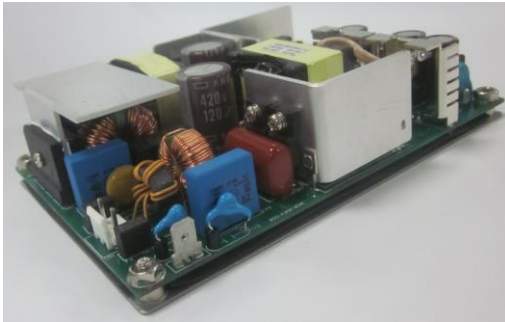


**SPECIFICATION
FOR
SWITCHING POWER SUPPLY**

M/N: MPM-K455(-SB)

Revision History

Version	Date	Change Items
Rev. 01	April. 18.2019	Established.



FEATURES

- ✓ 300W convection cooling and 450W fan cooling.
- ✓ **Peak Load 600W.**
- ✓ Safety Class I or Class II.
- ✓ Design for BF application.
- ✓ High efficiency up to **92%**.
- ✓ No load input power < **0.5W(Target)**.
- ✓ Remote sense & built-in fan supply.
- ✓ Optional remote on/off and PG / PF signal.
- ✓ 5,000m operation altitude.
- ✓ Optional cover-kit.



Models & Ratings

Model Number	Wattage (Rated / Max)	Output Voltage		Min. Current	Rated Current	Max. Current
MPM-K455	300 W /400~450W	V1	+24 V	0 A	12.5 A	18.75 A
MPM-K455-SB	300 W /400~450W	V1	+24 V	0 A	12.5 A	18.75 A
		V2	+5 V	0 A	0.5 A	
		V Fan	+12 V		0.25 A	

Total Output Power: Max. 300W convection cooled at 50°C environment temperature. Max. 450W with 30 CFM(Target) at 50°C environment temperature. **600W peak load with input 100VAC 10sec (Note 3).**

Note:

1. Please refer to page 3 output for the detail notes & conditions.
2. Initial Setting Accuracy is at Input 115VAC and all output at 60% rated load.
3. Peak load derating curve:
 600W peak load with input 100VAC 10sec
 500W peak load with input 90VAC 10sec
 460W peak load with input 85VAC 10sec

Summary

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Range	85	115 / 230	264	Vac	Universal input range.
Input Frequency	47	50 / 60	63	HZ	
Efficiency		92		%	At input 230Vac, rated load, 1.0 hr. warm up.
Operation Temperature	-30(TBD)		+80(TBD)	°C	Derate linearly from 50°C, become 40%(TBD) load at 80°C(TBD).
Weight		TBD		g	
Dimensions	152.4 (L) x 101.6 (W) x 32/37 (H) mm, Tolerance +/- 0.5mm.				
EMC	EN 55011, EN 60601-1-2, EN 61000-3-2, EN 61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11				
Safety Approvals	TBD				

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage - Operating	85	115 / 230	264	Vac	Universal input range.
Input Voltage – Fault Condition			290(TBD)	Vac	5 seconds max.
Input Frequency	47	50 / 60	63	HZ	AC input.
Power Factor		TBD/TBD			115Vac/230Vac at rated load.
Input Current		6/3(TBD)		A	Nominal AC Input Voltage (115Vac/230Vac), rated load.
Inrush Current			30 / 60	A	Nominal AC Input Voltage (115Vac/230Vac), one cycle at 25°C cold start.
Standby Input Power			0.5	W	(TBD)W output load at 115Vac/230Vac.
Input Protection	Dual non-user serviceable internally located AC input line fuse. Fuse : T6.3A / 250Vac * 2pcs				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage		24 ^(V1)		Vdc	Only for –SB version.
		5 ^(V2)			
	11	12 ^(V Fan)	13		
Output Current		12.5 ^(V1)	18.75	A	
		0.5 ^(V2)			
		0.25 ^(V Fan)			
Initial Set Accuracy (Note 1)		±1		%	
Minimum Load		0		A	
Start Up Delay		TBD		Sec.	Time required for initial output voltage stabilization. Nominal AC Input Voltage (115VAC/230VAC), rated load at 25°C.
Hold Up Time		20(300w)		mS	Nominal AC Input Voltage (115VAC/230VAC), rated load.
		12(450w)		mS	Nominal AC Input Voltage (115VAC/230VAC), max load.
Line Regulation		±1		%	Measured at rated load with ±10% changing in input voltage.
Load Regulation		±1		%	Measured from 60% to 100% rated load and from 60% to 20% rated load (60% ±40% rated load).
Ripple & Noise (Note 2)		240 ^(V1) 50 ^(V2)		mV	Rated load, 20MHz bandwidth.
Over Voltage Protection	110	TBD	140	%	Latch-off mode.
Over Current/Short Protection	110	TBD	Short Circuit	%	Auto-recovery mode.
Remote On/Off		Complies			Only for –SB version.
Remote Sense		0.5V		V	Compensates for wire voltage drop.

