



# SPECIFICATION

For

SWITCHING POWER SUPPLY

**M/N: MPI-822H**

## Revision history

REV.	June 25 <sup>th</sup> 2009	Added 170W convection cooled at 40°C condition
REV.	June 4 <sup>th</sup> 2010	Added minimum load condition in description.
REV.	June 9 <sup>th</sup> 2010	Correction of height and adding note in section 4.
REV.	Aug. 13 <sup>th</sup> 2010	Ripple & noise p-p of +12V was 100mV is 120mV, and -12V was 150mV is 120mV.
REV.	Oct. 11 <sup>st</sup> 2010	Changing the over temperature protection point and upgrade to 125°C. Changing the hi-pot test level from 4242VDC to 3000VAC.
REV.	Nov. 8 <sup>th</sup> 2010	Changing the +5V initial setting accuracy between 4.95V-5.05V. Define the size of cooling fan. Describing conditions of ripple & initial setting. Updating efficiency & revising the operating temperature.
REV.	Nov. 16 <sup>th</sup> 2010	Describing conditions of no-load power consumption.
REV.	Dec. 21 <sup>st</sup> 2010	Revised the value of Hold-up time and Efficiency.
REV.	Jan. 13 <sup>th</sup> 2011	Describing conditions of air-cooling.
REV.	Feb. 10 <sup>th</sup> 2011	Revised the safety approvals.
REV.	Feb. 23 <sup>rd</sup> 2011	Updating the mechanical drawing.
REV.	Mar. 15 <sup>th</sup> 2011	Revised the specification of the inrush current and the hold-up time.
REV.	Aug. 9 <sup>th</sup> 2011	Added part number for optional cover provided.
REV.	Aug. 12 <sup>th</sup> 2011	Updated the efficiency.



## FEATURES

- 220W open frame ATX
- Active PFC Class D
- Meets EMI EN 55022 Class B
- U chassis design for thermal conduction
- Input wattage <0.5W at no load condition
- Optional cover provided is available (see section 8)

## 1. Description

MPI-822H is a 220W ATX power supply with active PFC for industrial and embedded system application. The device utilizes a thermally efficient U channel chassis design.

Output Voltage	Mini. Output Current <sup>(Note 4)</sup>	Rated Output Current	Max Output Current <sup>(Note 1)</sup>	Line Regulation	Load Regulation	Ripple & Noise p-p <sup>(Note 2)</sup>	Initial Setting Accuracy <sup>(Note 3)</sup>
+5V	2.5W	11A	14A	±1%	±2%	50mV	4.95V to 5.05V
+12V		5A	12A	±1%	±4%	120mV	11.6V to 12.6V
-12V	0A	0.5A	1A	±1%	±5%	120mV	-11.4V to -12.6V
+3.3V	0A	7.5A	12A	±1%	±4%	50mV	3.20V to 3.40V
+5Vsb	0A	0.75A	2A	±1%	±4%	100mV	4.80V to 5.20V

**Total Output Power:** Max. 220W with force air cooling<sup>(Note 5)</sup>; 170W convection cooled at 40°C and 150W convection cooled at 50°C environment temperature<sup>(Note 6)</sup>.

Note: 1) The maximum total combined output power on the +3.3V and +5V rails is 90W at convection cooled condition, and 100W with force air cooling.<sup>(Note 5)</sup>

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. Test with nominal input (115/230VAC).

3) Initial Setting Accuracy is at Input 115VAC and all output at 60% rated load.

4) Total minimum load 2.5 watts, which is combination or any one from +5V & +12V output, is required.

5) It is required 23.3CFM at environment temperature below 65°C; 38.8CFM at 65~70°C.

6) For the optional cover provided version, please see the performance curves in section 6 for detail.

