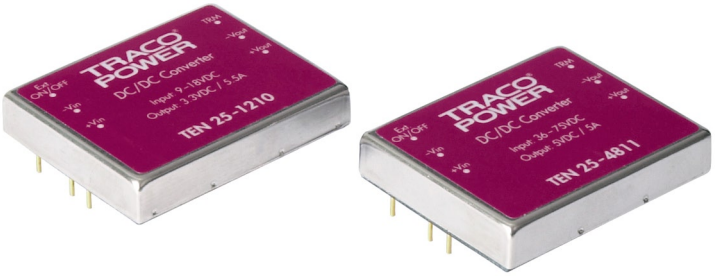
DC/DC Converters

TEN 25 Series, 25/30 Watt

Features

- Wide 2:1 Input Range
- Very high Efficiency up to 89%
- Extended Operating Temperature
- Range –40°C to +85°C
- Adjustable Output Voltage
- Remote On/Off
- Continuous Short Circuit Protection
- Over Voltage Protection
- I/O-Isolation 1500 VDC
- Input Filter meets EN 55022, Class A and FCC, Level A without external Components
- 3 Year Product Warranty



The TEN 25 series is a range of isolated DC/DC converters with high power density in a 51x41x9.5mm shielded metal case. All 18 models have a wide 2:1 input voltage range. The very high efficiency allows a safe operating temperature range of –40°C to +85°C. Other features are internal EMI-filter to meet EN55022, class A and remote On/Off. Typical applications for these converter modules are industrial electronics, communication systems, battery operated equipment and distributed power systems.

Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEN 25-1210WI	9 – 18 VDC	3.3 VDC	5'500 mA	81 %
TEN 25-1211WI		5 VDC	5'000 mA	84 %
TEN 25-1212WI		12 VDC	2'500 mA	88 %
TEN 25-1213WI		15 VDC	2'000 mA	88 %
TEN 25-1222WI		± 12 VDC	± 1'250 mA	88 %
TEN 25-1223WI		± 15 VDC	± 1'000 mA	88 %
TEN 25-2410WI	18 – 36 VDC	3.3 VDC	5'500 mA	82 %
TEN 25-2411WI		5 VDC	5'000 mA	85 %
TEN 25-2412WI		12 VDC	2'500 mA	89 %
TEN 25-2413WI		15 VDC	2'000 mA	89 %
TEN 25-2422WI		± 12 VDC	± 1'250 mA	89 %
TEN 25-2423WI		± 15 VDC	± 1'000 mA	89 %
TEN 25-4810WI	36 – 75 VDC	3,3 VDC	5'500 mA	82 %
TEN 25-4811WI		5 VDC	5'000 mA	85 %
TEN 25-4812WI		12 VDC	2'500 mA	89 %
TEN 25-4813WI		15 VDC	2'000 mA	89 %
TEN 25-4822WI		± 12 VDC	± 1'250 mA	89 %
TEN 25-4823WI		± 15 VDC	± 1'000 mA	89 %

Input Specifications

Input current no load		12 Vin models:	40 mA max.
		24 Vin models:	20 mA max.
		48 Vin models:	10 mA max.
Input current (full load)	12 Vin;	3.3/ 5 Vout models:	1870 mA typ. / 2480 mA typ.
	12 Vin;	other output models:	2840 mA typ.
	24 Vin;	3.3/ 5 Vout models:	920 mA typ. / 1220 mA typ.
	24 Vin;	other output models:	1400 mA typ.
	48 Vin;	3.3/ 5 Vout models:	460 mA typ. / 610 mA typ.
	48 Vin;	other output models:	700 mA typ.
Start-up voltage / under voltage shut down		12 Vin models:	8.8 VDC / 8.3 VDC typ.
		24 Vin models:	17.5 VDC / 16.5 VDC typ.
		48 Vin models:	35.0 VDC / 33.0 VDC typ.
Surge voltage (1000 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 %
Output voltage adj. range			± 10%
Regulation	– Input variation Vin min. to Vin max.		± 0.3 % max.
	– Load variation 10 – 100 %		
	– single output models		± 0.5 % max.
	– dual output models balanced load		± 1.0 % max.
	– dual output models unbalanced load		± 2.0 % max.
Ripple and noise (20 MHz Bandwidth)			80 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		3.3 & 5 Vout models:	10'000 µF
		12 &15 Vout models:	1'000 µF
		dual output models:	330 µF

