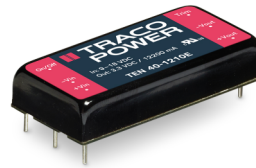


- Developed to maximize quality in a cost efficient design
- Excellent temperature capabilities
- 2" x 1" metal package (6-side shielded)
- Wide 2:1 input voltage range:
9-18, 18-36, 36-75 VDC
- Minimal heat development due to high efficiencies up to 93%
- Operating temperature range -40 to +85°C
- 1600 VDC I/O-isolation
- Remote On/Off and Trim function
- Protection against short circuit, overvoltage and overtemperature
- 3-year product warranty



The TEN 40E is rounding out Traco Power's existing 40 Watt product range. Driven by current market trends this series was developed to maximize quality and cost efficiency in one product. Due to a new design approach the TEN 40E thus offers a cost efficient solution with not only no concession on quality or reliability but even improved specifications compared to its predecessor. It comes in a standard 2" x 1" metal package with a 2:1 input voltage range. High efficiencies of up to 93% allow for an operating temperature range (natural convection) of -40 to +70°C without power derating (model dependent). Certified according to the latest IT standard (IEC/EN/UL 62368-1) and equipped with additional features like remote on/off function and protection against short circuit, overvoltage and over temperature the TEN 40E series is suitable for many industrial applications.

| Models | | | | | | |
|--------------|------------------------------|----------|------------------|----------|------------------|-----------------|
| Order Code | Input Voltage Range | Output 1 | | Output 2 | | Efficiency typ. |
| | | Vnom | I _{max} | Vnom | I _{max} | |
| TEN 40-1210E | 9 - 18 VDC (12 VDC nom.) | 3.3 VDC | 12'200 mA | | | 89 % |
| TEN 40-1211E | | 5 VDC | 8'000 mA | | | 90 % |
| TEN 40-1212E | | 12 VDC | 3'333 mA | | | 91 % |
| TEN 40-1213E | | 15 VDC | 2'666 mA | | | 91 % |
| TEN 40-1215E | | 24 VDC | 1'666 mA | | | 90 % |
| TEN 40-1222E | | +12 VDC | 1'666 mA | -12 VDC | 1'666 mA | 90 % |
| TEN 40-1223E | | +15 VDC | 1'333 mA | -15 VDC | 1'333 mA | 90 % |
| TEN 40-1225E | | +24 VDC | 833 mA | -24 VDC | 833 mA | 91 % |
| TEN 40-2410E | 18 - 36 VDC (24 VDC nom.) | 3.3 VDC | 12'200 mA | | | 90 % |
| TEN 40-2411E | | 5 VDC | 8'000 mA | | | 92 % |
| TEN 40-2412E | | 12 VDC | 3'333 mA | | | 92 % |
| TEN 40-2413E | | 15 VDC | 2'666 mA | | | 93 % |
| TEN 40-2415E | | 24 VDC | 1'666 mA | | | 91 % |
| TEN 40-2422E | | +12 VDC | 1'666 mA | -12 VDC | 1'666 mA | 91 % |
| TEN 40-2423E | | +15 VDC | 1'333 mA | -15 VDC | 1'333 mA | 91 % |
| TEN 40-2425E | | +24 VDC | 833 mA | -24 VDC | 833 mA | 91 % |
| TEN 40-4810E | 36 - 75 VDC (48 VDC nom.) | 3.3 VDC | 12'200 mA | | | 90 % |
| TEN 40-4811E | | 5 VDC | 8'000 mA | | | 91 % |
| TEN 40-4812E | | 12 VDC | 3'333 mA | | | 92 % |
| TEN 40-4813E | | 15 VDC | 2'666 mA | | | 92 % |
| TEN 40-4815E | | 24 VDC | 1'666 mA | | | 92 % |
| TEN 40-4822E | | +12 VDC | 1'666 mA | -12 VDC | 1'666 mA | 91 % |
| TEN 40-4823E | | +15 VDC | 1'333 mA | -15 VDC | 1'333 mA | 91 % |
| TEN 40-4825E | | +24 VDC | 833 mA | -24 VDC | 833 mA | 92 % |

| Options | |
|--|--|
| TEN-HS1 | - Optional Heat Sink with Height = 0.22 inch: www.tracopower.com/overview/ten-hs1 |
| TEN-HS8 | - Optional Heat Sink with Height = 0.3 inch: www.tracopower.com/overview/ten-hs8 |
| on demand (backorder with MOQ non stocking item) | - Optional Heat Sink with Height = 0.8 inch: www.tracopower.com/overview/ten-hs10 - Optional Heat Sink with Height = 0.5 inch: www.tracopower.com/overview/ten-hs9 - Optional models with pre-assembled heatsink - Optional models with inverse Remote On/Off function (passive = off) |

