120W AC to DC Power Supply
DIN Rail Mount

RoHS Compliant

Features

- Universal 85 - 277VAC or 120 - 390VDC Input voltage
- Efficiency up to 94.5%
- Operating ambient temperature range: -40°C to +85°C, full load at 60°C
- 150% peak load
- Active PFC, PF≥0.98
- DC OK function
- Double-sided conformal coating, salt-spray proof, explosion-proof
- Operating altitude up to 5000m
- 5 years warranty
- Output short circuit, over-current, over-voltage, over-temperature protection
- Safety according to ATEX, IECEx increased safety type explosion-proof certification
- Safety according to ANSI/ISA 71.04-2013 G3 anticorrosion test
- Safety according to IEC/EN/UL/BS EN62368, UL61010, EN60335, EN62477, UL

MPIMF120-23Bxx is an explosion-proof Din-rail power supply featuring with energy saving, high performance, high reliability, high efficiency. With 150% peak load capacity is enough to support heavy loads such as DC motors or capacitive loads, up to 94.5% efficiency can greatly improve power supply reliability and service life. With good EMC performance and compliant with international standards of IEC/EN/UL/BS EN62368, UL61010, EN60335, EN62477, UL508 for EMC and safety. The power supply meets the “ec” increased safety and “nC” isolation short-circuit n-type explosion-proof certification
and is suitable for explosive environments where the equipment protection level is Gc in zone 2. They are widely used in wind power industry, DCS, industrial control equipment, machine control, LED, street light control, electric power, security, 5G communication and other fields.

Selection Guide

Part Number	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range (V)	Efficiency at 400V AC (%) Typ.	Max. Capacitive Load (μF)
MPIMF120-23B12	120	12V/10A	12-14	93	80000
MPIMF120-23B24		24V/5A	24-28	94	50000
MPIMF120-23B48		48V/2.5A	48-56	94.5	25000
Note: *When the output voltage rises, the total power of the product should not exceed the rated power.					

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	Rated input (Certified voltage)	100	--	240	V AC
	AC input	85		277	
	DC input	120		390	V DC

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Maximum Input Voltage	Lasts for 2h without damage		-	--	305	V AC
Input Voltage Frequency			47		63	Hz
Input Current	115VAC		--		1.5	A
	230VAC		--		0.75	
Inrush Current	115V AC	Cold start		15	--	
	230V AC			30		
Power Factor	115VAC	Room temperature, full load	0.98	--	--	--
	230V AC		0.95			
Start-up Delay Time	115V AC/230V AC, rated load		--	--	3000	ms
Input Fuse	Built-in fuse		--	8	--	A
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range		--	±1	-	%
Line Regulation	Rated load			±0.5		
Load Regulation	0%-100% load			±1		
Minimum Load			0	--		
Stand-by Power Consumption			--	--	5	W
Power Consumption*	230V AC, rated load			8	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)			--	100	mV
Hold-up Time				35	--	ms
DC OK Signal	Resistive load		30V DC/1A Max.			
Over-current Protection*	115V AC/230V AC	Room temperature	110	150	--	%
		High temperature, low temperature	105	--	--	
Short Circuit Protection*			Hiccup mode, constant current works 1s (Typ.), turn off 10s, continuous, self-recover			
Over-voltage Protection	12V		≤18V DC (Hiccup, self-recover)			
	24V		≤35V DC (Hiccup, self-recover)			
	48V		≤60VDC (Hiccup, self-recover)			
Over-temperature Protection*	230V AC, rated load	Over-temperature protection start	--	--	90	°C
		Over-temperature protection release	60	--	--	

Note: 1. *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;
2. *Over-temperature protection: Put the product into a high temperature box. After the ambient temperature stabilizes, increase the temperature slightly (3°C to 5°C), and the load remains unchanged. After the product reaches thermal equilibrium, increase the temperature until the product triggers over-temperature protection;
3. *Power consumption curve, over-current protection mode and short circuit protection mode see product characteristic curve.

