# 5W Single Output Medical Grade Switching Power Supply

### FEATURES:
- Universal AC input / Full range
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Ultra-miniature size, light weight
- Cooling by free air convection
- Isolation class II
- Medical safety approved (2 x MOPP between primary to secondary)
- No load power consumption < 0.5W
- 100% full load burn-in test
- Fixed switching frequency at 67KHz
- High reliability
- Suitable for BF application with appropriate system consideration
- 3 years warranty

## SPECIFICATION

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DC VOLTAGE</th>
<th>RATED CURRENT</th>
<th>CURRENT RANGE</th>
<th>RATED POWER</th>
<th>RIPPLE &amp; NOISE (max.)</th>
<th>VOLTAGE ADJ. RANGE</th>
<th>VOLTAGE TOLERANCE</th>
<th>LINE REGULATION</th>
<th>LOAD REGULATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFM-05-3.3</td>
<td>3.3V</td>
<td>1.25A</td>
<td>0 ~ 1.25A</td>
<td>5W</td>
<td>3 ~ 6.3V</td>
<td>±2.0%</td>
<td>±1.0%</td>
<td>±1.0%</td>
<td></td>
</tr>
<tr>
<td>NFM-05-5</td>
<td>5V</td>
<td>1A</td>
<td>0 ~ 1.0A</td>
<td>5W</td>
<td>4.5 ~ 5.5V</td>
<td>±2.0%</td>
<td>±1.0%</td>
<td>±1.0%</td>
<td></td>
</tr>
<tr>
<td>NFM-05-12</td>
<td>12V</td>
<td>0.42A</td>
<td>0 ~ 0.42A</td>
<td>5.04W</td>
<td>10.8 ~ 13.2V</td>
<td>±1.0%</td>
<td>±0.5%</td>
<td>±0.5%</td>
<td></td>
</tr>
<tr>
<td>NFM-05-15</td>
<td>15V</td>
<td>0.33A</td>
<td>0 ~ 0.33A</td>
<td>4.95W</td>
<td>13.5 ~ 16.5V</td>
<td>±1.0%</td>
<td>±0.5%</td>
<td>±0.5%</td>
<td></td>
</tr>
<tr>
<td>NFM-05-24</td>
<td>24V</td>
<td>0.23A</td>
<td>0 ~ 0.23A</td>
<td>5.52W</td>
<td>21.6 ~ 26.4V</td>
<td>±1.0%</td>
<td>±0.5%</td>
<td>±0.5%</td>
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</tr>
</tbody>
</table>

### INPUT

- **VOLTAGE RANGE**: 85 ~ 264VAC
- **FREQUENCY RANGE**: 47 ~ 440Hz
- **EFFICIENCY (Typ.)**: 87%
- **AC CURRENT (Typ.)**: 0.12A/115VAC / 0.08A/230VAC
- **INRUSH CURRENT (Typ.)**: Cold start 25A/115VAC / 45A/230VAC

### PROTECTION

- **OVERLOAD**: Above 105% rated output power
- **OVER VOLTAGE**: 3.8 ~ 4.95V / 5.75 ~ 6.75V / 13.8 ~ 16.2V / 17.25 ~ 20.25V / 27.6 ~ 32.4V

### ENVIRONMENT

- **WORKING TEMP.**: -20 ~ +70°C (Refer to "Derating Curve")
- **WORKING HUMIDITY**: 20 ~ 90% RH non-condensing
- **STORAGE TEMP. / HUMIDITY**: -40 ~ +85°C, 10 ~ 95% RH
- **TEMP. COEFFICIENT**: ±0.03%/°C (0 ~ 50°C)
- **VIBRATION**: 10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes

### SAFETY & EMC (Note 4)

- **SAFETY STANDARDS**: ANSI/UL60601-1, TÜV EN60601-1, IEC60601-1, EAC TP TC 004 approved

### OTHERS

- **MTBF**: 738.7Khrs min. / MIL-HDBK-217F (25°C)
- **DIMENSION**: 58x49x19.1mm (L*W*H)
- **PACKING**: 0.03Kg / 120pcs/4.6Kg/0.97CUFT

### NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance: includes set up tolerance, line regulation and load regulation.
4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it meets EMC directives.
5. The over temperature protection (OTP) is the built-in function of the control IC (U1). The activating level described above is based on the specification provided by the IC manufacturer.
6. Touch current was measured from primary input to DC output.
7. The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m (6500ft).
**Mechanical Specification**

Unit: inch (mm)

<table>
<thead>
<tr>
<th>Component</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC INPUT</td>
<td>1.17&quot; (46mm)</td>
</tr>
<tr>
<td>AC/N</td>
<td>0.689&quot; (17.5mm)</td>
</tr>
<tr>
<td>T2A250V</td>
<td>2.28&quot; (57.9mm)</td>
</tr>
<tr>
<td>+V</td>
<td>0.75&quot; (19.1mm)</td>
</tr>
<tr>
<td>-V</td>
<td>0.491&quot; (12.47mm)</td>
</tr>
<tr>
<td>0.041&quot; (1.05mm)</td>
<td></td>
</tr>
<tr>
<td>0.138&quot; (3.5mm)</td>
<td></td>
</tr>
<tr>
<td>0.196&quot; (5mm)</td>
<td></td>
</tr>
<tr>
<td>0.491&quot; (12.47mm)</td>
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</tr>
</tbody>
</table>

**Block Diagram**

- **EMI FILTER**
- **RECTIFIERS & FILTER**
- **POWER SWITCHING**
- **PWM CONTROL**
- **RECTIFIERS & FILTER**
- **DETECTION CIRCUIT**

**Derating Curve**

- AMBIENT TEMPERATURE (℃)
- LOAD (%)

**Output Derating VS Input Voltage**

- INPUT VOLTAGE (VAC) 60Hz
- LOAD (%)