| Input Specifications | |
|------------------------|---|
| Input Current | - At no load 12 Vin models: 20 mA typ. 24 Vin models: 15 mA typ. 48 Vin models: 10 mA typ. |
| Surge Voltage | 12 Vin models: 25 VDC max. (1 s max.) 24 Vin models: 50 VDC max. (1 s max.) 48 Vin models: 100 VDC max. (1 s max.) |
| Under Voltage Lockout | 12 Vin models: 7 VDC min. / 8 VDC typ. / 8.8 VDC max. 24 Vin models: 15 VDC min. / 16 VDC typ. / 17.5 VDC max. 48 Vin models: 32 VDC min. / 33 VDC typ. / 35 VDC max. |
| Recommended Input Fuse | 12 Vin models: 8'000 mA (fast acting) 24 Vin models: 4'000 mA (slow blow) 48 Vin models: 2'000 mA (slow blow) (The need of an external fuse has to be assessed in the final application.) |
| Input Filter | Internal Pi-Type |

| Output Specifications | |
|--|--|
| Output Voltage Adjustment | -10% to +20% (15 & 24 Vout models) ±10% (other models) (single output models only) (By external trim resistor) See application note: www.tracopower.com/ten40e-adj Output power must not exceed rated power! |
| Voltage Set Accuracy | ±1% max. |
| Regulation | - Input Variation (Vmin - Vmax) single output models: 0.2% max. dual output models: 0.2% max. - Load Variation (0 - 100%) single output models: 0.3% max. dual output models: 0.5% max. (Output 1) 0.5% max. (Output 2) - Cross Regulation (25% / 100% asym. load) dual output models: 5% max. |
| Ripple and Noise (20 MHz Bandwidth) | - single output 3.3 Vout models: 75 mVp-p typ. 5 Vout models: 75 mVp-p typ. 12 Vout models: 100 mVp-p typ. 15 Vout models: 100 mVp-p typ. 24 Vout models: 150 mVp-p typ. - dual output 12 / -12 Vout models: 100 / 100 mVp-p typ. 15 / -15 Vout models: 100 / 100 mVp-p typ. 24 / -24 Vout models: 150 / 150 mVp-p typ. |

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

| | | |
|---------------------------|-----------------|---|
| Capacitive Load | - single output | 3.3 Vout models: 22'000 µF max. 5 Vout models: 12'000 µF max. 12 Vout models: 2'000 µF max. 15 Vout models: 1'300 µF max. 24 Vout models: 490 µF max. |
| | - dual output | 12 / -12 Vout models: 980 / 980 µF max. 15 / -15 Vout models: 630 / 630 µF max. 24 / -24 Vout models: 250 / 250 µF max. |
| Minimum Load | | Not required |
| Temperature Coefficient | | ±0.02 %/K max. |
| Start-up Time | | 30 ms typ. / 60 ms max. |
| Short Circuit Protection | | Continuous, Automatic recovery |
| Output Current Limitation | | 150% typ. of Iout max. |
| Oversvoltage Protection | | 125% typ. of Vout nom. (By Zener diode) |
| Transient Response | - Response Time | 250 µs typ. (25% Load Step) |

Safety Specifications

| | | |
|-----------------------|-----------------------------|---|
| Standards | - IT / Multimedia Equipment | EN 62368-1 IEC 62368-1 UL 62368-1 www.tracopower.com/ten40e-safety-cert |
| | - Certification Documents | |
| Energy Source | - Output, acc. to 62368-1 | ES1 |
| Power Source | - Output, acc. to 62368-1 | PS3 |
| Pollution Degree | | PD 2 |
| Over Voltage Category | | Not mains connected |

EMC Specifications

| | | |
|---------------------|-----------------------------|--|
| EMI (Emissions) | - Conducted Emissions | EN 55032 class A (with external filter) EN 55032 class B (with external filter) |
| | - Radiated Emissions | EN 55032 class A (with external filter) EN 55032 class B (with external filter) External filter proposal: www.tracopower.com/ten40e-emc-filter |
| EMS (Immunity) | - Electrostatic Discharge | Air: EN 61000-4-2, ±8 kV, perf. criteria A Contact: EN 61000-4-2, ±6 kV, perf. criteria A |
| | - RF Electromagnetic Field | EN 61000-4-3, 10 V/m, perf. criteria A |
| | - EFT (Burst) / Surge | EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±2 kV, perf. criteria A |
| | - Conducted RF Disturbances | Ext. input component: 2 x KY 220 µF SMDJ36A (12 Vin models) 2 x KY 220 µF SMDJ58A (24 Vin models) 2 x KY 220 µF SMDJ120A (48 Vin models) EN 61000-4-6, 10 Vrms, perf. criteria A |
| | - PF Magnetic Field | Continuous: EN 61000-4-8, 100 A/m, perf. criteria A 1 s: EN 61000-4-8, 1000 A/m, perf. criteria A |
| EMC / Environmental | - Certification Documents | www.tracopower.com/ten40e-emc-cert |

