AC-DC Enclosed Power Supply 500W

RoHS Compliant

Features

- Universal 85 to 305V AC or 120 to 430V DC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -40°C to +85°C
- Output short circuit, over-current, over-voltage, over temperature protection
- Low ripple & noise
- High efficiency
- Active PFC
- 150% peak load output for 1 second
- Ultra narrow shape, semi-potted process, fanless design
- High I/O isolation test voltage up to 4000V AC
- Operating up to 5000m altitude
- 3 years warranty
- Safety according to IEC60335, EN61558

MPMF500-23BxxUH-C series is one of enclosed fanless semi-potted ultra narrow AC-DC switching power supply, it is suitable for industrial and outdoor occasions where the application environment is relatively harsh. It features universal AC input and at the same time accepts DC input voltage, cost-effective, low no load power consumption, high efficiency, high reliability and double or reinforced insulation. These converters offer excellent EMC performance and meet IEC/UL/EN/BS EN62368, IEC60335, EN61558, GB4943 standards and they are widely used in areas of industrial, LED, street light control, electricity, security, telecommunications, smart home, etc.

Selection Guide

Part Number	Rated Output Power (W)*	Nominal Output Voltage and Current (Vo/Io	Output Voltage Adjustable Range (V)	Efficiency at 230V AC (%) Typ.	Room Temperature Max. Capacitive Load (uF)	Low Temperature Max. Capacitive Load (uF)
MPMF500-23B05UH-C	400	5V/80.0A	4.5-5.5	90	12000	6000
MPMF500-23B12UH-C	500.4	12V/41.7A	11.4-12.6	94	10000	4000
MPMF500-23B24UH-C	501.6	24V/20.9A	22.8-25.2	94.5	8000	3000
MPMF500-23B28UH-C	501.2	28V/17.9A	26.6-29.4	94.5	6000	2000
MPMF500-23B36UH-C	500.4	36V/13.9A	34.2-37.8	95	6000	2000
MPMF500-23B48UH-C	501.6	48V/10.45A	45.6-50.4	95.0	4000	1000
MPMF500-23B55UH-C	489.5	55V/8.9A	45.0-58.0	95.0	2000	600

Note: 1. *Under any conditions, the total power of the product should not exceed the rated output power, and the output current should not exceed the rated output current;
2. *Use suffix “C” for terminal with protective cover and 12V, 24V output.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input		85	--	305	V AC
	DC input		120		430	V DC
Input Voltage Frequency			47		63	Hz
Input Current	115V AC		--		6	A
	230V AC				3	
Inrush Current	115V AC	Cold start		30	--	
	230V AC			60		
Leakage Current	277V AC		<0.75mA			
Hot Plug	--		Unavailable			
Power Factor	115VAC	Normal temperature, full load	PF ≥ 0.98			
	230VAC		PF ≥ 0.95			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	5V	--	±2	--	%
		Other output		±1		
Line Regulation	Rated load	5V		±0.5		
		Other output		±0.3		
Load Regulation	0% - 100% load	5V		±1		
		Other output		±0.5		
Ripple & Noise*	20MHz bandwidth (peak-to-peak value), 25°C			--	200	mV
Hold-up Time	115V AC		10	12	--	ms
	230V AC		10	12		
Short Circuit Protection	Recover time <5s after the short circuit disappear		Hiccup, continuous, self-recover			
Over-current Protection			>110% Io, hiccup, self-recover			
Over-temperature Protection			Output voltage turn off, self-recover after the temperature drops			
Over-voltage Protection	5V		5.75VDC≤ Vo ≤6.75VDC		Output voltage turn off, re-power on for recover	
	12V		13.2VDC≤ Vo ≤15.6VDC			
	24V		26.4VDC≤ Vo ≤31.2VDC			
	28V		30.8VDC≤ Vo ≤36.4VDC			
	36V		39.6VDC≤ Vo ≤46.8VDC			
	48V		52.8VDC≤ Vo ≤60.0VDC			
	55V		60.0VDC≤ Vo ≤69.0VDC			

Note: 1. *Output Voltage Accuracy: including setting error, line regulation, load regulation;
2. *The "Tip and barrel method" is used for ripple and noise test, output parallel 47uF electrolytic capacitor and 0.1uF ceramic capacitor, please refer to Enclosed Switching Power Supply Application Notes for specific information;
3. *For all the above test items, please refer to our company standard "AC-DC Black Box Test Specification" for specific test specifications and methods.

