

Features

- ◆ Wide 2:1 input range
- ◆ High efficiency up to 89 %
- ◆ Extended operating temperature range
-40°C to +85°C
- ◆ Indefinite short circuit protection
- ◆ I/O isolation 1500VDC
- ◆ 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°C.

Models

Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEN 20-1210	9 – 18 VDC (12 VDC nominal)	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 (24 VDC nominal)	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 (48 VDC nominal)	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 VDC models:	30 mA typ./1360 mA typ.
	12 Vin, 5 VDC models:	30 mA typ./1985 mA typ.
	12 Vin, other output models:	30 mA typ./1900 mA typ.
	24 Vin, 3.3 VDC models:	17 mA typ./670 mA typ.
	24 Vin, 5 VDC models:	17 mA typ./980 mA typ.
	24 Vin, other output models:	17 mA typ./935 mA typ.
	48 Vin, 3.3 VDC models:	10 mA typ./335 mA typ.
48 Vin, 5 VDC models:	10 mA typ./490 mA typ.	
48 Vin, other output models:	10 mA typ./420 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, 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 – 100 %	0.5 % max.
		1.0 % max. for 3.3 VDC 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		indefinite (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 VDC models:	6'800 µF max.
	12 / 15 VDC models:	680 µF max.
	±12 / ±15 VDC models:	270 µF max.

General Specifications

Temperature ranges	– Operating	–40°C to +85°C
	– Case temperature	+100°C max.
	– Storage	–55°C to +125°C
Load derating	– without heatsink	2.3 %/K above 60°C
	– with heatsink	2.9 %/K above 70°C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		>1 Mio h
Isolation voltage (60 sec.)	– Input/Output	1'500 VDC
Isolation capacitance	– 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)
Remote On/Off:	– On:	2.5 ... 100 VDC or open circuit.
	– Off:	–1 ... 1.0 VDC or short circuit pin 2 and pin 6
	– Off standby input current:	5 mA max.
	– Control common:	referenced to negativ input
Safety standards		UL 60950-1, IEC/EN 60950-1 Compliance up to 60 VDC input voltage (SELV limit)
Safety approvals		CSA File No. 226037 http://directories.csa-international.org

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