General Specifications

Item		Operating Conditions		Min.	Typ.	Max.	Unit
Isolation Test	Input - ⏚	Electric strength test for 1min., leakage current <10mA (Isolation Test for ⏚ need to remove the screw at the mark shall *)		2500	--	--	V AC
	Input - output			4000			
	Output - ⏚			500			
	Output - DC OK			500			
Insulation Resistance	Input - ⏚	Ambient temperature: 25 ±5°C Relative humidity: < 95%RH, no condensation Test voltage: 500V DC		500	--		MΩ
	Input - output						
	Output - ⏚						
Operating Temperature				-40		+85	°C
Storage Temperature				-40		+85	
Operating Humidity		Non-condensing		10		95	%RH
Storage Humidity				20		90	
Switching Frequency		PFC		40	--	130	kHz
		DC-DC		50	--		
		Auxiliary source		--	65	--	
Power Derating		Operating temperature derating	+40°C to +25°C	3.34	--		%/°C
			+60°C to +70°C	3			
			+70°C to +85°C	3.34			
		Input voltage derating	85V AC - 100V AC	1			%/V AC
Leakage Current		240V AC	Touch current	<0.88mA			
Safety Standard				Design refer to IEC/EN/UL/BS EN62368-1, UL61010-1, UL508, IEC60079-0, IEC60079-7, IEC60079-15, EN60335-1, EN62477-1, ANSI/ISA 71.04-2013			
Safety Class				CLASS I			
MTBF		MIL-HDBK-217F@25°C		>702,000h			
		MIL-HDBK-217F@40°C		>524,000h			
Warranty		Ambient temperature: <40°C		5 years			
High and Low Voltage Crossing		Need to cooperate with our UPS testing		NB/T 31111-2017			

Note: 1. *The gas discharge tube built into the device effectively protects the power supply against damage by asymmetric disturbance variables (eg EN 61000-4-5). Each power supply continuous withstand voltage test will cause extremely high load to the power supply. Therefore, unnecessary loading or damage to the power supply due to excessive test voltage should be avoided. If necessary, disconnect the gas discharge tube built into the device to use a higher test voltage. After successful completion of the test, reconnect the gas discharge tube. Please refer to the "MPIMF120-23Bxx Installation and Application Manual" for specific operation methods;

2. *The power supply has three converters with three different switching frequencies. Auxiliary source frequency is nearly constant, other switching frequencies depend on input voltage and load.

Environmental Characteristics		
Item	Operating Conditions	Standard
High and Low Temperature Working	+85°C, -40°C	GB2423.1, IEC60068-2-1
Sinusoidal Vibration	10 - 500Hz, 2g, three directions of X, Y, Z axis	GB2423.10, IEC60068-2-6
Salt Mist	+35°C, 5%NACL, 48h	GB2423.17, IEC60068-2-11
Alternating Hot and Humid	+25°C, 95%RH - +60°C, 95%RH	GB2423.4, IEC60068-2-30
Low Temperature Storage	-40°C	GB2423.1, IEC60068-2-1
High Temperature Storage	+85°C	GB2423.2, IEC60068-2-2
High Temperature Aging	+60°C	GB2423.2, IEC60068-2-2
Normal Temperature Aging	+25°C	GB2423.1, IEC60068-2-1
Temperature Shock	-40°C to +85°C	GB2423.22, IEC60068-2-14
Temperature Cycle	-25°C to +60°C	GB2423.22, IEC60068-2-14
Hot and Humid	+85°C, 85%RH	GB2423.50, IEC60068-2-67
High Temperature Elevation	+60°C, 54KPa	GB2423.26, IEC60068-2-41
Low Temperature Elevation	-25°C, 54KPa	GB2423.25, IEC60068-2-40
Constant Humid and Hot	+40°C, 95%RH	GB2423.3, IEC60068-2-78
Random Vibration	5 - 10Hz, ASD 0.3 - 10g²/Hz, three directions of X, Y, Z axis	GB/T 4798.2-2008, IEC60721-3-2
Sinusoidal Vibration Response	10 - 150Hz, 1g, three directions of X, Y, Z axis	GB/T 11287-2000, IEC60255-21-1
Sinusoidal Vibration Endurance Test		
Sinusoidal Impulse Response	15g, pulse duration 11ms, three times in each direction of X, Y, Z axis	GB/T 114537-1993, IEC60255-21-2
Sinusoidal Impact Endurance Test		
Packaging Drop	1m, one corner, three edges and six sides	GB2423.8, IEC68-2-32

