

## SPECIFICATION

For

## SWITCHING POWER SUPPLY

### M/N: MPD-815H

#### Revision History

Version	Revise Date	Change Items
Rev. 01	Apr. 8. 2009	Update mechanical dimension (Height).
Rev. 02	Sep. 28. 2010	Revising the specification of fix screws.
Rev. 03	Mar. 28. 2011	Updated the safety approvals status.
Rev. 04	Feb. 14. 2018	1.Changed form. 2. Added EN 55032.
Rev. 05	Dec. 22. 2018	Added output current to output field.



## FEATURES

- ✓ 150W DC/DC converter convection cooled for P4 application.
- ✓ Power Good/Power Fail signal.
- ✓ +5V Stand by & Remote On/Off.
- ✓ MTBF>130,000 hr. MIL-217F at 50°C.
- ✓ Reverse Input (at I/P 18~36VDC) & Thermal protection.



### Models & Ratings

Model Number	Wattage (Rated / Max)	Output Voltage		Min. Current	Rated Current	Max. Current <sup>(Note1)</sup>
		V1	V2			
MPD-815H	150 W	V1	+5 V	1.0 A	11.0 A	14.0 A
		V2	+12 V	0 A	5.0 A	10.0 A
		V3	-12 V	0 A	0.5 A	1.0 A
		V4	+3.3 V	0 A	7.5 A	12.0 A
		V5	+5Vsb	0 A	0.75 A	1.5 A

Total Output Power: 150W at 50°C environment temperature.

Note:

1. The maximum total combined output power on the +3.3V and +5V rails is 90W.

### Summary

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Range	18	24	36	VDC	Continuous input range.
Efficiency		78		%	Rated load, 24VDC.
Operation Temperature	0		70	°C	Derate linearly above 50°C by 2.5% per °C to a maximum temperature of 70°C at 50% load.
Weight		653		g	
Dimensions	198 (L) x 97 (W) x 40.5 (H) mm, Tolerance +/- 0.4mm.				
EMC	EN 55022 / EN 55032 / CISPR 22 & FCC Part 15				
Safety Approvals	EN 60950-1: 2006+A1: 2009, UL 60950-1, 1st Edition, 2006-07-07, CSA C22.2 No. 60950-1-03, 1 <sup>st</sup> Edition, 2003-11				

## Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage	18	24	36	VDC	Continuous input range.
Hold Up Time	5			ms	Nominal DC Input Voltage (24VDC), rated load.
Input Current			15	A	Nominal DC Input Voltage (24VDC) rated load.
Inrush Current			60	A	Nominal DC Input Voltage (24VDC), one cycle at 25°C.

## Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage		+5 V		DC	
		+12 V			
		-12 V			
		+3.3 V			
		+5Vsb			
Output Current		11.0	14.0	A	
		5.0	10.0		
		0.5	1.0		
		7.5	12.0		
		0.75	1.5		
Initial Set Accuracy	5.05		5.15	VDC	Initial Setting Accuracy is at Input 24VDC and all output at 60% rated load.
	11.8		12.8		
	-11.4		-12.6		
	3.20		3.5		
	4.80		5.20		
Minimum Load		1.0		A	At Output Voltage +5V At Output Voltage +12 V, -12 V, +3.3 V, +5Vsb
		0			
Line Regulation		±1 <sup>(V1)</sup> ±1 <sup>(V2)</sup> ±1 <sup>(V3)</sup> ±1 <sup>(V4)</sup> ±1 <sup>(V5)</sup>		%	Less than ±1% at rated load with ±10% changing in input voltage.
Load Regulation		±2.0 <sup>(V1)</sup> ±4.0 <sup>(V2)</sup> ±5.0 <sup>(V3)</sup> ±4.0 <sup>(V4)</sup> ±4.0 <sup>(V5)</sup>		%	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%.
Ripple & Noise		50 <sup>(V1)</sup> 100 <sup>(V2)</sup> 150 <sup>(V3)</sup> 50 <sup>(V4)</sup> 100 <sup>(V5)</sup>		mV	Measured by a 20MHz bandwidth limited oscilloscope and the each output is connected with a 10µF Electrolytic Capacitor and a 0.1µF Ceramic Capacitor.
Short Circuit Protection	Fully protected against short circuit. Latch off mode upon of short circuit 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. The trigger point is about 5.4-7V 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. The protection point is at the temperature of the T1 over 125°C. After the temperature of T1 going down, the power supply will restart automatically.				
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 1 mS before any of the output voltages fall below the regulation limits.				

