• Compact SIP-8 package
• I/O-isolation voltage 1'600 VDC
• Fully regulated outputs
• Operating temperature range –40°C to +90°C
• Continuous short circuit protection
• Remote On/Off
• 3-year product warranty
• Designed to meet UL 62368-1

TEC 3 is a new series with the design purpose to improve the prevalent 3 Watt SIP-8 DC/DC converters in terms of cost, efficiency and performance. The latest technology and components effectuate a high efficiency for a low thermal loss. This enables an operating temperature range from -40°C up to +90°C. The converters are fully regulated over 0 - 100% load. The low input range input is extended from 4.5 to 13.2 VDC while models are also available with the standard 2:1 input ranges of 9-18, 18-36 and 36-75 VDC (see TEC 3WI series for 4:1 input ranges). The functional I/O-isolation system is designed to meet IEC/EN 62368-1 with a test voltage (60s) of 1600 VDC.

### Models

<table>
<thead>
<tr>
<th>Order Code</th>
<th>Input Voltage Range</th>
<th>Output 1</th>
<th>Output 2</th>
<th>Efficiency typ.</th>
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<tr>
<td></td>
<td>Vnom</td>
<td>Imax</td>
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<td>Imax</td>
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<tr>
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<td>4.5 - 13.2 VDC (9 VDC nom.)</td>
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<td>+15 VDC</td>
<td>100 mA</td>
<td>–15 VDC</td>
<td>100 mA</td>
</tr>
</tbody>
</table>
Input Specifications

Input Current
- At no load
  9 Vin models: 55 mA typ.
  12 Vin models: 30 mA typ.
  24 Vin models: 12 mA typ.
  48 Vin models: 8 mA typ.

Surge Voltage
  9 Vin models: 15 VDC max. (1 s max.)
  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
  9 Vin models: 2 VDC min. / 3 VDC typ. / 4 VDC max.
  12 Vin models: 6 VDC min. / 7 VDC typ. / 8 VDC max.
  24 Vin models: 13 VDC min. / 15 VDC typ. / 17 VDC max.
  48 Vin models: 29 VDC min. / 32 VDC typ. / 35 VDC max.

Recommended Input Fuse
  9 Vin models: 1'600 mA (slow blow)
  12 Vin models: 800 mA (slow blow)
  24 Vin models: 500 mA (slow blow)
  48 Vin models: 315 mA (slow blow)

(The need of an external fuse has to be assessed in the final application.)

Input Filter
  Internal Capacitor

Output Specifications

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: 1% max.
  Dual output models: 1% max. (Output 1)
  Dual output models: 1% max. (Output 2)

- Cross Regulation
  (25% / 100% asym. load)
  Dual output models: 5% max.

Ripple and Noise
- 20 MHz Bandwidth
  75 mVp-p typ.

Capacitive Load
- Single output
  3.3 Vout models: 4'400 µF max.
  5 Vout models: 2'200 µF max.
  9 Vout models: 1'300 µF max.
  12 Vout models: 1'000 µF max.
  15 Vout models: 820 µF max.
  24 Vout models: 470 µF max.

- Dual output
  5 / -5 Vout models: 1'200 / 1'200 µF max.
  12 / -12 Vout models: 520 / 520 µF max.
  15 / -15 Vout models: 440 / 440 µF max.

Minimum Load
  Not required

Temperature Coefficient
  ±0.02 %/°K max.

Start-up Time
  10 ms typ. / 20 ms max.

Short Circuit Protection
  Continuous, Automatic recovery

Output Current Limitation
  140 - 240% of Iout max.
  180% typ. of Iout max.

Transient Response
- Response Time
  500 µs typ. (25% Load Step)

Safety Specifications

Safety Standards
- IT / Multimedia Equipment
  Designed for EN 62368-1 (no certification)

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

- 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/overview/tec3

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
- EFT (Burst) / Surge
- Conducted RF Disturbances
- PF Magnetic Field

General Specifications

Relative Humidity: 95% max. (non-condensing)

Temperature Ranges
- Operating Temperature: -40°C to +90°C
- Case Temperature: +105°C max.
- Storage Temperature: -55°C to +125°C

Power Derating
- High Temperature: 3.4 %/K above 75°C

Cooling System: Natural convection (20 LFM)

Remote Control
- Current Controlled Remote
  - On: open circuit
  - Off: 2 to 4 mA current (internal 1 kΩ resistor)
  - Off Idle Input Current: 2.5 mA typ.


Switching Frequency: 100 kHz min. (PFM)

Insulation System: Functional Insulation

Isolation Test Voltage
- Input to Output, 60 s: 1'600 VDC
- Input to Output, 500 VDC: 1'000 MΩ min.
- Input to Output, 100 kHz, 1 V: 50 pF max.

Isolation Capacitance: 5'124'000 h (MIL-HDBK-217F, ground benign)

Reliability
- Calculated MTBF:
- MIL-STD-810F
- MIL-STD-810F
- MIL-STD-810F

Environment
- Vibration
- Mechanical Shock
- Thermal Shock

Housing Material: Non-conductive Plastic (UL 94 V-0 rated)

Potting Material: Silicone (UL 94 V-0 rated)

Pin Material: Copper

Pin Foundation Plating: Nickel (1 - 2 µm)

Pin Surface Plating: Tin (3 - 5 µm), matte

Soldering Profile: Wave Soldering
- 280°C / 10 s max.

Connection Type: THD (Through-Hole Device)

Weight: 4.5 g

Environmental Compliance
- Reach
- RoHS

Supporting Documents

Overview Link (for additional Documents): www.tracopower.com/overview/tec3

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

www.tracopower.com

April 27, 2020
Outline Dimensions

Dimensions in mm (inch)
Tolerances: ±0.5 (±0.02)  
Pin pitch tolerances ±0.25 (±0.01)  
Pin dimension tolerance ±0.1 (0.004)

Pinout

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single</th>
<th>Dual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>−Vin (GND)</td>
<td>−Vin (GND)</td>
</tr>
<tr>
<td>2</td>
<td>+Vin (Vcc)</td>
<td>+Vin (Vcc)</td>
</tr>
<tr>
<td>3</td>
<td>Remote On/Off</td>
<td>Remote On/Off</td>
</tr>
<tr>
<td>5</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>6</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>7</td>
<td>−Vout</td>
<td>Common</td>
</tr>
<tr>
<td>8</td>
<td>NC</td>
<td>−Vout</td>
</tr>
</tbody>
</table>

NC: Not connected