45W AC-DC High Reliable PCB-Mount Green Medical Power Module MPM-45 series

User's Manual



(MPM-45)



(MPM-45-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℃
- 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)
- 50W 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-45 is a 45W high density and small size (87x52x29.5mm) AC/DC PCB-mount 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 92.5%, 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 ES60601-1version 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

MPM - 45 - 5 ST

- ST: Blank : PCB mounting style; ST : Screw terminal style
- 5: Output voltage
- 45: Rated wattage
- MPM: Series name

SPECIFICATION

MODEL			MPM-45-5 ☐	MPM-45-12 ☐	MPM-45-15 ☐	MPM-45-24 ☐	MPM-45-48 ☐
OUTPUT	DC VOLTAGE		5V	12V	15V	24V	48V
	CURRENT	Peak(10 sec.)	8.8A	4.13A	3.3A	2.1A	1.05A
		Convection	8A	3.75A	3A	1.88A	0.94A
	RATED POWER	Peak(10 sec.)Note.2	44W	49.5W	49.5W	50.4W	50.4W
		Convection	40W	45W	45W	45.1W	45.1W
	RIPPLE & NOISE (max.) Note.3		80mVp-p	120mVp-p	120mVp-p	200mVp-p	240mVp-p
	VOLTAGE TOLERANCE Note.4		±2.0%	±2.0%	±2.0%	±2.0%	±2.0%
	LINE REGULATION		±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION		±1.0%	±1.0%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME		1000ms, 30ms/230VAC 1000ms, 30ms/115VAC at full load				
	HOLD UP TIME (Typ.)		50ms/230VAC 12ms/115VAC at full load				
INPUT	VOLTAGE RANGE Note.5		80 ~ 264VAC 113 ~ 370VDC				
	FREQUENCY RANGE		47 ~ 63Hz				
	EFFICIENCY (Typ.)		88%	91.5%	92.5%	92.5%	92%
	AC CURRENT (Typ.)		1.2A/115VAC 0.6A/230VAC				
	INRUSH CURRENT (Typ.)		COLD START 30A/115VAC 60A/230VAC				
	LEAKAGE CURRENT (max.) Note.6		Touch current <100μA/264VAC				
PROTECTION	OVERLOAD		115% ~ 135% rated output power				
			Protection type : Hiccup mode, recovers automatically after fault condition is removed				
	OVER VOLTAGE		5.3 ~ 7.2V	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℃ (Refer to "Derating Curve")				
	WORKING HUMIDITY		20 ~ 90% RH non-condensing				
	STORAGE TEMP.		-40 ~ +85℃				
	TEMP. COEFFICIENT		±0.03%/℃ (0 ~ 60℃)				
	SOLDERING TEMPERATURE		Wave soldering: 265℃,5s (max.); Manual soldering: 390℃,3s (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 Note.7		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 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℃/ 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) 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, >95% interruptions 250 periods		
OTHERS	MTBF		4590.4K hrs min. Telcordia SR-332 (Bellcore) ; 563.4K hrs min. MIL-HDBK-217F (25℃)				
	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 : 0.185Kg;60pcs/12.1Kg/0.94CUFT Screw terminal style :0.206Kg;50pcs/11.3Kg/0.56CUFT				

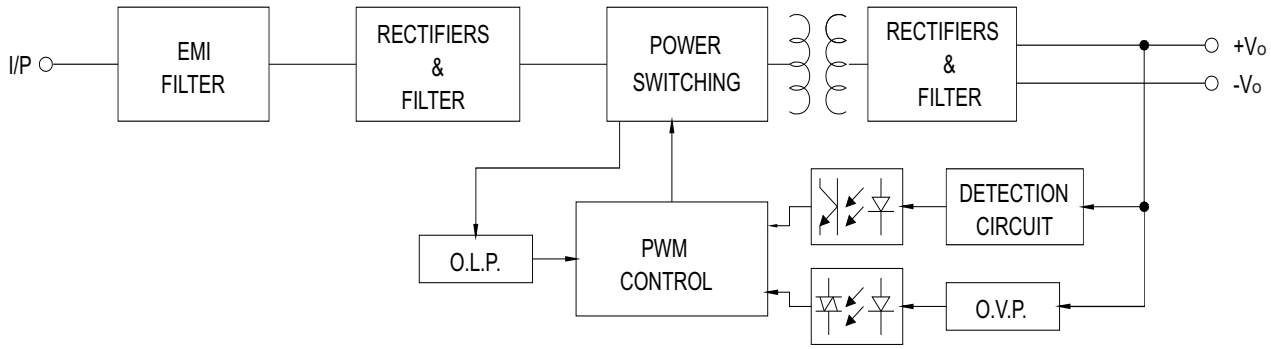
NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ 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 μF & 47 μF 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℃/1000m with fanless models and of 5℃/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 https://www.meanwell.com//Upload/PDF/EMI_statement_en.pdf)

