



(MPM-90)



(MPM-90-xxST)



ANSI/AAMI ES60601-1 BS EN/EN60601-1 IEC60601-1 TPTC004

**Features**

- 3.43"x2.05" compact size
- PCB, chassis or screw terminal mounting version
- Medical safety approved (2 x MOPP) according to ANSI/AAMI ES60601-1 and IEC/BS EN/EN60601-1
- Suitable for BF application with appropriate system consideration
- No load power consumption < 0.1W
- Extremely low leakage current
- Wide operating temp. range -30 ~ +80°C
- EMI Class B without additional components
- Isolation Class II
- Protections: Short circuit / Overload / Over voltage
- No minimum load required
- Operating altitude up to 4000 meters( Note.7)
- 100W peak(10 sec.)
- 3 years warranty

**Applications**

- Portable medical device
- Mobile clinical workstation
- Medical computer monitor
- Medical examination instrument

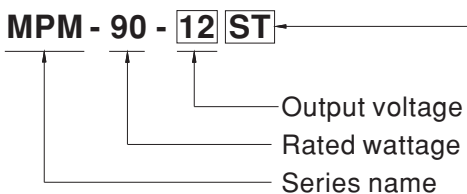
**GTIN CODE**

MW Search: <https://www.meanwell.com/serviceGTIN.aspx>

**Description**

MPM-90 is a 90W high density and small size (87x52x29.5mm) AC/DC PCB-mount module type medical grade power supply . It features the operation for 80~264VAC, a low no load power consumption less than 0.1W, a high efficiency up to 93%, Class II (no FG) double insulation, outstanding dissipation, 2~5G anti-vibration by model, high EMC performance, 4KVAC isolation, etc. The design observes IEC/BS EN/EN60601-1 and ANSI/AAMI ES60601-1 version three with 2 x MOPP level and ultra-low leakage current (<100µA). It is very suitable for BF (patient contact) type medical device or relevant equipment.

