



(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

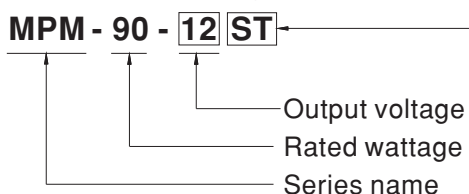
### ■ Applications

- 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



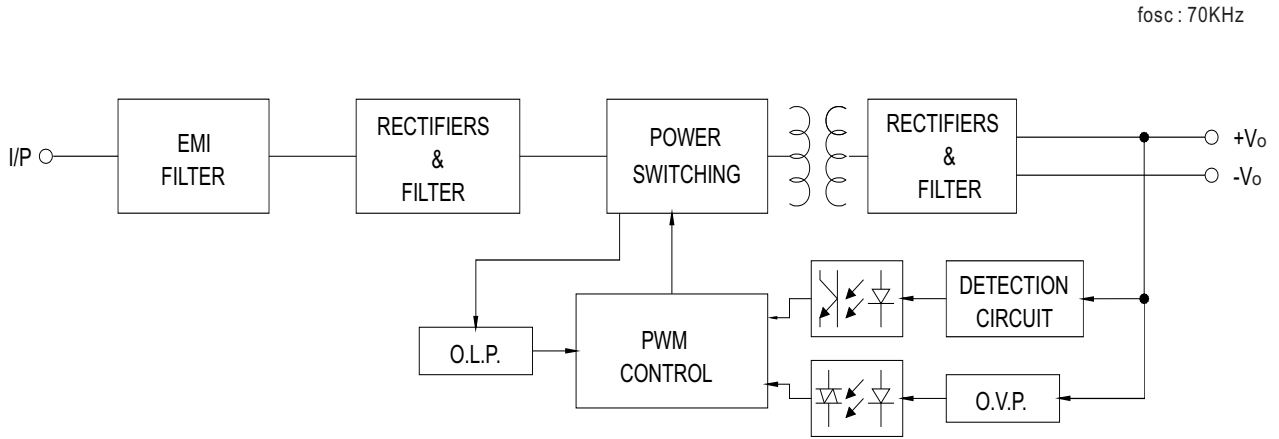
- { Blank : PCB mounting style
- { ST : Screw terminal style