Note:

1. Initial setting accuracy is adjusted at input 115VAC and output at 60% rated load.
2. Measured by a 20MHz bandwidth limited oscilloscope and each output is connected with a 10µF Electrolytic Capacitor and a 0.1µF Ceramic Capacitor.

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		92		%	At input 230VAC, rated load, 1 hr. warm up.
Isolation	IP to OP	4000		Vac	2 MOPP
	IP to Ground	1500		Vac	1 MOPP
	OP to Ground	1500		Vac	1 MOPP
Earth Leakage Current		TBD/TBD	300	μA	Typ.: 115Vac/60HZ/230Vac/50HZ Max.: 264Vac/60HZ
Patient Leakage Current			100	μA	264Vac/60HZ
Switching Frequency		TBD		KHZ	
MTBF		TBD		hrs.	MIL-HDBK-217F at 25°C
Power Good Signal	100		500	mS	When power is turned on, the power good signal will go high after the output voltage are within regulation limit. Only for -SB model.
Power Fail Signal	1			mS	When power is turned off, the power fail signal will go low before the output voltage fall below the regulation limit. Only for -SB model.

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Low temperature start up	-30(TBD)			°C	Some specification parameters maybe exceeded until after 20 minutes warm up period. (Note 1)
Operating Temperature	-30(TBD)		+80(TBD)	°C	Derate linearly above 50°C, performance curves will be provided after testing.
Storage Temperature	-40		+85	°C	
Relative Humidity	5		95	%RH	Non-condensing.
Cooling		30(TBD)		CFM	Forced-cooled > 300W
Operating Altitude		5000		m	
Vibration		TBD		G	Frequency Type: Sweep Frequency Frequency Range: 10~55 Hz Displacement: 1.0mm Sweep Rate: 60 minute / cycle Number of cycle: 1 cycle / axis Direction: X , Y and Z axis

Note:
1. To start up at low temperature, when the $V_{IP} < 115VAC$, please set the rated load @ 10% for maximum; when $115VAC < V_{IP} < 230VAC$, please set the rated load @ 30% for maximum; when $V_{IP} \geq 230VAC$, there will be no specific limitation on rated load setting.

EMC: Emissions

Phenomenon	Standard	Class	Notes & Conditions
Conducted	EN 55011 / CISPR 11 & FCC Part 18	B	1. Measured without enclosure. 2. Measured with a metal plate below the power supply. 3. Class II Primary need to add EMI Core around four turns (EROCORE A81280200160).(TBD) 4. Class II Pass EMI with build in metal plate below the power supply. (TBD) 5. Class I Pass EMI with a metal plate below the power supply and Load.
Radiated	EN 55011 / CISPR 11 & FCC Part 18	B	
Harmonic Current	EN 61000-3-2	D	>200 Watt.
Voltage Flicker	EN 61000-3-3		

- Note:
- Above specification is applied with output equal or below **300W(Class II)**. For higher output power, please re-confirm with us.
 - Above specification is applied with output equal or below **450W(Class I)**.
 - Above specification is based on the test conditions of EN 55011 / CISPR 11 & FCC Part 18. If there is any question when the power supply is applied to the system, please contact us for assistance.

