SPECIFICATION

For

SWITCHING POWER SUPPLY

M/N: MPM-G200 Series

REV	Mar. 13th 2012	Established.
REV	May 9th 2012	Revised the dimension and mechanical drawing.
REV	Jun. 1st 2012	Added performance curves.
REV	Jul. 26th 2012	Updated hold-up time.
REV	Oct. 5th 2012	Revised peak load specification.
REV	Jun. 21st 2013	Updated safety approvals status.
REV	Dec. 6th 2013	Correct peak and max current of MPM-G205 from 7.9A - 8.4A to 10.6A - 8.4A
REV	Apr. 10th 2014	Correct peak and max current of MPM-G205 from 10.6A-8.4A to 8.4A
REV	Apr. 10th 2014	Correct OVP from Auto recovery to Latch off
REV	Jun. 23rd 2014	1. Add +19V-20V(MPM-G205-19) 2. Change +20-24V for MPM-G205
REV	Sep. 10th 2014	1. Add mechanical drawing with cover 2. Add derating curve with cover 3. Add UL & cUL approved.
REV	Nov. 25th 2015	a) Added "or equivalent" after "Molex" and " European" b) Changed Molex Proposed Terminals from 5176 to 5167 c) Added vibration test

BF direct patient contact rated

FEATURES

- 200W forced air cooling, rated 120W and peak 200W convection cooled medical power supply
- Industry standard 3" x 5" foot print
- Active Power Factor Correction meets Class D
- Adjustable output range
- Class II construction for Home Healthcare Environmental applications
- Also class I with optional functional ground connected
- No-load power consumption < 0.5W (Green power design)
- Design to meet medical standard IEC 60601-1, EN 60601-1, UL 60601-1 type BF rated patient contact leakage current
- Meets EMI CISPR/FCC class B
- Optional +5Vsb & Remote on/off function
- Optional cover kit with suffix –C order no.

1. Description

Model Number	Output Voltage	Min. Output Current	Rated / Peak Output Current	Max Output Current	Line Regulation (Note 1)	Load Regulation (Note 1)	Ripple & Noise p-p (Note 2)	Initial Setting (Note 3)	Initial Setting Accuracy (Note 4)
MPM-G203	**+12V - 14V**	0 A	10A - 8.6A / 16.7A - 14.3A	16.7A - 14.3A	±1%	±1%	±1%	+12V	1%
MPM-G205-19	**+19V - 20V**	0A	6.4 - 6A / 8.4A	8.4A	±1%	±1%	1%	+19V	±1%
MPM-G205	**+20V - 24V**	0 A	6A - 5A / 8.4A	8.4A	±1%	±1%	±1%	+24V	1%
Suffix code "–SB"	**+5Vsb**	0 A	0.1A	0.1A	±1%	±2%	±2%	+5V	2%

Total Output Power: Max. 200W with 11.7 CFM force air cooling; rated 120W (peak 200W for 5 sec. (Note 5)) convection cooled at 50°C environment temperature (Note 6).

Note:
1) Please refer to paragraph 3 for detail notes & conditions.
2) Measured by a 20MHz bandwidth limited oscilloscope and the each output is connected with a 10μF Electrolytic Capacitor and a 0.1μF Ceramic Capacitor.
3) Others output voltage by requested, please see detail model no. coding in paragraph 4.
4) Initial Setting Accuracy is at Input 115VAC and all output at 60% rated load.
5) Peak load with convection cooled up to 200W (160W-168W at +19V-20V output) keeps 5 seconds, please see the detail directions in paragraph 7.
6) For more detail information of performance, please see in paragraph 6.

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	Nominal AC Input Voltage (115VAC), rated load	25			ms
Input Current	Nominal AC Input Voltage (115VAC/230VAC), rated load			2.5	A
No-load power consumption	Nominal AC Input Voltage (115VAC/230VAC)			< 0.5	W
Inrush Current	Nominal AC Input Voltage (115VAC/230VAC), one			30 / 60	A

	cycle at 25˚C				
Power Factor	AC Input Voltage 230 VAC, rated load	0.9			
Input Protect	Non-user serviceable internally located AC input line fuse				

3. Output Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Efficiency (Note 1)	At 230VAC Input, rated load	87			%
Minimum load			See Chart of Description		
Ripple & Noise	Rated load, 20MHz bandwidth		See Chart of Description		
Output Power	Continuous output power		See Chart of Description		
Line Regulation	Less than ±1% at rated load with ±10% changing in input voltage		See Chart of Description		
Load Regulation	Measured from 60% to 100% rated load and from 60% to 20% rated load (60% ±40% rated load)		See Chart of Description		
Turn-on Delay	Time required for initial output voltage stabilization, at 230VAC Input, rated load		1.5		Sec

Note: 1) It shall be warmed up above 0.5 hr.

