



(MPM-90)



(MPM-90-xxST)



### ■ 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/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

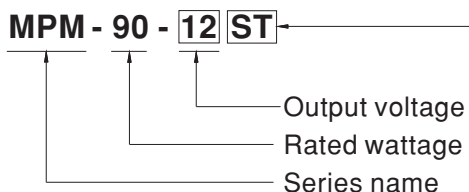
### ■ Applications

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

### ■ 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/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



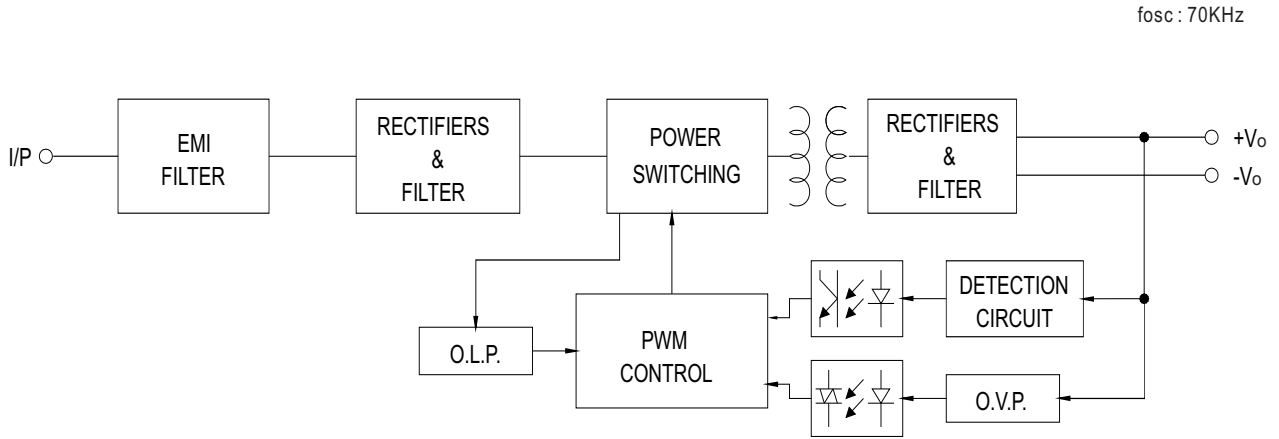
- { Blank : PCB mounting style
- { ST : Screw terminal style



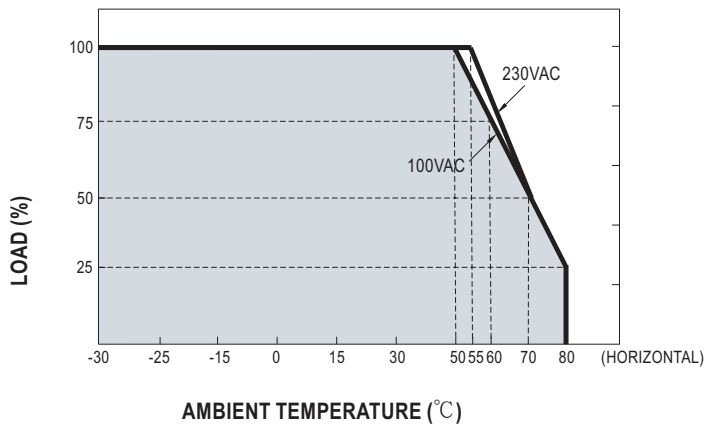
**SPECIFICATION**

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.) <small>Note.2</small>	88.4W	93.5W	99W	99.2W
		Convection	80.4W	85.05W	90W	90.2W
	RIPPLE & NOISE (max.) <small>Note.3</small>	120mVp-p	150mVp-p	200mVp-p	240mVp-p	
	VOLTAGE TOLERANCE <small>Note.4</small>	±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 <small>Note.5</small>	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.) <small>Note.6</small>	Touch current <100 $\mu$ A/264VAC				
PROTECTION	OVERLOAD	115% ~ 160% rated output power 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	
		Protection type : Shut down o/p voltage, re-power on to recover				
	OVER TEMPERATURE	Protection type : Shut down o/p voltage, re-power on to recover				
ENVIRONMENT	WORKING TEMP.	-30 ~ +80 $^{\circ}$ C (Refer to "Derating Curve")				
	WORKING HUMIDITY	20 ~ 90% RH non-condensing				
	STORAGE TEMP.	-40 ~ +85 $^{\circ}$ C				
	TEMP. COEFFICIENT	±0.03%/ $^{\circ}$ C (0 ~ 50 $^{\circ}$ C)				
	SOLDERING TEMPERATURE	260 $^{\circ}$ C ±5 $^{\circ}$ C/10sec.max.				
	VIBRATION	Blank:10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes ST:10 ~ 500Hz, 5G 10min./1cycle, period for 60min. each along X, Y, Z axes				
	OPERATING ALTITUDE <small>Note.7</small>	4000 meters / OVC II				
SAFETY & EMC (Note 8)	SAFETY STANDARDS	IEC60601-1, EN60601-1, EAC TP TC 004, UL ANSI/AAMI ES60601-1(3.1 version), CAN/CSA-C22 3 <sup>rd</sup> Edition approved; Design refer to 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 $^{\circ}$ C / 70% RH				
	EMC EMISSION	Parameter	Standard		Test Level / Note	
		Conducted	EN55011 (CISPR11)		Class B	
		Radiated	EN55011 (CISPR11)		Class B	
		Harmonic Current	EN61000-3-2		Class A	
		Voltage Flicker	EN61000-3-3		-----	
	EMC IMMUNITY	EN60601-1-2				
Parameter		Standard		Test Level / Note		
ESD		EN61000-4-2		Level 4, 15KV air ; Level 4, 8KV contact		
RF field susceptibility		EN61000-4-3		Level 3, 10V/m( 80MHz~2.7GHz ) Table 9, 9~28V/m( 385MHz~5.78GHz )		
EFT bursts		EN61000-4-4		Level 3, 2KV		
Surge susceptibility		EN61000-4-5		Level 3, 1KV/Line-Line		
Conducted susceptibility		EN61000-4-6		Level 3, 10V		
Magnetic field immunity		EN61000-4-8		Level 4, 30A/m		
Voltage dip, interruption	EN61000-4-11		>95% dip 0.5 periods, 30% dip 25 periods, >95% interruptions 250 periods			
OTHERS	MTBF	570.5Khrs min. MIL-HDBK-217F (25 $^{\circ}$ C);		1514.81Khrs min. Telcordia TR/SR-332 (Bellcore) (25 $^{\circ}$ 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/0.97CUFT		Screw terminal style :0.219Kg;50pcs/12Kg/0.55CUFT		
NOTE	<ol style="list-style-type: none"> <li>All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25<math>^{\circ}</math>C of ambient temperature.</li> <li>33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power.</li> <li>Ripple &amp; noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 <math>\mu</math>f &amp; 47 <math>\mu</math>f parallel capacitor.</li> <li>Tolerance : includes set up tolerance, line regulation and load regulation.</li> <li>Derating may be needed under low input voltages. Please check the derating curve for more details.</li> <li>Touch current was measured from primary input to DC output.</li> <li>The ambient temperature derating of 3.5<math>^{\circ}</math>C/1000m with fanless models and of 5<math>^{\circ}</math>C/1000m with fan models for operating altitude higher than 2000m(6500ft).</li> <li>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." (as available on <a href="http://www.meanwell.com">http://www.meanwell.com</a>)</li> </ol>					

