DC/DC Converters

TEN 8WI Series, 8 Watt

Features

- DIP-24 metal package
- Ultra wide 4:1 input voltage range 9–36, 18–75, 43–160 VDC
- EN 50155 approval for railway applications
- Thermal shock and vibration resistant according EN 61373
- High efficiency up to 88 %
- No minimum load required
- Operating temperature range –40°C to +85°C
- Remote On/Off
- Under voltage lock-out circuit
- 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 8 Watt dc/dc converter modules featuring ultra wide 4:1 input voltage ranges in a DIP-24 package with industry-standard footprint. Input voltages up to 160 VDC, excellent EMC characteristics and EN 50155 approval make this product the best choice for many demanding applications in railroad and transportation systems. Further standard features include remote On/Off, over voltage protection, under voltage lockout and short circuit protection. Typical applications for these converters are also in wireless networks, telecom/datacom, industry control systems and measurement equipments.

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	2'400 mA	85 %
TEN 8-2411WI		5 VDC	1'600 mA	87 %
TEN 8-2412WI		12 VDC	666 mA	86 %
TEN 8-2413WI		15 VDC	533 mA	86 %
TEN 8-2421WI		±5 VDC	±800 mA	84 %
TEN 8-2422WI		±12 VDC	±333 mA	86 %
TEN 8-2423WI		±15 VDC	±267 mA	86 %
TEN 8-4810WI	18 – 75 VDC (48 VDC nominal)	3.3 VDC	2'400 mA	85 %
TEN 8-4811WI		5 VDC	1'600 mA	87 %
TEN 8-4812WI		12 VDC	666 mA	87 %
TEN 8-4813WI		15 VDC	533 mA	88 %
TEN 8-4821WI		±5 VDC	±800 mA	84 %
TEN 8-4822WI		±12 VDC	±333 mA	87 %
TEN 8-4823WI		±15 VDC	±267 mA	87 %
TEN 8-7210WI	43 – 160 VDC (110 VDC nominal)	3.3 VDC	2'400 mA	84 %
TEN 8-7211WI		5 VDC	1'600 mA	85 %
TEN 8-7212WI		12 VDC	666 mA	86 %
TEN 8-7213WI		15 VDC	533 mA	86 %
TEN 8-7221WI		±5 VDC	±800 mA	82 %
TEN 8-7222WI		±12 VDC	±333 mA	85 %
TEN 8-7223WI		±15 VDC	±267 mA	85 %

Input Specifications

Input current (no load)		9–36 Vin, 3.3 VDC & 5 VDC models:	40 mA typ.
		9–36 Vin other models:	25 mA typ.
		18–75 Vin, 3.3 VDC & 5 VDC models:	20 mA typ.
		18–75 Vin other models:	13 mA typ.
		43–160 Vin, 3.3 VDC & 5 VDC models:	8 mA typ.
		43–160 Vin other models:	5 mA typ.
Input current (full load)		9–36 Vin models:	410 mA typ
		18–75 Vin models:	210 mA typ
		43–160 Vin models:	90 mA typ.
Input voltage variation (dv/dt)			5 V/ms, max. (complies with ETS300 132 part 4.4)
Start-up voltage		9–36 Vin models:	9.0 VDC (or lower)
		18–75 Vin models:	18 VDC (or lower)
		43–160 Vin models:	43 VDC (or lower)
Under voltage shut down (lock-out circuit)		9–36 Vin models:	8.0 VDC typ.
		18–75 Vin models:	16 VDC typ.
		43–160 Vin models:	42 VDC typ.
Surge voltage (100 msec. max.)		9–36 Vin models:	50 V max.
		18–75 Vin models:	100 V max.
		43–160 Vin models:	170 V max.
Reflected ripple current			20 mAp-p typ.
Conducted noise			EN 55022 class A with external components see application note:
ESD (electrostatic discharge)			EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A
Radiated immunity			EN 61000-4-3, 20 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, ±2 kV perf. criteria A
	– external input capacitor	24/48 Vin models:	Nippon chemi-con KY 220 µF, 100 V, ESR 48 mOhm
		110 Vin models:	Nippon chemi-con KX J 150 µF, 200 V, ESR 48 mOhm
Conducted immunity			EN 61000-4-6, 10 Vrms, perf. criteria A

Output Specifications

Voltage set accuracy			±1 %
Regulation	– Input variation Vin min. to Vin max.		0.2 % max.
	– Load variation 0 – 100 %	single output models:	0.5 % max.
		dual output models:	1 % max.
	– Load cross variation 25 % / 100 %		5 % max.
Minimum load			not required
Temperature coefficient			±0.02 %/K
Ripple and noise (20 MHz bandwidth)		24/48 Vin models:	50 mVp-p typ.
		110 Vin models:	75 mVp-p typ.
Start up time	– Power On		450 ms typ.
(constant resistive load)	– Remote On		5 ms typ.
Transient Response (25% load step change)			250 µs typ.
Short circuit protection			indefinite (automatic recovery)
Over load protection			150 % of Iout max. typ.

