

# AC/DC 320W Enclosed Switching Power Supply

LMF320-23Bxx, LMF320-23Bxx-C, LMF320-23Bxx-Q,  
LMF320-23Bxx-CQ, LMF320-23Bxx-QQX Series

**MORNSUN®**



## FEATURES

- Universal 85 - 305VAC or 120 - 430VDC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating temperature range: -30°C to +70°C
- Built-in active PFC function
- High I/O isolation test voltage up to 4000VAC
- Output short circuit, over-current, over-voltage, over-temperature protection
- LED indicator for power on
- Built-in DC fan
- 3 years warranty
- Emissions meets CISPR32/EN55032 CLASS B



UL62368-1



IEC62368-1



GB4943.1



EN62368-1



BS EN62368-1



IEC60950-1

LMF320-23Bxx series are one of Mornsun's enclosed AC-DC switching power supply. It features universal AC input and at the same time accepts DC input voltage, cost-effective, built-in active PFC function, high efficiency and high reliability. These converters offer excellent EMC performance and meet IEC/EN61000-4, CISPR32/EN55032, IEC/UL/EN62368, GB4943, IEC60950, EN60335 standards and they are widely used in areas of industrial, LED, street light control, electricity, security, telecommunications, smart home etc.

## Selection Guide

Certification	Part No.*	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range (V)	Efficiency at 230VAC (%) Typ.	Max. Capacitive Load (µF)
BIS	LMF320-23B04	240	4V/60A	3.6-4.4	83	5000
BIS/UL/EN/CCC	LMF320-23B05	300	5V/60A	4.5 - 5.5	84	5000
BIS/UL/EN/CCC/IEC	LMF320-23B12	320.4	12V/26.7A	10 - 13.2	86.5	5000
BIS/UL/EN/CCC	LMF320-23B15	321	15V/21.4A	13.5 - 18	89	5000
	LMF320-23B24	321.6	24V/13.4A	20 - 26.4	88.5	5000
--	LMF320-23B27	321.3	27V/11.9A	26 - 31.5	88	5000
--	LMF320-23B36	320.4	36V/8.9A	32-40	88	5000
BIS/UL/EN/CCC	LMF320-23B48	321.6	48V/6.7A	41 - 56	89	5000

Note: \*Use suffix "C" for terminal with protective cover, suffix "Q" for bottom conformal coating and "QQX" for both sides conformal coating.

## Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input		85	--	305	VAC
	DC input		120	--	430	VDC
Input Voltage Frequency			47	--	63	Hz
Input Current	115VAC		--	4	4.2	A
	230VAC		--	2	2.1	
Inrush Current	115VAC		Cold start	--	35	--
	230VAC			--	65	
Power Factor	115VAC		Full load	--	0.98	--
	230VAC			--	0.95	
Hot Plug			Unavailable			

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## Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	4V/5V	--	±2	--	
		12V/15V/24V/27V/36V/48V	--	±1	--	
Line Regulation	Rated load	4V/5V	--	±0.5	--	
		12V/15V	--	±0.3	--	
		24V/27V/36V/48V	--	±0.2	--	
Load Regulation	0% - 100% load	4V/5V	--	±1	--	
		12V/15V/24V/27V/36V/48V	--	±0.5	--	
Output Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	4V/5V/12V/15V/24V	--	60	150	mV
		27V/36V/48V	--	60	200	
Temperature Coefficient			--	±0.03	--	%/°C
Minimum Load*			0	--	--	%
Hold-up Time	115VAC/230VAC		--	12	--	ms
Short Circuit Protection	Recovery time <5s after the short circuit disappear.		Hiccup, continuous, self-recover			
Over-current Protection*			105% - 150% Io, hiccup, self-recover			
Over-voltage Protection	4V		≤5.3V (Hiccup, self-recover)			
	5V		≤7.0V (Hiccup, self-recover)			
	12V		≤16.2V (Hiccup, self-recover)			
	15V		≤21.8V (Hiccup, self-recover)			
	24V		≤32.4V (Hiccup, self-recover)			
	27V		≤35.0V (Hiccup, self-recover)			
	36V		≤45.0V (Hiccup, self-recover)			
Over-temperature Protection*	48V		≤60.0V (Hiccup, self-recover)			
			Hiccup, self-recover			

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.\*Minimum load: When the product is working at a temperature above 50°C, the minimum load is 5% of the rated load, so that the fan could work at high temperature to reduce the temperature rise of the product.  
3.\*Over-current Protection: Test at rated output voltage, Io is rated output current load.  
4.\*Over-temperature Protection needs to be tested under rated full load conditions.