EMC: Immunity

Phenomenon	Standard	Criteria	Notes & Conditions
Medical Device EMC	IEC 60601-1-2: 2014	As below	Edition 4.0
ESD	IEC 61000-4-2	A	±15KV air discharge, ±8KV contact discharge
Radiated	IEC 61000-4-3	A	10V/m
EFT	IEC 61000-4-4	A	±2KV Line & PE at 100KHz
Surges	IEC 61000-4-5	A	L-N:±1KV, L/N-PE:±2KV
Conducted	IEC 61000-4-6	A	10V
Power Magnetic	IEC 61000-4-8	A	30A/m
Dips and Interruptions	IEC 61000-4-11	A A A/B B	DIP: 100%, 0.5 cycles DIP: 100%, 1 cycles Note3 DIP: 30%, 25 cycle Note2 DIP: 100%,5 Sec

- Note:
- Above specification is applied with output equal or below (TBD)W. For higher output power, please re-confirm with us.
 - The test result of input 240Vac / 100Vac is criteria A / B.
 - The test result of output 300W / 450W is criteria A / B.

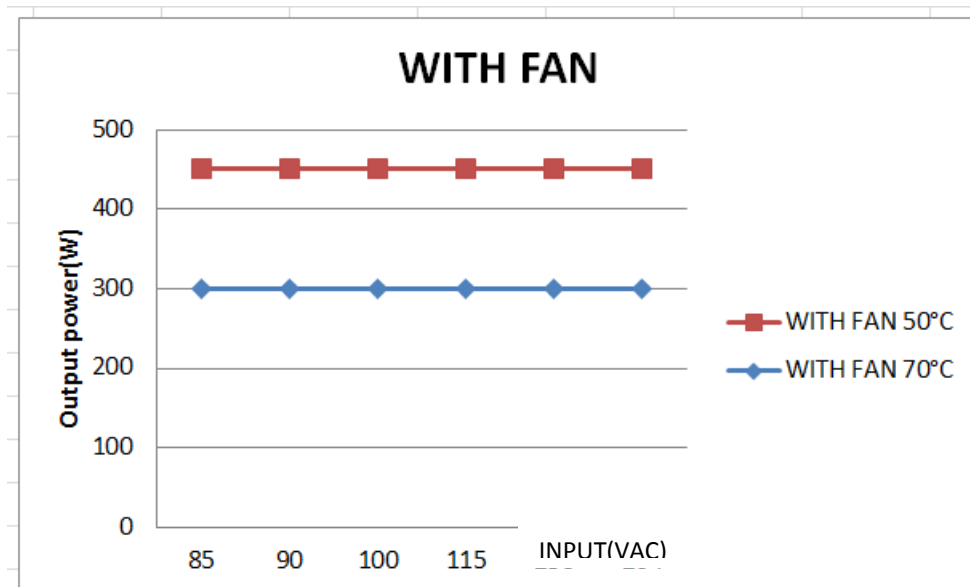
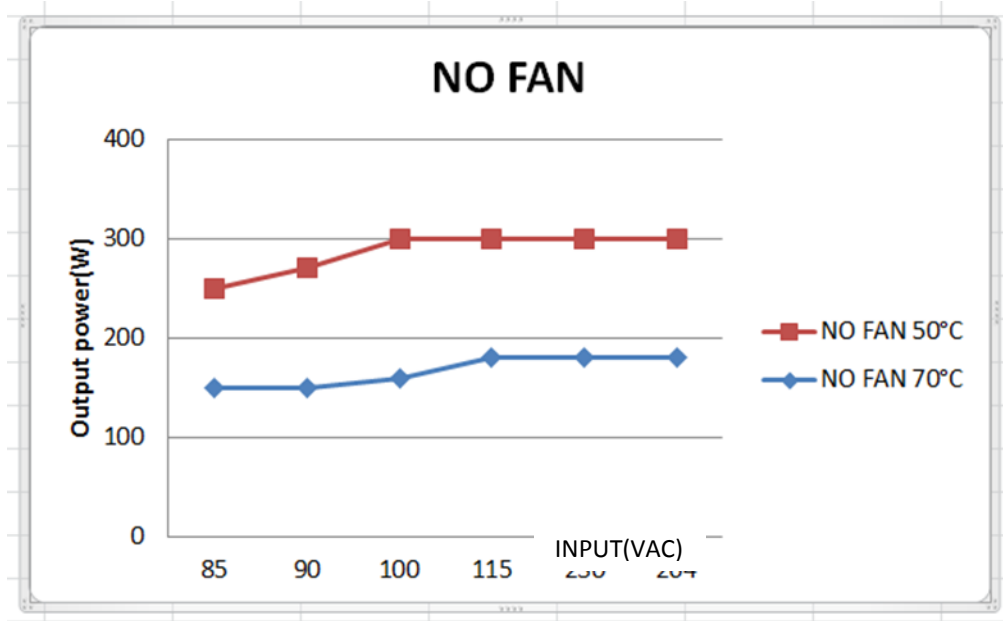
Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
TUV	EN 60601-1: 2006+A11+A1+A12	Designed to meet (Medical 3.1 rd).
CB	IEC 60601-1: 2005+CORR. 1: 2006+CORR. 2: 2007+A1: 2012	
UL/cUL	ANSI/AAMI ES60601-1, CAN/CSA-C22. 2 No. 60601-1	
CE	EN 60601-1: 2006+A11+A1+A12	

