TIM250-S Series
250W Medical & ITE Grade AC/DC Power Supplies

FEATURES

- Medical & ITE Dual Safety Approvals
- 2 x MOPP BF Rated Insulation
- Low Leakage Current
- 250W in 4.1” x 2.1” Footprint
- Various Form Factors & Output Connector Options
- Optional Fan Output
- Efficiency Up to 94.5%

INPUT SPECIFICATIONS

Input Voltage Range ................. 90 - 264 VAC
Input Frequency .................... 47 - 63 Hz
Input Current ........................ 2.8A rms @ 115 VAC,
1.4A rms @ 230 VAC
Inrush Current ....................... 50A max. @ 115 VAC, 100A max.
@ 230 VAC, at 25°C cold start
Earth Leakage Current ............. 300 μA max. @ 264 VAC
Touch Current ....................... 100 μA max. @ 264 VAC

OUTPUT SPECIFICATIONS

Output Power Ratings .............. See models list
Total Regulation ..................... See models list
Ripple and Noise .................... See models list
Over Load Protection .............. Set at 105 - 150% of its nominal
output voltage; Auto recovery
Over Temperature Protection ...... Shut down
Over Voltage Protection .......... Latch off
Short Circuit Protection .......... Shut down, Auto recovery
Temperature Coefficient .......... ±0.04%/°C max.
Transient Response ............... 20 ms @ 10% max.
Hold-up Time ....................... 10 ms min. @ 80%, full load

GENERAL SPECIFICATIONS

Power Factor ....................... 0.95 @ 115 VAC,
0.90 @ 230 VAC, full load
Efficiency .......................... 93% typ. @ 230 VAC, full load
Switching Frequency ............. 80 - 100 KHz @ full load
Operating Temperature .......... -20°C to +70°C
Derating ............................. See models list
Storage Temperature ............. -20°C to +85°C
Storage Humidity ................... 0% to 95% non-condensing
Operating Humidity ............... 10% to 95% non-condensing
Withstand Voltage ............... 5,656 VDC, input-output, 2 MOPP
2,121 VDC, input-ground, 1 MOPP
2,121 VDC, output-ground, 1 MOPP
Operating Altitude ............... 3,000 meters max. for medical,
5,000 meters max. for ITE
MTBF ................................ 350K hours minimum at full load,
25°C ambient, calculated per
Telcordia (Bellcore TR-332)

STANDARDS & COMPLIANCE

IEC/EN 60601-1-2, 4th Ed. ... EMC & Immunity Performance
EN 55011, EN 55032 .......... Class B, conducted & radiated
EN 55024 ......................... Class B, conducted & radiated
FCC, VCCI ......................... Class B, conducted & radiated
EN 61000-3-2 ..................... Harmonic distortion, Class A & D
EN 61000-3-3 ..................... Line fluctuations & flicker
EN 61000-4-2 ..................... ESD, ±15 KV air and ±8 KV contact
EN 61000-4-3 ..................... Radiated immunity, 10V/m
EN 61000-4-4 ..................... Fast transient/burst, ±2 KV
EN 61000-4-5 ..................... Surge, ±1 KV diff., ±2 KV com.
EN 61000-4-6 ..................... Conducted immunity, 6 Vrms
EN 61000-4-8 ..................... Magnetic field immunity, 30A/m
EN 61000-4-11 ................. Voltage dip immunity,
30% reduction for 500ms,
60% reduction for 100ms,
>95% reduction for 10ms
Safety Standards ............... UL/IEC/EN 60601-1 (Edition 3.1),
UL/IEC/EN 62368-1
Agency Approvals ............... UL, cUL, TUV, CE, CB
Other Compliance .............. RoHS3
# TIM250-S Series

## 250W Medical & ITE Grade AC/DC Power Supplies

### MODELS LIST

<table>
<thead>
<tr>
<th>Product No.</th>
<th>Output Voltage</th>
<th>Max. Output Power</th>
<th>Open Frame PCB</th>
<th>U-Bracket</th>
<th>Enclosed (U-Bracket with Cover)</th>
<th>Enclosed with Top Mounted Fan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>90-120 VAC, Convection</td>
<td>200-264 VAC, Convection</td>
<td>18 CFM Forced Air</td>
<td>90-120 VAC, Convection</td>
<td>200-264 VAC, Convection</td>
</tr>
<tr>
<td>TIM250-S12A</td>
<td>12V</td>
<td>12.5A</td>
<td>14.16A</td>
<td>20.83A</td>
<td>150W</td>
<td>170W</td>
</tr>
<tr>
<td>TIM250-S24A</td>
<td>24V</td>
<td>6.25A</td>
<td>7.08A</td>
<td>10.41A</td>
<td>160W</td>
<td>190W</td>
</tr>
<tr>
<td>TIM250-S48A</td>
<td>48V</td>
<td>3.12A</td>
<td>3.54A</td>
<td>5.2A</td>
<td>20.83A</td>
<td></td>
</tr>
</tbody>
</table>