## General Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Isolation Test	Input - ⊕	Electric strength test for 1min., leakage current <3mA	2000	--	--	VAC
	Input - output	Electric strength test for 1min., leakage current <5mA	4000	--	--	
	Output - ⊕	Electric strength test for 1min., leakage current <3mA	500	--	--	
Insulation Resistance	Input - ⊕	Ambient temperature: 25±5°C,	100	--	--	MΩ
	Input - output	Relative humidity : < 95%RH, non-condensing	100	--	--	
	Output - ⊕	Test voltage: 500VDC,	100	--	--	
Operating Temperature			-30	--	+70	°C
Storage Temperature			-40	--	+85	
Storage Humidity	Non-condensing		10	--	95	%RH
Operating Humidity			20	--	90	
Switching Frequency			--	--	--	kHz
Power Derating	Operating temperature derating	+50°C to +70°C	2.5	--	--	%/°C
	Input voltage derating	85VAC - 100VAC@50Hz	2.0	--	--	%/VAC

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		85VAC - 100VAC@60Hz	1.33	--	--	
		120VDC - 140VDC	1.25	--	--	%/VDC
Safety Standard	4V	IS 13252 (Part1) safety approved Design refer to IEC/EN/UL62368-1, GB4943.1, IEC60950-1, EN60335-1				
	5V	UL62368-1, GB4943.1, IS 13252 (Part1) safety approved & EN62368-1 (Report) Design refer to IEC62368-1, IEC60950-1				
	12V	IEC/UL62368-1, IEC60950-1, GB4943.1, IS 13252 (Part1) safety approved & EN62368-1 (Report) Design refer to EN60335-1				
	15V/24V/48V	UL62368-1, IS 13252 (Part1), GB4943.1 safety approved & EN62368-1 (Report) Design refer to IEC62368-1, IEC60950-1, EN60335-1				
	27V	Design refer to IEC/EN/UL62368-1, GB4943.1, IEC60950-1, EN60335-1				
	36V	Design refer to IEC/EN/UL62368-1, GB4943.1, IEC60950-1, EN60335-1				
Safety Class		CLASS I				
MTBF	MIL-HDBK-217F@25°C	>250,000 h				

## Mechanical Specifications

Case Material	Metal (AL1100, SGCC)
Dimensions	215.00mm x 115.00mm x 30.00mm
Weight	750.00g (Typ.)
Cooling Method	Forced air cooling

## Electromagnetic Compatibility (EMC)

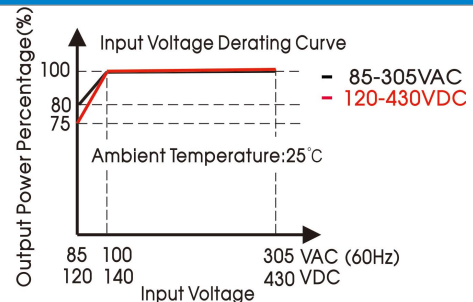
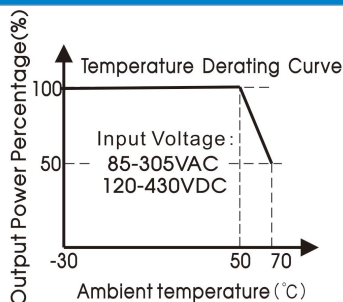
Emissions	CE*	CISPR32/EN55032	CLASS B	
	RE*	CISPR32/EN55032	CLASS B	
	Harmonic current	IEC/EN61000-3-2	CLASS A and CLASS D	
	Voltage flicker	IEC/EN61000-3-3		
Immunity	ESD	IEC/EN 61000-4-2	Contact ±6KV/Air ±8KV	perf. Criteria A
	RS	IEC/EN 61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4	±2KV	perf. Criteria A
	Surge*	IEC/EN 61000-4-5	±1KV/±2KV	perf. Criteria A
	CS	IEC/EN 61000-4-6	10 Vr.m.s	perf. Criteria A
	DIP	IEC/EN 61000-4-11	0%, 70%	perf. Criteria B

Note: 1.\*One magnetic bead (nickel-zinc ferrite) should be coupled with the output load line during CE/RE testing.

2.\*The power supply is considered a component as part of system, all EMC items are tested on a metal plate (L x W x H, 450mm x 450mm x 3mm). Power supply should be combined with final equipment for EMC confirmation.

3.\*By adding Mornsun EMC filter FC-L06Wx can improve the surge level to meet 2KV/4KV or 4KV/6KV.

## Product Characteristic Curve



Note: 1. With an AC input voltage between 85-100VAC and a DC input between 120-140VDC the output power must be derated as per the temperature derating curves;

2. This product is suitable for applications using forced air cooling; for applications in closed environment please consult Mornsun FAE.