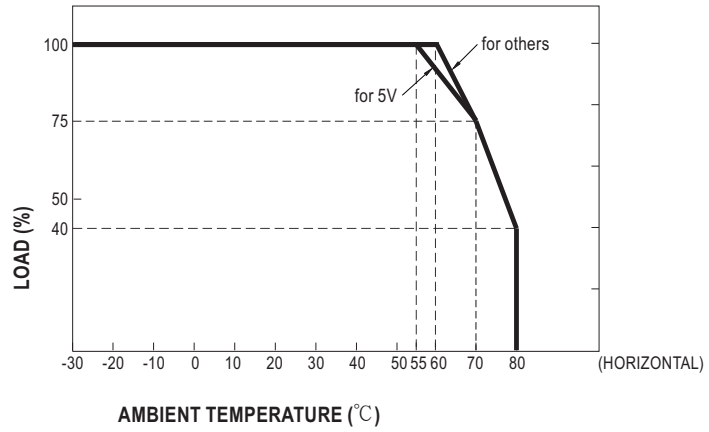
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■ Block Diagram

fosc : 70KHz

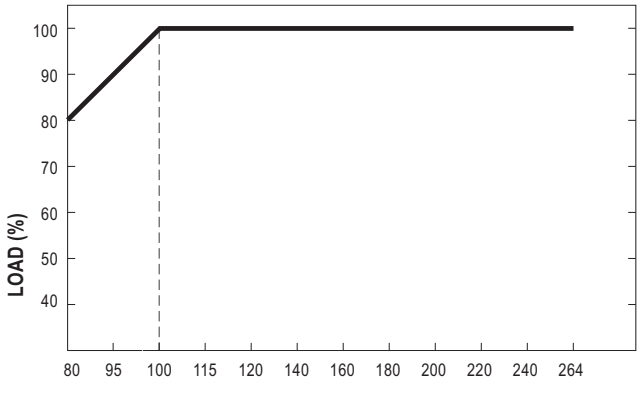


■ Derating Curve



AMBIENT TEMPERATURE (℃)

■ Output Derating VS Input Voltage



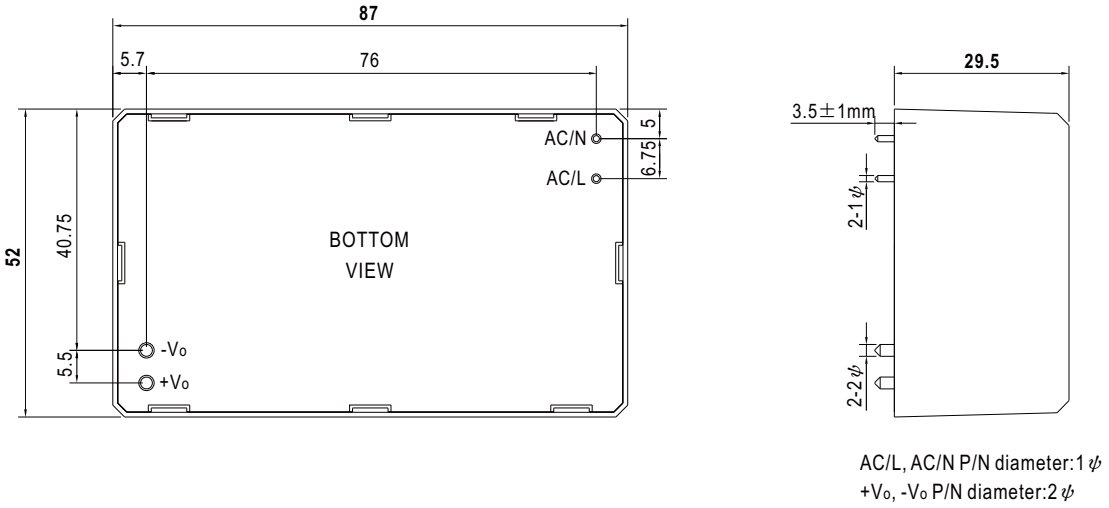
INPUT VOLTAGE (VAC) 60Hz

■ Mechanical Specification

(Unit: mm , tolerance ± 1mm)

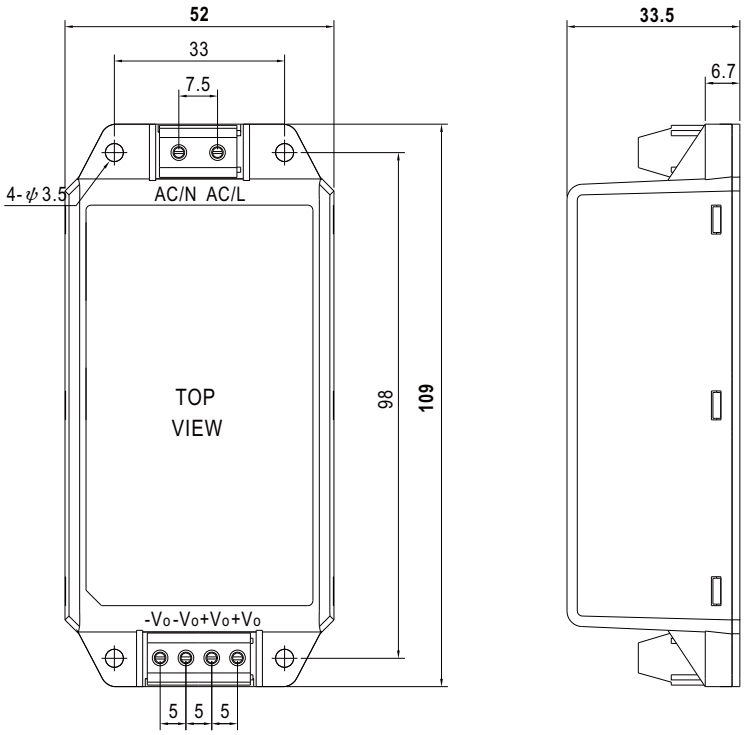
Case No.IRM60

- **PCB mounting style (MPM-45)**



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

- **Screw terminal style (MPM-45-xxST)**



■ Installation Manual

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