5W High Reliable Green Medical Encapsulated Type MPM-05 series

User's Manual

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

Features

- 1.8"x1" compact size
- 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<0.075W
- Extremely low leakage current
- Wide operating temp. range -40 ~ +85℃
- EMI class B for class Ⅱ configuration
- Protections: Short circuit / Overload / Over voltage / Over temperature
- No minimum load required
- Typical lifetime > 48K hours
- 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-05 is a 5W high density and small size (45.7*25.4*21.5mm) AC/DC module type medical grade power supply series offered in pin type. It features the operation for 80~264VAC, a low no load power consumption less than 0.075W, a high efficiency up to 82%, Class Ⅱ (no FG) double insulation, outstanding dissipation and high lifespan thanks to the interior potting, 5G anti-vibration, high EMC performance, 4KVAC isolation, etc. The design observes IEC/BS EN/EN60601-1 and ANSI/AAMI ES60601-1version three with 2xMOPP level and ultra-low leakage current (<80 μA). It is very suitable for BF (patient contact) type medical device or relevant equipment.

Model Encoding

MPM - 05 - 5

- 5 — Output voltage
- 05 — Rated wattage
- MPM — Series name

SPECIFICATION

MODEL		MPM-05-3.3	MPM-05-5	MPM-05-12	MPM-05-15	MPM-05-24
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	24V
	RATED CURRENT	1.25A	1A	0.42A	0.33A	0.23A
	CURRENT RANGE Note.2	0 ~ 1.25A	0 ~ 1A	0 ~ 0.42A	0 ~ 0.33A	0 ~ 0.23A
	PEAK CURRENT	1.38A	1.1A	0.46A	0.36A	0.25A
	RATED POWER	4.1W	5W	5W	5W	5.5W
	PEAK LOAD(10sec.) Note.3	4.6W	5.5W	5.5W	5.4W	6W
	RIPPLE & NOISE (max.) Note.4	100mVp-p	100mVp-p	150mVp-p	150mVp-p	180mVp-p
	VOLTAGE TOLERANCE Note.5	±2.5%	±2.5%	±2.5%	±2.5%	±2.5%
	LINE REGULATION	±0.3%	±0.3%	±0.3%	±0.3%	±0.3%
	LOAD REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME	1000ms, 30ms/230VAC 1000ms, 30ms/115VAC at full load				
	HOLD UP TIME (Typ.)	40ms/230VAC 12ms/115VAC at full load				
INPUT	VOLTAGE RANGE Note.6	80 ~ 264VAC 113V~370VDC				
	FREQUENCY RANGE	47 ~ 440Hz				
	EFFICIENCY (Typ.)	74%	78%	80%	81%	82%
	AC CURRENT (Typ.)	0.2A/115VAC 0.1A/230VAC				
	INRUSH CURRENT (Typ.)	COLD START 25A/115VAC 45A/230VAC				
	LEAKAGE CURRENT (max.) Note.7	Touch current <80μA/264VAC				
PROTECTION	OVERLOAD	110% ~ 180% rated output power				
		Protection type : Hiccup mode, recovers automatically after fault condition is removed				
	OVER VOLTAGE	3.8 ~ 5V	5.8 ~ 6.8V	13.8 ~ 16.2V	17.3 ~ 20.3V	27.6 ~ 32.4V
		Protection type : Shut off o/p voltage, clamping by zener diode				
	OVER TEMPERATURE	Protection type : Shut down o/p voltage, recovers automatically after temperature goes down				
ENVIRONMENT	WORKING TEMP.	-40 ~ +85℃ (Refer to "Derating Curve")				
	WORKING HUMIDITY	20 ~ 90% RH non-condensing				
	STORAGE TEMP., HUMIDITY	-40 ~ +100℃, 10 ~ 95% RH non-condensing				
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 60℃)				
	SOLDERING TEMPERATURE	Wave soldering: 265℃,5s (max.); Manual soldering: 390℃,3s (max.)				
	VIBRATION	10 ~ 500Hz, 5G 10min./1cycle, period for 60min. each along X, Y, Z axes				
	OPERATING ALTITUDE Note.8	5000 meters				
SAFETY & EMC (Note 9)	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	100% dip 1 periods, 30% dip 25 periods, 100% interruptions 250 periods		
OTHERS	MTBF	9337.3K hrs min. Telcordia SR-332 (Bellcore) ; 1799.5K hrs min. MIL-HDBK-217F (25℃)				
	DIMENSION	45.7*25.4*21.5mm (L*W*H) or 1.8*1.0*0.85" inch				
	PACKING	0.035Kg; 270pcs/10.5Kg/0.94CUFT				

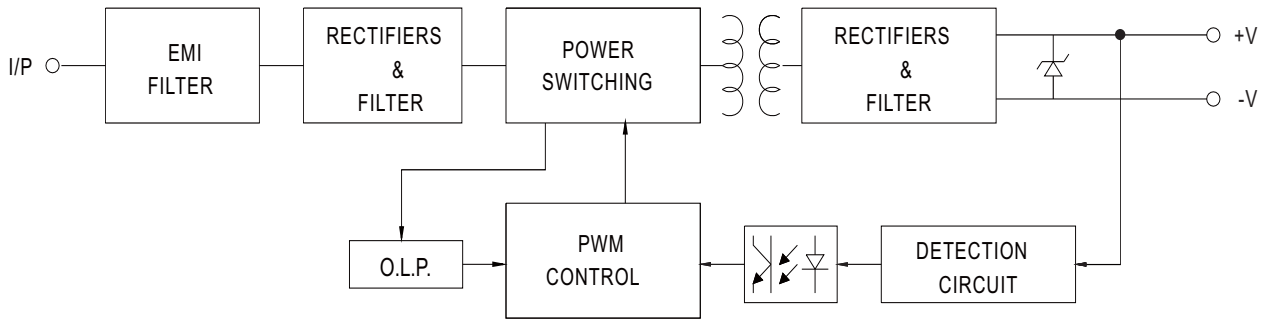
NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. No minimum load required.
3. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power
4. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1μF & 47μF parallel capacitor.
5. Tolerance : includes set up tolerance, line regulation and load regulation.
6. Derating may be needed under low input voltages. Please check the derating curve for more details.
7. Touch current was measured from primary input to DC output.
8. 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).
9. 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)

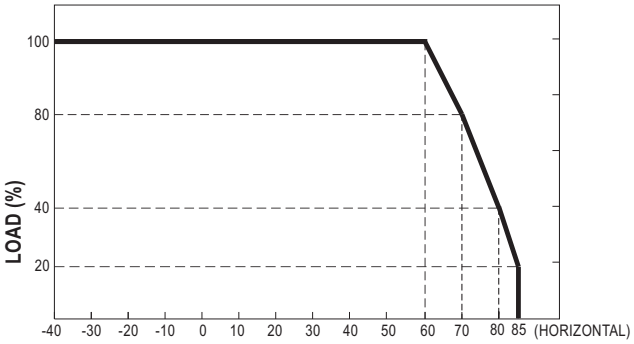
※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx

■ Block Diagram

fosc : 100KHz

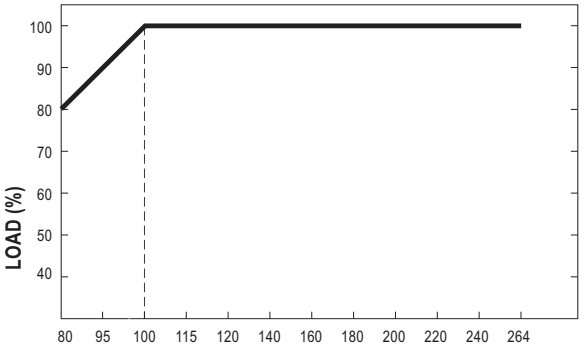


■ Derating Curve



AMBIENT TEMPERATURE (℃)

■ Output Derating VS Input Voltage

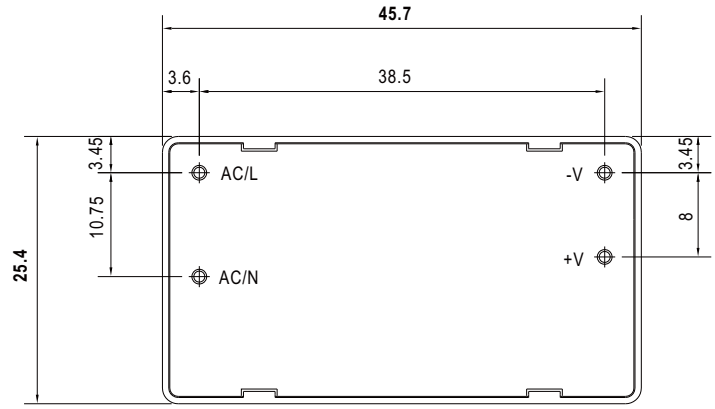


INPUT VOLTAGE (VAC) 60Hz

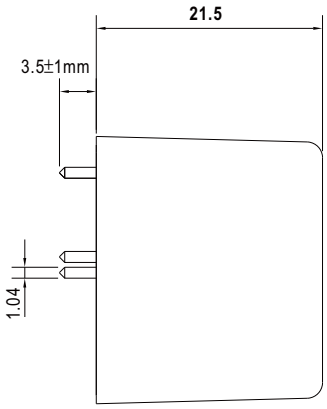
■ Mechanical Specification

(Unit: mm , tolerance ± 0.5mm)

Case No.222A



BOTTOM VIEW



SIDE VIEW

■ Installation Manual

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

10W High Reliable Green Medical Encapsulated Type MPM-10 series

User's Manual

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

Features

- 1.8"x1" compact size
- 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<0.075W
- Extremely low leakage current
- Wide operating temp. range -30 ~ +85℃
- EMI class B for class Ⅱ configuration
- Protections: Short circuit / Overload / Over voltage / Over temperature
- No minimum load required
- 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-10 is a 10W high density and small size (45.7*25.4*21.5mm) AC/DC module type medical grade power supply series offered in pin type. It features the operation for 80~264VAC, a low no load power consumption less than 0.075W, a high efficiency up to 84%, Class Ⅱ (no FG) double insulation, outstanding dissipation and high lifespan thanks to the interior potting, 5G anti-vibration, high EMC performance, 4KVAC isolation, etc. The design observes IEC/BS EN/EN60601-1 and ANSI/AAMI ES60601-1version three with 2xMOPP level and ultra-low leakage current (<80 μA). It is very suitable for BF (patient contact) type medical device or relevant equipment.