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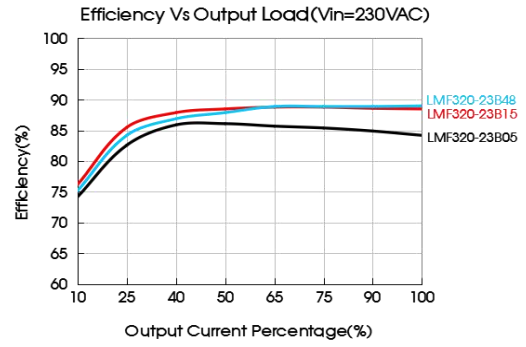
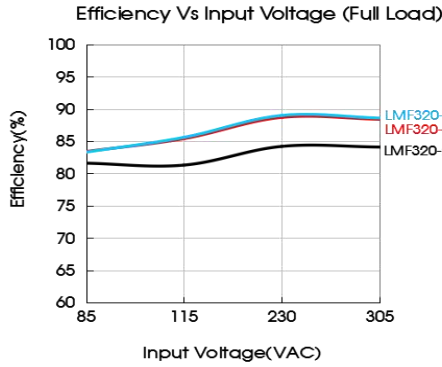
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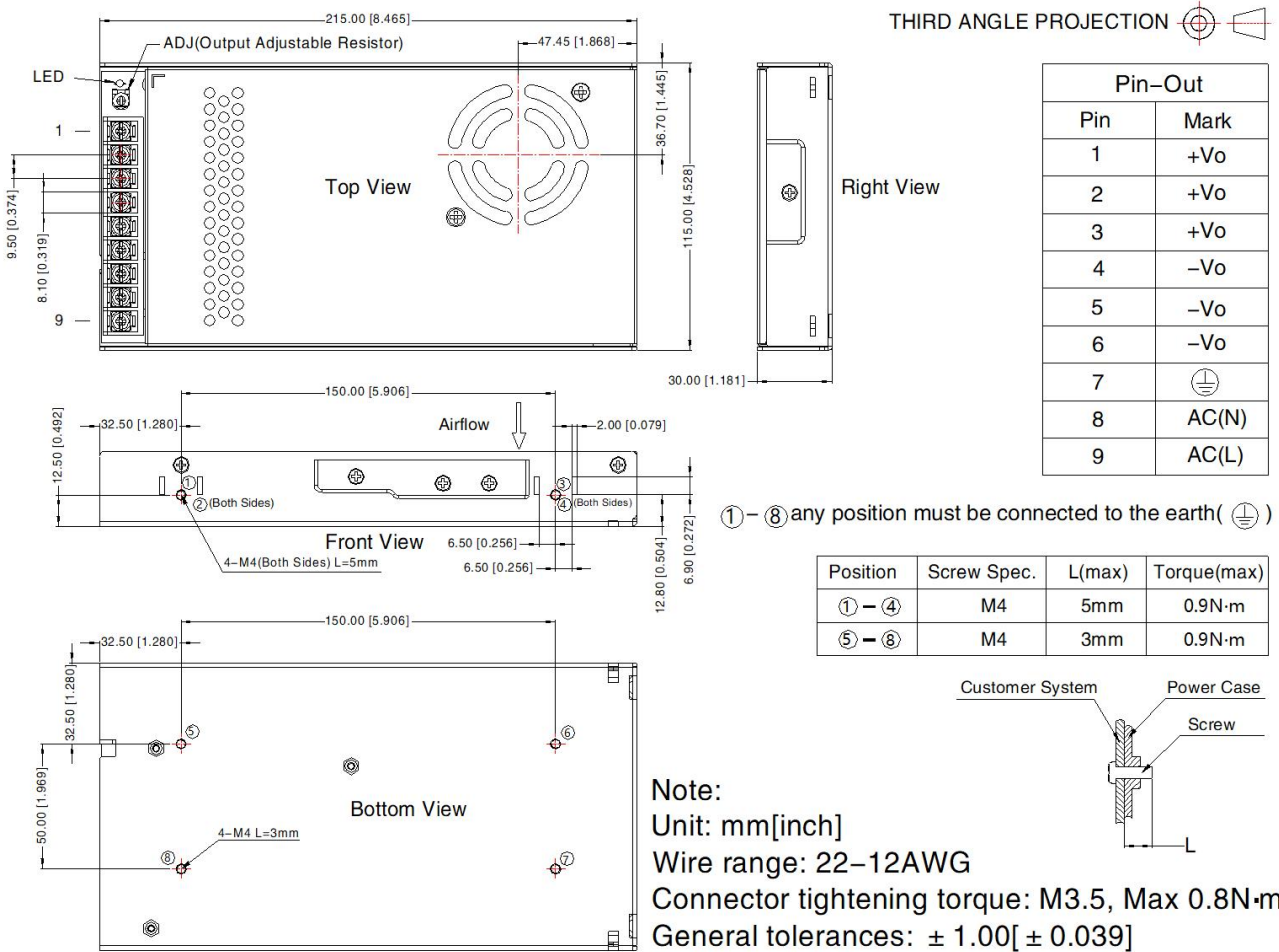
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## Dimensions and Recommended Layout