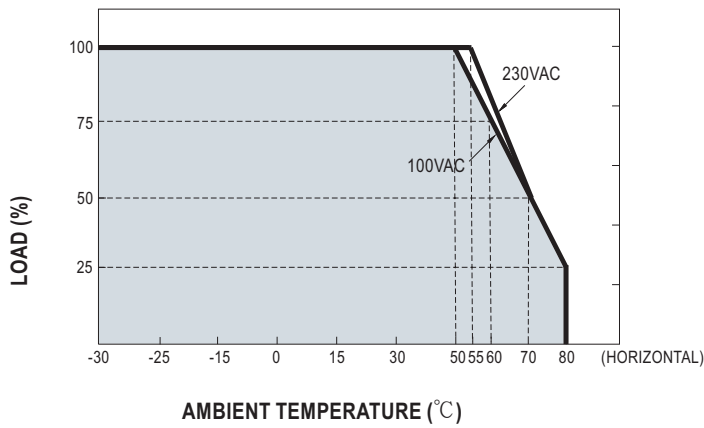
**SPECIFICATION**

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/0.94CUFT		Screw terminal style :0.219Kg;50pcs/12Kg/0.56CUFT		
NOTE	1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25 $^{\circ}$ C of ambient temperature.					
	2. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power.					
	3. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 $\mu$ f & 47 $\mu$ f parallel capacitor.					
	4. Tolerance : includes set up tolerance, line regulation and load regulation.					
	5. Derating may be needed under low input voltages. Please check the derating curve for more details.					
	6. Touch current was measured from primary input to DC output.					
	7. The ambient temperature derating of 3.5 $^{\circ}$ C/1000m with fanless models and of 5 $^{\circ}$ C/1000m with fan models for operating altitude higher than 2000m(6500ft).					
	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." (as available on <a href="http://www.meanwell.com">http://www.meanwell.com</a> )					
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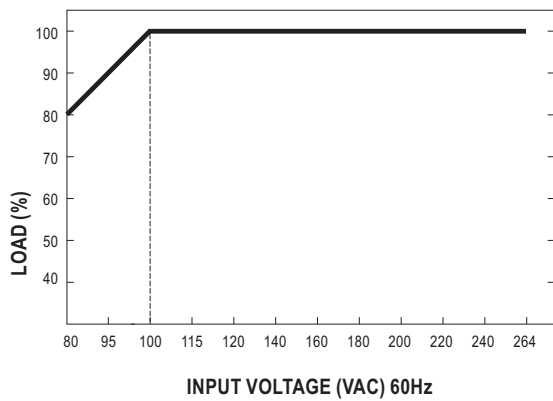
**Block Diagram**



**Derating Curve**



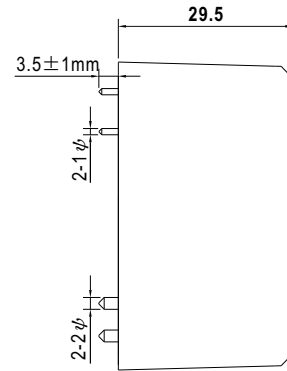
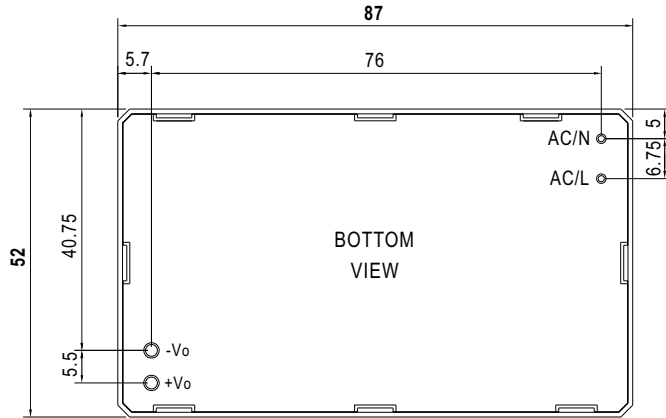
**Output Derating VS Input Voltage**



■ Mechanical Specification

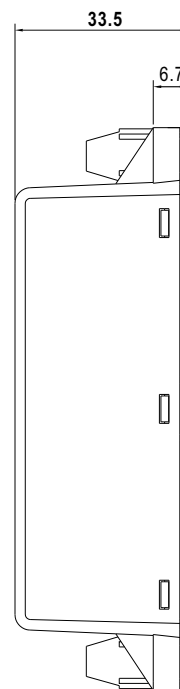
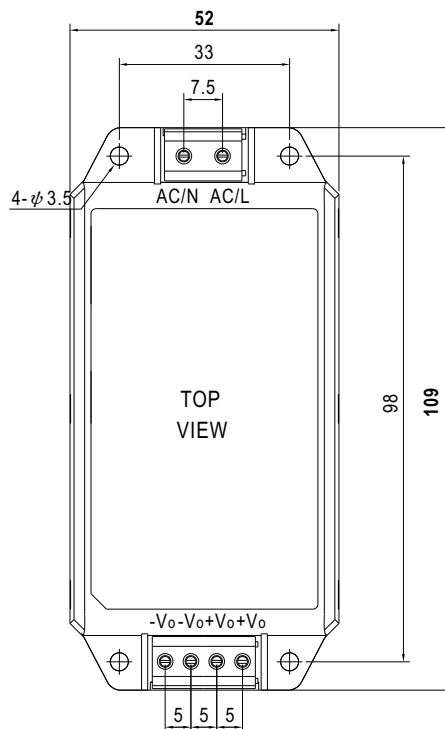
Case No. IRM60 Unit:mm

• 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>