- Note:
- If you want to use a metal plate under this power, the distance in between accessible metal part needs to add at least 4mm of 1xMOPP to meet Class II.

Derating curve

(TBD)



Mechanical Details

All dimensions are in Inches [mm]

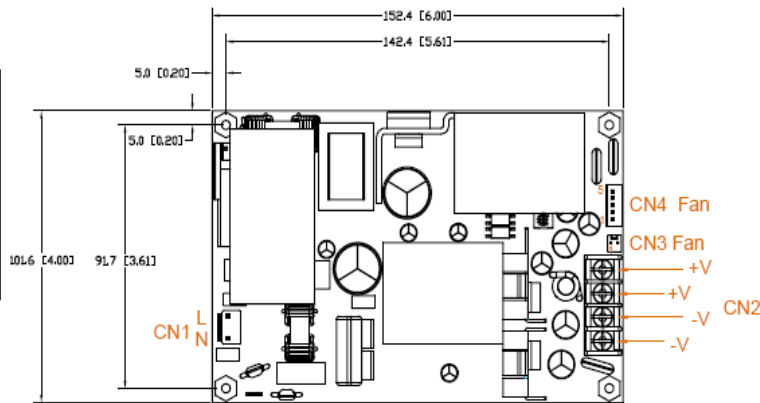
Tolerance ± 0.02 [± 0.5]

With Fan, CLASS II

Ac Input Connector CN1
 Metes with MOLEX
 09-50-1031(5195-03) OR 09-52-4034(5239-03)
 OR Equivalent
 JST: VHR-3N OR Equivalent (Note)

PIN number	PIN assignment
1	AC in(L)
2	AC in(N)

Note: Exist with model no.suffixed -J,
 please see comparison in Model no.coding:



Singal Connector CN4
 MOLEX5045-05A or Equivalent

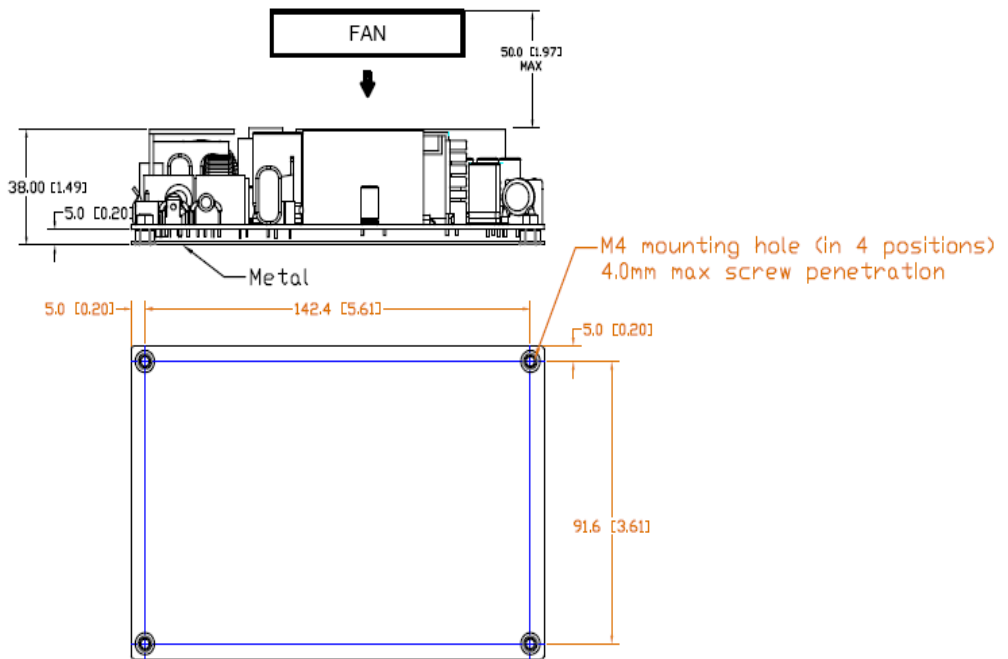
PIN number	PIN assignment
1	Fan 12V (V _{Fan})
2	0V
3	+5VSB(V ₂)
4	PG/PF
5	Remote