## 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		63	Hz
Hold Up Time	Nominal AC Input Voltage (115VAC/230VAC), rated load.	20/30	24/36		ms
Input Current	Nominal AC Input Voltage (115VAC/230VAC), rated load.			4/2	A
Inrush Current	Nominal AC Input Voltage (115VAC/230VAC), one cycle at 25°C.			30/60	A
Input Protect	Non-user serviceable internally located AC input line fuse.				
No-load consumption	Nominal AC Input Voltage (115VAC/230VAC), no any output except 5Vsb, and no any loading in secondary side.	0.14		0.5	W

## 3. Output Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Efficiency	At 200VAC, Rated load, without cover provided.			83%	%
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) for each output, and others voltage setting at 60%.				See Chart of Description
Turn-on Delay	Time required for initial output voltage stabilization	0.3		5	Sec



#### 4. Interface Signals and Internal Protection

Parameter	Conditions/Description
Power On/Off	The power supply will be turned on when the power On/Off pin is connected to secondary GND.
Power Good Signal	When power is turned on, the power good signal will go high 100ms to 500ms after all output DC voltages are within regulation limits.
Power Fail Signal	The power fail signal will go low at least 1ms before any of the output voltages fall below the regulation limits.
Short Circuit Protection	Fully protected against short circuit. Latch off mode upon of short circuit condition <sup>(Note 1)</sup> .
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. The trigger point is 7V max. at +5V. If the OVP occur, PSU cannot be recovered.
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. After the temperature going down, the power supply will restart automatically.

Note: 1) Only +5Vsb and -12V is protected by auto recovery.

#### 5. Safety Approvals, EMI and EMS Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Approvals	UL, UL 60950-1, 2nd edition				Approved
	EN 60950-1: 2006+ A1: 2010, 2 <sup>nd</sup> edition				Declaration of conformity
Hi-Pot	Input to output	3000			VAC
EMI <sup>(Note 1.)</sup>	EN 55022 / CISPR 22 & FCC Part 15	B			Class
PFC	EN 61000-3-2 & EN 610003-3	D			
EMS	IEC 61000-4-2, 8KV air discharge and 6KV contact discharge	A			Criteria
	IEC 61000-4-3, 3V/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, 10V	A			
	IEC 61000-4-8, 10A/M	A			
	IEC 61000-4-11, Voltage dips > 95%, 0.5 cycle	A			
	Voltage dips > 30%, 25 cycles	A			
	Voltage Interruption > 95%, 250 cycles	B			

Note: 1) 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.

