The TUP1000 is a Small Form Factor (SFF*) DC-DC converter using ultra capacitors versus batteries to provide seamless UPS backup capabilities. This high performance power supply can produce 35 watts @ +5VDC or 42 Watts @ +12VDC.

The PC/104 footprint design supports many low power embedded systems requiring short-term power during a power loss.

The TUP1000 has a fully programmable power output of +4.5VDC to +12.6VDC — its rugged design includes transient suppression and locking terminal mating plugs.

---

**Key Specifications**

- **Ultra Capacitor Backup**
  - Twelve ultra capacitors in series

- **Enhanced Protection**
  - 10000W transient suppression
  - Active input voltage clamping
  - Reverse polarity, short circuit

- **Wide Input Voltages**
  - Ranges from +4.5V to +33V DC

- **Standard Output**
  - Model 1000-5 +5V @ 7A max.
  - Model 1000-12 +12V @ 3.5A max.

- **High Performance**
  - Up to 96% efficiency

- **Extended Temperature**
  - -40°C to +85°C / -40°F to +185°F

---

**Advantages**

- **500,000 Charging Cycles**
  - Low maintenance & high reliability

- **Smart Charging**
  - Full charge in less than 10 seconds

- **Rugged Design**
  - Tested to meet MIL-STD-810G²

- **Input Voltage Protection**
  - Protects system components

- **Small Form Factor UPS**
  - Compatible with many industry standard form factors

---

**Our Capabilities**

- **Application Engineering**
- **Rapid Development**
- **Engineered Systems**
- **Custom Software**
- **Industry Standards & Certification**
- **Exceptional Customer Experience**

---

1 SFF* includes PC/104, PC/104-Plus, PC/104-Express™, EPIC, EBX, Mini-ITX, and SUMIT.

² For more information, see the Certificate of Compliance available at www.tri-m.com.
### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>TUP1000-5</th>
<th>TUP1000-12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Input</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Voltage Range</td>
<td>+4.5V to +33V DC</td>
<td></td>
</tr>
<tr>
<td><strong>Ultra Capacitors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backup Capacity 12x10F ultra capacitors in series</td>
<td>0.833 farads</td>
<td></td>
</tr>
<tr>
<td>Energy Capacity</td>
<td>260 joules</td>
<td></td>
</tr>
<tr>
<td>Self-discharge Rate (see note 1)</td>
<td>1.67mV/sec</td>
<td></td>
</tr>
<tr>
<td><strong>Output 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage Range</td>
<td>4.75 to 5.25V</td>
<td>11.4 to 12.6V</td>
</tr>
<tr>
<td>Current</td>
<td>7A</td>
<td>3.5A</td>
</tr>
<tr>
<td>Ripple Voltage</td>
<td>10 to 20mV</td>
<td>15 to 50mV</td>
</tr>
<tr>
<td>Load Regulation</td>
<td>100 to 120mV</td>
<td>80 to 100mV</td>
</tr>
<tr>
<td>Line Regulation</td>
<td>&lt;10mV</td>
<td></td>
</tr>
<tr>
<td>Output Temperature Drift</td>
<td>100mV</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>92%</td>
<td>95%</td>
</tr>
<tr>
<td><strong>Input/Output 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage Range</td>
<td>6.5 to 25V</td>
<td></td>
</tr>
<tr>
<td>Current (see note 2)</td>
<td>7A</td>
<td></td>
</tr>
<tr>
<td>Ripple Voltage</td>
<td>80 to 100mV</td>
<td></td>
</tr>
<tr>
<td>Load Regulation</td>
<td>&lt;350mV</td>
<td></td>
</tr>
<tr>
<td>Line Regulation</td>
<td>10 to 20mV</td>
<td></td>
</tr>
<tr>
<td>Output Temperature Drift</td>
<td>150mV</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>96%</td>
<td></td>
</tr>
</tbody>
</table>

**Note**
For detailed dimensions, connector and pin spacing information, please see the TUP1000 User Guide.

### Ordering Information

**Models** TUP1000-x[-Cy]-PBF

where “x” is the output voltage
- ex: TUP1000-5-PBF; 5V output, no conformal coating, RoHS
- ex: TUP1000-12-PBF; 12V output, no conformal coating, RoHS
- ex: TUP1000-ADJ-PBF; full adjustable output, no conformal coating, RoHS

where [-Cy] is the optional conformal coating selection
- “-CS” is silicon conformal coating
- “-CU” is urethane conformal coating
- “-CH” is HumiSeal conformal coating

ex: TUP1000-5-CU-PBF; 5V output, urethane conformal coating, RoHS

1) Based on an internal quiescent current of 1.4mA when the TUP1000 is in “deep power down” mode.
2) The onboard microcontroller will set the current limit of 3.5A or 7A, depending on the input supply capability and whether the output 2 converter is working in buck or boost switching mode.