Mechanical Specifications	
Case Material	Metal (AL5052, SUS304)
Dimensions	124mm × 121mm × 34mm
Weight	540g (Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE (Input port)	CISPR32/EN55032	150K - 30MHz	CLASS B
	CE (Output port)	CISPR32/EN55032	150K - 30MHz	CLASS A +20dB
	RE	CISPR32/EN55032	30K - 2MHz	CLASS B
	Harmonic current	IEC/EN61000-3-2		CLASS A and CLASS D
	Voltage flicker	EN61000-3-3		
Immunity	ESD	IEC/EN 61000-4-2	Contact ±8KV/Air ±15KV	perf. Criteria A
	RS	IEC/EN 61000-4-3	20V/m	
	EFT (Input port)	IEC/EN 61000-4-4	±4KV	
	EFT (Output port)	IEC/EN 61000-4-4	±2KV	
	Surge (Input port)	IEC/EN 61000-4-5	line to line ±3KV/line to PE ±6KV	
	Surge (Output port)	IEC/EN 61000-4-5	line to line ±1KV/line to ground ±2KV	
	MS	IEC/EN61000-4-8	30A/m	
	CS	IEC/EN61000-4-6	0.15 - 80MHz 20Vr.m.s	
	Voltage dips	IEC/EN61000-4-11	0% of 100V AC, 0V AC, 20ms	perf. Criteria A
			40% of 100V AC, 40V AC, 200ms	perf. Criteria C
			70% of 100V AC, 70V AC, 500ms	perf. Criteria A
			0% of 200V AC, 0V AC, 20ms	perf. Criteria A
			40% of 200V AC, 80V AC, 200ms	perf. Criteria A
			70% of 200V AC, 140V AC, 500ms	perf. Criteria A
	Voltage interruption	IEC/EN61000-4-11	0% of 200V AC, 0V AC, 5000ms	perf. Criteria C

Note: *perf. Criteria:
A: The equipment shall continue to operate as intended without operator intervention;
B: After the test, the equipment shall continue to operate as intended without operator intervention;
C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

Product Characteristic Curve

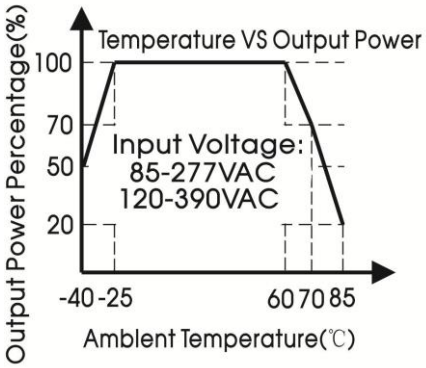


Figure 1

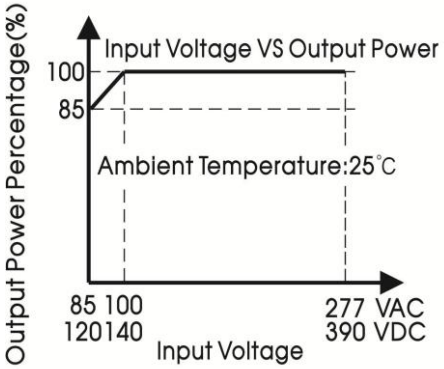


Figure 2

Output voltage VS Output current curve (Typ.)