Singal Connector CN3
 MOLEX5045-02A or Equivalent

PIN number	PIN assignment
1	Fan 12V (V _{Fan})
2	0V

Dc Output Terminal Blocks CN2
 DINKLE DT-35
 European type by request

PIN number	PIN assignment
1	+V
2	+V
3	-V
4	-V



MPM-K455(-SB)

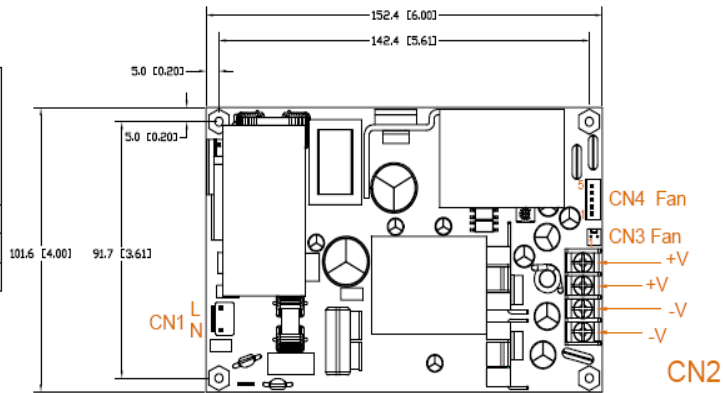
450W Medical AC / DC

All dimensions are in Inches [mm]
 Tolerance ± 0.02 [± 0.5]
 No Fan, CLASS II

Ac Input Connector CN1
 Mates with MOLEX
 09-50-1031(5195-03) OR 09-52-4034(5239-03)
 OR Equivalent
 JST: VHR-3N OR Equivalent (Note)

PIN number	PIN assignment
1	AC in(L)
2	AC in(N)

Note: Exist with model no. suffixed -J,
 please see comparison in Model no. coding:



Singal Connector CN4
 MOLEX5045-05A or Equivalent

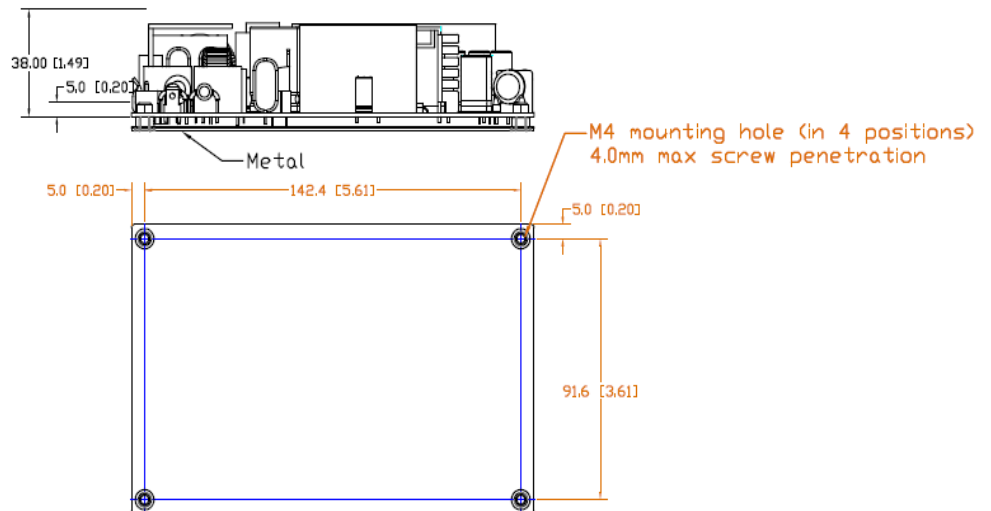
PIN number	PIN assignment
1	Fan 12V (V_{Fan})
2	0V
3	+5VSB(V_2)
4	PG/PF
5	Remote