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

Output Specifications

Over voltage protection (only single output models)	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	3.3 VDC & 5 VDC models:	1330 µF
	12 VDC models:	288 µF
	15 VDC models:	200 µF
	±5 VDC models:	900 µF (each output)
	±12 VDC models:	133 µF (each output)
	±15 VDC models:	90 µF (each output)

General Specifications

Temperature ranges	– Operating	–40°C to +85°C
	– Case temperature	+105°C max.
	– Storage	–55°C to +125°C
Power derating		3 %/K above +70°C
Thermal inpedance	– Natural convection	18.2°C/W
	– Natural convection with heat sink	15.8°C/W
Humidity (non condensing)		5 – 95 % rel. H max.
Isolation voltage (60 sec.)	– Input / Output	1500 VDC
Isolation resistance	– Input / Output	>1000 M Ohm
Isolation capacitance	– Input / Output	1500 pF max.
Switching frequency		300 kHz typ. (pulse width modulation PWM)
Thermal shock, mechanical shock & vibration	– Test conditions	EN 61373, MIL-STD-810F www.tracopower.com/products/mil810.pdf
Safety standards		UL/cUL 60950-1, IEC/EN 60950-1, EN 50155
Safety approvals	– UL/cUL	www.ul.com -> certifications -> File e188913
	– Railway	www.tracopower.com/products/ten8wi-coc.pdf
Remote On/Off	– On:	3.0 ... 12 VDC or open circuit
	– Off:	0 ... 1.2 VDC or short circuit pin 1 and pin 2/3
	– Off idle current:	2.5 mA
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		1 Mio. h
Environmental compliance	– Reach	www.tracopower.com/products/ten8wi-reach.pdf
	– RoHS	RoHS directive 2002/95/EC

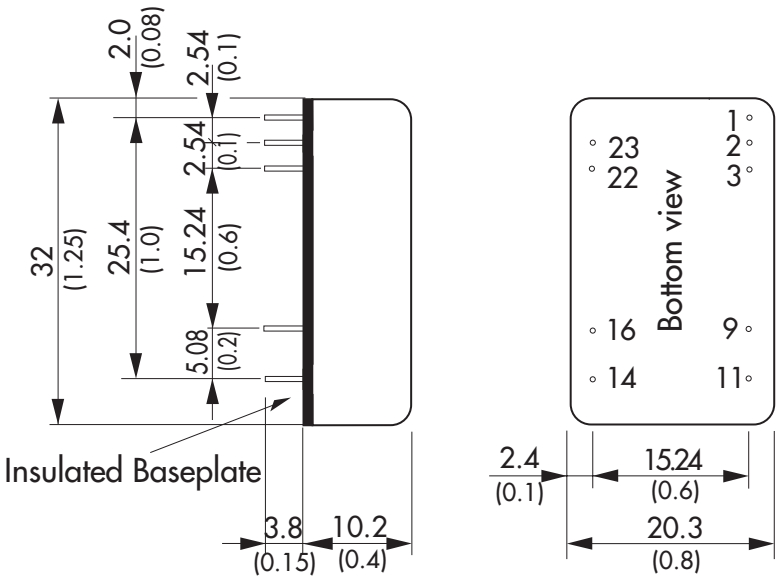
Application note: www.tracopower.com/products/ten8wi-application.pdf

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

Physical Specifications

Casing material	copper, nickel plated
Baseplate material	non conductive FR4
Potting material	epoxy (UL94V-0 rated)
Weight	18 g (0.63 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	ntc	Common
11	ntc	–Vout
14	+Vout	+Vout
16	–Vout	Common
22	+Vin (Vcc)	+Vin (Vcc)
23	+Vin (Vcc)	+Vin (Vcc)

ntc = not to connect

Dimensions in [mm], () = Inch
Pin diameter ⌀ 0.5 ±0.05 (0.02 ±0.002)
Tolerances ±0.5 (±0.02)
Pin pich tolerances ±0.25 (±0.001)

Jenatschstrasse 1 · CH-8002 Zurich · Switzerland
Tel. +41 43 311 45 11 · Fax +41 43 311 45 45 · info@traco.ch · www.tracopower.com

Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
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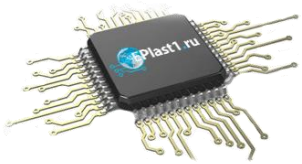
- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.