Model Encoding

MPM - 10 - 5

- 5 — Output voltage
- 10 — Rated wattage
- MPM — Series name

SPECIFICATION

MODEL		MPM-10-3.3	MPM-10-5	MPM-10-12	MPM-10-15	MPM-10-24
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	24V
	RATED CURRENT	2.5A	2A	0.85A	0.67A	0.42A
	CURRENT RANGE Note.2	0 ~ 2.5A	0 ~ 2A	0 ~ 0.85A	0 ~ 0.67A	0 ~ 0.42A
	PEAK CURRENT	2.75A	2.2A	0.94A	0.74A	0.46A
	RATED POWER	8.3W	10W	10.2W	10W	10W
	PEAK LOAD(10sec.) Note.3	9W	11W	11.3W	11.1W	11W
	RIPPLE & NOISE (max.) Note.4	120mVp-p	100mVp-p	180mVp-p	180mVp-p	200mVp-p
	VOLTAGE TOLERANCE Note.5	±2.5%	±2.5%	±2.5%	±2.5%	±2.5%
	LINE REGULATION	±0.3%	±0.3%	±0.3%	±0.3%	±0.3%
	LOAD REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME	1000ms, 30ms/230VAC 1000ms, 30ms/115VAC at full load				
	HOLD UP TIME (Typ.)	40ms/230VAC 8ms/115VAC at full load				
INPUT	VOLTAGE RANGE Note.6	80 ~ 264VAC 113V~370VDC				
	FREQUENCY RANGE	47 ~ 440Hz				
	EFFICIENCY (Typ.)	78%	81%	83%	83%	84%
	AC CURRENT (Typ.)	0.3A/115VAC 0.2A/230VAC				
	INRUSH CURRENT (Typ.)	COLD START 25A/115VAC 45A/230VAC				
	LEAKAGE CURRENT (max.) Note.7	Touch current <80μA/264VAC				
PROTECTION	OVERLOAD	110% ~ 180% rated output power				
		Protection type : Hiccup mode, recovers automatically after fault condition is removed				
	OVER VOLTAGE	3.8 ~ 5V	5.8 ~ 6.8V	13.8 ~ 16.2V	17.3 ~ 20.3V	27.6 ~ 32.4V
		Protection type : Shut off o/p voltage, clamping by zener diode				
	OVER TEMPERATURE	Protection type : Shut down o/p voltage, recovers automatically after temperature goes down				
ENVIRONMENT	WORKING TEMP.	-30 ~ +85℃ (Refer to "Derating Curve")				
	WORKING HUMIDITY	20 ~ 90% RH non-condensing				
	STORAGE TEMP., HUMIDITY	-40 ~ +100℃, 10 ~ 95% RH non-condensing				
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 60℃)				
	SOLDERING TEMPERATURE	Wave soldering: 265℃,5s (max.); Manual soldering: 390℃,3s (max.)				
	VIBRATION	10 ~ 500Hz, 5G 10min./1cycle, period for 60min. each along X, Y, Z axes				
	OPERATING ALTITUDE Note.8	5000 meters				
SAFETY & EMC (Note 9)	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	100% dip 1 periods, 30% dip 25 periods, 100% interruptions 250 periods		
OTHERS	MTBF	9314.1K hrs min. Telcordia SR-332 (Bellcore) ; 1756.2K hrs min. MIL-HDBK-217F (25℃)				
	DIMENSION	45.7*25.4*21.5mm (L*W*H) or 1.8*1.0"0.85" inch				
	PACKING	0.035Kg; 270pcs/10.5Kg/0.94CUFT				

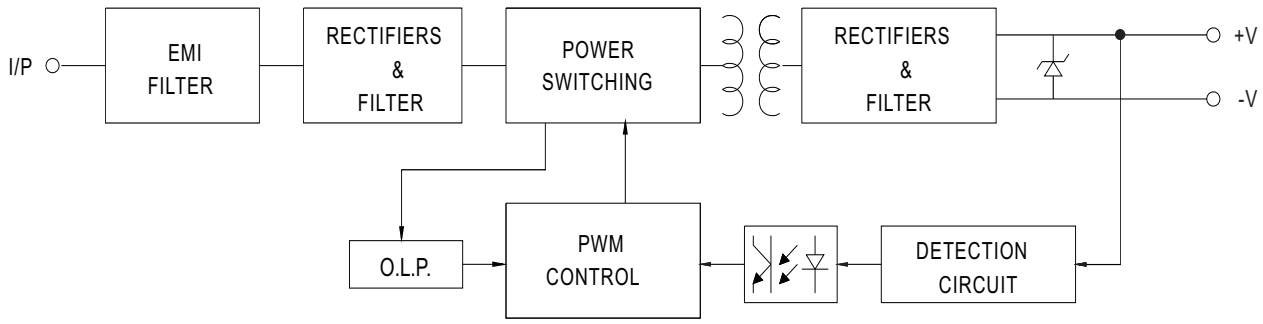
NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. No minimum load required.
3. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power
4. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1μF & 47μF parallel capacitor.
5. Tolerance : includes set up tolerance, line regulation and load regulation.
6. Derating may be needed under low input voltages. Please check the derating curve for more details.
7. Touch current was measured from primary input to DC output.
8. 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).
9. 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)

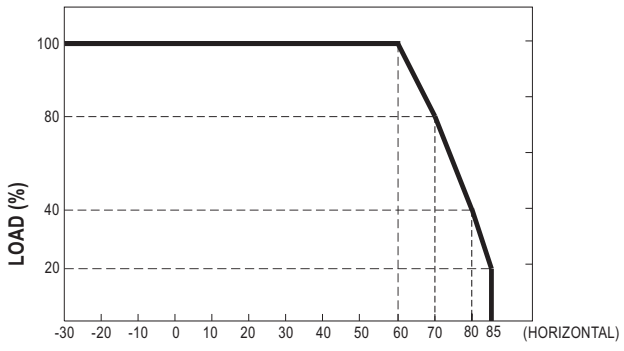
※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx

■ Block Diagram

fosc : 100KHz

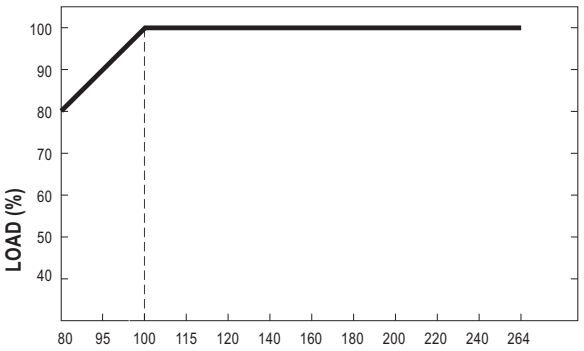


■ Derating Curve



AMBIENT TEMPERATURE (℃)

■ Output Derating VS Input Voltage

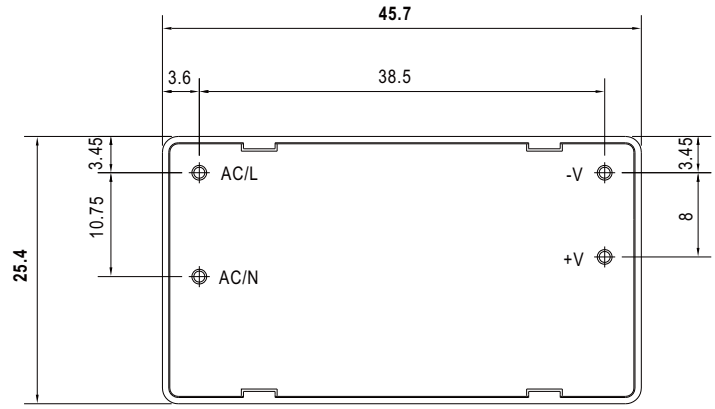


INPUT VOLTAGE (VAC) 60Hz

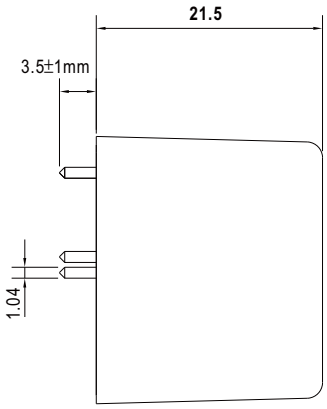
■ Mechanical Specification

(Unit: mm , tolerance ± 0.5mm)

Case No.222A



BOTTOM VIEW



SIDE VIEW

■ Installation Manual

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

15W High Reliable Green Medical Encapsulated Type MPM-15 series

User's Manual

BS EN/EN60335-1 ANSI/AAMI ES60601-1 BS EN/EN60601-1 IEC60601-1 TPTC004

Features

- 2.06"x1.07" compact size
- 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 -40 ~ +85℃
- EMI class B for class Ⅱ configuration
- Protections:
  Short circuit / Overload / Over voltage / Over temperature
- No minimum load required
- 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-15 is a 15W high density and small size (52.4*27.2*24mm) AC/DC module type medical power supply series offered in pin type. It features the operation for 80~264VAC, a low no load power consumption less than 0.1W, a high efficiency up to 87%, Class Ⅱ (no FG) double insulation, outstanding dissipation and high lifespan thanks to the interior potting, 2G anti-vibration, high EMC performance, 4KVAC isolation, etc. The design observes IEC/BS EN/EN60601-1 and ANSI/AAMI ES60601-1version three with 2xMOPP level and ultra-low leakage current (<80 μA). It is very suitable for BF (patient contact) type medical device or relevant equipment.