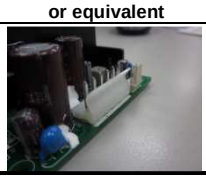
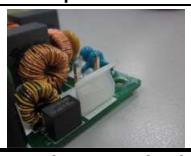
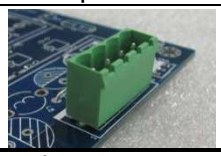
4. Model no. coding

M P M – G 2 0 X – Y – aaa – Z

X =	Fixed Output voltage
3	+12V
5-19	+19V
5	+24V

Y =	Output number
blank	Single output
SB	Dual output (with +5Vsb & remote on/off function)

aaa =	Adjusted Output Voltage
blank	Single output refer to "X"
aaa	Max. 3-digit Ex: 13 = +13V, 138 = +13.8V

Z =	Input Connector Type	Output Connector Type
blank	Molex Type Connector or equivalent 	Molex Type Connector or equivalent 
E	Molex Type Connector or equivalent 	European Type Connector or equivalent 
Please see the detail in paragraph 8.		

5. Interface Signals and Internal Protection

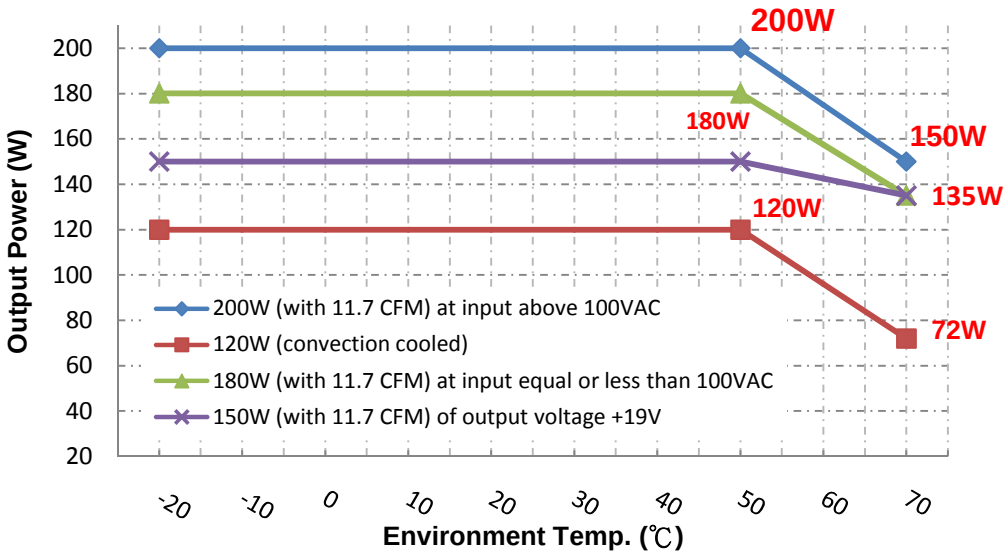
Parameter	Conditions/Description
Short Circuit Protection	Fully protected against output overload and short circuit. Automatic recovery upon of overload condition.
Over Voltage Protection	For some reason the power supply fails to control itself, the build-in over voltage protection circuit will latch off the outputs to prevent damaging external circuits.
Over Temperature Protection	When the power supply operating over the temperature or over load limit, the power supply will be shut down automatically to protect itself.
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, model no. suffix "-SB".

