



Preliminary SPECIFICATION

For

SWITCHING POWER SUPPLY

M/N: MPM-0200 series

Revisions History

Rev	June 25 th , 2009	Efficiency changed to "above 91%"
		1) Change Convection cooled wattage from 150W to 120W 2) Change Efficiency from 89% to 88% nominal. 3) Add type BF rated patient contact leakage current 4) Input wattage <0.5W at no load condition. 5) Add +48V output version MPM-0206 6) Inrush current at 60A 7) Add optional +5Vsb & remote on/off 8) Add Derate linearly above 50°C "(TBD for MPM-0203 model)" 9) Add comment of radiation and conduction at 120W and 200W. 10) Change height from 35mm to 37.8mm 11) Change output connector from Molex 5273-03A to Dinkle 5EHDVC or ED500V(selection)
Rev	Oct. 19 th , 2009	12) Add point 8 option



BF direct patient contact rated

FEATURES

- 200W forced air cooling and 120W convection cooled at 50°C single output medical power supply
- Compact size 3 x 5 inch
- Active PFC meets Class D and Conducted EMI meets CISPR/FCC Class B
- High Efficiency at 88% typical.
- Adjustable output range
- Design to meet medical standard IEC 60601-1, EN 60601-1, UL 60601-1 type BF rated patient contact leakage current
- Input wattage <0.5W at No load condition.
- Optional +5Vsb & Remote on/off function (see point 8)

1. Description

MPM-0200 series is a 200W with force air cooling and 120W convection cooled medical grade single output power supply. Its compact size is 3 x 5 inch and with active PFC function for medical application.

Model Number	Output Voltage ^(Note 1)	Min. Output Current	Rated Output Power	Max. Output Power	Total Regulation ^(Note 2)	Ripple & Noise p-p ^(Note 3)	Initial Setting Accuracy ^(Note 4)
MPM-0203	+12-14V / 12V	0	120W	200W	±2%	±1%	1%
MPM-0205	+19-28V / 24V	0	120W	200W	±2%	±1%	1%
MPM-0206	+48V	0	120W	200W	±2%	±1%	1%

Total Output Power: total maximum power is rated 120W, peak 200W max. 5 seconds with convection cooled; max. 200W continuously with minimum _____CFM forced air cooling at 50°C environment temperature.

- Note: 1) Output voltage can be adjusted by variable resistor with nominal 12/24V which would be adjusted at factory.
 2) Total regulation is measured a setting output voltage. Input voltage is from 90-264VAC and output from 0 to 120W.
 3) Measured by a 20MHz bandwidth limited oscilloscope and the each output is connected with a 10µF Electrolytic Capacitor and a 0.1µF Ceramic Capacitor. Output is at rated load. For output at max. load, the ripple noise will be ± 1.5%.
 4) Voltage setting is at nominal AC input voltage, 60% rated load and 25°C.

2. Input Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Input Voltage	Continuous input range	90	115/230	264	VAC
Input Frequency	AC input.	47	50/60	63	Hz
Hold Up Time		16			ms
Inrush Current	230VAC input, Rated load.			60	A

3. Output Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Efficiency	AC 115V input, rated load and O/P setting at 12V, 24V or 48V. It is excluding option +5Vsb.		88		%
Minimum load		See Chart of Description			
Ripple & Noise	Rated load, 20MHz bandwidth	See Chart of Description			
Total Regulation	On condition of a setting output voltage, input voltage from 90-264VAC and output from 0 to 200W.	See Chart of Description			



4. Interface Signals and Internal Protection

Parameter	Conditions/Description
Short Circuit Protection	Fully protected against output overload and short circuit. Automatic recovery upon of overload condition.
Over Voltage Protection	For some reason the power supply fails to control itself, the build-in over voltage protection circuit will shut down the outputs to prevent damaging external circuits.
Remote on/off (optional)	The power supply will be turned on when the power On/Off pin is connected to secondary GND. This function exists only with optional +5Vsb (see Point 8).