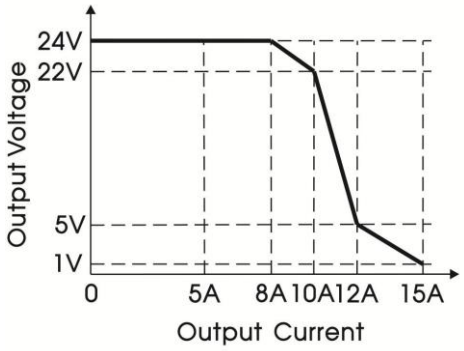


Figure 3

DC OK behavior curve (Typ.)

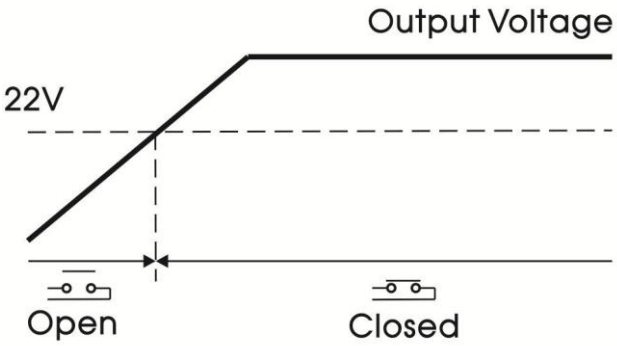


Figure 4

Over-current protection curve (Typ.)

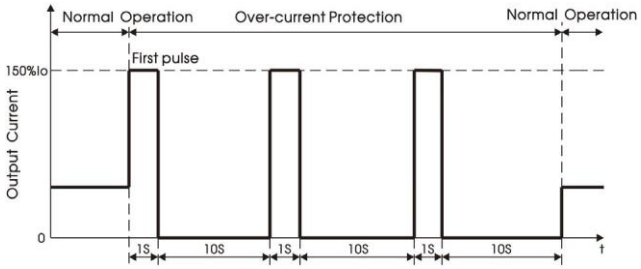


Figure 5

Short circuit protection curve (Typ.)

