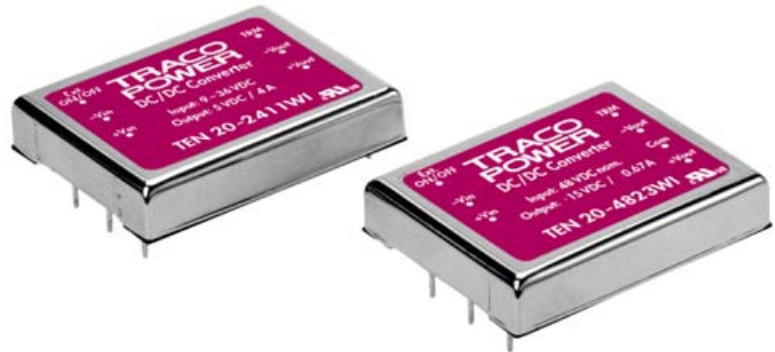


Features



- Ultra wide 4 : 1 Input Range
- Extended Operating Temperature Range – 40°C to +85°C
- I/O-Isolation 1500 VDC
- Input Filter meets EN 55022, Class A and FCC, Level A without external Components
- Remote On/Off
- Adjustable Output
- Industry Standard Footprint
- Shielded Metal Case with insulated Baseplate
- 3 Year Product Warranty



The TEN 20WI series is a family of high performance 20W DC/DC converter modules featuring ultra wide 4:1 input voltage ranges in a compact 2"x1.6" low profile package with industry-standard footprint. A very high efficiency allows an operating temperature range of –40°C to 85°C. A built-in EMI input filter complies with EN 55022, class A without external components. Further standard features include remote On/Off, output voltage trimming, over voltage protection and short-circuit protection.

Typical applications for these converters are battery operated equipment and distributed power architectures in communication and industrial electronics, everywhere where isolated, tightly regulated voltages are required.

Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEN 20-2411WI	9 – 36 VDC	5 VDC	4'000 mA	79 %
TEN 20-2412WI		12 VDC	1'670 mA	81 %
TEN 20-2413WI		15 VDC	1'330 mA	81 %
TEN 20-2421WI		± 5 VDC	± 2'000 mA	79 %
TEN 20-2422WI		± 12 VDC	± 835 mA	81 %
TEN 20-2423WI		± 15 VDC	± 665 mA	82 %
TEN 20-4811WI	18 – 75 VDC	5 VDC	4'000 mA	80 %
TEN 20-4812WI		12 VDC	1'670 mA	81 %
TEN 20-4813WI		15 VDC	1'330 mA	81 %
TEN 20-4821WI		± 5 VDC	± 2'000 mA	79 %
TEN 20-4822WI		± 12 VDC	± 835 mA	83 %
TEN 20-4823WI		± 15 VDC	± 665 mA	84 %

Input Specifications

Input current no load /full load	12 Vin models: 24 Vin models: 48 Vin models:	40 mA typ. 35 mA typ. 25 mA typ.
Input current (full load)	24 Vin models: 48 Vin models:	1000 mA typ. 500 mA typ.
Surge voltage (100 msec. max.)	24 Vin models: 48 Vin models:	50 V max.. 100 V max.
Conducted noise (input)	EN 55022 level A, FCC part 15, level A	
ESD (input)	EN 61000-4-2, Perf. Criteria B	
Fast Transient (input)	EN 61000-4-4, Perf. Criteria B	
Surge (input)	EN 61000-4-5, Perf. Criteria B	

