

**SPECIFICATION**  
**For**  
**SWITCHING POWER SUPPLY**

**M/N: MPD-S103**

**Revision History**

Version	Revise Date	Change Items
Rev. 01	Feb. 26. 2016	Established.
Rev. 02	Mar. 9. 2016	Changed Radiation to EMI in page 2.
Rev. 03	May. 18. 2016	1.Added Performance Curve (with fan) at 70°C. 2.Revised Operating Temperature Conditions/Description.
Rev. 04	Jul. 19. 2016	1.Modify Mechanical Drawing. 2.Added Vibration testing.
Rev. 05	Dec. 20. 2016	1.Changed 60950-1 to A2: 2013. 2. Changed IEC 61000-4-3: 2002 to 10V/m. 3. Changed IEC 61000-4-6: 2006 to 10V.
Rev. 06	Apr. 20. 2017	Deleted "Optional".
Rev. 07	Nov. 2. 2017	Changed EN 55022 / CISPR 22 to EN 55032 / CISPR 32.
Rev. 08	Dec. 22. 2017	1. Changed form. 2. Added EN 55032.
Rev. 09	Dec. 24. 2018	Added output current to output field.
Rev. 10	April. 01. 2020	Added CE-LVD EN 62368-1 approved.



## FEATURES

- ✓ 100W with forced air cooling and 70W convection cooled isolated DC/DC converter cooled.
- ✓ Fully isolated Primary to Secondary; Primary to Earth Ground.
- ✓ Input polarity reversed protection.
- ✓ Compact size 2 x 4 inch.
- ✓ CE-LVD EN 62368-1:2014+A11:2017.

## Models & Ratings

Model Number	Wattage (Rated / Max)	Output Voltage	Min. Current	Rated Current	Max. Current
MPD-S103	70 W / 100 W	+12 V	0 A	5.8 A	8.3 A <sup>(Note.1)</sup>

Total Output Power: 100W with at 50°C environment temperature. <sup>(Note.2)</sup>

Note:

1. When output current above rated output current, it has to force air cooling 13.6 CFM.
2. The total DC continuous power shall be kept with 70 W at input from 18 V to 32 DC; 65 W at input from 12 to 17.9 VDC; 55W at input from 9-11.9VDC. convection cooled. When above 70 W with 13.6 CFM force air cooling.
3. Model no. coding:

**MPD-S10X**

①

①

X =	Output (V)
3	+12

## Summary

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Range	9	12 / 24	32	VDC	Continuous input range.
Efficiency		88		%	At input voltage 24VDC, rated load condition, above 1 hr. warm up.
Operation Temperature	-10		+70	°C	Derate linearly above 50°C 70W at input from 18 to 32 Vdc By 1.25% per °C 65W at input from 12 to 17.9 Vdc By 1.25% per °C 55W at input from 9 to 11.9 Vdc By 1.25% per °C to a maximum temperature of 70°C
Weight		139.0		g	
Dimensions	101.6 (L) x 50.8 (W) x 32.3 (H) mm, Tolerance +/- 0.5mm.				
EMC	EN 55022 / EN 55032, CISPR 22 & FCC Part 15, IEC 61000-4-2: 2001, IEC 61000-4-3: 2002, IEC 61000-4-4: 2004, IEC 61000-4-5: 2001, IEC 61000-4-6: 2006				
Safety Approvals	CE-LVD EN 62368-1:2014+A11:2017				
	IEC 60950-1: 2005+A2: 2013, 2 <sup>nd</sup> , EN 60950-1: 2006+A2 2013, UL 60950-1, 2 <sup>nd</sup> Edition, 2007-03-27, CSA C22.2 No.60950-1-07, 2 <sup>nd</sup> Edition, 2007-03				

## Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage	9	12 / 24	32	VDC	Continuous input range.
Input Current			14	A	DC Input Voltage 9VDC, Max load.
Inrush Current			12	A	Cold start at 25°C.
Input Reverse Polarity Protection	When incorrect input polarity installation, the PSU will be not damaged and no output voltage.				

## Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage		12		VDC	
Output Current		5.8	8.3	A	
Initial Set Accuracy	11.76		12.24	VDC	At factory, all outputs in 60% rated load. Each output voltage is set in the initial setting accuracy.
Minimum Load		0		A	
Line Regulation		±1.0		%	Less than ±1% at rated load with ±10% changing in input voltage +12V and +24V.
Load Regulation		±1.0		%	Measured from 60% to 100% rated load and from 60% to 20% rated load (60% ±40% rated load).
Ripple & Noise		120		mV	Measured at rated load by a 20MHz bandwidth limited oscilloscope and each output is connected with a 10µF Electrolytic Capacitor and a 0.1µF Ceramic Capacitor.
Overvoltage 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.				
Short Circuit or Over Load Protection	The power supply will go into hiccup mode against short circuit or over load conditions, and will auto-recovery while fault conditions moved.				

## General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		88		%	At input voltage 24VDC, rated load condition, above 1 hr. warm up.
Isolation	IP to OP	500		VAC	
	IP to Ground	500		VAC	
Switching Frequency		65		KHZ	

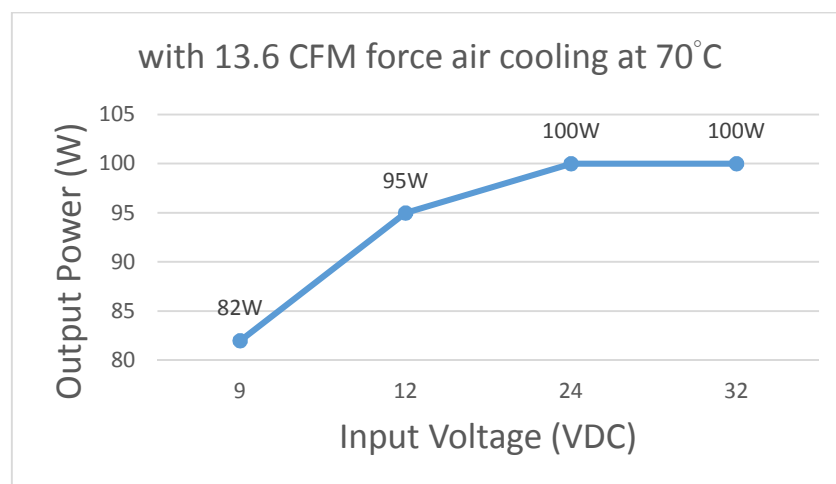
## Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-10		+70	°C	Derate linearly above 50°C 70W at input from 18 to 32 Vdc By 1.25% per °C 65W at input from 12 to 17.9 Vdc By 1.25% per °C 55W at input from 9 to 11.9 Vdc By 1.25% per °C to a maximum temperature of 70°C
Storage Temperature	-20		+75	°C	
Relative Humidity	10		90	%RH	Non-condensing.
Cooling	13.6			CFM	Forced-cooled > 70W
Operating Altitude		5000		m	
Vibration	0.26		6.09	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:

- To start up unit, the output power should be derated to 20% rated load @  $V_{in} < 115VAC$ , or derated to 40% rated load @  $V_{in} < 230VAC$ , and don't need derated @  $V_{in} \geq 230VAC$ .

## Derating curve



Performance curves (with fan) at 70°C

## EMC: Emissions

Phenomenon	Standard	Class	Notes & Conditions
Conducted	EN 55022 / EN 55032, CISPR 22 & FCC Part 15	B	
Radiated	EN 55022 / EN 55032, CISPR 32 & FCC Part 15	B	

Note:  
 1. As a build-in type power supply, the power supply needs to be installed in a suitable enclosure to pass the EMC tests. The final assembly has to comply with the valid EMC and safety.