6. Environment Specification

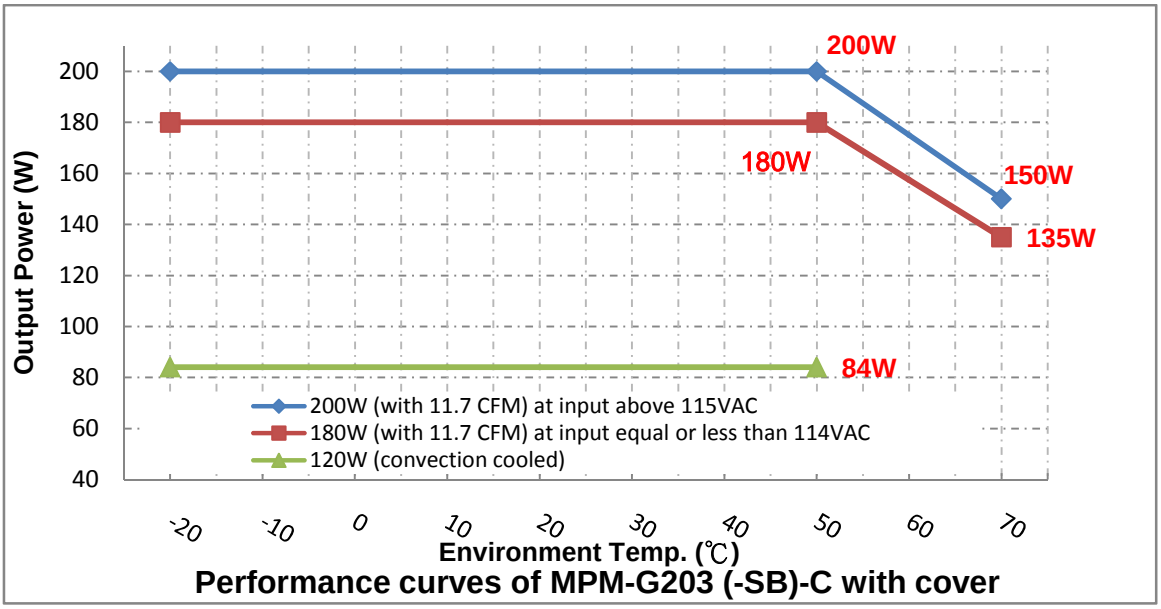
Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Operating Temperature (Note 1)	Please see the performance curves as below	-20 (-40)		+70	˚C
Storage Temperature		-40		+85	˚C
Cooling	Apply to output power > rated load	11.7			CFM
Relative Humidity	Non-condensing.	5		95	%RH
Altitude	Operating Non-operating			4K	Meter

Note: 1) The unit can start-up at -40˚C.