Model Encoding

MPM - 15 - 5

- 5 — Output voltage
- 15 — Rated wattage
- MPM — Series name

SPECIFICATION

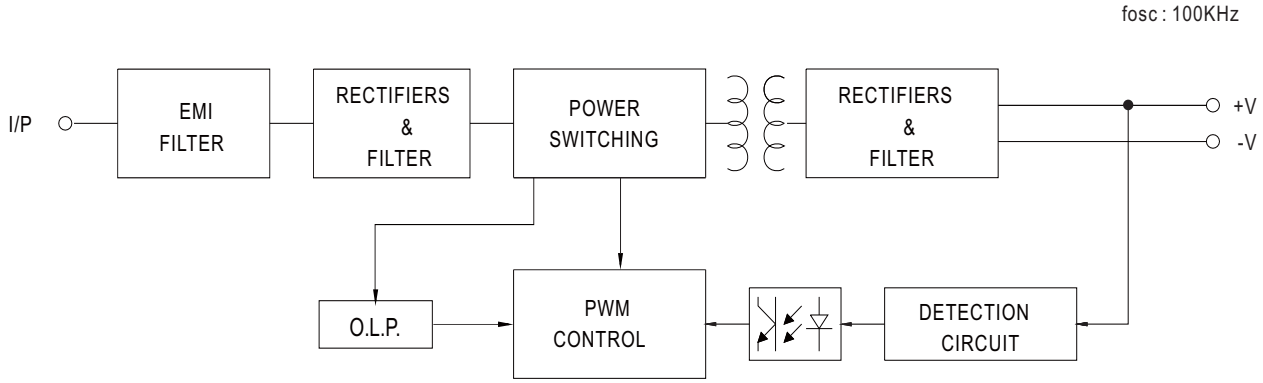
MODEL		MPM-15-3.3	MPM-15-5	MPM-15-12	MPM-15-15	MPM-15-24
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	24V
	RATED CURRENT	3.5A	3A	1.25A	1A	0.63A
	CURRENT RANGE Note.2	0 ~ 3.5A	0 ~ 3A	0 ~ 1.25A	0 ~ 1A	0 ~ 0.63A
	PEAK CURRENT	3.85A	3.3A	1.38A	1.1A	0.69A
	RATED POWER	11.6W	15W	15W	15W	15.1W
	PEAK LOAD(10sec.) Note.3	12.7W	16.5W	16.6W	16.5W	16.6W
	RIPPLE & NOISE (max.) Note.4	150mVp-p	150mVp-p	150mVp-p	180mVp-p	180mVp-p
	VOLTAGE TOLERANCE Note.5	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%
	LINE REGULATION	±0.5%	±0.5%	±0.3%	±0.3%	±0.3%
	LOAD REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME	1500ms, 30ms/230VAC 1500ms, 30ms/115VAC at full load				
	HOLD UP TIME (Typ.)	40ms/230VAC 10ms/115VAC at full load				
INPUT	VOLTAGE RANGE Note.6	80 ~ 264VAC 113V~370VDC				
	FREQUENCY RANGE	47 ~ 440Hz				
	EFFICIENCY (Typ.)	83.5%	85.5%	86.5%	87%	86.5%
	AC CURRENT (Typ.)	0.6A/115VAC 0.3A/230VAC				
	INRUSH CURRENT (Typ.)	COLD START 20A/115VAC 45A/230VAC				
	LEAKAGE CURRENT (max.) Note.7	Touch current <80μA/264VAC				
PROTECTION	OVERLOAD	110% ~ 150% rated output power				
		Protection type : Hiccup mode, recovers automatically after fault condition is removed				
	OVER VOLTAGE	3.8 ~ 5V	5.8~ 6.8V	13.8 ~ 16.2V	17.3 ~ 20.3V	27.6 ~ 32.4V
		Protection type : Shut off o/p voltage, clamping by zener diode				
	OVER TEMPERATURE	Protection type : Shut down o/p voltage, recovers automatically after temperature goes down				
ENVIRONMENT	WORKING TEMP.	-40 ~ +85℃ (Refer to "Derating Curve")				
	WORKING HUMIDITY	20 ~ 90% RH non-condensing				
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH non-condensing				
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 60℃)				
	SOLDERING TEMPERATURE	Wave soldering: 265℃,5s (max.); Manual soldering: 390℃,3s (max.)				
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes				
	OPERATING ALTITUDE Note.8	5000 meters				
SAFETY & EMC (Note.9)	SAFETY STANDARDS	IEC 60601-1:2005+A1,TUV BS EN/ EN 60601-1:2006+A1+A12+A2,ANSI/AAMI ES60601-1:2005/A2:2021, CAN/CSA C22.2 No. 60601-1:2014+A2,IEC 60335-1:2010/AMD2:2016, Dekra BS EN/ EN 60335-1:2012+A11+A13+A1+A14+A2+A15 ,EAC TP TC 004 approved				
	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 emission	BS EN/EN55011 (CISPR11)	Class B		
		Radiated emission	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	100% dip 1 periods, 30% dip 25 periods, 100% interruptions 250 periods		
OTHERS	MTBF	7319.8K hrs min. Telcordia SR-332 (Bellcore) ; 1210.0K hrs min. MIL-HDBK-217F (25℃)				
	DIMENSION	52.4*27.2*24mm (L*W*H) or 2.06″*1.07″*0.94″ inch				
	PACKING	0.056Kg; 240pcs/14.4Kg/0.94CUFT				

NOTE

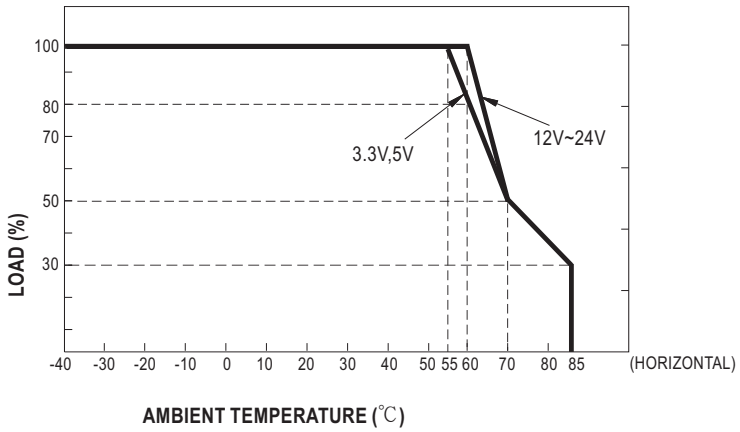
1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. No minimum load required.
3. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power.
4. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 μF & 47 μF parallel capacitor.
5. Tolerance : includes set up tolerance, line regulation and load regulation.
6. Derating may be needed under low input voltages. Please check the derating curve for more details.
7. Touch current was measured from primary input to DC output.
8. 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).
9. 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)

※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx

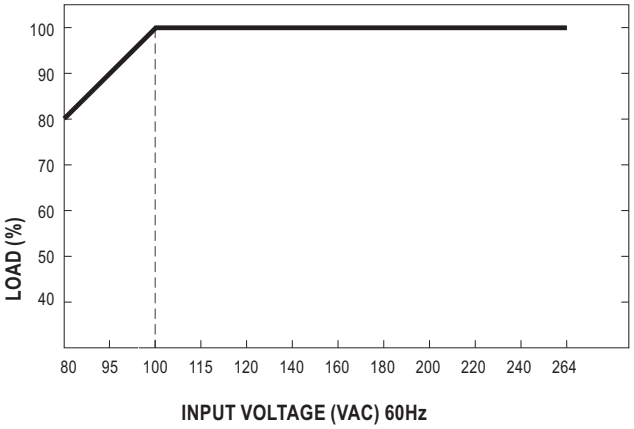
■ Block Diagram



■ Derating Curve



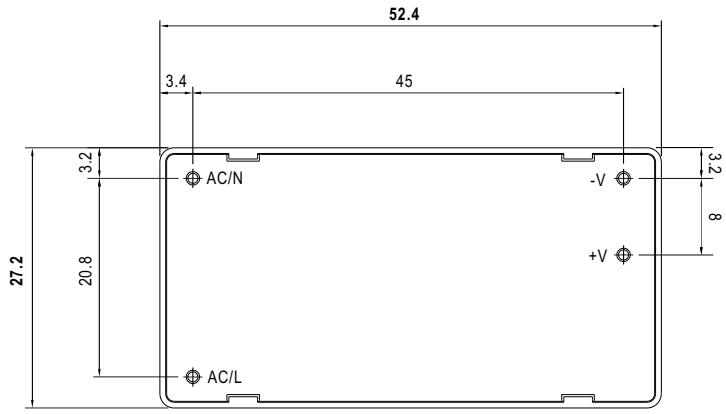
■ Output Derating VS Input Voltage



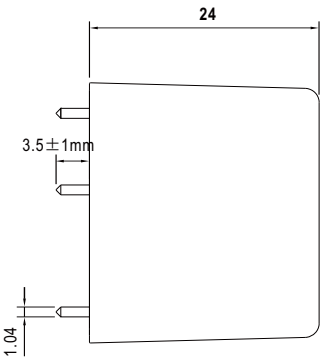
■ Mechanical Specification

(Unit: mm , tolerance ± 0.5mm)