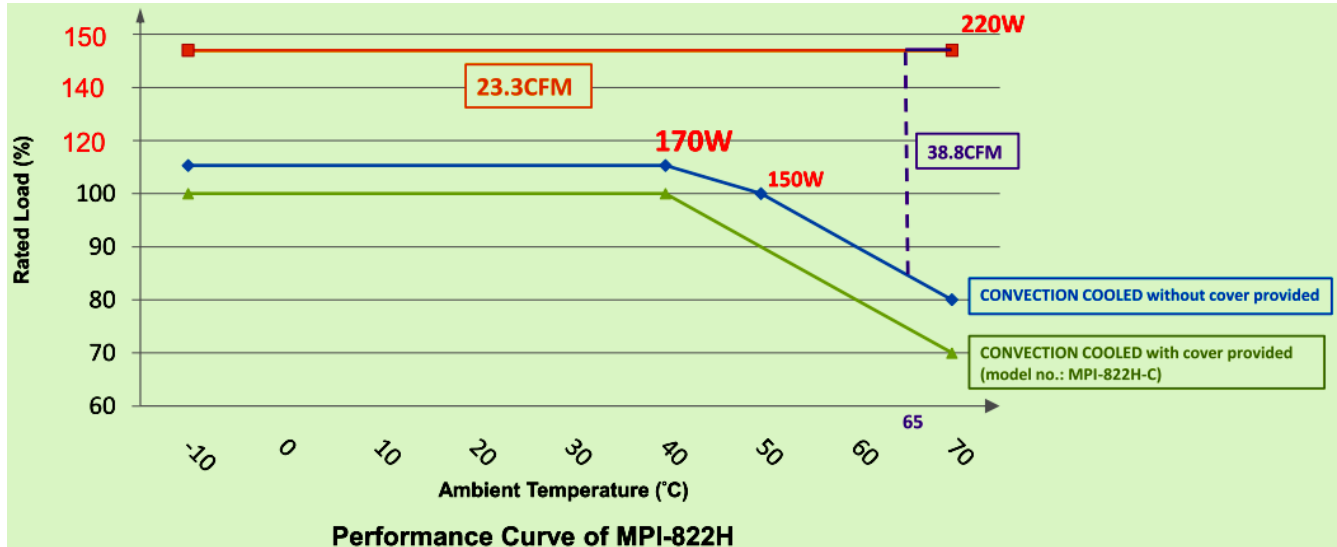


6. Environment Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Operating Temperature	Derate linearly above 50°C (Note 2.)	-10 (Note 1.)		+70	°C
Storage Temperature		-20		+70	°C
Relative Humidity	Non-condensing.	5		95	%RH
Altitude	Operating Non-operating			6.5K 40K	feet

Note: 1) The min. operating temperature would be 0°C if input is lower than 115Vac.  
 2) Derate linearly above 40°C with cover provided version.