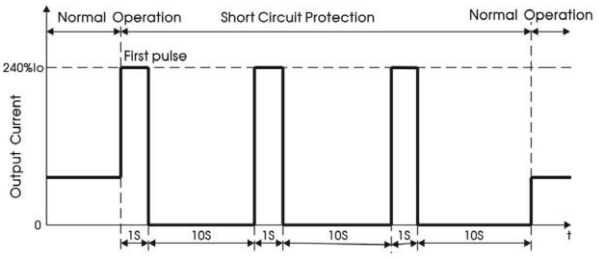


Figure 6

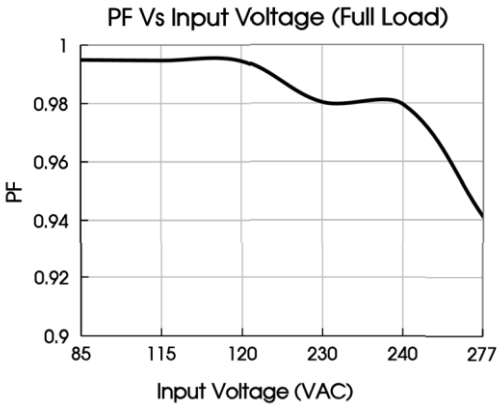


Figure 7

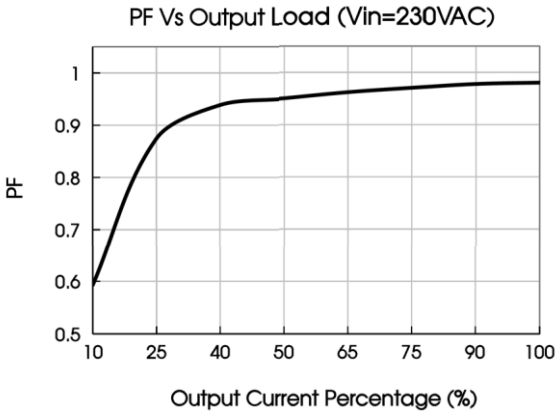


Figure 8

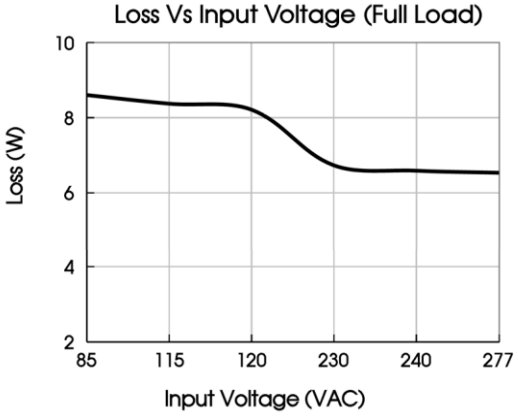


Figure 9

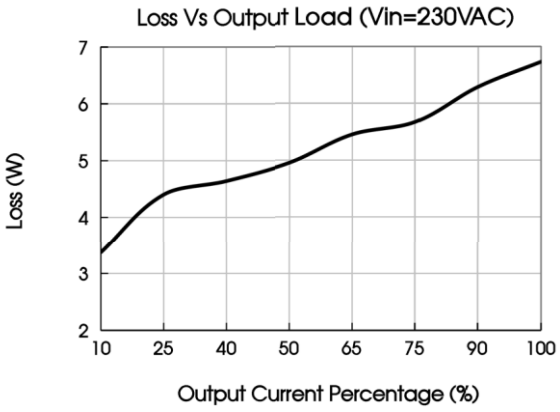


Figure 10

Note: 1. All curves are for 24V output, measured at input 230VAC, 50Hz, output Io, ambient temperature 25°C, unless otherwise stated;

2. Figure 3 shows that the product will enter the overload state when the rated output current increases to 100%-150%Io (TYP.), and enter the overcurrent protection when the current > 150%Io (TYP.), and the output voltage will decrease with the increase of the output current. When the output current increases to a certain value, the product will enter the constant current mode;

3. With an AC input voltage between 85-100VAC and a DC input between120-140VDC the output power must be derated as per the temperature derating curves;

