

Features

- ◆ 2" x 1" 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 92%
- ◆ No minimum load required
- ◆ Operating temperature range
–40°C to +85°C
- ◆ Under voltage lock-out circuit
- ◆ Remote On/Off
- ◆ Output voltage adjustable
- ◆ Lead free design, RoHS compliant
- ◆ 3-year product warranty



The TEN 40WIR series is a family of high performance 40 Watt dc/dc converter modules featuring ultra wide 4:1 input voltage ranges in a 2" x 1" 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. Low input current characteristics at minimal load make these converters also the ideal solution for battery-operated systems. Typical applications are 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 40-2410WIR | 9 – 36 VDC (24 VDC nominal) | 3.3 VDC | 10'000 mA | 90 % |
| TEN 40-2411WIR | | 5.0 VDC | 8000 mA | 91 % |
| TEN 40-2412WIR | | 12 VDC | 3333 mA | 91 % |
| TEN 40-2413WIR | | 15 VDC | 2666 mA | 91 % |
| TEN 40-2415WIR | | 24 VDC | 1666 mA | 91 % |
| TEN 40-2422WIR | | ±12 VDC | ±1666 mA | 90 % |
| TEN 40-2423WIR | | ±15 VDC | ±1333 mA | 90 % |
| TEN 40-4810WIR | | 18 – 75 VDC (48 VDC nominal) | 3.3 VDC | 10'000 mA |
| TEN 40-4811WIR | 5.0 VDC | | 8000 mA | 91 % |
| TEN 40-4812WIR | 12 VDC | | 3333 mA | 92 % |
| TEN 40-4813WIR | 15 VDC | | 2666 mA | 92 % |
| TEN 40-4815WIR | 24 VDC | | 1666 mA | 91 % |
| TEN 40-4822WIR | ±12 VDC | | ±1666 mA | 90 % |
| TEN 40-4823WIR | ±15 VDC | | ±1333 mA | 90 % |
| TEN 40-7210WIR | 43 – 160 VDC (110 VDC nominal) | | 3.3 VDC | 10'000 mA |
| TEN 40-7211WIR | | 5.0 VDC | 8000 mA | 89 % |
| TEN 40-7212WIR | | 12 VDC | 3333 mA | 90 % |
| TEN 40-7213WIR | | 15 VDC | 2666 mA | 90 % |
| TEN 40-7215WIR | | 24 VDC | 1666 mA | 90 % |
| TEN 40-7222WIR | | ±12 VDC | ±1666 mA | 89 % |
| TEN 40-7223WIR | | ±15 VDC | ±1333 mA | 89 % |

Input Specifications

| | |
|--|--|
| Input current (no load) | 24 Vin models: 15 mA typ. 48 Vin models: 10 mA typ. 110 Vin models: 6 mA typ. |
| Start-up voltage | 24 Vin models: < 9.0 VDC 48 Vin models: < 18 VDC 110 Vin models: < 43 VDC |
| Under voltage shut down (lock-out circuit) | 24 Vin models: 8.0 VDC typ. 48 Vin models: 16 VDC typ. 110 Vin models: 40 VDC typ. |
| Surge voltage (1 sec.) | 24 Vin models: 50 V max. 48 Vin models: 100 V max. 110 Vin models: 170 V max. |
| Reflected ripple current | 20 mA _{p-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, 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, ±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: Ruby-con BXF 68 µF, 200 V, 3pcs in parallel. |
| Conducted immunity | EN 61000-4-6, 10 V _{rms} , perf. criteria A |

Output Specifications

| | |
|--|--|
| Voltage set accuracy | ±1 % |
| Voltage adjustment range (single output models only) | 15 & 24 VDC models: +20%, -10% other models: ±10 % |
| 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, measured with 1 µF/ 50 V MLCC) | 3.3 & 5.0 VDC models: 75 mV _{p-p} max. 24 VDC models: 150 mV _{p-p} max. other models: 100 mV _{p-p} max. |
| Start up time | – Power On 60 ms typ. (constant resistive load) – Remote On 60 ms typ. |
| Transient response (25% load step change) | 250 µs typ. |
| Short circuit protection | indefinite (automatic recovery) |
| Over load protection | 150 % of lout max. typ. |
| Over voltage protection (only single output models) | 3.3 VDC models: 3.9 V 5 VDC models: 6.2 V 12 VDC models: 15 V 15 VDC models: 20 V 24 VDC models: 31 V |

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

Output Specifications

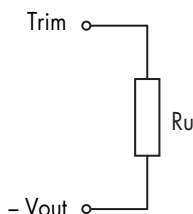
| | | |
|-------------------------------|----------------------|----------------------------|
| Capacitive load (max. values) | 3.3 VDC models: | 26'600 μ F |
| | 5.0 VDC models: | 20'000 μ F |
| | 12 VDC models: | 3900 μ F |
| | 15 VDC models: | 2600 μ F |
| | 24 VDC models: | 1300 μ F |
| | \pm 12 VDC models: | 2600 μ F (each output) |
| | \pm 15 VDC models: | 1600 μ F (each output) |