Case No.219A



BOTTOM VIEW



P/N diameter:1.04

SIDE VIEW

■ Installation Manual

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

20W High Reliable Green Medical Encapsulated Type MPM-20 series

User's Manual

BS EN/EN60335-1 ANSI/AAMI ES60601-1 BS EN/EN60601-1 IEC60601-1 TPTC004

Features

- 2.06"x1.07" compact size
- 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 -35 ~ +85℃
- EMI class B for class Ⅱ configuration
- Protections:
  Short circuit / Overload / Over voltage / Over temperature
- No minimum load required
- 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-20 is a 20W high density and small size (52.4*27.2*24mm) AC/DC module type medical power supply series offered in pin type. It features the operation for 80~264VAC, a low no load power consumption less than 0.1W, a high efficiency up to 87%, Class Ⅱ (no FG) double insulation, outstanding dissipation and high lifespan thanks to the interior potting, 2G anti-vibration, high EMC performance, 4KVAC isolation, etc. The design observes IEC/BS EN/EN60601-1 and ANSI/AAMI ES60601-1version three with 2xMOPP level and ultra-low leakage current (<80 μA). It is very suitable for BF (patient contact) type medical device or relevant equipment.

Model Encoding

MPM - 20 - 5

- 5 — Output voltage
- 20 — Rated wattage
- MPM — Series name

SPECIFICATION

MODEL		MPM-20-3.3	MPM-20-5	MPM-20-12	MPM-20-15	MPM-20-24
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	24V
	RATED CURRENT	4.5A	4A	1.8A	1.4A	0.9A
	CURRENT RANGE Note.2	0 ~ 4.5A	0 ~ 4A	0 ~ 1.8A	0 ~ 1.4A	0 ~ 0.9A
	PEAK CURRENT	4.95A	4.4A	1.98A	1.54A	0.99A
	RATED POWER	14.9W	20W	21.6W	21W	21.6W
	PEAK LOAD(10sec.) Note.3	16.3W	22W	23.8W	23.1W	23.8W
	RIPPLE & NOISE (max.) Note.4	150mVp-p	150mVp-p	150mVp-p	180mVp-p	180mVp-p
	VOLTAGE TOLERANCE Note.5	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%
	LINE REGULATION	±0.5%	±0.5%	±0.3%	±0.3%	±0.3%
	LOAD REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME	1500ms, 30ms/230VAC 1500ms, 30ms/115VAC at full load				
	HOLD UP TIME (Typ.)	40ms/230VAC 10ms/115VAC at full load				
INPUT	VOLTAGE RANGE Note.6	80 ~ 264VAC 113V~370VDC				
	FREQUENCY RANGE	47 ~ 440Hz				
	EFFICIENCY (Typ.)	81%	85%	85.5%	87%	87%
	AC CURRENT (Typ.)	0.75A/115VAC 0.5A/230VAC				
	INRUSH CURRENT (Typ.)	COLD START 20A/115VAC 45A/230VAC				
	LEAKAGE CURRENT (max.) Note.7	Touch current <80μA/264VAC				
PROTECTION	OVERLOAD	110% ~ 150% rated output power				
		Protection type : Hiccup mode, recovers automatically after fault condition is removed				
	OVER VOLTAGE	3.8 ~ 5V	5.8 ~ 6.8V	13.8 ~ 16.2V	17.3 ~ 20.3V	27.6 ~ 32.4V
		Protection type : Shut off o/p voltage, clamping by zener diode				
	OVER TEMPERATURE	Protection type : Shut down o/p voltage, recovers automatically after temperature goes down				
ENVIRONMENT	WORKING TEMP.	-35 ~ +85℃ (Refer to "Derating Curve")				
	WORKING HUMIDITY	20 ~ 90% RH non-condensing				
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH non-condensing				
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 55℃)				
	SOLDERING TEMPERATURE	Wave soldering: 265℃,5s (max.); Manual soldering: 390℃,3s (max.)				
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes				
	OPERATING ALTITUDE Note.8	5000 meters				
SAFETY & EMC (Note.9)	SAFETY STANDARDS	IEC 60601-1:2005+A1,TUV BS EN/ EN 60601-1:2006+A1+A12+A2,ANSI/AAMI ES60601-1:2005/A2:2021, CAN/CSA C22.2 No. 60601-1:2014+A2,IEC 60335-1:2010/AMD2:2016, Dekra BS EN/ EN 60335-1:2012+A11+A13+A1+A14+A2+A15 ,EAC TP TC 004 approved				
	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 emission	BS EN/EN55011 (CISPR11)	Class B		
		Radiated emission	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	100% dip 1 periods, 30% dip 25 periods, 100% interruptions 250 periods		
OTHERS	MTBF	7319.8K hrs min. Telcordia SR-332 (Bellcore) ; 1210.0K hrs min. MIL-HDBK-217F (25℃)				
	DIMENSION	52.4*27.2*24mm (L*W*H) or 2.06"*1.07"*0.94" inch				
	PACKING	0.056Kg; 240pcs/14.4Kg/0.94CUFT				

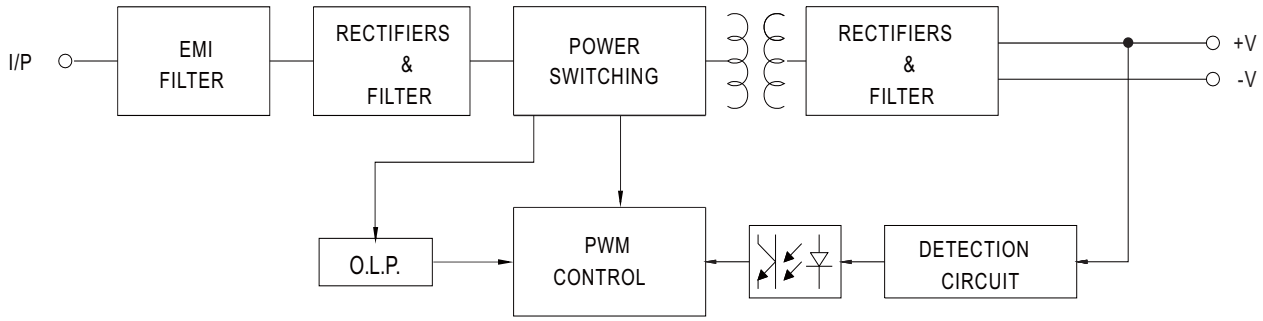
NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. No minimum load required.
3. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power.
4. 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.
5. Tolerance : includes set up tolerance, line regulation and load regulation.
6. Derating may be needed under low input voltages. Please check the derating curve for more details.
7. Touch current was measured from primary input to DC output.
8. 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).
9. 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)

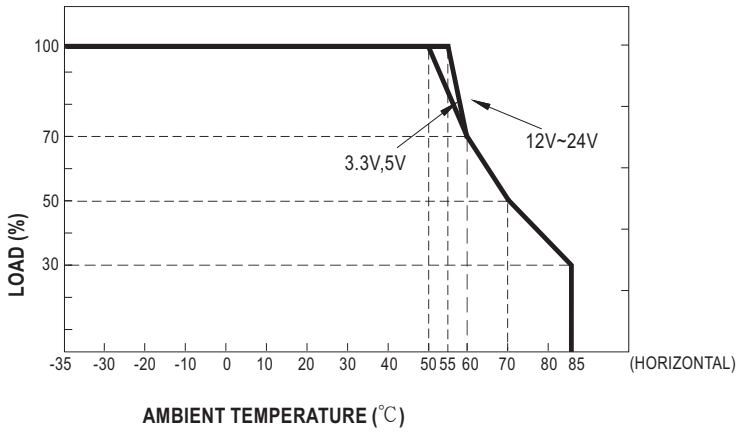
※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx

■ Block Diagram

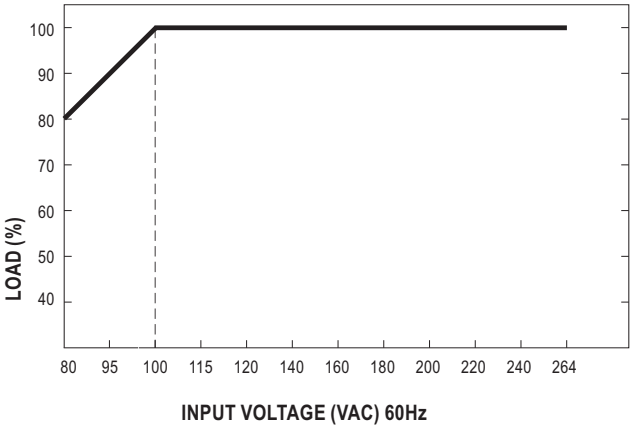
fosc : 100KHz



■ Derating Curve



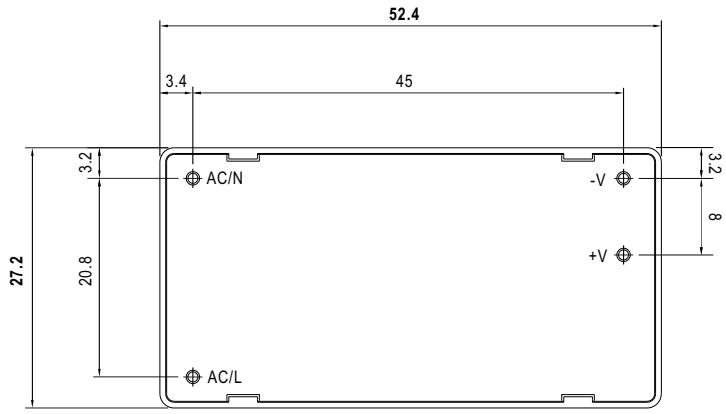
■ Output Derating VS Input Voltage



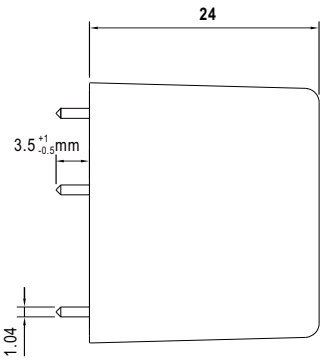
■ Mechanical Specification

(Unit: mm , tolerance ± 0.5mm)

Case No.219A



BOTTOM VIEW



P/N diameter:1.04

SIDE VIEW

■ Installation Manual

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

30W High Reliable Green Medical Encapsulated Type MPM-30 series

User's Manual

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

Features

- 2.73"x1.53" compact size
- 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<0.075W
- Extremely low leakage current
- Wide operating temp. range -40 ~ +85℃
- EMI class B for class Ⅱ configuration
- Protections: Short circuit / Overload / Over voltage
- No minimum load required
- 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-30 is a 30W high density and small size (69.5x39x24mm) AC/DC module type medical power supply series offered in pin type. It features the operation for 80~264VAC, a low no load power consumption less than 0.075W, a high efficiency up to 91%, Class Ⅱ (no FG) double insulation, outstanding dissipation and high lifespan thanks to the interior potting, high EMC performance, 4KVAC isolation, etc. PCB mounting style model(Blank) meet the anti-vibration demand up to 2G and screw terminal style model (ST) meet the anti-vibration demand up to 5G .

The design observes IEC/BS EN/EN60601-1 and ANSI/AAMI ES60601-1version three with 2xMOPP level and ultra-low leakage current (<80 μA). It is very suitable for BF (patient contact) type medical device or relevant equipment. In addition to PCB mounting style,MPM-30 series also offers the screw terminal style model (ST).

Model Encoding

MPM - 30 - 5 ST

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

MODEL		MPM-30-3.3□	MPM-30-5□	MPM-30-12□	MPM-30-15□	MPM-30-24□	MPM-30-48□
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	24V	48V
	RATED CURRENT	6A	6A	2.5A	2A	1.3A	0.63A
	CURRENT RANGE Note.2	0 ~ 6A	0 ~ 6A	0 ~ 2.5A	0 ~ 2A	0 ~ 1.3A	0 ~ 0.63A
	PEAK CURRENT	7.8A	6.9A	2.9A	2.3A	1.5A	0.73A
	RATED POWER	19.8W	30W	30W	30W	31.2W	30.2W
	PEAK LOAD(10sec.) Note.3	25.7W	34.5W	34.8W	34.5W	36W	35W
	RIPPLE & NOISE (max.) Note.4	80mVp-p	80mVp-p	120mVp-p	120mVp-p	200mVp-p	200mVp-p
	VOLTAGE TOLERANCE Note.5	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%
	LINE REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION	±1.0%	±1.0%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME	500ms, 30ms/230VAC 500ms, 30ms/115VAC at full load					
	HOLD UP TIME (Typ.)	40ms/230VAC 12ms/115VAC at full load					
INPUT	VOLTAGE RANGE Note.6	80 ~ 264VAC					
	FREQUENCY RANGE	47 ~ 63Hz					
	EFFICIENCY (Typ.)	82.5%	86.5%	90%	89%	90%	91%
	AC CURRENT (Typ.)	0.75A/115VAC 0.5A/230VAC					
	INRUSH CURRENT (Typ.)	COLD START 25A/115VAC 45A/230VAC					
	LEAKAGE CURRENT (max.) Note.7	Touch current <80μA/264VAC					
PROTECTION	OVERLOAD	115% ~ 165% rated output power					
		Protection type : Hiccup mode, recovers automatically after fault condition is removed					
	OVER VOLTAGE	3.5 ~ 4.5V	5.3 ~ 6.8V	12.6 ~ 16.2V	15.8 ~ 20.3V	25.2 ~ 32.4V	50.4 ~ 64V
		Protection type : Shut down o/p voltage, re-power on to recover					
ENVIRONMENT	WORKING TEMP.	-40 ~ +85℃ (Refer to "Derating Curve")					
	WORKING HUMIDITY	20 ~ 90% RH non-condensing					
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH non-condensing					
	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.8	PCB mounting: 5000 meters Screw terminal style: 3000 meters					
SAFETY & EMC (Note 9)	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		100% dip 1 periods, 30% dip 25 periods, 100% interruptions 250 periods	
OTHERS	MTBF	6325.8K hrs min. Telcordia SR-332 (Bellcore) ; 778.9K hrs min. MIL-HDBK-217F (25℃)					
	DIMENSION	PCB mounting style:69.5*39*24mm (L*W*H) or 2.73"*1.53"*0.94" inch Screw terminal style:91*39.5*28.5mm (L*W*H) or 3.58"*1.55"*1.12" inch					
	PACKING	PCB mounting style:0.102Kg;144pcs/15.7Kg/0.97CUFT Screw terminal style :0.12Kg;120pcs/14.9Kg/0.74CUFT					

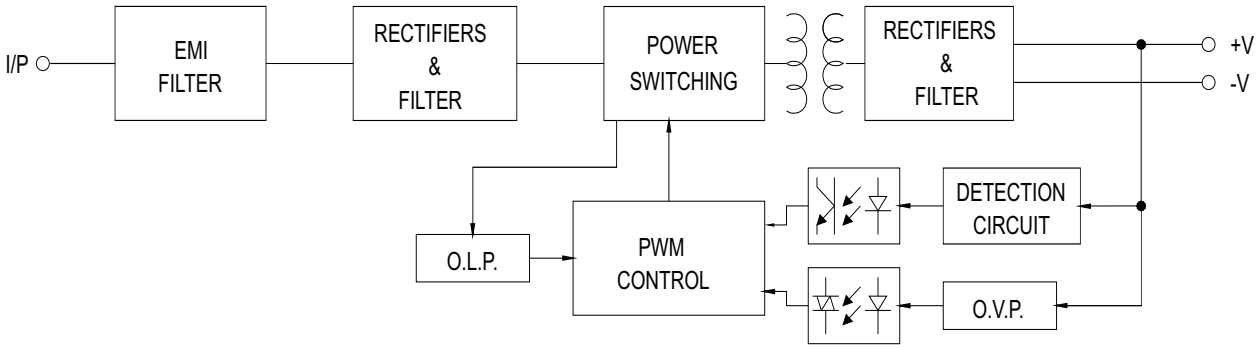
NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. No minimum load required.
3. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power.
4. 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.
5. Tolerance : includes set up tolerance, line regulation and load regulation.
6. Derating may be needed under low input voltages. Please check the derating curve for more details.
7. Touch current was measured from primary input to DC output.
8. 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).
9. 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)

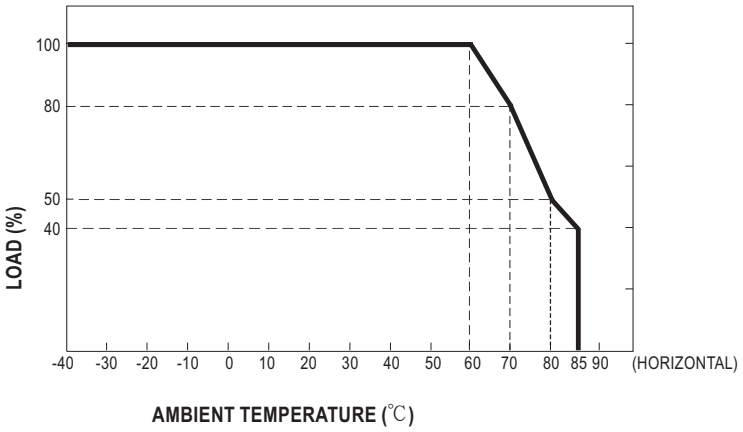
※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx

■ Block Diagram

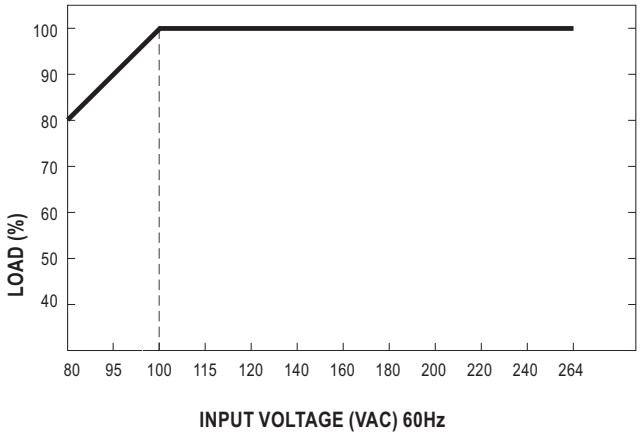
fosc : 65KHz



■ Derating Curve



■ Output Derating VS Input Voltage

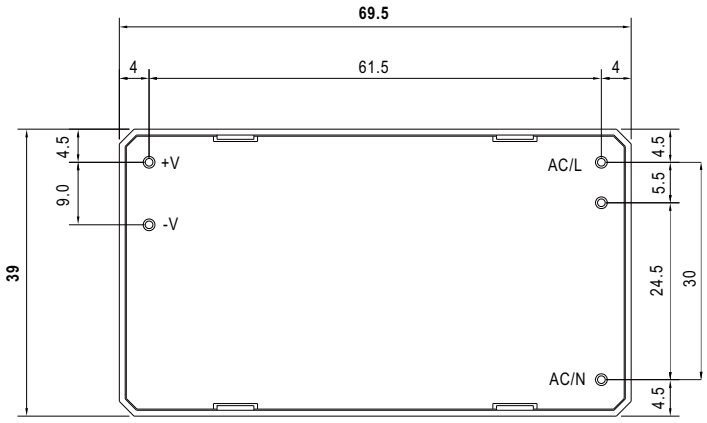


■ Mechanical Specification

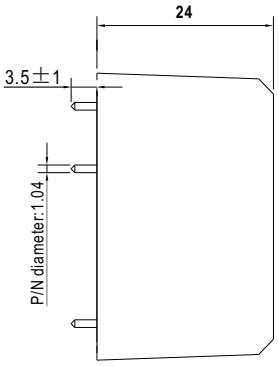
(Unit: mm , tolerance ± 1mm)

Case No.IRM30

- **MPM-30 (PCB mounting style)**

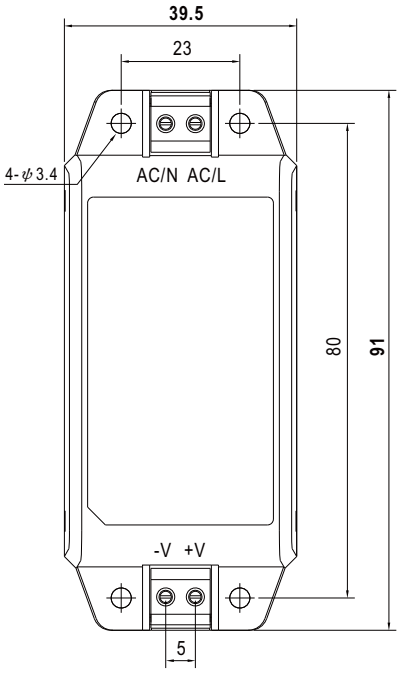


BOTTOM VIEW

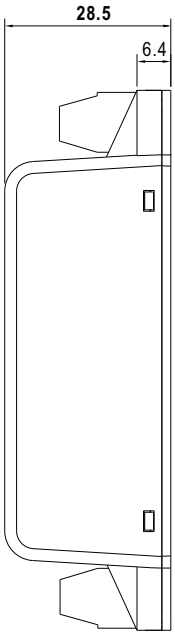


SIDE VIEW

- **MPM-30-ST (Screw terminal style)**



TOP VIEW



SIDE VIEW

■ Installation Manual

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

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				

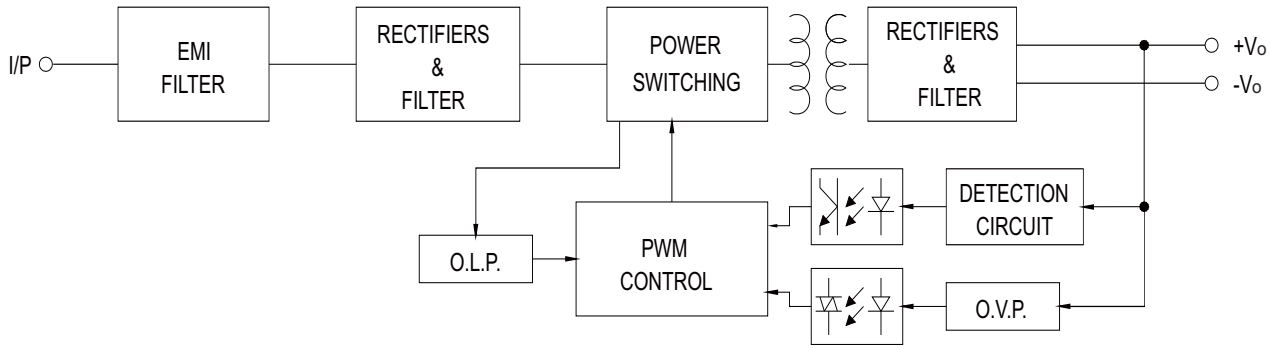
NOTE

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)

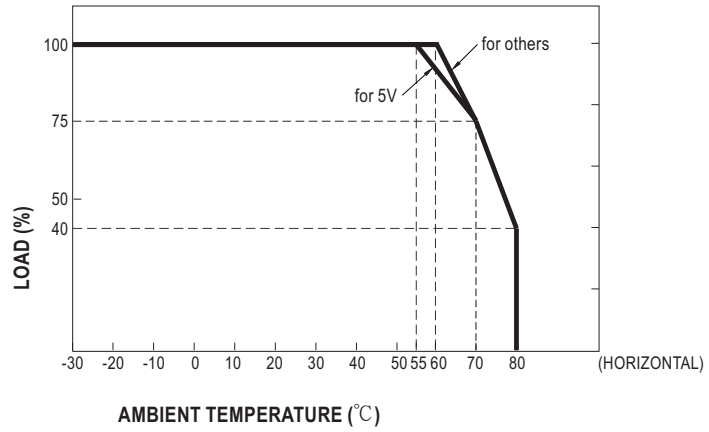
※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx

■ Block Diagram

fosc : 70KHz

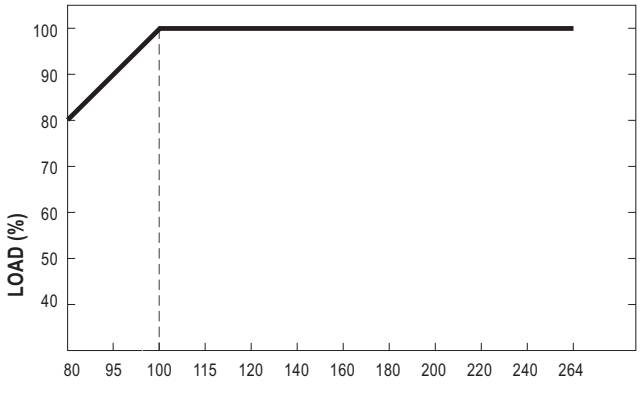


■ Derating Curve



AMBIENT TEMPERATURE (℃)

■ Output Derating VS Input Voltage



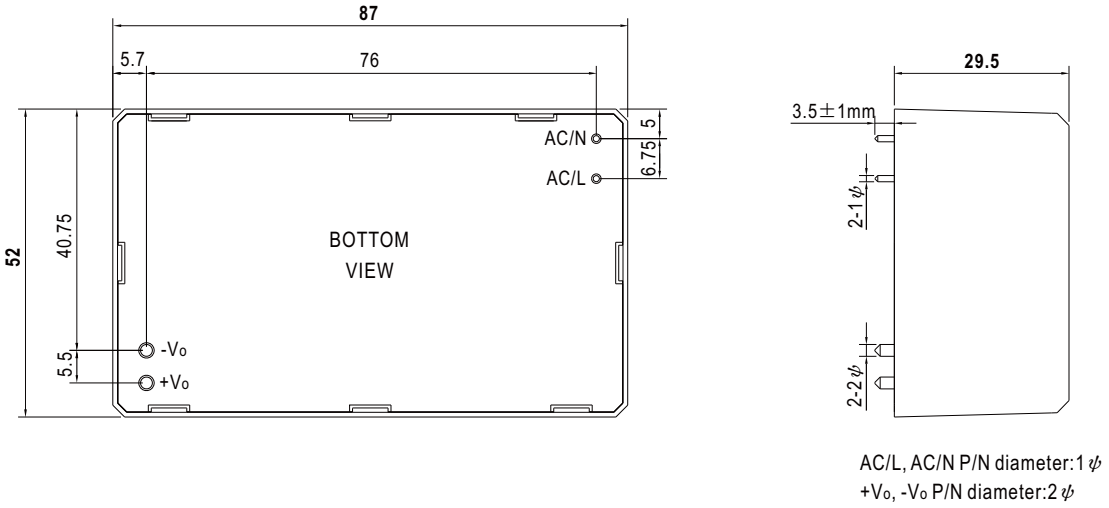
INPUT VOLTAGE (VAC) 60Hz

■ Mechanical Specification

(Unit: mm , tolerance ± 1mm)

