Features

- Very high power density: 50 W in 1" x 2" x 0.4" package
- Wide 4:1 input range
- Excellent efficiency up to 92 %
- Operating temperature range –40°C to +80°C
- Protection against over-temperature
- No minimum load required
- Output voltage adjustable
- Remote On/Off
- I/O isolation 1500 VDC
- 3-year product warranty

The TEN 50WI Series is a range of isolated high performance DC/DC converter modules. With a very high efficiency of up to 92% and the use of highest reliable components these 50 W converters can be packed into the standard 1.0" x 2.0" casing. The 10 models have a wide 4:1 input voltage range and a tight output voltage regulation. They do not need a minimum load and offer a high efficiency also at low load conditions. The output voltage is adjustable by external resistor. Remote On/Off and protection against overload and short circuit are standard features of these converters.
Typical applications are in mobile equipment, instrumentation, distributed power architectures in communication and industrial electronics and everywhere where space on the PCB is critical.

Models

Order code	Input voltage range	Output voltage	Output current max.	Efficiency
TEN 50-2410WI	**9 – 36 VDC** (nominal 24 VDC)	3.3 VDC	10'000 mA	90 %
TEN 50-2411WI		5.0 VDC	10'000 mA	91 %
TEN 50-2412WI		12 VDC	4'170 mA	92 %
TEN 50-2413WI		15 VDC	3'330 mA	92 %
TEN 50-2415WI		24 VDC	2'080 mA	91 %
TEN 50-4810WI	**18 – 75 VDC** (nominal 48 VDC)	3.3 VDC	10'000 mA	90 %
TEN 50-4811WI		5.0 VDC	10'000 mA	91 %
TEN 50-4812WI		12 VDC	4'170 mA	92 %
TEN 50-4813WI		15 VDC	3'330 mA	92 %
TEN 50-4815WI		24 VDC	2'080 mA	91 %

Input Specifications

Input current at no load (nominal input voltage)		24 Vin models: 48 Vin models:	80 mA typ 50 mA typ.
Recommended input fuse (slow blow)		24 Vin models: 48 Vin models:	1000 mA 500 mA
Surge voltage (100 msec. max.)		24 Vin models: 48 Vin models:	50 V max. 100 V max.
Reflected input ripple current		24Vin models: 48Vin models:	40 mA typ. 30 mA typ.
Conducted noise (input)			EN 55022 class A, FCC part 15 level A with external LC see application note
Start-up voltage / under voltage shut down		24 Vin models: 48 Vin models:	9 VDC max./ 7.5 VDC typ. 18 VDC max./ 16 VDC typ.
EMC immunity	– ESD (electrostatic discharge)		EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A
	– Radiated immunity		EN 61000-4-3, 10 V/m, perf. criteria A
	– Fast transient / surge (with external input capacitor)		EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±1 kV perf. criteria A Nippon chemi-con KY 220 µF, 100 V, ESR 48 mOhm
	– Conducted immunity		EN 61000-4-6, 10 Vrms, perf. criteria A

Output Specifications

Voltage set accuracy			±1.0 % max.
Output voltage adjustment range		24 VDC models: other models:	+20 / –10 % ±10 %
Regulation	– Input variation Vin min. to Vin max. – Load variation 0 – 100 %		0.5 % max. 0.5 % max.
Minimum load			not required
Temperature coefficient			±0.02 %/K
Ripple and noise (20 MHz Bandwidth)		3.3 & 5.0 VDC models: other models:	100 mVpk-pk. typ. 150 mVpk-pk typ. with 1µF MLCC and a 10µF tantalum capacitor
Transient response (alignment to 1% at load step change 75% to 100%)			250 µs typ.
Output current limitation			at 150% of Iout max.
Short circuit protection			hiccup mode, automatic recovery
Capacitive load		3.3 VDC models: 5.0 VDC models: 12.0 VDC models: 15.0 VDC models: 24.0 VDC models:	26'000 µF max. 17'000 µF max. 3'000 µF max. 2'000 µF max. 750 µF max.