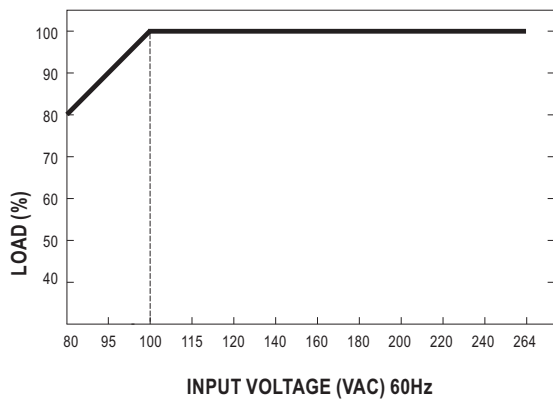
**Block Diagram**



**Derating Curve**



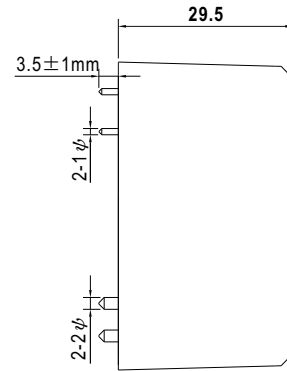
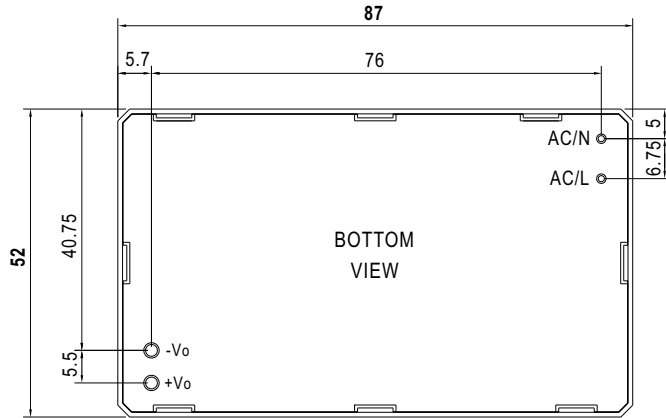
**Output Derating VS Input Voltage**



■ **Mechanical Specification**

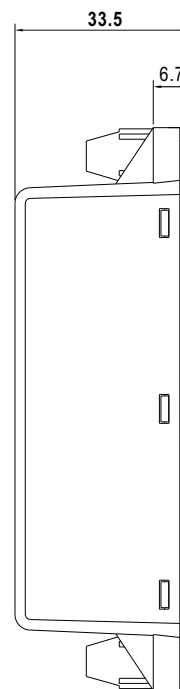
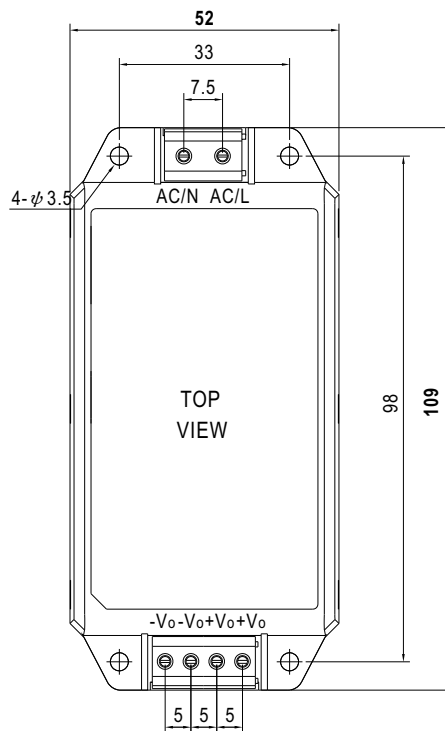
Case No. IRM60 Unit:mm

• PCB mounting style (MPM - 90)



AC/L, AC/N P/N diameter: 1 φ  
+Vo, -Vo P/N diameter: 2 φ

• Screw terminal style (MPM-90-xxST)



■ **Installation Manual**

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