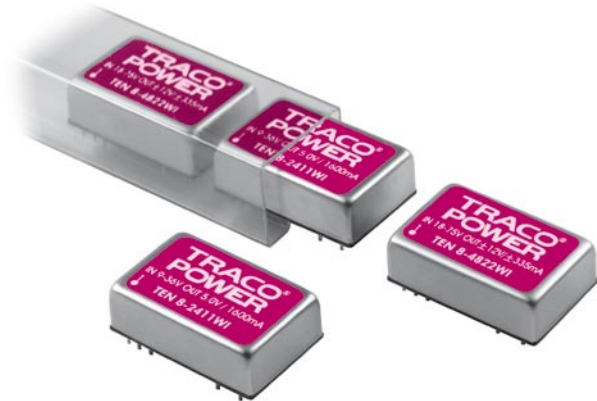




#### Features

- ◆ High Power Density in DIP-24 Metal Package
- ◆ Ultra wide 4:1 Input Voltage Range
- ◆ High Efficiency up to 88%
- ◆ Operating Temperature Range: -40°C to +85°C
- ◆ Remote On/Off
- ◆ Under Voltage Lockout
- ◆ Shielded Metal Case with insulated Base plate
- ◆ Lead free Design, RoHS compliant
- ◆ 3 Year Product Warranty



The TEN 8WI series is a family of high performance 8W DC/DC converter modules featuring ultra wide 4:1 input voltage ranges in a DIP-24 package with industry-standard footprint. A very high efficiency allows an operating temperature range of -40°C to +85°C. Full SMD-design with exclusive use of ceramic capacitors guarantees a high reliability and long product lifetime. Further standard features include remote On/Off, over voltage protection, under voltage lockout and short circuit protection. Typical applications for these converters are battery operated equipment, instrumentation, communication and industrial electronics, everywhere where isolated, tightly regulated voltages are required.

#### Models

Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEN 8-2410WI	9 – 36 VDC (24 VDC nominal)	3.3 VDC	2'000 mA	85 %
TEN 8-2411WI		5 VDC	1'500 mA	87 %
TEN 8-2412WI		12 VDC	665 mA	86 %
TEN 8-2413WI		15 VDC	535 mA	86 %
TEN 8-2421WI		± 5 VDC	± 800 mA	84 %
TEN 8-2422WI		±12 VDC	± 335 mA	86 %
TEN 8-2423WI		±15 VDC	± 265 mA	86 %
TEN 8-4810WI	18 – 75 VDC (48 VDC nominal)	3.3 VDC	2'000 mA	85 %
TEN 8-4811WI		5 VDC	1'500 mA	87 %
TEN 8-4812WI		12 VDC	665 mA	87 %
TEN 8-4813WI		15 VDC	535 mA	88 %
TEN 8-4821WI		± 5 VDC	± 800 mA	84 %
TEN 8-4822WI		±12 VDC	± 335 mA	86 %
TEN 8-4823WI		±15 VDC	± 265 mA	87 %

### Input Specifications

Input current (no load)	9–36 Vin, 3.3VDC & 5VDC output models: 40 mA typ. 9–36 Vin other output models: 25 mA typ. 18–75 Vin, 3.3VDC & 5VDC output models: 20 mA typ. 18–75 Vin other output models: 13 mA typ.
Input current (full load)	9–36 Vin models: 410 mA typ 18–75 Vin models: 210 mA typ
Input voltage variation (dv/dt)	5 V/ms, max. (complies with ETS300 132 part 4.4)
Start-up voltage / under voltage lockout	9–36 Vin models: 9.0 VDC / 8.0 VDC (typ.) 18–75 Vin models: 18 VDC / 16 VDC (typ.)
Surge voltage (100 msec. max.)	9–36 Vin models: 50 V max.. 18–75 Vin models: 100 V max.
Conducted noise (input)	EN 55022 level A, FCC part 15, level A with external capacitor (see note 1)
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	± 1 %
Regulation	– Input variation Vin min. to Vin max 0.2 % max. – Load variation 10 – 100 % single output models: 0.5 % max. dual output models: 1 % max. – Load cross variation 25 % / 100 % 5 % max.
Temperature coefficient	± 0.02 % /K
Ripple and noise (20 MHz Bandwidth)	50 mVpk-pk max.
Start up time (constant resistive load)	– Power On 450 ms typ. – Remote On 5 ms max.
Transient Response (25% load step change)	250 µs typ.
Short circuit protection	indefinite (automatic recovery)
Over load protection	150% of Iout max. typ.
Over voltage protection	3.3 V output: 3.9 V 5 V output: 6.2 V 12 V output: 15 V 15 V output: 18 V
Capacitive load	tba
Temperature ranges	– Operating –40 °C ... +85 °C – Case temperature +100 °C max. – Storage –55 °C ... +125 °C
Derating	see graph below
Humidity (non condensing)	95 % rel. H max.
Reliability, calculated MTBF (MIL-HDBK-217 F)	1 Mio. h @ +25°C
Isolation voltage (60 sec)	– Input / Output 1'500 VDC
Isolation resistance	– Input / Output > 1'000 M Ohm
Isolation capacity	– Input / Output 300 pF max.
Switching frequency	300 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**