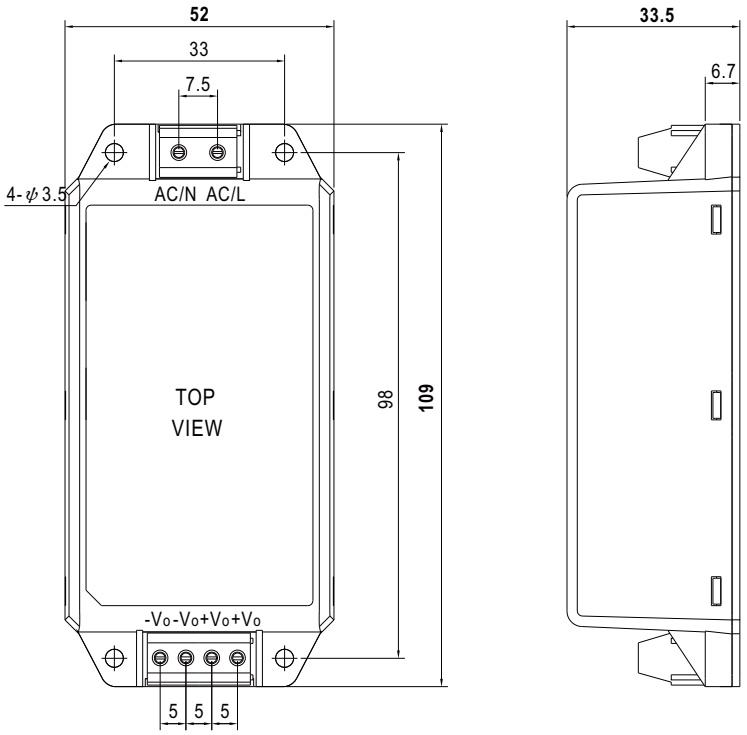
Case No.IRM60

- **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

65W AC-DC High Reliable PCB-Mount Green Medical Power Module MPM-65 series

User's Manual

(MPM-65)

(MPM-65-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)
- 71W 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-65 is a 65W 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 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 ES60601-1version 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 - 65 - 5 ST

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

SPECIFICATION

MODEL			MPM-65-5 ☐	MPM-65-12 ☐	MPM-65-15 ☐	MPM-65-24 ☐	MPM-65-48 ☐
OUTPUT	DC VOLTAGE		5V	12V	15V	24V	48V
	CURRENT	Peak(10 sec.)	11A	5.96A	4.77A	2.98A	1.49A
		Convection	10A	5.42A	4.33A	2.71A	1.36A
	RATED POWER	Peak(10 sec.)Note.2	55W	71.5W	71.6W	71.5W	71.5W
		Convection	50W	65W	65W	65W	65.3W
	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.)		86.5%	92.5%	92.5%	93%	92%
	AC CURRENT (Typ.)		1.5A/115VAC 1A/230VAC				
	INRUSH CURRENT (Typ.)		COLD START 30A/115VAC 65A/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 ~ 50℃)				
	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		5087.8K 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 : 0.191Kg;60pcs/12.5Kg/0.94CUFT Screw terminal style :0.216Kg;50pcs/11.8Kg/0.56CUFT				

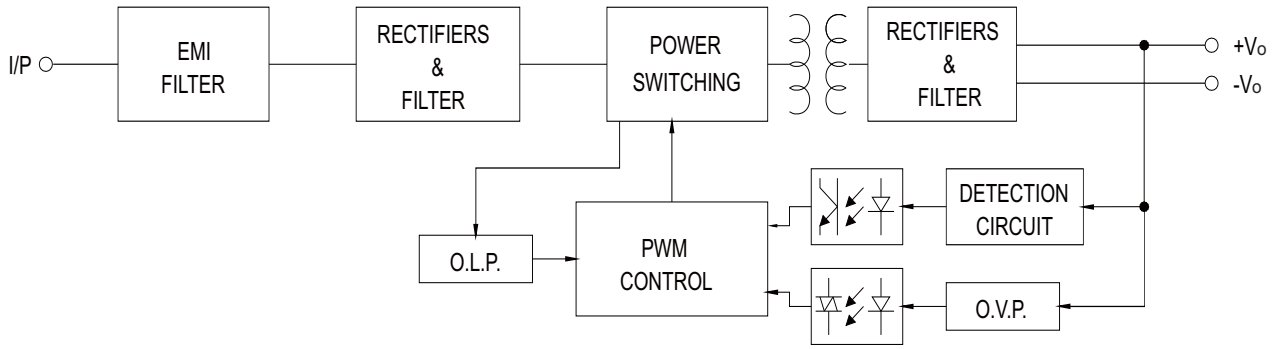
NOTE

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)

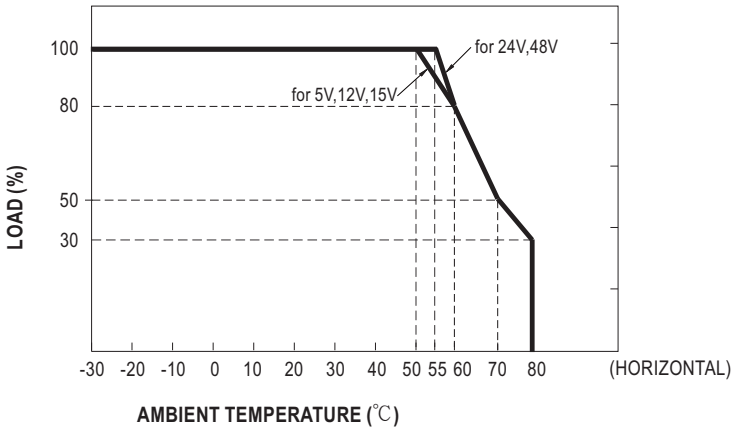
※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx

■ Block Diagram

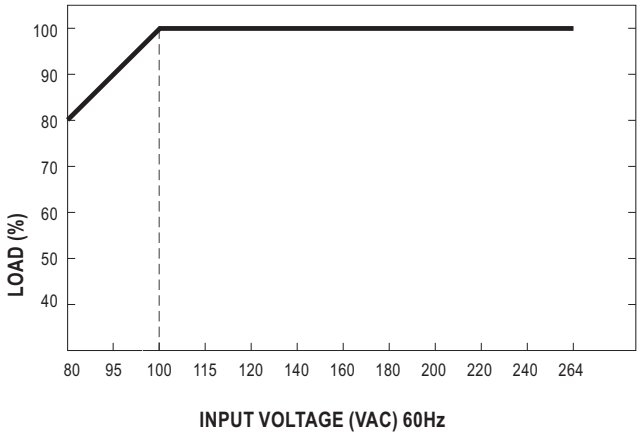
fosc : 70KHz



■ Derating Curve



■ Output Derating VS Input Voltage

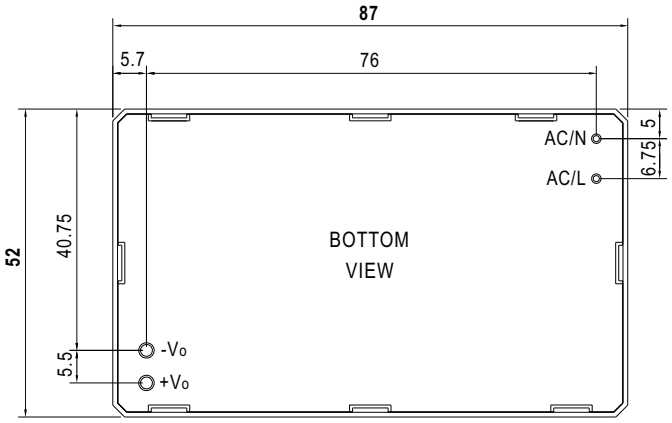


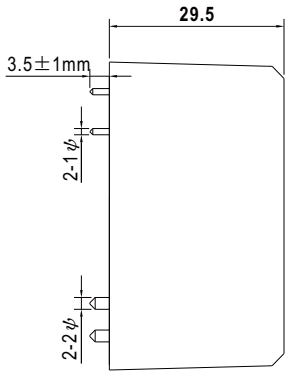
■ Mechanical Specification

(Unit: mm , tolerance ± 1mm)