**Model Encoding**



- { Blank : PCB mounting style
- { ST : Screw terminal style

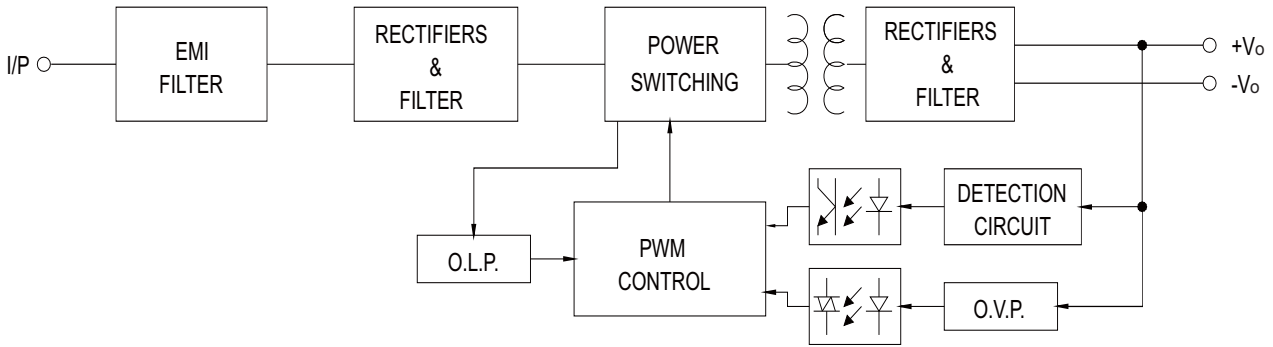


**SPECIFICATION**

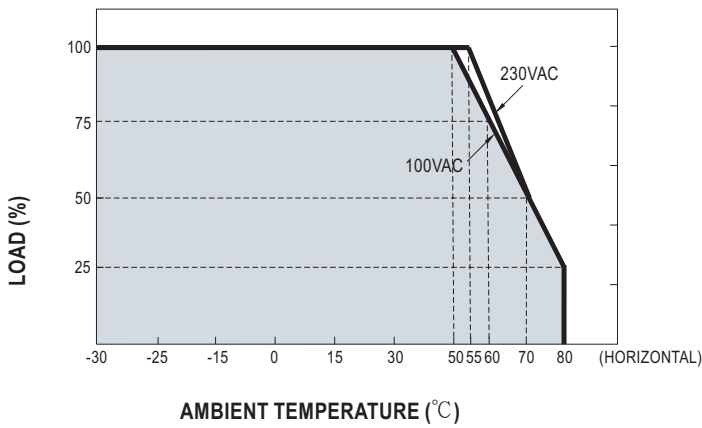
| MODEL                     |   | MPM-90-12 <input type="checkbox"/>  | MPM-90-15 <input type="checkbox"/>  | MPM-90-24 <input type="checkbox"/>                 | MPM-90-48 <input type="checkbox"/>                                   |       |
|---------------------------|---|---|---|--|--|-------|
| OUTPUT                    | DC VOLTAGE  | 12V   | 15V   | 24V  | 48V  |       |
|                           | CURRENT   | Peak(10 sec.)   | 7.37A   | 6.23A  | 4.13A  | 2.07A |
|                           |   | Convection  | 6.7A  | 5.67A  | 3.75A  | 1.88A |
|                           | RATED POWER   | Peak(10 sec.) <sup>Note.2</sup>   | 88.4W   | 93.5W  | 99W  | 99.2W |
|                           |   | Convection  | 80.4W   | 85.05W   | 90W  | 90.2W |
|                           | RIPPLE & NOISE (max.) <sup>Note.3</sup>   | 120mVp-p  | 150mVp-p  | 200mVp-p   | 240mVp-p   |       |
|                           | VOLTAGE TOLERANCE <sup>Note.4</sup>   | ±2.0%   | ±2.0%   | ±2.0%  | ±2.0%  |       |
|                           | LINE REGULATION   | ±0.5%   | ±0.5%   | ±0.5%  | ±0.5%  |       |
|                           | LOAD REGULATION   | ±1.0%   | ±0.5%   | ±0.5%  | ±0.5%  |       |
|                           | SETUP, RISE TIME  | 1000ms, 30ms/230VAC   |   | 1000ms, 30ms/115VAC at full load                   |  |       |
| HOLD UP TIME (Typ.)       | 30ms/230VAC   |   | 10ms/115VAC at full load  |  |  |       |
| INPUT                     | VOLTAGE RANGE <sup>Note.5</sup>   | 80 ~ 264VAC 113 ~ 370VDC  |   |  |  |       |
|                           | FREQUENCY RANGE   | 47 ~ 63Hz   |   |  |  |       |
|                           | EFFICIENCY (Typ.)   | 92%   | 92.5%   | 93%  | 93%  |       |
|                           | AC CURRENT (Typ.)   | 1.9A/115VAC 1.1A/230VAC   |   |  |  |       |
|                           | INRUSH CURRENT (Typ.)   | COLD START 30A/115VAC 65A/230VAC  |   |  |  |       |
|                           | LEAKAGE CURRENT (max.) <sup>Note.6</sup>  | Touch current <100µA/264VAC   |   |  |  |       |
| PROTECTION                | OVERLOAD  | 115% ~ 160% rated output power<br>Protection type : Hiccup mode, recovers automatically after fault condition is removed  |   |  |  |       |
|                           | OVER VOLTAGE  | 12.6 ~ 16.2V  | 15.8 ~ 20.3V  | 25.2 ~ 32.4V                                       | 50.4 ~ 64.8V   |       |
|                           | OVER TEMPERATURE  | Protection type : Shut down o/p voltage, re-power on to recover   |   |  |  |       |
| ENVIRONMENT               | WORKING TEMP.   | -30 ~ +80°C (Refer to "Derating Curve")   |   |  |  |       |
|                           | WORKING HUMIDITY  | 20 ~ 90% RH non-condensing  |   |  |  |       |
|                           | STORAGE TEMP.   | -40 ~ +85°C   |   |  |  |       |
|                           | TEMP. COEFFICIENT   | ±0.03%/°C (0 ~ 50°C)  |   |  |  |       |
|                           | SOLDERING TEMPERATURE   | Wave soldering: 265°C, 5s (max.); Manual soldering: 390°C, 3s (max.)  |   |  |  |       |
|                           | VIBRATION   | Blank: 10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes<br>ST: 10 ~ 500Hz, 5G 10min./1cycle, period for 60min. each along X, Y, Z axes                                     |   |  |  |       |
|                           | OPERATING ALTITUDE <sup>Note.7</sup>  | 4000 meters / OVC II  |   |  |  |       |