General Specifications

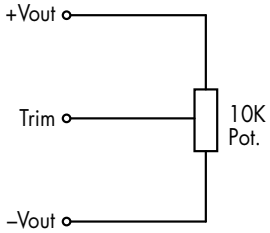
Temperature ranges	– Operating	– 40 °C ... + 85 °C
	– Case temperature	+ 100 °C max.
	– Storage	– 55 °C ... + 125 °C
Load derating		2.5%/K above 60°C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217 E)		> 1'000'000 h @ + 25 °C
Isolation voltage	– Input/Output	1'500 VDC
Isolation capacity	– Input/Output	1200 pF typ.
Isolation resistance	– Input/Output (500 VDC)	> 1'000 MOhm
Switching frequency (fixed)		330 kHz typ. (puls width modulation)
Remote On/Off:	– On:	2.5...100 VDC or open circuit.
	– OFF:	–0.7...1.0 VDC or short circuit pin 3 and pin 2
	– Standby current:	100µA max.
Safety standards		UL /cUL 60950, IEC/EN 60950 compliance up to 60 VDC input voltage (SELV limit)
Safety approvals		CSA (File no.: 226037)

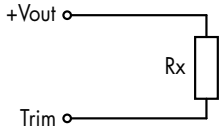
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Physical Specifications

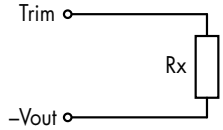
Case material	copper, nickel plated
Baseplate	non conductive FR4
Potting material	silicon rubber (UL 94 V-0 rated)
Weight	48g (1.69oz)
Soldering temperature	max. 265°C / 10 sec.

Output Voltage Adjustments





$$Rx = \frac{36.667 \times Vo - 33 \times Vn}{Vn - Vo}$$

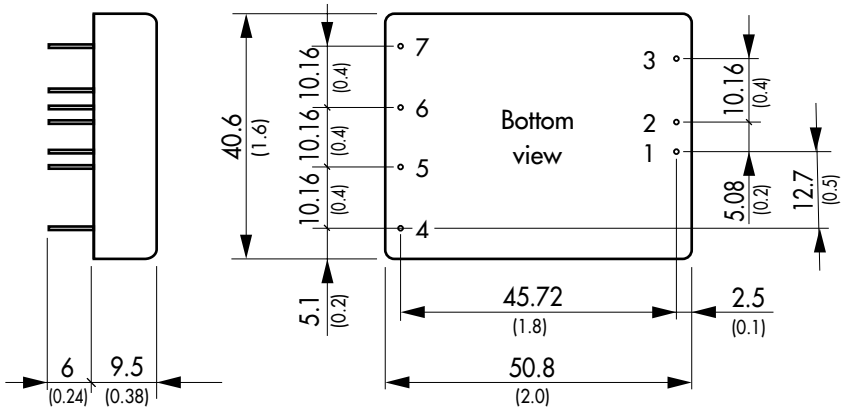


$$Rx = \frac{33 \times Vn - 30 \times Vo}{Vo - Vn}$$

Vo = adjusted output voltage [VDC]
Vn = nominal output voltage [VDC]
Rx = trim resistor [Kohm]

Nominal output voltage at open Trim input.

Outline Dimensions



Pin-Out		
Pin	**Single**	**Dual**
1	+Vin (Vcc)	+Vin (Vcc)
2	–Vin (GND)	–Vin (GND)
3	Remote On/Off	
4	No pin	+ Vout
5	+ Vout	Common
6	–Vout	–Vout
7	Trim	

Dimensions in [mm], () = Inch
Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
Pin pitch tolerances: ±0.25 (±0.01)
Case tolerances: ±0.5 (±0.02)

Specifications can be changed without notice

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