General Specifications

| | | |
|--|-------------------------|--|
| Relative Humidity | | 95% max. (non condensing) |
| Temperature Ranges | - Operating Temperature | -40°C to +85°C |
| | - Case Temperature | +105°C max. |
| | - Storage Temperature | -55°C to +125°C |
| Power Derating | - High Temperature | Depending on model |
| | | See application note: www.tracopower.com/ten40e-cc |
| Over Temperature Protection Switch Off | - Protection Mode | 115°C typ. (Automatic recovery) |
| Cooling System | | Natural convection (20 LFM) |

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

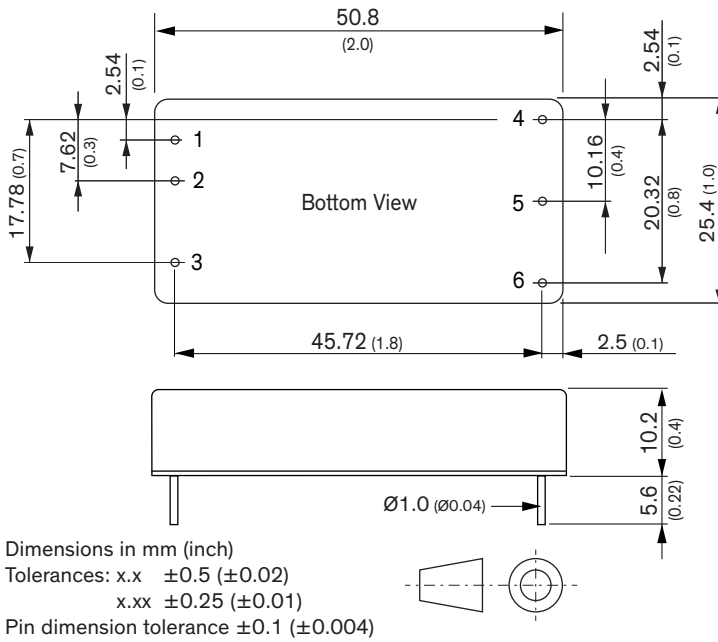
| | | |
|--------------------------|--|---|
| Remote Control | <ul style="list-style-type: none"> - Voltage Controlled Remote (passive = on) - Off Idle Input Current - Remote Pin Input Current | <p>On: 3.0 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin 3 mA typ. -0.5 to 1.0 mA (Optional models with inverse Remote On/Off function (passive = off))</p> |
| Switching Frequency | | <p>225 - 275 kHz (PWM) 250 kHz typ. (PWM)</p> |
| Insulation System | | Functional Insulation |
| Isolation Test Voltage | <ul style="list-style-type: none"> - Input to Output, 60 s - Input to Case, 60 s - Output to Case, 60 s | <p>1'600 VDC 1'600 VDC 1'600 VDC</p> |
| Isolation Resistance | - Input to Output, 500 VDC | 1'000 MΩ min. |
| Isolation Capacitance | - Input to Output, 100 kHz, 1 V | 1'500 pF max. |
| Reliability | - Calculated MTBF | 1'245'000 h (MIL-HDBK-217F, ground benign) |
| Washing Process | | <p>According to Cleaning Guideline www.tracopower.com/info/cleaning.pdf</p> |
| Environment | <ul style="list-style-type: none"> - Vibration - Mechanical Shock - Thermal Shock | <p>MIL-STD-810F MIL-STD-810F MIL-STD-810F</p> |
| Housing Material | | Copper |
| Base Material | | Non-conductive FR4 (UL 94 V-0 rated) |
| Potting Material | | Silicone (UL 94 V-0 rated) |
| Pin Material | | Copper |
| Pin Foundation Plating | | Nickel (2 - 3 μm) |
| Pin Surface Plating | | Tin (3 - 5 μm), matte |
| Housing Type | | Metal Case |
| Mounting Type | | PCB Mount |
| Connection Type | | THD (Through-Hole Device) |
| Footprint Type | | 2" x 1" |
| Soldering Profile | | <p>Lead-Free Wave Soldering 260°C / 6 s max.</p> |
| Weight | | 34 g |
| Thermal Impedance | - Case to Ambient | <p>10.8 K/W typ. 10.3 K/W typ. (with heatsink TEN-HS1) 9.3 K/W typ. (with heatsink TEN-HS8) 7.7 K/W typ. (with heatsink TEN-HS9) 6.2 K/W typ. (with heatsink TEN-HS10)</p> |
| Environmental Compliance | <ul style="list-style-type: none"> - REACH Declaration - RoHS Declaration - SCIP Reference Number | <p>www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7(a), 7(c)-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule.) 839c5ec8-798d-4d15-80e9-bb71025a4b99</p> |

Additional Information

| | |
|----------------------------|--|
| Supporting Documents | www.tracopower.com/overview/ten40e |
| Frequently Asked Questions | www.tracopower.com/glossary-faq |
| Glossary | www.tracopower.com/info/glossary.pdf |

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

Outline Dimensions



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