### Notes:

1. Ripple and noise on +12V rail is 180mV max., 280mV for +24V and 380mV for +48V, measured at oscilloscope 20MHz bandwidth with a 100uF electrolytic capacitor and a 0.1uF ceramic capacitor in parallel at output wire 300mm length connector.
2. Output regulation: ±3% for +12V, ±2% for +24V and +48V. The worst case is ±5% @ -1 to -20°C ambient temperature.
3. For A/B/C type @ convection, the output power should derate linearly 2.2%/°C from +40°C to +70°C ambient temperature.
4. For A/B/C types @ 18 CFM forced air and T type with top mounted fan, the output power should derate linearly 2.2%/°C from +50°C to +70°C, and derate linearly 1%/°C from 0°C to -20°C ambient temperature.
5. For A/B/C types @ 18 CFM forced air and T type with top mounted fan, the output power should derate 1% per VAC from 100 to 90 VAC input.

For A/B/C types only, add suffix "F" to order +12V/0.25A fan output, e.g. TIM250-S12AF, TIM250-S12BF, TIM250-S12CF, etc.

*Output Connector Suffix: "E" for Euro style terminal block, "J" for JST connector, "M" for Molex connector, "S" for screw terminal; e.g. TIM250-S12AE, TIM250-S12BJ, TIM250-S12CM, TIM250-S12TS, etc. Refer to the mechanical drawings for detailed information.
TIM250-S Series
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MECHANICAL SPECIFICATIONS

Open Frame PCB

Notes:
1. Unit: mm
2. Tolerance: ±1 mm
3. Weight: 230 grams
4. Four mounting holes must be securely connected to protective earth ground in the final system for optimum safety and EMI performance.

U-Bracket

Notes:
1. Unit: mm
2. Tolerance: ±0.5 mm
3. Weight: 320 grams
U-Bracket with Cover

Notes:
1. Unit: mm
2. Tolerance: ±0.5 mm
3. Weight: 340 grams

Enclosed with Top Mounted Fan

Notes:
1. Unit: mm
2. Tolerance: ±0.5 mm
3. Weight: 350 grams
Mounting Points Notes and Mounting Method:
1. U-shaped chassis must be securely connected to protective earth ground in the final system assembly for optimum Safety and EMI performance.
2. Mounting point A: M3 x 0.5m thread, 5mm max. penetration depth.
3. Mounting point B: M3 x 0.5m thread, 2.5mm max. penetration depth.
4. Mounting point C: M3 x 0.5m thread, 3mm max. penetration depth.
5. Mounting point D: M3 x 0.5m optional DIN-Rail type holes.

Recommended Airflow

Notes:
1. Recommended airflow direction for open frame PCB and U-bracket types is from the top of the AC side.
2. Recommended airflow direction for U-bracket with cover/enclosed type is from the AC side.
TIM250-S Series

AC Input Connector (CN1)

<table>
<thead>
<tr>
<th>JST CONNECTOR</th>
<th>PIN</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>AC NEUTRAL</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>AC LINE</td>
</tr>
</tbody>
</table>

JST P/N B2P3-VH 3.96mm pitch or equivalent, mates with JST VAR-2 or equivalent.

Optional Connectors for Main Output (CN3)

JST Connector

<table>
<thead>
<tr>
<th>JST CONNECTOR</th>
<th>PIN</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>GND</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>GND</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>+V</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>+V</td>
</tr>
</tbody>
</table>

JST P/N B4P-V/H-B 3.96mm pitch or equivalent, mates with JST VHR-4N or equivalent.

Molex Mini-Fit Connector

<table>
<thead>
<tr>
<th>MOLEX 8 PIN MINI-FIT CONNECTOR</th>
<th>PIN</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1, 2</td>
<td>+V</td>
</tr>
<tr>
<td></td>
<td>3, 4</td>
<td>GND</td>
</tr>
<tr>
<td></td>
<td>5, 6</td>
<td>+V</td>
</tr>
<tr>
<td></td>
<td>7, 8</td>
<td>GND</td>
</tr>
</tbody>
</table>

Molex P/N 39281083 Mini-Fit 4.2mm pitch or equivalent, mates with Molex P/N 39012085 or equivalent.

Screw Terminal

<table>
<thead>
<tr>
<th>SCREW TERMINAL</th>
<th>PIN</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>+V</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>GND</td>
</tr>
</tbody>
</table>

Quick PCB terminal blocks 11mm pitch mates with metric ring terminal or equivalent.

Euro Style Terminal Block

<table>
<thead>
<tr>
<th>EURO STYLE TERMINAL BLOCK</th>
<th>PIN</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>+V</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>+V</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>GND</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>GND</td>
</tr>
</tbody>
</table>

Euro style terminal block 3.81mm pitch mates with wire rating 0.5–1.3mm² (20–16 AWG) and 5-6mm wire strip or wire pin terminal.

Optional Fan Output Connector (CN4)

<table>
<thead>
<tr>
<th>JST CONNECTOR</th>
<th>PIN</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>+12V (FAN+)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>GND (FAN-)</td>
</tr>
</tbody>
</table>

JST P/N B2B-XH-A 2.5mm pitch or equivalent, mates with JST XHP-2 or equivalent.