General Specifications

Item		Operating Conditions			Min.	Typ.	Max.	Unit
Isolation Test	Input ⏚	Electric strength test for 1min., leakage current <10mA			2000		--	V AC
	Input - output				4000			
	Output - ⏚				1500			
Insulation Resistance	Input - ⏚	Ta= 25 ± 5°C Relative humidity: < 95%RH, no condensation Test voltage: 500V DC			50			MΩ
	Input - output							
	Output - ⏚							
Operating Temperature					-40		+85	°C
Storage Temperature					-40		+85	
Operating Humidity		Non-condensing			20		90	%RH
Storage Humidity					10		95	
Power Derating		Operating temperature derating (with heat-sink plate*)	5V	+40°C to +85°C	1.667	--	--	%/°C
			12V	+45°C to +85°C	2			
			24V/28V/36V/48V/55V	+50°C to +85°C	2.5			
		Operating temperature derating (110V AC input, without heat-sink plate)	5V (derating from 70% load)	+40°C to +85°C	1			
			12V/24V/28V/36V/48V/55V (derating from 70% load)	+50°C to +85°C	1.5			
		Operating temperature derating (230VAC input, without heat-sink plate)	5V (derating from 80% load)	+40°C to +50°C	1			
				+50°C to +85°C	1.5			
			12V (derating from 90% load)	+40°C to +85°C	1.33			
			24V/28V/36V/48V /55V (derating from 90% load)	+45°C to +85°C	1.6			
		Input voltage derating	85V AC -100V AC		1			%/V AC
Safety Standard		5V/12V/24V/36V/48V			UL62368-1, GB4943.1, IS13252 (Part1) safety approved & BS EN62368-1, EN 62368-1 (Report); Design refer to IEC60335-1, EN61558-1			
		28V/30V/55V			UL62368-1, GB4943.1 safety approved & BS EN62368-1, EN 62368-1(Report); Design refer to IEC60335-1, EN61558-1			
Safety Class					CLASS I			
MTBF		MIL-HDBK-217F@25°C			≥300,000 h			

Note: *In order to optimize the heat dissipation performance, when the aluminum plate is used for auxiliary heat dissipation, please note: 1. The size of the aluminum plate is 450mm × 450mm × 3mm; 2. The surface of the aluminum plate mast be coated with thermal grease; 3. The product must be tightly attached to the aluminum plate.

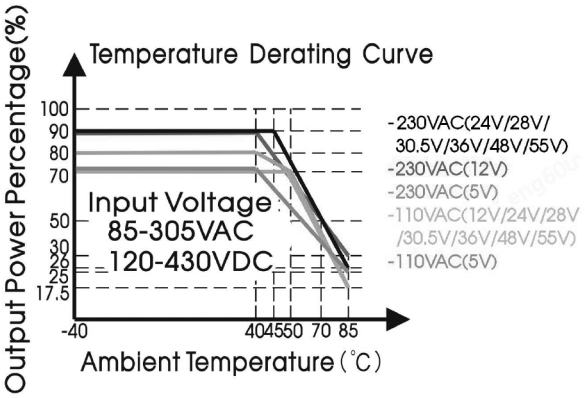
Mechanical Specifications	
Product Appearance	Enclosed
Case Material	Metal (AL6063, SGCC)
Dimensions	232mm × 81mm × 31mm
Weight	985g (Typ.)
Cooling Method*	Free air convection
Note: *Cooling method and output power derating refer to the Product Characteristic Curve.	

Electromagnetic Compatibility (EMC)

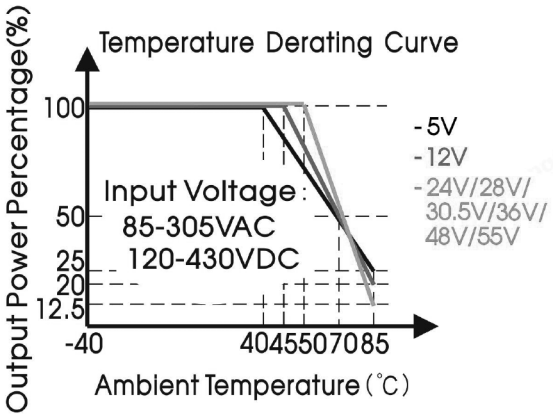
Emissions	CE	CISPR32 EN55032 CLASS B	
	RE	CISPR32 EN55032 CLASS B	
	Harmonic current	IEC/EN61000-3-2 CLASS A/D	
	Voltage flicker	IEC/EN61000-3-3	
Immunity	ESD	IEC/EN61000-4-2 Contact ±8KV/Air ±15KV	Perf. Criteria A
	RS	IEC/EN61000-4-3 10V/m	
	EFT (Input port)	IEC/EN61000-4-4 ±2KV	
	EFT (Output port)	IEC/EN61000-4-4 ±2KV	
	Surge (Input port)	IEC/EN61000-4-5 Line to line ±2KV/line to PE ±4KV	
	Surge (Output port)	IEC/EN61000-4-5 Line to line ±0.5KV/line to PE ±1KV	
	CS (Input port)	IEC/EN61000-4-6 10Vr.m.s	
	CS (Output port)	IEC/EN61000-4-6 10Vr.m.s	
	Power frequency magnetic field	IEC/EN61000-4-8 30A/m	
	Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11 0%, 70%	perf. Criteria B
	Intercom interference test	MS-SOP-DQC-007	perf. Criteria B