| SAFETY & EMC (Note 8)     | SAFETY STANDARDS  | IEC 60601-1:2005+A1, TUV BS EN/ EN 60601-1:2006+A1+A12+A2, ANSI/AAMI ES60601-1:2005+A2<br>CAN/CSA C22.2 No. 60601-1:2014+A2, EAC TP TC 004 approved; Design refer to BS EN/EN60335-1 (by request) |   |  |  |       |
|                           | ISOLATION LEVEL   | Primary-Secondary: 2xMOPP   |   |  |  |       |
|                           | WITHSTAND VOLTAGE   | I/P-O/P: 4KVAC  |   |  |  |       |
|                           | ISOLATION RESISTANCE  | I/P-O/P: 100M Ohms / 500VDC / 25°C / 70% RH   |   |  |  |       |
|                           | EMC EMISSION  | Parameter   | Standard  |  | Test Level / Note  |       |
|                           |   | Conducted   | BS EN/EN55011 (CISPR11)   |  | Class B  |       |
|                           |   | Radiated  | BS EN/EN55011 (CISPR11)   |  | Class B  |       |
|                           |   | Harmonic Current  | BS EN/EN61000-3-2   |  | Class A  |       |
|                           |   | Voltage Flicker   | BS EN/EN61000-3-3   |  | -----  |       |
|                           | EMC IMMUNITY  | BS EN/EN55035, BS EN/EN60601-1-2  |   |  |  |       |
|                           |   | Parameter   | Standard  |  | Test Level / Note  |       |
|                           |   | ESD   | BS EN/EN61000-4-2   |  | Level 4, 15KV air ; Level 4, 8KV contact                             |       |
|                           |   | RF field susceptibility   | BS EN/EN61000-4-3   |  | Level 3, 10V/m( 80MHz~2.7GHz )<br>Table 9, 9~28V/m( 385MHz~5.78GHz ) |       |
|                           |   | EFT bursts  | BS EN/EN61000-4-4   |  | Level 3, 2KV   |       |
|                           |   | Surge susceptibility  | BS EN/EN61000-4-5   |  | Level 3, 1KV/Line-Line   |       |
| Conducted susceptibility  |   | BS EN/EN61000-4-6   |   | Level 3, 10V                                       |  |       |
| Magnetic field immunity   |   | BS EN/EN61000-4-8   |   | Level 4, 30A/m                                     |  |       |
| Voltage dip, interruption | BS EN/EN61000-4-11  |   | >95% dip 0.5 periods, 30% dip 25 periods,<br>>95% interruptions 250 periods |  |  |       |
| OTHERS                    | MTBF  | 4548.9K hrs min. Telcordia SR-332 (Bellcore) ; 570.5K hrs min. MIL-HDBK-217F (25°C)   |   |  |  |       |
|                           | DIMENSION   | PCB mounting style : 87*52*29.5mm (L*W*H)   |   | Screw terminal style : 109*52*33.5mm (L*W*H)       |  |       |
|                           | PACKING   | PCB mounting style : 0.197Kg;60pcs/12.8Kg/0.94CUFT  |   | Screw terminal style : 0.219Kg;50pcs/12Kg/0.56CUFT |  |       |
| NOTE                      | <p>1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.</p> <p>2. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power.</p> <p>3. Ripple &amp; noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 µ F &amp; 47 µ F parallel capacitor.</p> <p>4. Tolerance : includes set up tolerance, line regulation and load regulation.</p> <p>5. Derating may be needed under low input voltages. Please check the derating curve for more details.</p> <p>6. Touch current was measured from primary input to DC output.</p> <p>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).</p> <p>8. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies."<br/>(as available on <a href="https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf">https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf</a>)</p> <p>※ Product Liability Disclaimer : For detailed information, please refer to <a href="https://www.meanwell.com/serviceDisclaimer.aspx">https://www.meanwell.com/serviceDisclaimer.aspx</a></p> |   |   |  |  |       |