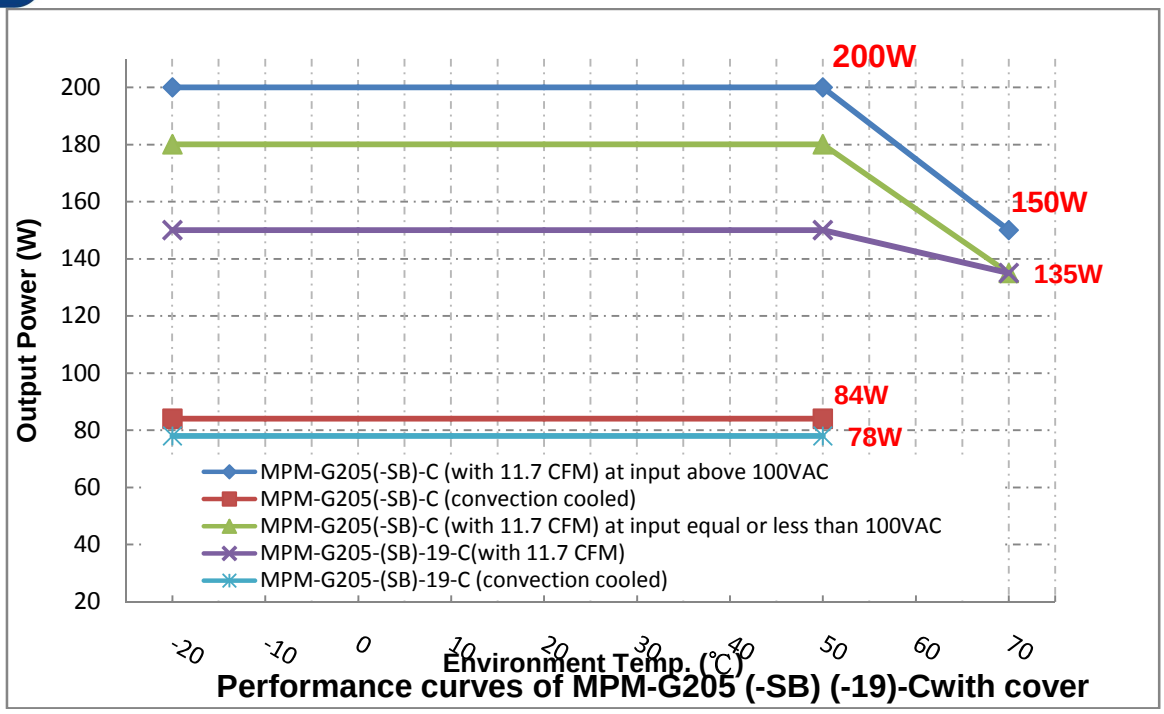
Performance curve



Performance curves of MPM-G200 Series



Performance curves of MPM-G203 (-SB)-C with cover



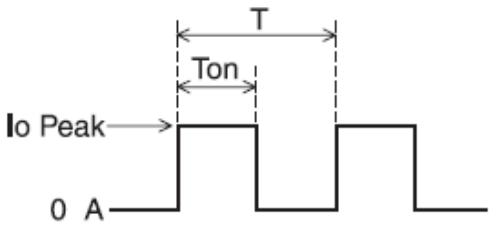
Performance curves of MPM-G205 (-SB) (-19)-Cwith cover

7. Directions of Peak Load

To boosting the output power, It shall be met the following conditions at the same time.

- **The peak load shall not over the specified value.**
- **The duration of peak load shall less than 5 seconds.**
- **The duty cycle shall been met the following formula**
- **The max. ambient temp. ≤ 50°C**

$$Io^2 \geqq (Io\ Peak)^2 \times (Ton / T)$$



Io: Rated output current
Io Peak: Peak output current
T: Duty cycle
Ton: Duration of peak load.

8. Thermal Considerations

In order to ensure correct and reliable operation of the PSU in the most adverse conditions permitted in the end-use equipment, the temperature of the components listed in the table below must not be exceeded. Please see drawing in paragraph 10 for component locations.

Component	Max Temperature
T1	110˚C
Q1	130˚C
C7 (input capacitor)	100˚C

9. Safety Approvals, EMI and EMS Specification

Parameter	Conditions/Description		Min.	Nom.	Max.	Units
Approvals	IEC 60601-1: 2005, 3rd Edition			TUV approved		
	EN 60601-1: 2006, 3rd Edition			TUV approved		
	ANSI/AAMI ES60601-1:2005, 3rd ed.			UL approved		
	CAN/CSA-C22.2 No. 60601-1 (2008)			cUL approved		
Hi-Pot	Reinforce or Double insulation (Primary to Secondary)		4000			VAC
	Basic insulation (Primary, or Secondary, to Protective earth)		1500			
Leakage Current	Patient Leakage Current at 264Vac, 63Hz normal condition		BF			TYPE
	Primary to Secondary					
	Normal Condition / Single Fault Condition				100/300	µA
	Primary to Earth GND (Note 1.)					
	Normal Condition / Single Fault Condition				100/300	µA
EMI (Note 2~4.)	EN 60601-1-2		B			
	EN 55011 / CISPR 11 & FCC Part 18		B			Class
	EN 61000-3-2 & EN 610003-3		D			
	EN 61204-3					
EMS (Note 4.)	IEC 61000-4-2	±8KV air discharge, ±6KV contact discharge	A			
	IEC 61000-4-3	10V/m	A			
	IEC 61000-4-4	±2KV Line & PE	A			
	IEC 61000-4-5	L-N:±1KV, L/N-PE:±2KV	A			
	IEC 61000-4-6	10Vrms	A			
	IEC 61000-4-8	10A/m	A			Criteria
	IEC 61000-4-11	Voltage dips >95%, 0.5 cycle	A			
		Voltage dips 30%, 25 cycles	A			
		Voltage dips 60%, 5 cycles	A / B (Note 5.)			
		Voltage interruptions >95%, 250 cycles	B			

Note: 1) Only exist when earth ground was connecting.
2) As a build-in type power supply, the power supply needs to be installed in a suitable enclosure to pass the EMI/EMC tests. The final assembly has to comply with the valid EMI/EMC and safety.
3) The mounting holes should be connected to each other to conforming the EMI limit.
4) Apply to output equal or below 120W, for higher output power, please re-confirm with MAGIC POWER.
5) The test result of input 240Vac / 100Vac is criteria A / B.