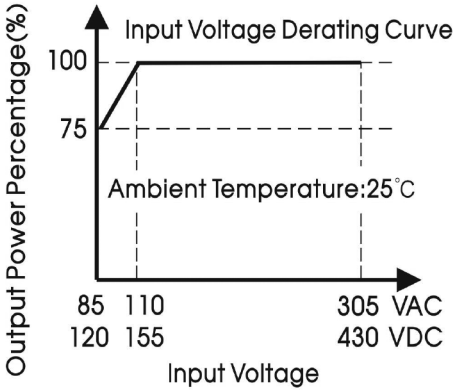
Product Characteristic Curve

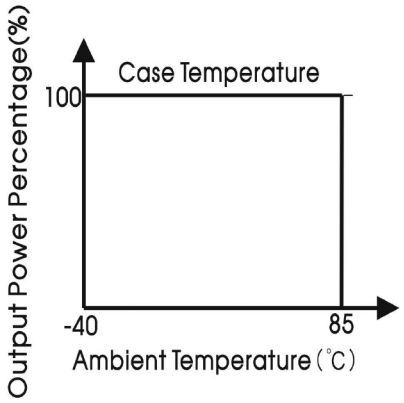
No aluminum plate for heat dissipation



With aluminum plate for heat dissipation

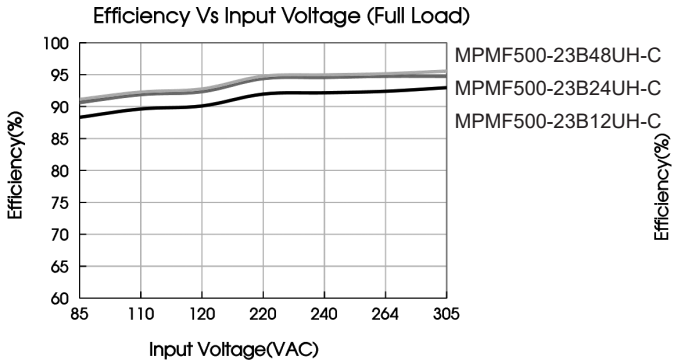


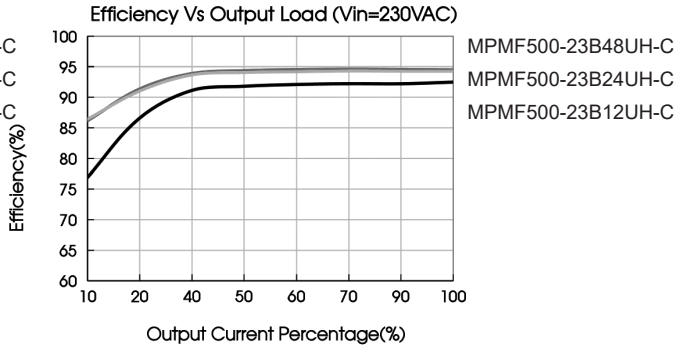




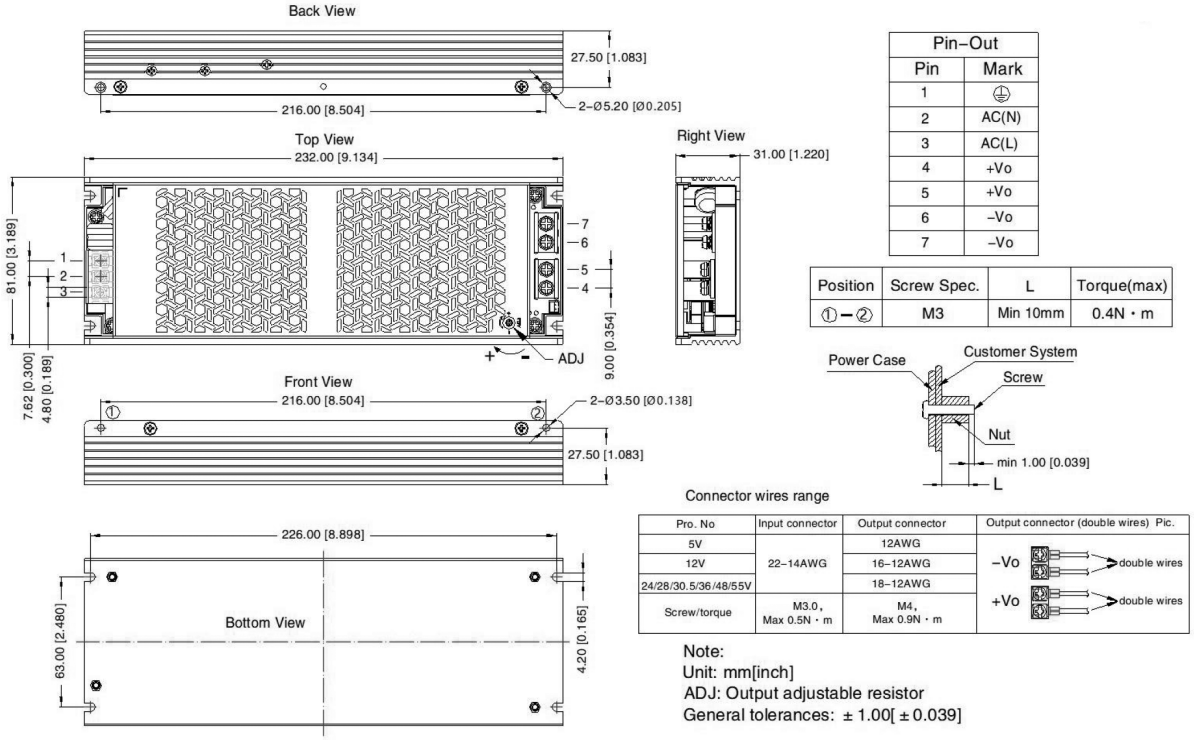
Note: 1. With an AC input voltage between 85 -110VAC and a DC input between 120 -155VDC the output power must be derated as per the temperature derating curves;