General Specifications

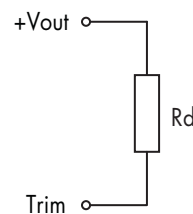
| | | |
|---|--|---|
| Temperature ranges | - Operating - Casing temperature - Storage | -40°C to +85°C (with derating) +105°C max. -55°C to +125°C |
| Power derating | - Natural convection - Natural convection with heat sink (optional) | 2.5 %/K above 60°C 2.8 %/K above 65°C |
| Thermal impedance | - Natural convection - Natural convection with heat sink (optional) | 10.8 K/W 10.3 K/W |
| Humidity (non condensing) | | 5 – 95 % rel. H |
| Isolation voltage (60 sec.) | - Input / Output | 1600 VDC |
| Isolation resistance | - Input / Output | >10'000 M Ohm |
| Isolation capacitance | - Input / Output | 1'500 pF max. |
| Switching frequency | | 250 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 (entry pending) | www.ul.com -> certifications -> File e188913 |
| Remote On/Off | - On: - Off: - Off idle current: | 3.0 ... 12 VDC or open circuit 0 ... 1.2 VDC or short circuit pin 2 and pin 6 3.0 mA |
| Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign) | | 370'000 h |
| Environmental compliance | - Reach - RoHS | www.tracopower.com/products/ten40wir-reach.pdf RoHS directive 2002/95/EC |

Output Voltage Adjustment (for single output models only)

Trim up



Trim down



Nominal output voltage at open Trim input
Ru, Rd for adjustment to be advised

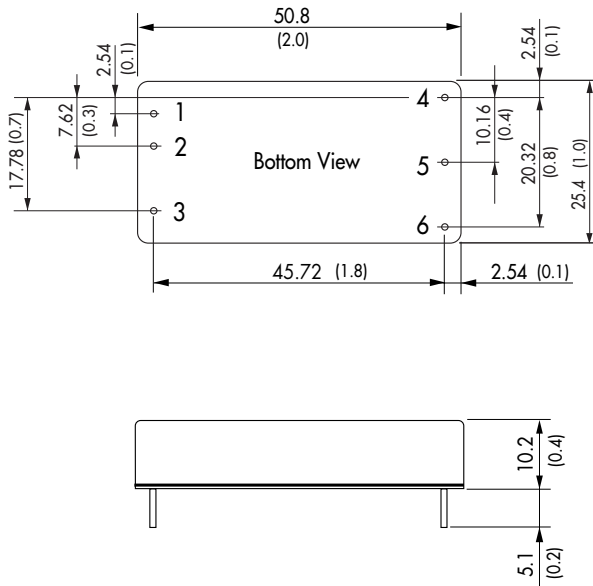
Application note: www.tracopower.com/products/ten40wir-application.pdf

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

Physical Specifications

| | |
|-----------------------|-------------------------|
| Casing material | copper |
| Baseplate material | non conductive FR4 |
| Potting material | silicon (UL94V-0 rated) |
| Weight | 21.5 g (0.76 oz) |
| Soldering temperature | max. +265°C / 10 sec. |

Outline Dimensions

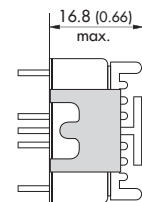
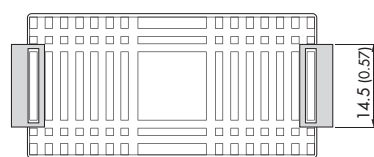
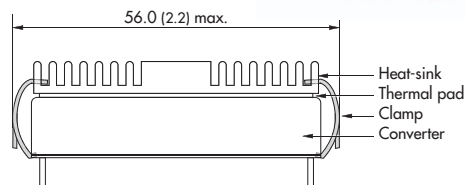
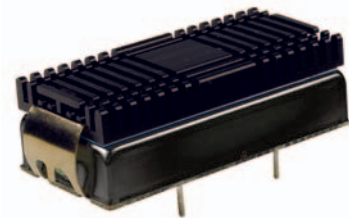


| Pin-Out | | |
|---------|---------------|------------|
| Pin | Single | Dual |
| 1 | +Vin (Vcc) | +Vin (Vcc) |
| 2 | -Vin (GND) | -Vin (GND) |
| 3 | Remote On/Off | |
| 4 | +Vout | +Vout |
| 5 | -Vout | Common |
| 6 | TRIM | -Vout |

Dimensions in [mm], () = Inch
 Pin diameter: 1.0 ±0.1 (0.04 ±0.004)
 Pin pitch tolerances: ±0.25 (±0.01)
 Case tolerances: ±0.5 (±0.02)

Heat-Sink (Option)

Order code: TEN-HS1
 (cont.: heat-sink, thermal pad, 2 clamps)
Material: Aluminum
Finish: Anodic treatment (black)
Weight: 17g (0.60oz) without converter
 Thermal impedance after assembling: 10.3 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.

Specifications can be changed any time without notice.

Dimensions in mm, () = Inch



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

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- 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;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- 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.