## General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		78		%	Rated load, 24VDC.
Isolation	500			VDC	
Switching Frequency		65		KHZ	

## Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operation Temperature	0		70	°C	Derate linearly above 50°C by 2.5% per °C to a maximum temperature of 70°C at 50% load.
Storage Temperature	-20		+70	°C	
Relative Humidity	5		95	%RH	Non-condensing.
Operating Altitude		10000 / 40000		Feet	

## EMC: Emissions

Phenomenon	Standard	Class	Notes & Conditions
Conducted	EN 55022 / EN 55032 CISPR 22 & FCC Part 15	A	
Radiated	EN 55022 / EN 55032 CISPR 22 & FCC Part 15	B	

## EMC: Immunity

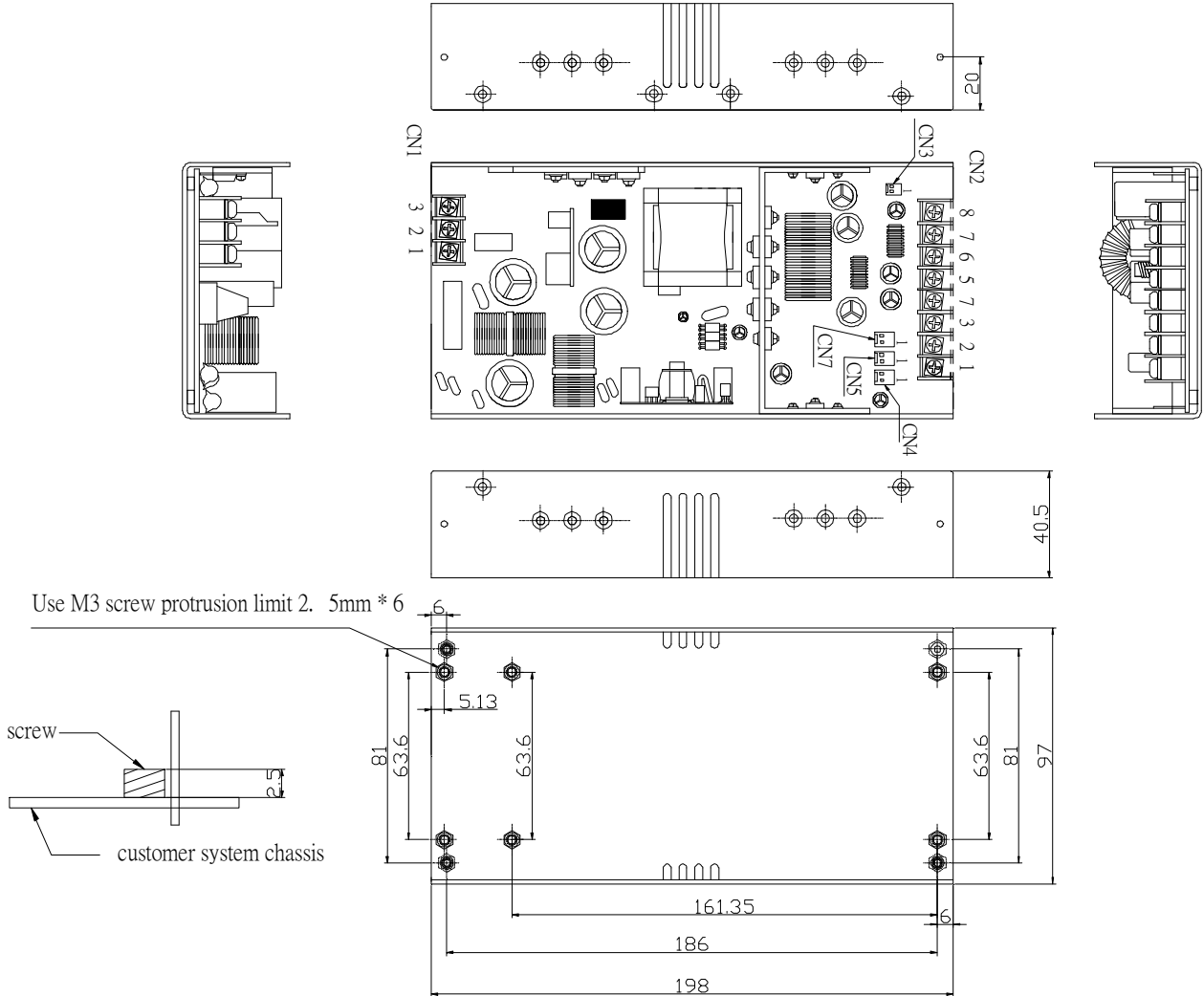
Phenomenon	Standard	Criteria	Notes & Conditions
ESD	IEC 61000-4-2	A	8KV air discharge and 6KV contact discharge
Radiated	IEC 61000-4-3	A	3V/m
EFT	IEC 61000-4-4	B	2KV
Surges	IEC 61000-4-5	B	Line to GND 1KV; Line to Line 0.5KV
Conducted	IEC 61000-4-6	A	10V

## Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
TUV	EN 60950-1: 2006+A1: 2009	Approved.
UL/cUL	UL 60950-1, 1st Edition, 2006-07-07 CSA C22.2 No. 60950-1-03, 1st Edition, 2003-11	Approved.

## Mechanical Details

SIZE : 198 (L) x 97 (W) x 40.5 (H) mm, Tolerance +/- 0.4mm.



Parameter	Conditions/Description				
Dimension	198 (L) x 97 (W) x 40.5 (H) mm, Tolerance +/- 0.4mm.				
Connector	CN1 --- DC input:	3 Positions Terminal blocks.			
	CN2 --- DC output:	8 Positions Terminal blocks.			
	CN3 --- Fan Connector:	Molex 5045-02A or equivalent			
	CN4 --- DC output:	Molex 5045-02A or equivalent			
	CN5 --- PS ON/OFF:	Molex 5045-02A or equivalent			
	CN7 --- PG/PF connector:	Molex 5045-02A or equivalent			
Pin Assignment	CN1	Pin	1. +	2. -	3. GND
	CN2	Pin	1. -12V	4. GND	7. +12V
			2. GND	5. +5V	8. GND
			3. +3.3V	6. +5V	
	CN3	Pin	1. +12V	2. GND	
	CN4	Pin	1. +5Vsb	2. GND	
CN5	Pin	1. +5V	2. GND		
CN7	Pin	1. +5V	2. GND		

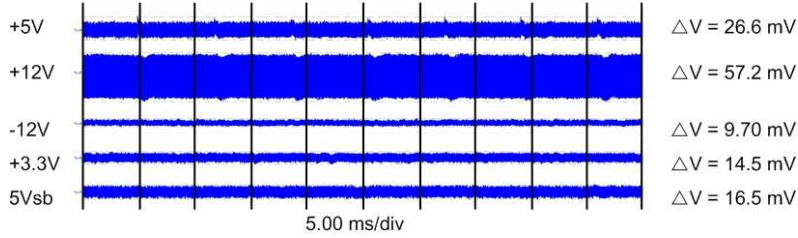
### Options

Parameter	Conditions/Description
Cable (No. 866-815H)	ATX connector, HDD connector x 2, FDD connector x 1
Cover (No. 831-815U)	Cover assembling with MPD-815H