Case No.IRM60

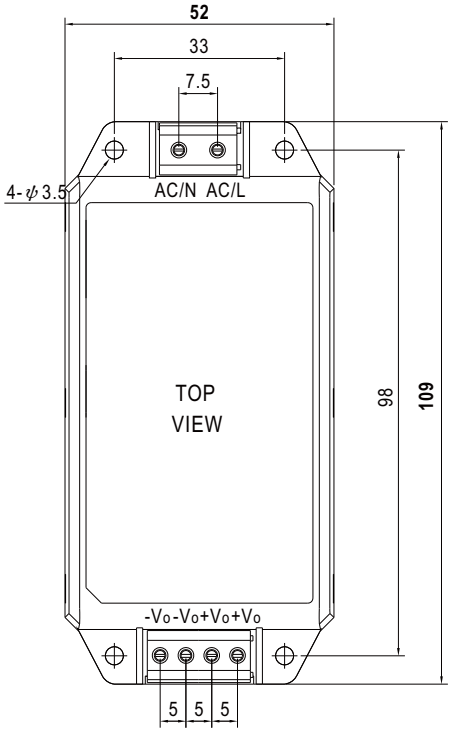
- **PCB mounting style (MPM-65)**

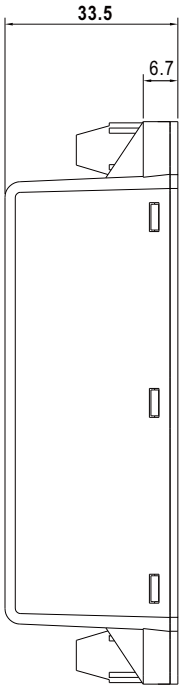




AC/L, AC/N P/N diameter:1ψ
+Vo, -Vo P/N diameter:2ψ

- **Screw terminal style (MPM-65-xxST)**





■ Installation Manual

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

90W AC-DC High Reliable PCB-Mount Green Medical Power Module **MPM-90 series**

User's Manual

(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℃
- 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 ES60601-1version 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 - 90 - 12 ST

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

SPECIFICATION

MODEL			MPM-90-12 ☐	MPM-90-15 ☐	MPM-90-24 ☐	MPM-90-48 ☐
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.)Note.2	88.4W	93.5W	99W	99.2W
		Convection	80.4W	85.05W	90W	90.2W
	RIPPLE & NOISE (max.) Note.3		120mVp-p	150mVp-p	200mVp-p	240mVp-p
	VOLTAGE TOLERANCE Note.4		±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 Note.5		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.) Note.6		Touch current <100μA/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℃ (Refer to "Derating Curve")			
	WORKING HUMIDITY		20 ~ 90% RH non-condensing			
	STORAGE TEMP.		-40 ~ +85℃			
	TEMP. COEFFICIENT		±0.03%/℃ (0 ~ 50℃)			
	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		4548.9K hrs min. Telcordia SR-332 (Bellcore) ; 570.5K 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 : 0.197Kg;60pcs/12.8Kg/0.94CUFT Screw terminal style :0.219Kg;50pcs/12Kg/0.56CUFT			

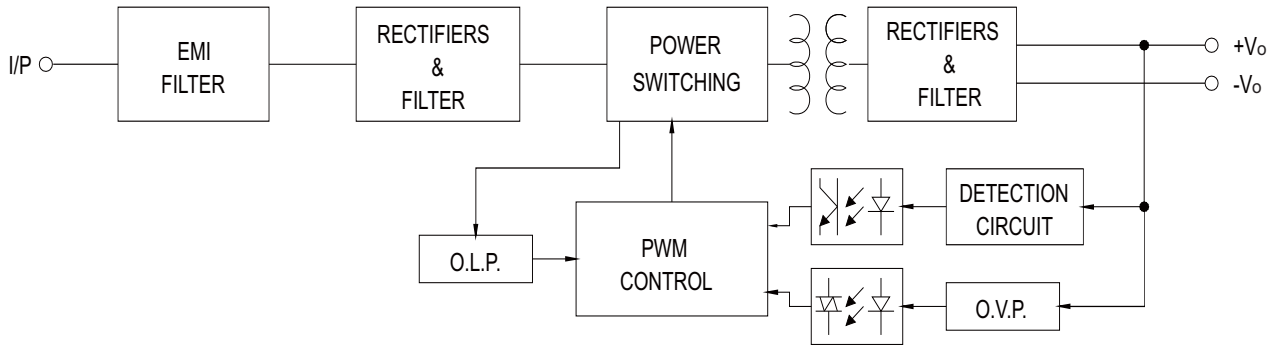
NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ 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)

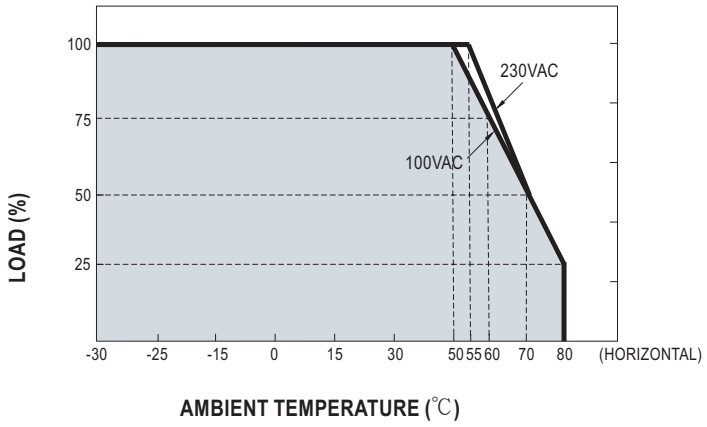
※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx

■ Block Diagram

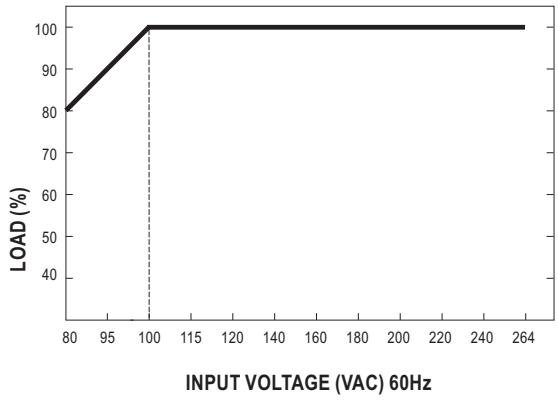
fosc : 70KHz



■ Derating Curve



■ Output Derating VS Input Voltage

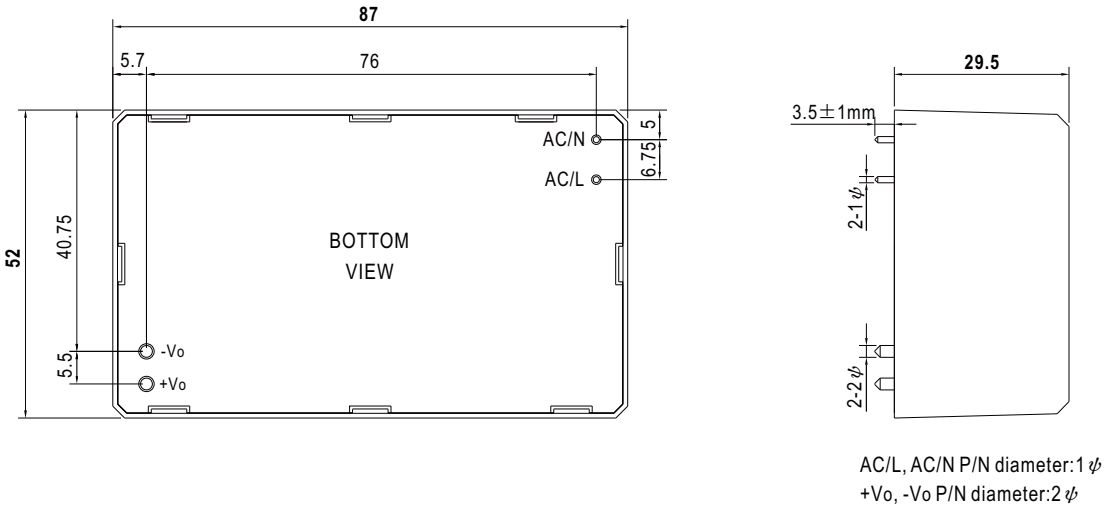


■ Mechanical Specification

(Unit: mm , tolerance ± 1mm)

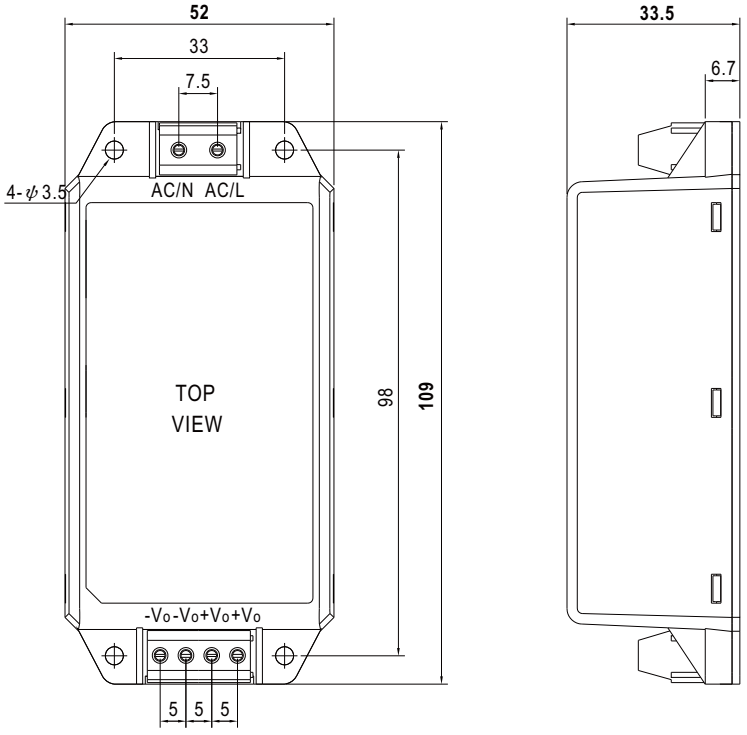
Case No.IRM60

• **PCB mounting style (MPM - 90)**



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

• **Screw terminal style (MPM-90-xxST)**



■ Installation Manual

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