4. This product is suitable for applications using natural air cooling; for applications in closed environment.

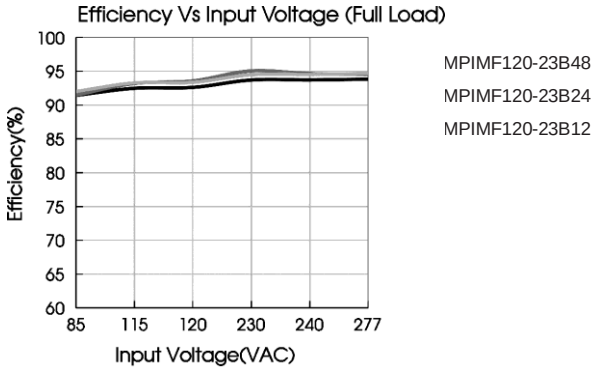


Figure 11

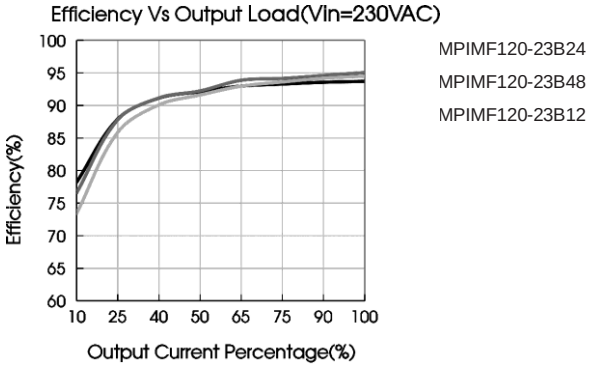
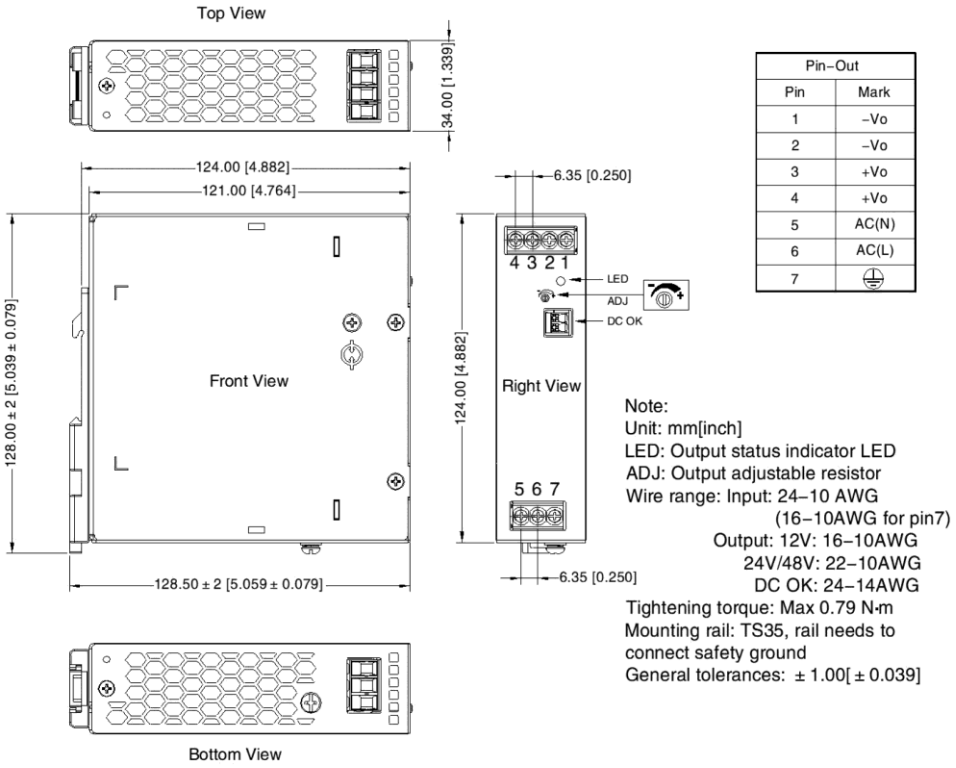


Figure 12

Dimensions and Recommended Layout



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

Note:
Unit: mm[inch]
LED: Output status indicator LED
ADJ: Output adjustable resistor
Wire range: Input: 24–10 AWG
(16–10AWG for pin7)
Output: 12V: 16–10AWG
24V/48V: 22–10AWG
DC OK: 24–14AWG
Tightening torque: Max 0.79 N·m
Mounting rail: TS35, rail needs to connect safety ground
General tolerances: ± 1.00[± 0.039]

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 5°C/1000m is needed for operating altitude greater than 2000m;
3. The out case needs to be connected to PE (⏚) of system when the terminal equipment in operating;
4. The output voltage can be adjusted by the ADJ, clockwise to increase;
5. WARNING Risk of electrical shock, fire, personal injury or death

Part Number Table

Description	Part Number
AC-DC DIN Rail Mount Power Supply, 1 Phase, 12V, 10A	MPIMF120-23B12
AC-DC DIN Rail Mount Power Supply, 1 Phase, 24V, 5A	MPIMF120-23B24
AC-DC DIN Rail Mount Power Supply, 1 Phase, 48V, 2.5A	MPIMF120-23B48