Performance curves



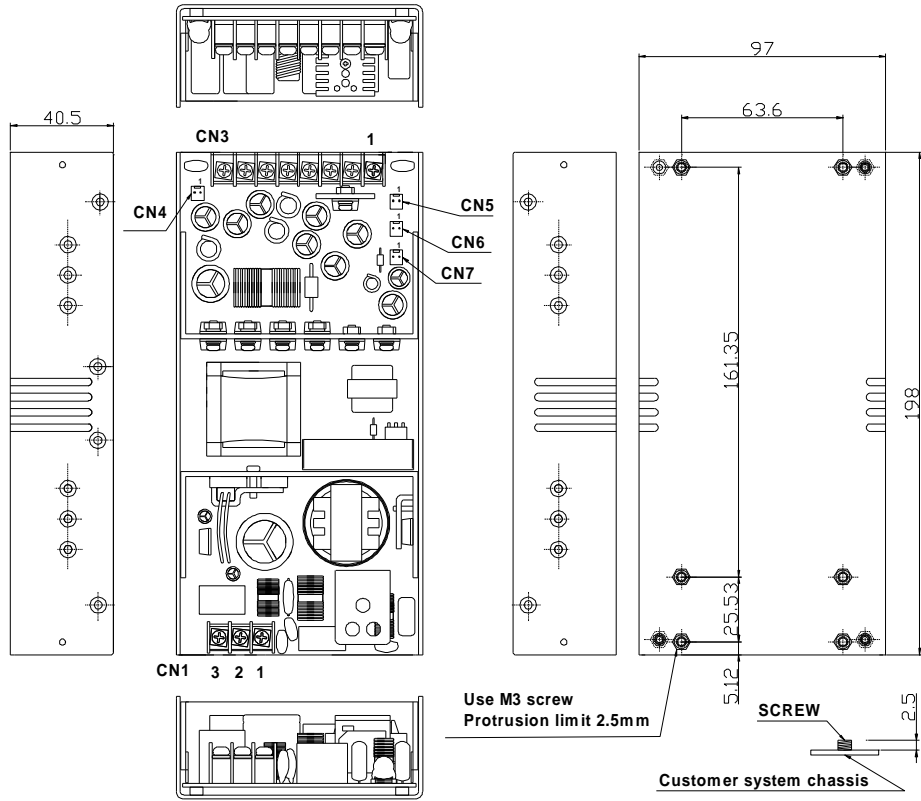
7. Mechanical Specification

Parameter	Conditions/Description																																								
Dimension	198 (L) x 97 (W) x 40.5 (H) mm, Tolerance +/- 0.4mm.																																								
Connector	CN1 --- AC input: 3 Positions Terminal blocks. CN3 --- DC output: 8 Positions Terminal blocks. CN4 --- Fan Connector: Molex 5045-02A or equivalent CN5 --- PG/PF: Molex 5045-02A or equivalent CN6 --- PS ON/OFF: Molex 5045-02A or equivalent CN7 --- 5Vsb: Molex 5045-02A or equivalent																																								
Pin Assignment	<table border="0"> <tr> <td>CN1</td> <td>Pin</td> <td>1. L</td> <td>2. N</td> <td>3. GND</td> </tr> <tr> <td>CN3</td> <td>Pin</td> <td>1. -12V</td> <td>2. GND</td> <td>3. 3.3V</td> </tr> <tr> <td></td> <td></td> <td>4. GND</td> <td>5. +5V</td> <td>6. +5V</td> </tr> <tr> <td></td> <td></td> <td>7. +12V</td> <td>8. GND</td> <td></td> </tr> <tr> <td>CN4 (Fan)</td> <td>Pin</td> <td>1. +12V</td> <td>2. GND</td> <td></td> </tr> <tr> <td>CN5</td> <td>Pin</td> <td>1. GND</td> <td>2. PG / F</td> <td></td> </tr> <tr> <td>CN6</td> <td>Pin</td> <td>1. GND</td> <td>2. ON / OFF</td> <td></td> </tr> <tr> <td>CN7</td> <td>Pin</td> <td>1. GND</td> <td>2. 5Vsb</td> <td></td> </tr> </table>	CN1	Pin	1. L	2. N	3. GND	CN3	Pin	1. -12V	2. GND	3. 3.3V			4. GND	5. +5V	6. +5V			7. +12V	8. GND		CN4 (Fan)	Pin	1. +12V	2. GND		CN5	Pin	1. GND	2. PG / F		CN6	Pin	1. GND	2. ON / OFF		CN7	Pin	1. GND	2. 5Vsb	
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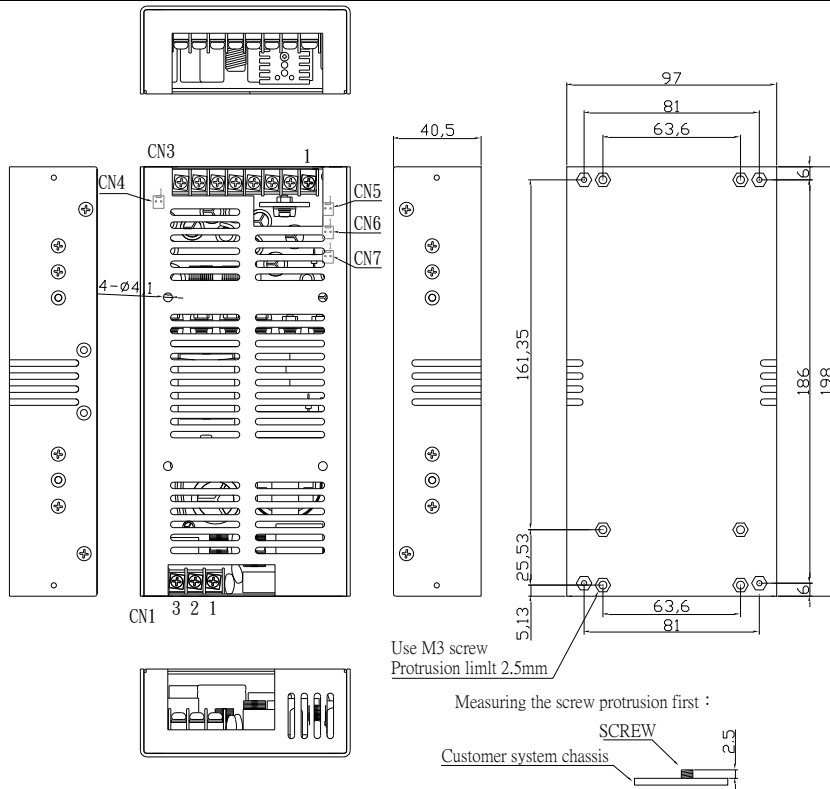


Mechanical

MPI-822H



MPI-822H-C





## 8. Options

Parameter	Conditions/Description
Cable (No. 866-815H)	ATX connector, HDD connector x 2, FDD connector x 1, SATA connector x 1
Cover (P/N:831-815U)	Order part number with suffix code "-C", with cover assembled.