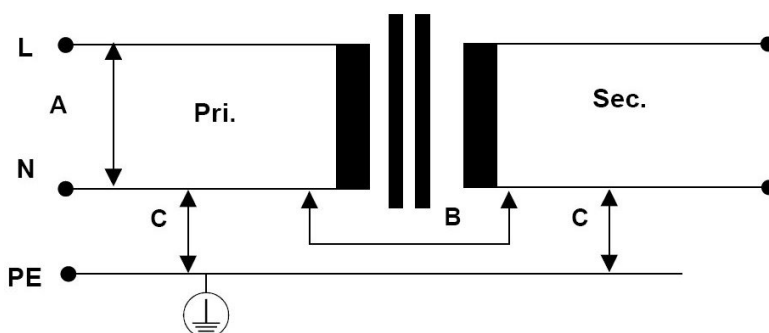
5. Environment Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Storage Temperature		-20		+85	°C
Relative Humidity	Non-condensing.	5		95	%RH
Altitude	Operating Non-operating			2K 4K	Meter
Operating Temperature	Derate linearly above 50°C (TBD for MPM-0203 model) by 2.5% per °C to maximum temperature of 70°C	-20		+70	°C

6. Safety Approvals, EMI and EMS Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Approvals	UL, UL 60601-1 CB, IEC 60601-1 3 rd edition TUV, EN 60601-1 3 rd edition			Pending	
Leakage Current	Patient Leakage Current at 264Vac, 63Hz normal condition (Primary to Earth GND) (Secondary to Earth GND)	BF		300 100	Type uA uA
HI-POT	Primary to Secondary Primary to Protective earth *Secondary to Protective earth		4000 2000 1500		VAC
*Creepage/Clearance distance	Primary to Secondary (refers to B of the insulation diagram) Primary to Protective earth (refers to A of the insulation diagram) Secondary to Protective earth (refers to C of the insulation diagram)	9.1/7.0 4.0/2.5 4.0/2.5			mm

INSULATION DIAGRAM



*This is only target currently. Secondary to Protective Earth and the creepage/Clearance distance would be confirmed after engineering sample stage.

EMI	EN 60601-1-2: 2001 EN 55011 / EN 55022	B*		Class
PFC	EN 61000-3-2: 2000 & EN 610003-3: 2001	D		

*At output 120W condition. Output Above 120W is Class A and class B with option filter _____ (P/N) is required.



EMS	IEC 61000-4-2: 2001,	8KV air discharge, 6KV contact discharge	A	Criteria
	IEC 61000-4-3: 2002,	10V/m	A	
	IEC 61000-4-4: 2004,	2KV line & PE	A	
	IEC 61000-4-5: 2001,	1KV line to line, 2KV line to PE	A	
	IEC 61000-4-6: 2004,	10V/m	A	
	IEC 61000-4-8: 2001,	3A/m	A	
	IEC 61000-4-11: 2004,	Voltage dips >95%, 0.5 cycle	A	
		Voltage dips 30%, 5 cycles	A	
		Voltage dips 60%, 25 cycles	C	
		Voltage interruptions >95%, 250 cycles	C	

7. Mechanical

Parameter	Conditions/Description
Dimension	127 (L) x 76.2 (W) x 37.8 (H) mm, tolerance +/- 0.4mm.
Connector	CN1 --- AC input: Molex 5273-03A withdraw 1 pin or equivalent. CN2 --- DC output: Dinkle 5EHDVC or ED500V (selection)
Pin Assignment	CN1 Pin 1. L 2. N CN2 Pin 1 to 2. V+ 3 to 4. V-

Mechanical drawing

8. Option

Parameter	Conditions/Description DIMENSIONS (mm)
+5Vsb & Remote on/off	Suffix "-SB" at model name is with +5Vsb/0.1A max. and remote on/off function.