Singal Connector CN3
 MOLEX5045-02A or Equivalent

PIN number	PIN assignment
1	Fan 12V (V_{Fan})
2	0V

Dc Output Terminal Blocks CN2
 DINKLE DT-35
 European type by request

PIN number	PIN assignment
1	+V
2	+V
3	-V
4	-V



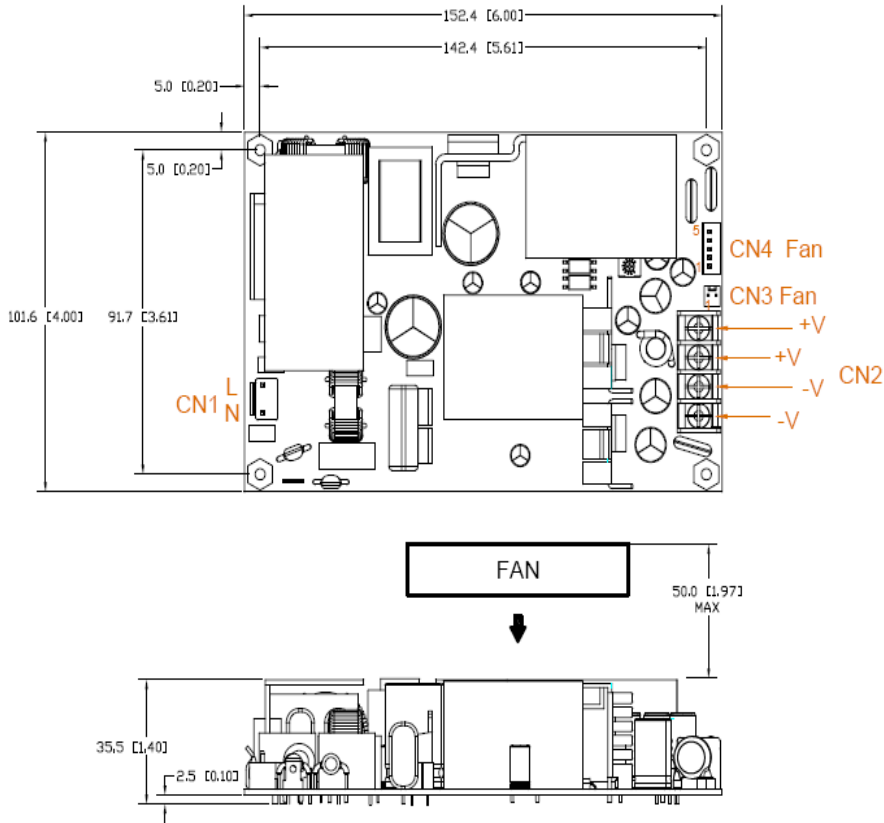
MPM-K455(-SB)

450W Medical AC / DC

All dimensions are in Inches [mm]
 Tolerance ± 0.02 [± 0.5]
 With Fan, CLASS I

Ac Input Connector CN1 Mates with MOLEX 09-50-1031(5195-03) OR 09-52-4034(6239-03) OR Equivalent JST: VHR-3N OR Equivalent (Note)	
PIN number	PIN assignment
1	AC in(L)
2	AC in(N)

Note: Exist with model no. suffixed -J,
 please see comparison in Model no. coding:



Signal Connector CN4 MOLEX5045-05A or Equivalent	
PIN number	PIN assignment
1	Fan 12V (V _{FAN})
2	0V
3	+5VSB(V ₂)
4	PG/PF
5	Remote