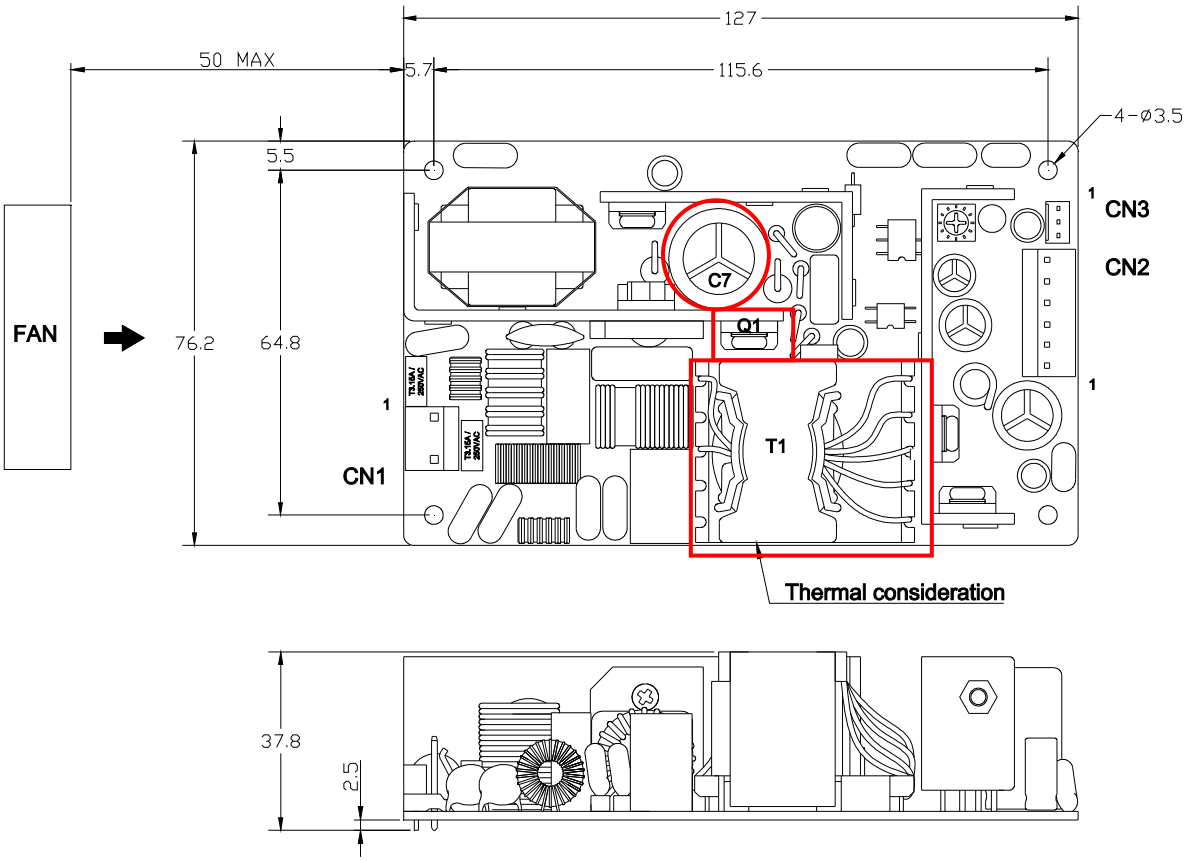
10. Mechanical Specification

Parameter	Conditions/Description				
Dimension	127 (L) x 76.2 (W) x 37.8 (H) mm, Tolerance +/- 0.4mm.				
Connector & Pin Assignment	Location	Pin	Assignment	Proposed Housing	Proposed Terminals
	CN1 (Input)	1	AC in (L)	MOLEX: 09-50-1031 (5195-03) or 09-52-4034 (5239-03) or equivalent;	MOLEX: 5194 or 5225 2478, 2578,5167 or 5168 or equivalent;
		2	AC in (N)		
	CN2 (Output)	1	+ V	MOLEX: 09-50-1061 (5195-06) or 09-52-4064 (5239-06) or equivalent;	MOLEX: 5194 or 5225 2478, 2578,5167 or 5168 or equivalent;
		2	+ V		
		3	+ V		
		4	0 V	MOLEX: 39523-7004 (Note 1) or equivalent	MOLEX: N/A
		5	0 V		
		6	0 V		
	CN3 (Option) (Note 2)	1	+5Vsb	MOLEX: 22-01-1032 (5051-03) or 51191-0300 or equivalent;	MOLEX: 2759 or 5159 50802 or equivalent;
		2	0 V		
		3	Remote On/off		

