

Features

- Wide 2 : 1 Input Range
- High Efficiency up to 89%
- Extended Operating Temperature Range -40°C to $+85^{\circ}\text{C}$
- Indefinite Short-Circuit Protection
- I/O-Isolation 1500 VDC
- Remote On/Off
- Input Filter meets EN 55022, Class A and FCC, Level A without external Components
- Industry Standard Pinout
- Shielded Metal Case with insulated Baseplate
- 3 Year Product Warranty



The TEN 20 series of DC/DC converters, comprising 18 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 an extended temperature range of -40°C to $+85^{\circ}\text{C}$.

Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEN 20-1210	9 – 18 VDC	3,3 VDC	4'000 mA	81 %
TEN 20-1211		5 VDC	4'000 mA	84 %
TEN 20-1212		12 VDC	1'670 mA	88 %
TEN 20-1213		15 VDC	1'340 mA	88 %
TEN 20-1222		± 12 VDC	± 835 mA	88 %
TEN 20-1223		± 15 VDC	± 670 mA	88 %
TEN 20-2410	18 – 36 VDC	3,3 VDC	4'000 mA	82 %
TEN 20-2411		5 VDC	4'000 mA	85 %
TEN 20-2412		12 VDC	1'670 mA	89 %
TEN 20-2413		15 VDC	1'340 mA	89 %
TEN 20-2422		± 12 VDC	± 835 mA	89 %
TEN 20-2423		± 15 VDC	± 670 mA	89 %
TEN 20-4810	36 – 75 VDC	3,3 VDC	4'000 mA	82 %
TEN 20-4811		5 VDC	4'000 mA	85 %
TEN 20-4812		12 VDC	1'670 mA	89 %
TEN 20-4813		15 VDC	1'340 mA	89 %
TEN 20-4822		± 12 VDC	± 835 mA	89 %
TEN 20-4823		± 15 VDC	± 670 mA	89 %

Input Specifications

Input current no load/full load	12 Vin;	3.3 Vout models:	30 mA typ./1360 mA typ.
	12 Vin;	5 Vout models:	30 mA typ./1985 mA typ.
	12 Vin;	other output models:	30 mA typ./1895 mA typ.
	24 Vin;	3.3 Vout models:	17 mA typ./ 670 mA typ.
	24 Vin;	5 Vout models:	17 mA typ./ 980 mA typ.
	24 Vin;	other output models:	17 mA typ./ 935 mA typ.
	48 Vin;	3.3 Vout models:	10 mA typ./ 335 mA typ.
Surge voltage (100 msec. max.)	12 Vin models:	25 V max.	
	24 Vin models:	50 V max..	
	48 Vin models:	100 V max.	
Conducted noise (input)	EN 55022 Class A and FCC part 15, level A		

Output Specifications

Voltage set accuracy	± 1 % max.		
Regulation	– Input variation Vin min. to Vin max.		0.3 % max.
	– Load variation 10 – 100 %		0.5 % max.
			1.0 % max. for 3.3VDC output models
Ripple and noise (20 MHz Bandwidth)	80 mVpk-pk max		
Temperature coefficient	± 0.02 % /K		
Output current limitation	110-160% of I out max., constant current		
Short circuit protection	idefinite, automatic recovery		
Minimum load	10% of rated max current (operation at lower load condition is safe but output ripple will increase)		
Capacitive load	3.3/5 Vout models:		6'800 µF max.
	12 /15 Vout models:		680 µF max.
	±12/ ±15 Vout models:		270 µF max.

General Specifications

Temperature ranges	– Operating	– 40 °C ... + 85 °C
	– Case temperature	+ 100 °C max.
	– Storage	– 55 °C ... + 125 °C
Derating		3.5%/K above 70°C
	5 V Models	4.0%/K above 60 °C
Humidity (non condensing)	95 % rel H max.	
Reliability, calculated MTBF (MIL-HDBK-217 E)	>1Mio. h @ + 25 °C	
Isolation voltage	– Input/Output	1'500 VDC
Isolation capacity	– Input/Output	1'200 pF typ
Isolation resistance	– Input/Output (500 VDC)	> 1'000 MOhm
Switching frequency (fixed)	330 kHz typ. (Pulse width modulation PWM)	

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

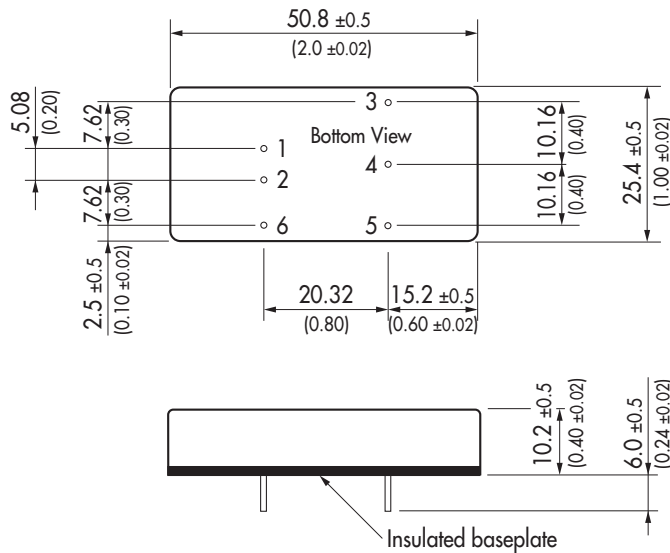
General Specifications

Remote ON/OFF	ON: OFF: OFF standby input current: Control common:	2.5 ... 100 VDC or open circuit. -1 ... 1.0 VDC or short circuit pin 2 and pin 6 5 mA max. referenced to negativ input
Safety standards		UL 60950, EN 60950, IEC 60950 Compliance up to 60 VDC input voltage (SELV limit)
Safety approvals		CSA

Physical Specifications

Case material	Copper, Nickel plated
Baseplate	non conductive FR4
Potting material	Silicon rubber TSE (UL 94V-0 rated)
Weight	30g (1.05oz)
Soldering temperature	max. 260 °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	Remote on/off	Remote on/off

Pin diameter $\varnothing 1.0 \pm 0.05$ (0.039 ± 0.002)

Dimensions in mm (Inch), Tolerance ± 0.25 (0.02)

Specifications can be changed any time without notice