Signal Connector CN3 MOLEX5045-02A or Equivalent	
PIN number	PIN assignment
1	Fan 12V (V _{FAN})
2	0V

Dc Output Terminal Blocks CN2 DINKLE DT-35 European type by request	
PIN number	PIN assignment
1	+V
2	+V
3	-V
4	-V

MPM-K455(-SB)

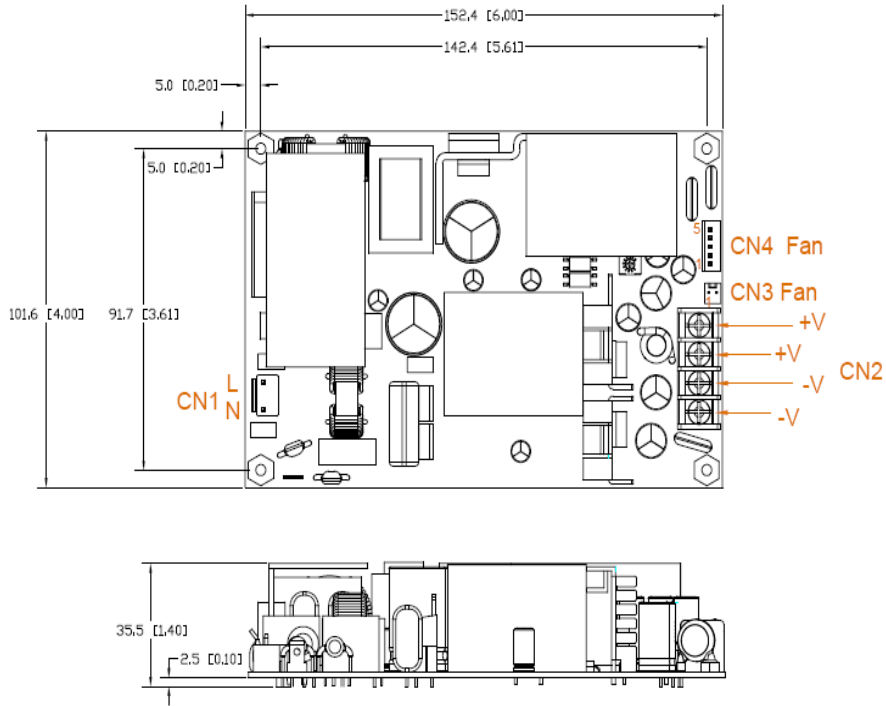
450W Medical AC / DC

All dimensions are in Inches [mm]
 Tolerance ± 0.02 [± 0.5]
 No Fan, CLASS I

Ac Input Connector CN1
 Meets with MOLEX
 09-50-1031(5195-03) OR 09-52-4034(5239-03)
 OR Equivalent
 JST: VHR-3N OR Equivalent (Note)

PIN number	PIN assignment
1	AC in(L)
2	AC in(N)

Note: Exist with model no. suffixed -J,
 please see comparison in Model no. coding:



Single Connector CN4
 MOLEX5045-05A or Equivalent

PIN number	PIN assignment
1	Fan 12V (V _{FAN})
2	0V
3	+5VSB(V _S)
4	PG/PF
5	Remote

Single Connector CN3
 MOLEX5045-02A or Equivalent

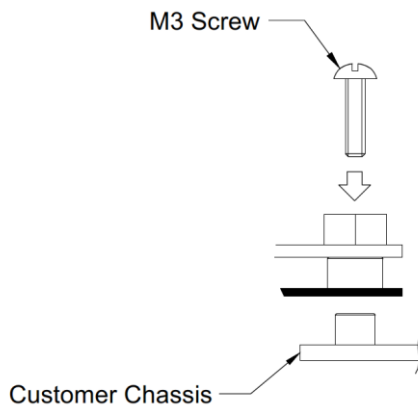
PIN number	PIN assignment
1	Fan 12V (V _{FAN})
2	0V

Dc Output Terminal Blocks CN2
 DINKLE DT-35
 European type by request

PIN number	PIN assignment
1	+V
2	+V
3	-V
4	-V

Application notes :

Application (1)



Application (2)

