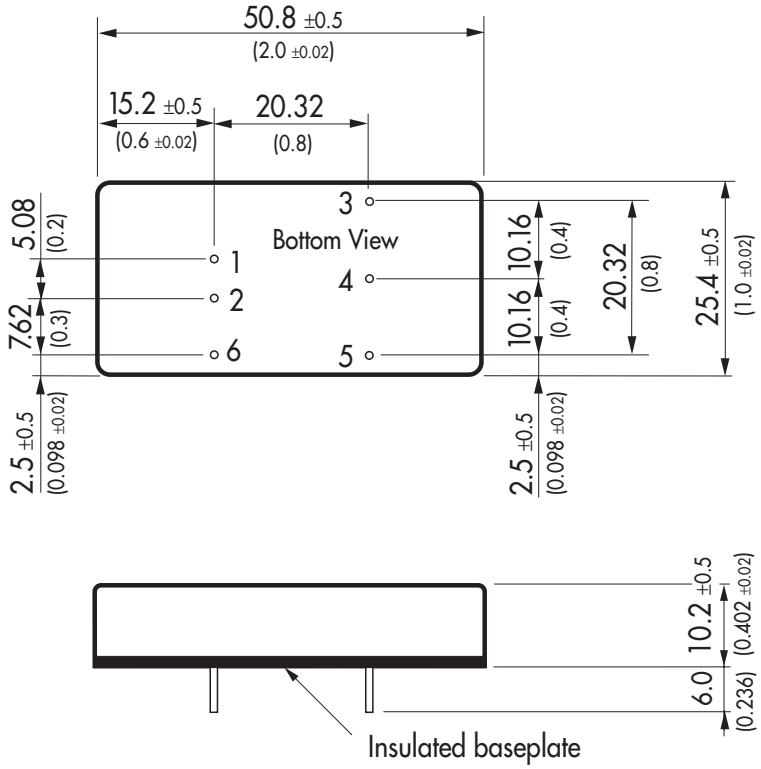
General Specifications

Switching frequency (fixed)	300 kHz typ. (Pulse width modulation PWM)
Safety standards	UL 1950, EN 60950, IEC 60950 Compliance up to 60 VDC input voltage(SELV limit)
Savety approvals	UL /cUL File E188913

Physical Specifications

Case material	Steel chrome-nickel plated
Baseplate	Epoxy
Potting material	Silicon rubber TES (UL 94V-0 rated)
Weight	30 g (1.2 oz)
Soldering temperature	max. 250 °C / 10 sec.

Outline Dimensions mm (inches)



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
6	Case ground (option)	Case ground (option)

Pin diameter ø 1.0 ±0.05 (0.039 ±0.002)

Specifications can be changed without notice

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