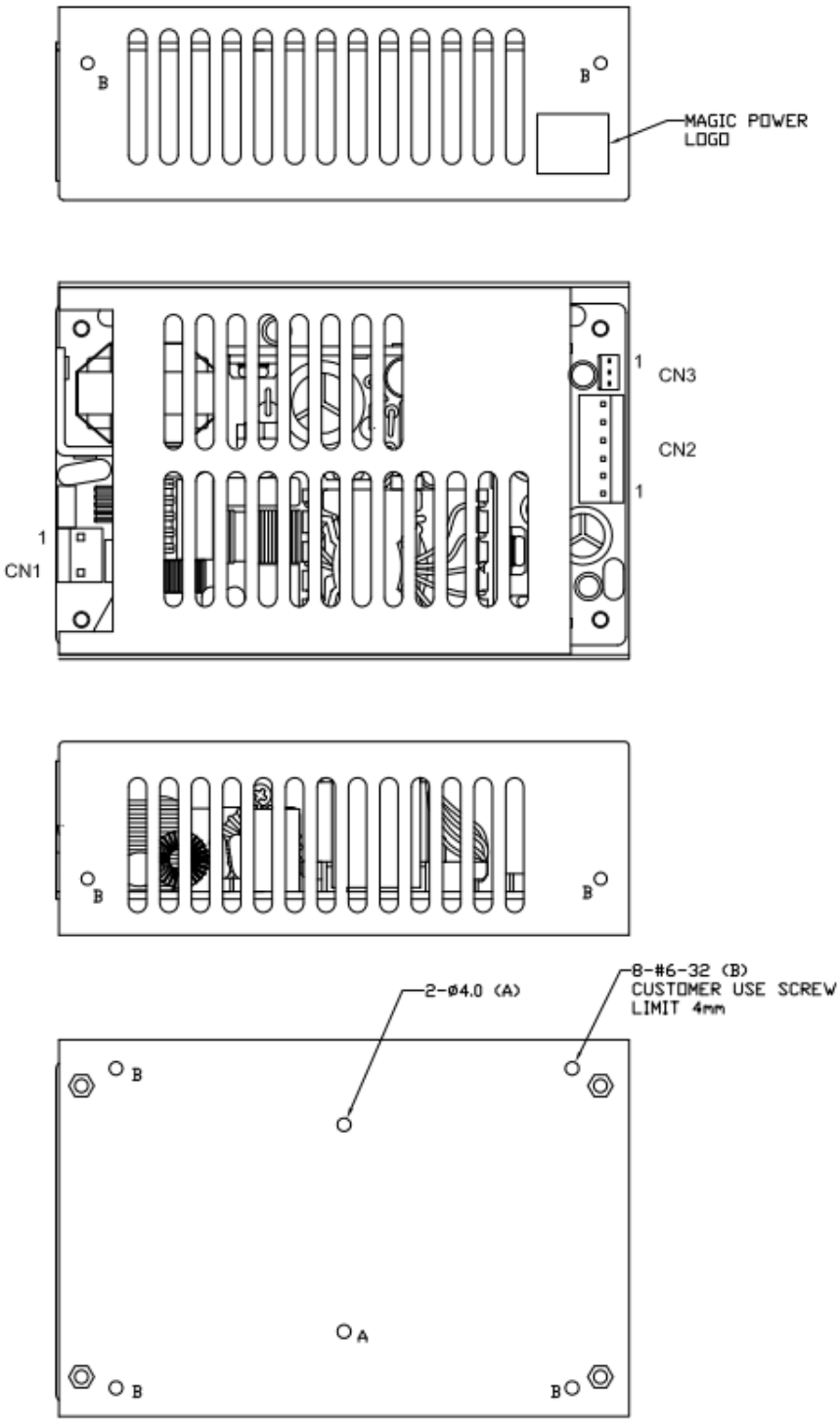
Note: 1) Exist with model no. suffixed -E, the pin assignment of CN2 is Pin 1~2 for + V, Pin 3~4 for - V; please also refer to the comparison in paragraph 4.
2) Exist with model no. suffixed -SB, please see the detail in paragraph 4.

Mechanical drawing

MPM-G20X



Mechanical drawing
MPM-G20X-C



11. Vibration Test

Parameter	Conditions/Description
Ambiance Condition	Temperature：20~35℃ Humidity：50~75 %RH
Test Standard	IEC 60068-2-6
Test Condition	Frequency Type：Sweep Frequency Frequency Range：10~55 Hz Sweep Rate：60 minute / cycle Number of cycle：1 cycle / axis Direction：X , Y and Z axis