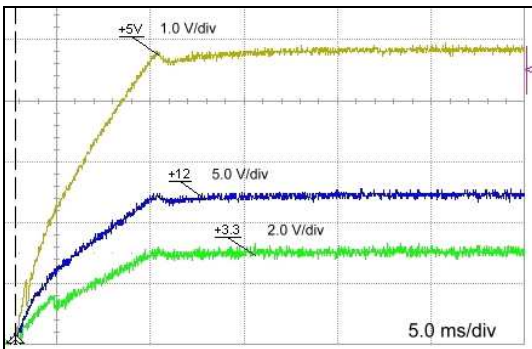
## Performance

### Line frequency ripple

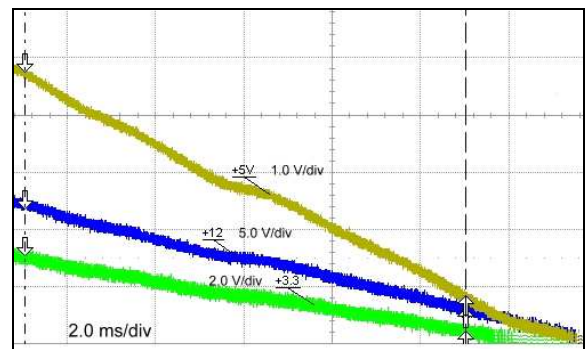
Ripple and Noise @24V Line In, Rated Load, Room Temperature