## EMC: Immunity

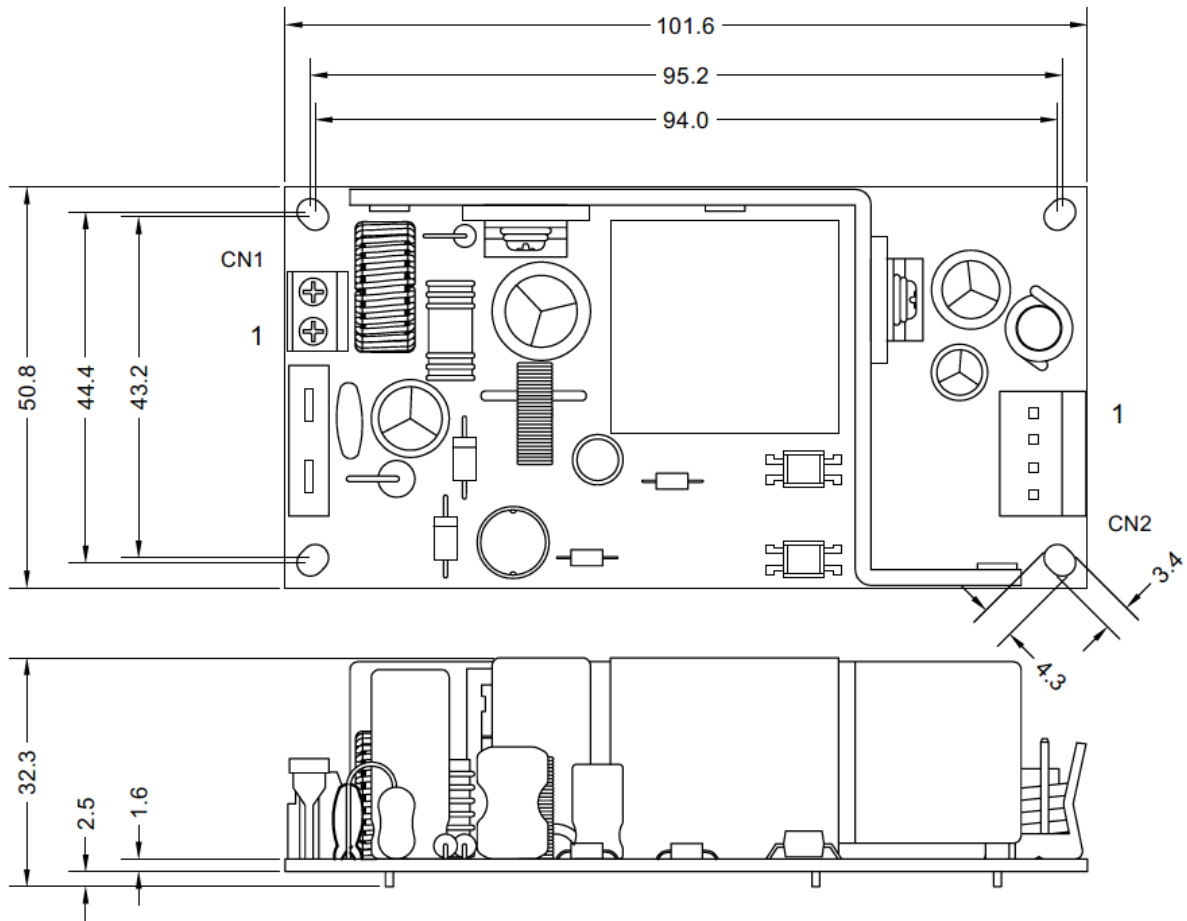
Phenomenon	Standard	Criteria	Notes & Conditions
ESD	IEC 61000-4-2: 2001	A	8KV air discharge, 6KV contact discharge
Radiated	IEC 61000-4-3: 2002	A	10V/m
EFT	IEC 61000-4-4: 2004	A	±0.5KV Line & Line
Surges	IEC 61000-4-5: 2001	A	±0.5KV Line to Line
Conducted	IEC 61000-4-6: 2006	A	10V

## Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
TUV	EN 60950-1: 2006+A2 2013	Designed to meet.
CB	IEC 60950-1: 2005+A2: 2013, 2 <sup>nd</sup>	Designed to meet.
CE-LVD	EN 62368-1:2014+A11:2017	Approved.
UL/cUL	UL 60950-1, 2 <sup>nd</sup> Edition, 2007-03-27, CSA C22.2 No.60950-1-07, 2 <sup>nd</sup> Edition, 2007-03	Designed to meet.

## Mechanical Details

SIZE : 101.6(L) x 50.8(W) x 32.3(H)mm, Tolerance +/-0.5mm.



Parameter	Conditions/Description				
Dimension	50.8 (L) x 101.6 (W) x 32.3 (H) mm, Tolerance +/- 0.5mm.				
Connector	CN1 --- DC input:		Dinkle ED500V-02 Terminal blocks.		
	CN2 --- DC output:		Molex 5273-04A or equivalent.		
Pin Assignment	CN1	Pin	1. +	2. -	(With max. torque=0.4N*m)
	CN2	Pin	1. +Vout	3. GND	
			2. +Vout	4. GND	

## 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
D5,D5A	120°C
C3	105°C
C21	105°C