2. This product is suitable for applications using natural air cooling, for applications in closed environment please consult FAE.





Dimensions and Recommended Layout



Pin-Out	
Pin	Mark
1	⏚
2	AC(N)
3	AC(L)
4	+Vo
5	+Vo
6	-Vo
7	-Vo

Position	Screw Spec.	L	Torque(max)
①-②	M3	Min 10mm	0.4N・m

Connector wires range

Pro. No	Input connector	Output connector	Output connector (double wires) Pic.
5V	22-14AWG	12AWG	-Vo double wires
12V		16-12AWG	
24/28/30.5/36/48/55V		18-12AWG	+Vo double wires
Screw/torque	M3.0, Max 0.5N・m	M4, Max 0.9N・m	

Note:
Unit: mm[inch]
ADJ: Output adjustable resistor
General tolerances: ± 1.00[± 0.039]

Installation Diagram

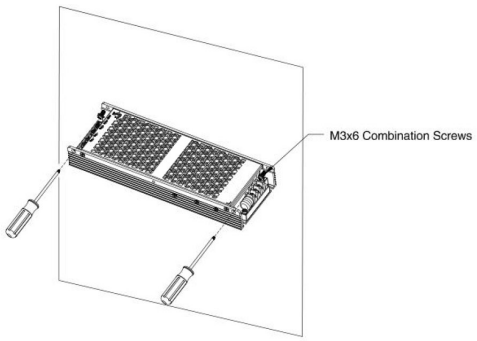


Figure 1

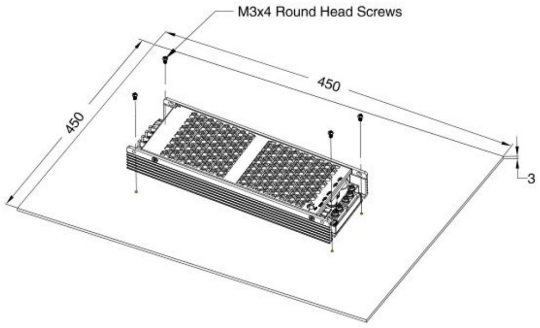


Figure 2

Note:1. Figure 1 is a schematic diagram of side installation, install with M3 × 6 combination screws, derating refer to without aluminum plate curve;

2. Figure 2 is the schematic diagram of the bottom installation, install with M3 × 4 round head screws, it is necessary to apply thermal grease on the bottom of the product, derating refer to with aluminum plate curve.

Notes:

1. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75%RH with nominal input voltage and rated output load;
2. The room temperature derating of 3.5°C/1000m is needed for operating altitude greater than 2000m;
3. In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability;
4. The out case needs to be connected to PE (⏚) of system when the terminal equipment in operating;

Part Number Table

Description	Part Number
Enclosed Power Supply, 5V DC, 80A	MPMF500-23B05UH-C
Enclosed Power Supply, 12V DC, 41.7A	MPMF500-23B12UH-C
Enclosed Power Supply, 24V DC, 20.9A	MPMF500-23B24UH-C
Enclosed Power Supply, 28V DC, 12.5A	MPMF500-23B28UH-C
Enclosed Power Supply, 36V DC, 13.9A	MPMF500-23B36UH-C
Enclosed Power Supply, 48V DC, 10.45A	MPMF500-23B48UH-C
Enclosed Power Supply, 55V DC, 8.9A	MPMF500-23B55UH-C