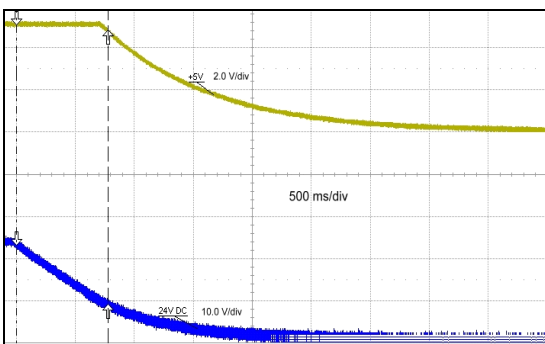
### Output turn on wave form



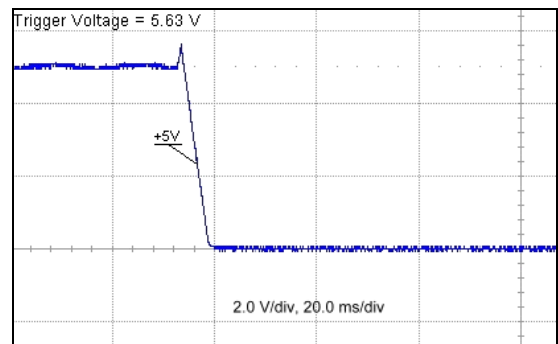
### Output turn off wave form



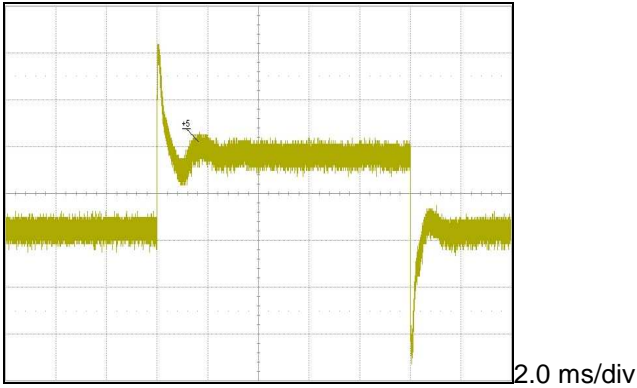
### Hold-up time



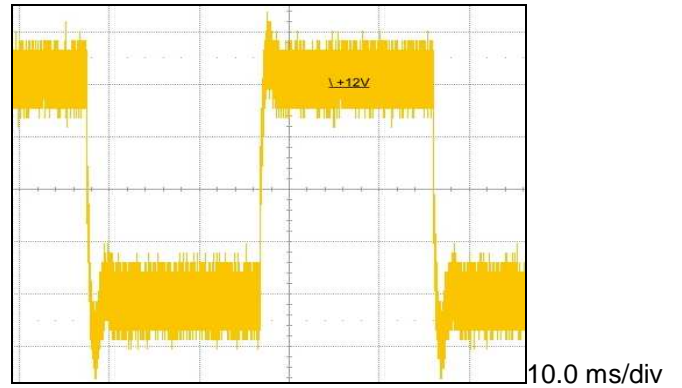
### Over voltage protection



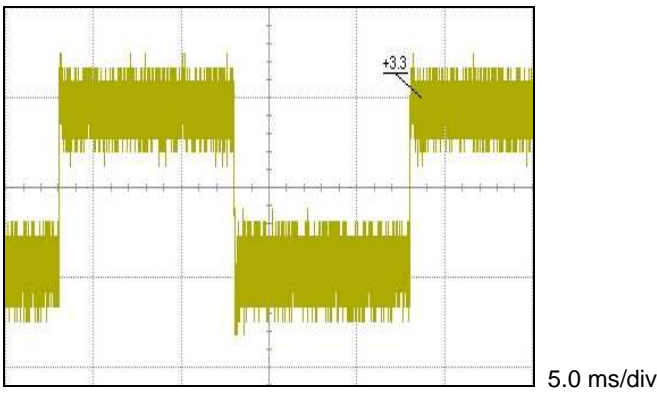
+5V step response



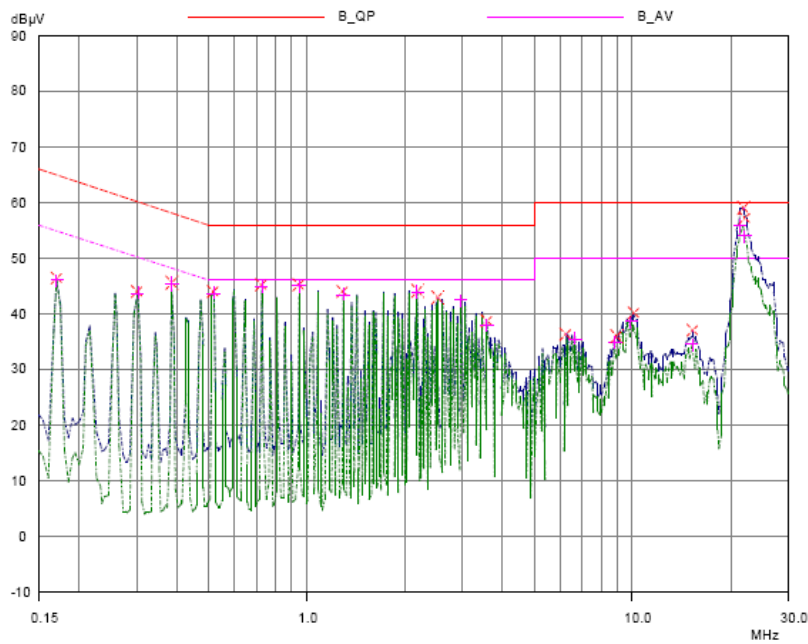
+12V step response



+3.3V step response



EMI conduction performance (Pass Class A, 10dB lower than Class B as below)





## Thermal Considerations

In order to ensure safe operation of the PSU in the end-use equipment, the temperature of the components listed in the table below must not be exceeded.

Temperature should be monitored using J type thermocouples placed on the hottest part of the component (out of any direct air flow). See Mechanical Details for component locations.

Temperature Measurements at max. amb.	
Component	Max Temperature
T1	110°C
Q2	120°C
D9	120°C
C17, C20	105°C
C10	105°C