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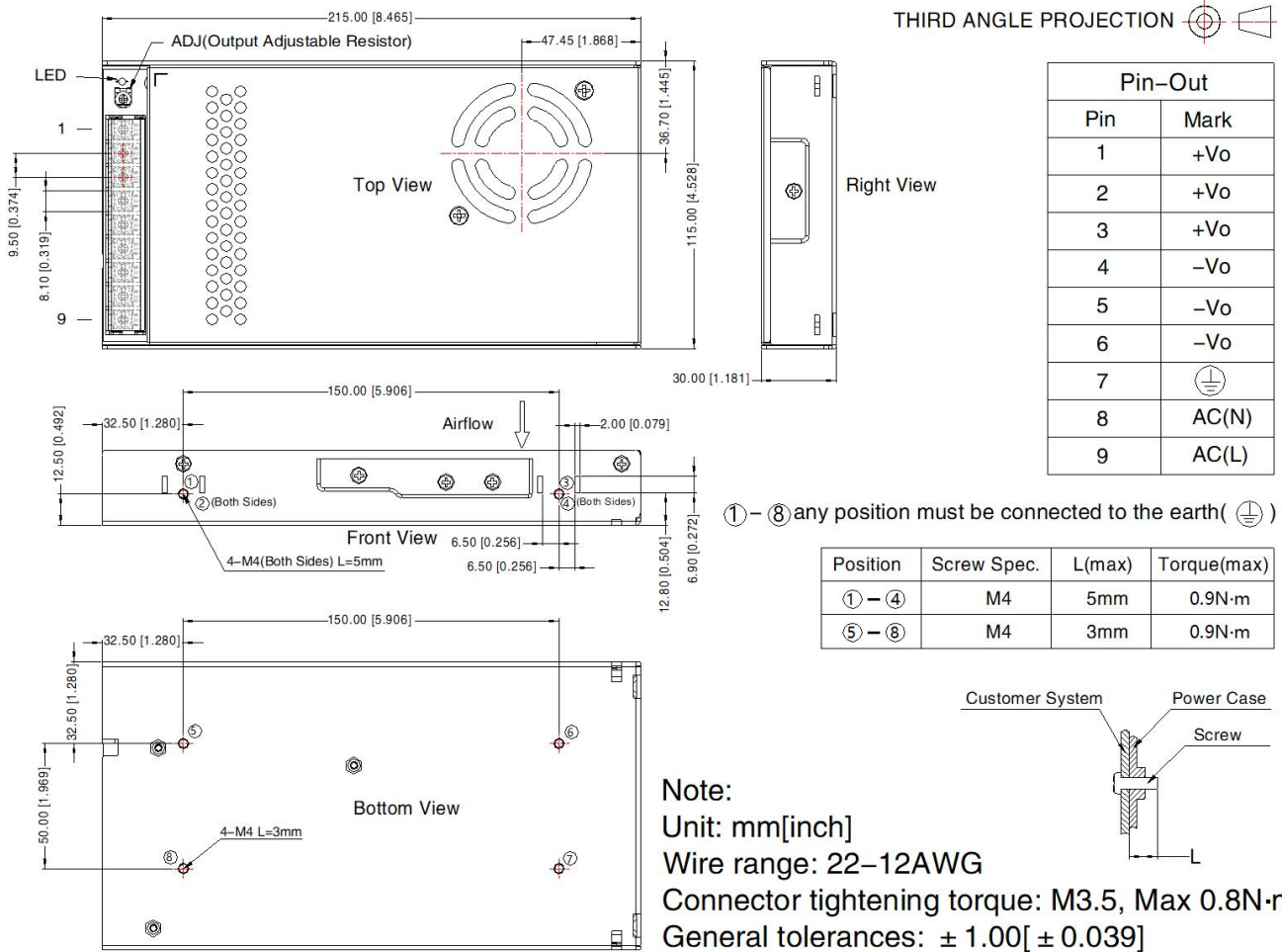


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## LMF320-23Bxx-C, LMF320-23Bxx-CQ Series



**Note:**

- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58220115;
- 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;
- The ambient temperature derating of 5°C/1000m is needed for operating altitude greater than 2000m;
- All index testing methods in this datasheet are based on our company corporate standards;
- 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;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- The out case needs to be connected to PE (⊕) of system when the terminal equipment in operating;
- The output voltage can be adjusted by the ADJ, clockwise to decrease;
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
- The power supply is considered a component which will be installed into a terminal equipment. All EMC tests should be confirmed with the final equipment. Please consult our FAE for EMC test operation instructions.

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