**Block Diagram**

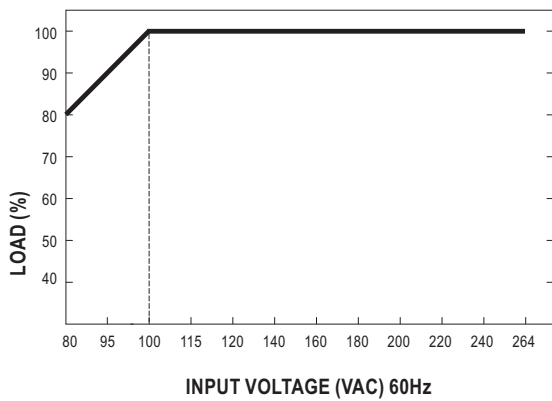
fosc : 70KHz



**Derating Curve**



**Output Derating VS Input Voltage**

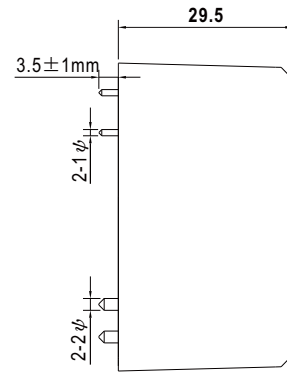
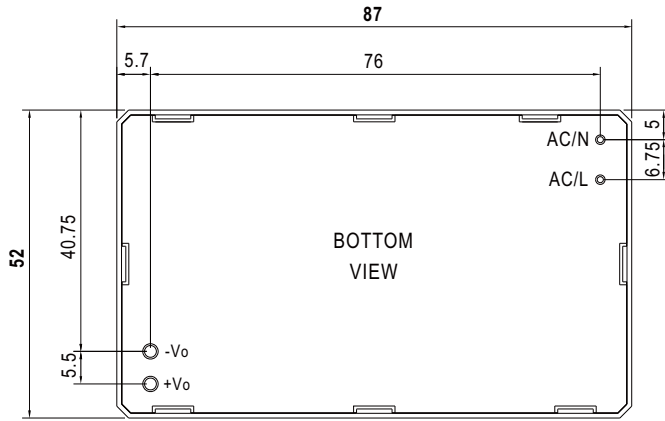


**Mechanical Specification**

(Unit: mm , tolerance  $\pm 1$ mm)

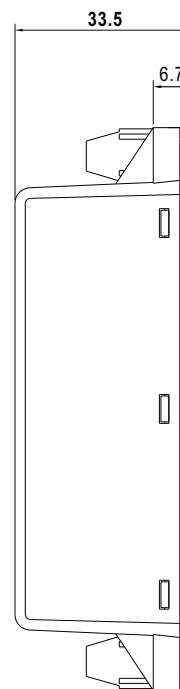
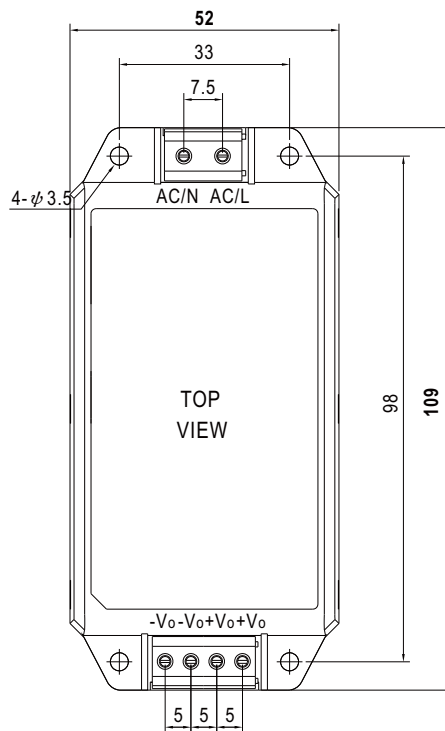
Case No.IRM60

• PCB mounting style (MPM - 90)



AC/L, AC/N P/N diameter: 1  $\phi$   
+Vo, -Vo P/N diameter: 2  $\phi$

• Screw terminal style (MPM-90-xxST)



**Installation Manual**

Please refer to : <http://www.meanwell.com/manual.html>