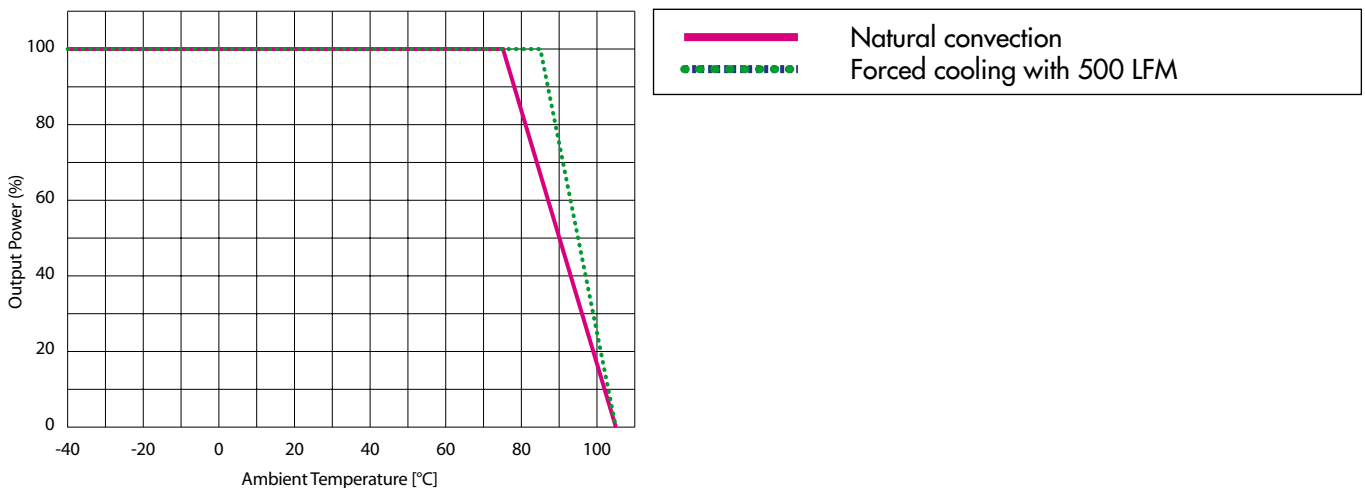
Vibration		10-55Hz, 10G, 30 minutes along X,Y,Z
Safety standards		UL/cUL 60950-1, IEC/EN 60950-1
Safety approvals		UL/cUL File tba
Remote On/Off	- On: - Off: - Off idle current:	3.5 ... 12 VDC or open circuit 0 ... 1.2 VDC or short circuit pin 1 and pin 2/3 2.5 mA

Application notes can be downloaded under:  
[www.tracopower.com/products/tmr2\\_application.pdf](http://www.tracopower.com/products/tmr2_application.pdf)

**Note 1:**

In order to meet conducted emissions EN55022-A an aluminium electrolytic capacitor (low ESR) has to be installed between +Vin and -Vin. The capacitor should be capable to handle 0.5A ripple current.

**Power Derating**

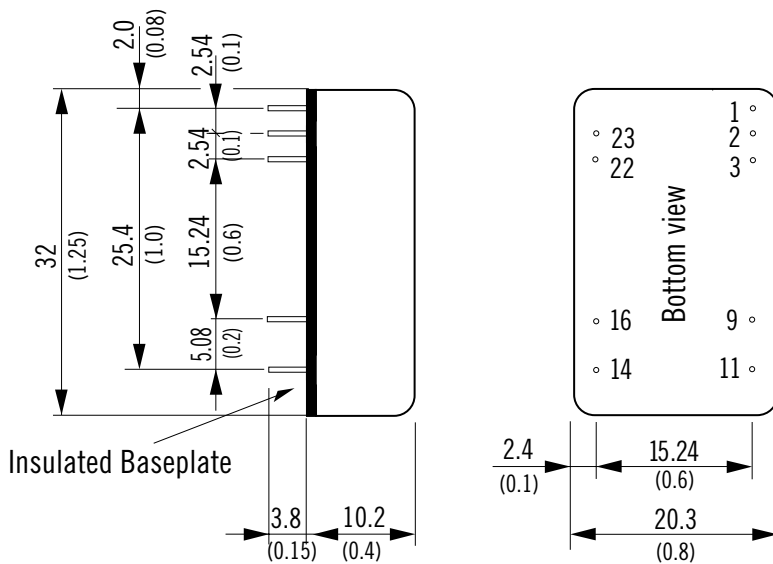


All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

**Physical Specifications**

Case material	copper, nickel plated
Baseplate material	non conductive FR4
Potting material	epoxy (UL94V-0 rated)
Weight	18 g (0.60 oz)
Soldering temperature	max. 265 °C / 10 sec.

**Outline Dimensions**



Pin-Out		
Pin	Single	Dual
1	Remote On/Off	Remote On/Off
2	-Vin (GND)	-Vin (GND)
3	-Vin (GND)	-Vin (GND)
9	No con.	Common
11	No con.	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin (Vcc)	+Vin (Vcc)
23	+Vin (Vcc)	+Vin (Vcc)

Dimensions in [mm], ( ) = Inch  
 Pin diameter  $\varnothing 0.5 \pm 0.05$  (0.02  $\pm$  0.002)  
 Tolerances  $\pm 0.5$  (0.02)  
 Pin pitch tolerances  $\pm 0.35$  (0.014)

Specifications can be changed any time without notice