Output Specifications

Voltage set accuracy	± 2 %	
Output voltage adjustment	± 10 %	
Regulation	– Input variation Vin min. to Vin max. – Load variation 25 – 100%: single output models: dual output models: – Load cross variation 25 % / 100 %	± 0.2 % max. ± 0.5 % max. ± 3 % max. ± 5 % max.
Temperature coefficient	± 0.02 % /K	
Ripple and noise (20 MHz Bandwidth)	single output models: dual output models:	75 mVpk-pk max. 100 mVpk-pk max.
Start up time (nominal Vin and constant resistive load)	20 ms typ.	
Transient Response (25% load step change)	500 µs typ.	
Short circuit protection	indefinite (automatic recovery)	
Over load protection	150% of Iout max typ. foldback	
Over voltage protection	5 Vout models: 12 Vout models: 15 Vout models:	6.2 V 15 V 18 V
Minimum load (only for dual output models)	10% of rated max current (operation at lower load condition will not damage these converters, however, they may not meet all listed specifications)	
Capacitive load	5 Vout models / ± 5 Vout models: 12 Vout models / ± 12 Vout models: 15 Vout models / ± 15 Vout models:	6'800 µF max. / ± 3'400 µF max. 2'200 µF max. / ± 680 µF max. 755 µF max. / ± 450 µF max.

General Specifications

Temperature ranges	– Operating – Case temperature – Storage	– 40 °C ... + 85 °C + 100 °C max. – 55 °C ... + 105 °C
Derating	2.0 %/K above 60°C typ. download model specific derating curves under: www.tracopower.com/products/ten20wi_derating.pdf	

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

General Specifications

Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217 E)		> 440'000 h @ + 25°C
Isolation (Input/Output)	– Voltage – Capacity – Resistance	1'500 VDC 300 pF max. > 1'000 M Ohm
Switching frequency (fixed)		300 kHz typ. (Pulse width modulation PWM)
Vibration		10-55Hz, 2G, 30 minutes along X,Y,Z
Remote on/off	ON: OFF: OFF idle current:	3.5 ... 12 VDC or open circuit. 0 ... 1.2 VDC or short circuit pin 3 and pin 2 20 mA typ.
Safety standards		UL 1950, EN 60950, IEC 60950 Compliance up to 60 VDC input voltage (SELV limit)
Safety approvals		UL /cUL File E 188913

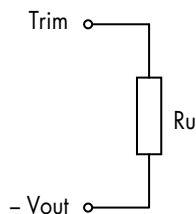
Physical Specifications

Case material	Copper, Nickel plated
Baseplate material	none conductive FR4
Potting material	epoxy (UL 94V-0 – rated)
Weight	50 g (1.2 oz)

Output Voltage Adjustment

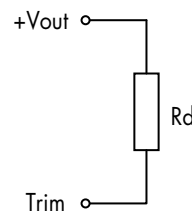
Output Voltage Adjustment

Trim up



	Ru [kohm]*		
output	5V	12V	15V
+5%	3.9	56	470
+10%	0.47	6.8	2.2
output	±5V	±12V	±15V
+5%	10	22	39
+10%	0.82	1.5	6.8

Trim down

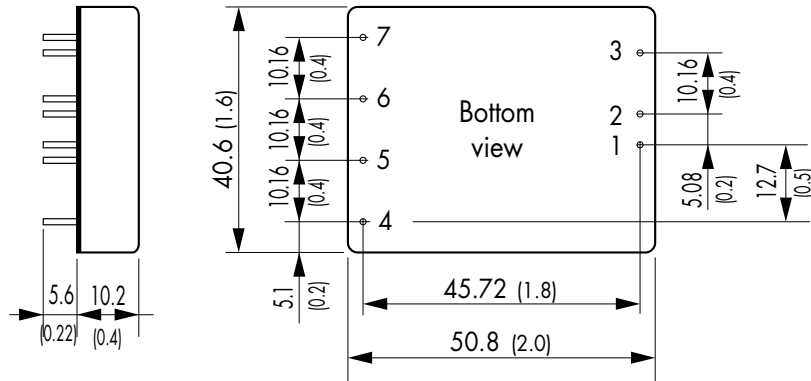


	Rd [kohm]*		
output	5V	12V	15V
-5%	5.6	47	56
-10%	0.68	2.7	1.8
output	±5V	±12V	±15V
-5%	15	47	47
-10%	1.2	10	8.2

* approximate values

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

Outline Dimensions mm (inches)



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

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

Specifications can be changed without notice