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

General Specifications

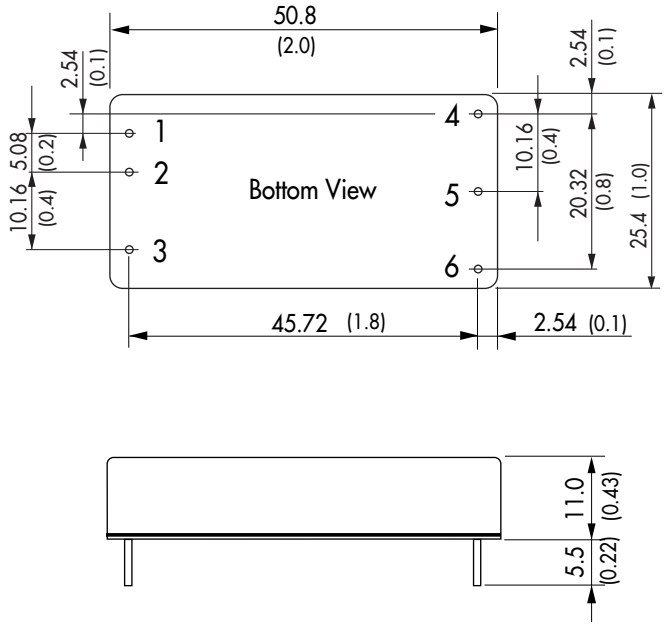
Temperature ranges	– Operating (natural convection 20 LFM) – Operating with heat sink (natural convection 20 LFM) – Case temperature – Storage	–40°C to +80°C (with derating) –40°C to +85°C (with derating) +105°C max. –50°C to +125°C
Load derating (natural convection 20 LFM, typical values over series)	– without heat sink – with heat sink	2.0 %/K above +55°C 2.5 %/K above +65°C
Thermal impedance	– Natural convection 20 LFM – Natural convection 20 LFM with heatsink	12°C/W 10°C/W
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		>230'900 h
Isolation voltage (60 sec.)	– Input/Output	1500 VDC
Isolation capacitance	– Input/Output	2200 pF max. (100 kHz, 1 V)
Isolation resistance	– Input/Output	>1000 Mohm (500 VDC)
Switching frequency		285 kHz typ.
Remote On/Off	– On: – Off: – Off idle current:	3.5 to 12 VDC to -Vin or open circuit. 0 to +1.2 VDC or short circuit to -Vin 2.5 mA typ.
Safety standards	– Certification documents	CAN/CSA-C22.2 No 60950-1-07, 2nd ed; A1:2011 ANSI/UL No. 60950-1, 2nd ed.; A1:2011, IEC 60950-1:2005 (2nd edition); Am 1:2009 EN 60950-1:2006/A11:2009/A1:2010/12:2011

Physical Specifications

Casing material		alluminium alloy, 6-side shielded, insulating baseplate
Potting material		epoxy (UL 94V-0 rated)
Weight		34 g (1.05 oz)
Soldering temperature		max. 260°C / 10 sec. (1.5 mm from casing)
Environmental compliance	– Reach – RoHS	 directive 2011/65/EU

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

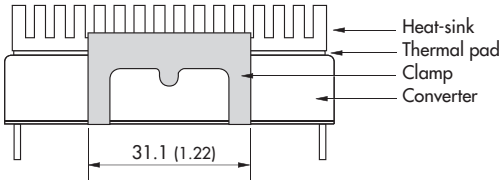
Outline Dimensions

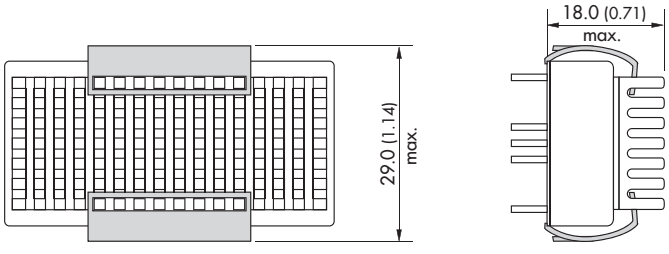


Pin-Out	
Pin	**Single**
1	+Vin (Vcc)
2	–Vin (GND)
3	Remote On/Off
4	+Vout
5	–Vout
6	Trim

Dimensions in [mm], () = Inch
Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
Pin pitch tolerance: ±0.13 (±0.005)
Case tolerances: ±0.25 (±0.01)

Heat-sink TEN-HS6 (optional)





Order code: **TEN-HS6**
(cont.: heat-sink, thermal pad, 2 clamps)
Material: Aluminum
Finish: Anodic treatment (black)
Weight: 9 g (0.31oz) without converter
Thermal impedance after assembling: 10 K/W

Note:
Before attaching the heatsink, the product label on converter has to be removed for optimal performance.
For volume orders we can supply the converters with heatsink already mounted. Please contact us for a relative quotation.