AC/DC 200W Enclosed Switching Power Supply

LMF200-23B05 (-PCQ), LMF200-23B05-C, LMF200-23B05-Q Series

MORNSUN®

RoHS

UL62368-1 | GB4943.1 | EN62368-1 | BS EN 62368-1

FEATURES

- Universal 85 - 305VAC or 120 - 430VDC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating temperature range: -30℃ to +70℃
- 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
- Emissions meets CISPR32/EN55032 CLASS B

LMF200-23B05 is 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. This converter offer excellent EMC performance and meet IEC/EN61000-4, CISPR32/EN55032, IEC62368, UL62368, EN62368, GB4943 standards and it is 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)
UL/EN/CCC/BIS	LMF200-23B05	200	5V/40A	4.5 - 5.5	85	3000

Note: *Use suffix "C" for terminal with protective cover, suffix "Q" for conformal coating and suffix "PCQ" for terminal with protective cover and 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		--	2.1	3	A
	230VAC		--	1.1	1.5	
Inrush Current	115VAC	Cold start	--	35	--	
	230VAC		--	65	--	
Power Factor	115VAC	Full load	--	0.98	--	--
	230VAC		--	0.95	--	
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	--	±2	--	%
Line Regulation	Rated load	--	±0.5	--	
Load Regulation	0% - 100% load	--	±1	--	
Output Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	60	150	mV
Temperature Coefficient		--	±0.03	--	%/℃
Minimum Load		0	--	--	%
Hold-up Time	115VAC	--	12	--	ms
	230VAC	--	12	--	
Short Circuit Protection	Recovery time <5s after the short circuit disappear.	Hiccup, continuous, self-recover			
Over-current Protection*		105% - 150% Io, hiccup, self-recover			

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Over-voltage Protection		≤7V (Hiccup, self-recover)
Over-temperature Protection*		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.*Over-current Protection: Test at rated output voltage, Io is rated output current load.
3.*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 - ⏚	500VDC,			100	--	--	MΩ
	Input - output	25±5℃,			100	--	--	
	Output - ⏚	Humidity < 95%RH, non-condensing			100	--	--	
Operating Temperature					-30	--	+70	℃
Storage Temperature					-40	--	+85	
Storage Humidity		Non-condensing			10	--	95	%RH
Operating Humidity					20	--	90	
Switching Frequency					--	--	--	kHz
Power Derating		Operating temperature derating*		-30℃ to 50℃	0	--	--	%/℃
				+50℃ to +70℃	2.5	--	--	
		Input voltage derating	Ta≥30℃	85VAC - 115VAC@50Hz	1.5	--	--	%/VAC
				85VAC - 115VAC@60Hz	1.33	--	--	
				120VDC - 160VDC	1.25	--	--	%/VDC
			Ta<30℃	85VAC - 100VAC@50Hz	2.0	--	--	%/VAC
				85VAC - 100VAC@60Hz	1.33	--	--	
				120VDC - 140VDC	1.25	--	--	%/VDC
Safety Standard					UL62368-1, GB4943.1, IS 13252 (Part1) safety approval & EN62368-1 (Report) Design refer to IEC62368-1			
Safety Class					CLASS I			
MTBF		MIL-HDBK-217F@25℃			>250,000 h			

Note : *The power supply is considerated a component as part of system, under the conditions of full power application, the product should be assembled on a metal plate (L x W x H greater than 450mm x 450mm x 3mm).

Mechanical Specifications

Case Material	Metal (AL1100, SGCC)
Dimensions	215.00 mm x 115.00 mm x 30.00 mm
Weight	750g (Typ.)
Cooling Method	Free air convection

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

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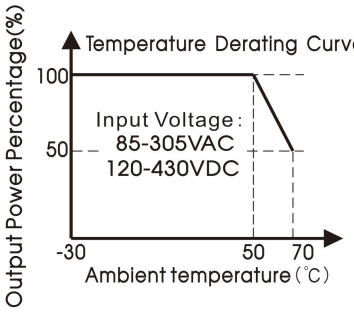
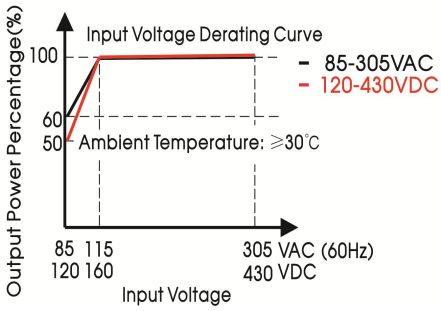
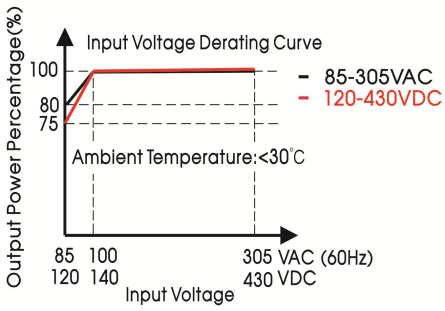
	EFT	IEC/EN 61000-4-4 ±2KV	perf. Criteria A
	Surge	IEC/EN 61000-4-5 ±1KV/±2KV	perf. Criteria A
	CS	IEC/EN 61000-4-6 10 Vr.m.s	perf. Criteria A
	DIP	IEC/EN 61000-4-11 0%, 70%	perf. Criteria B

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 considerated 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.

Product Characteristic Curve

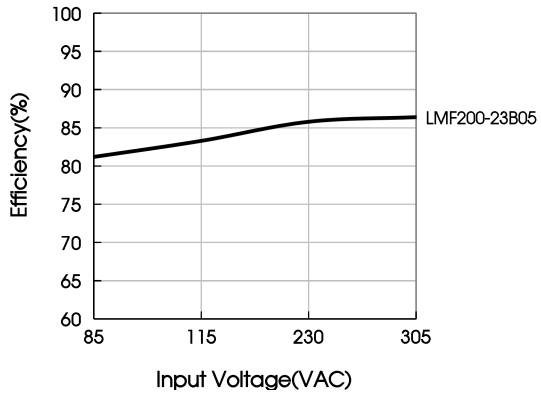




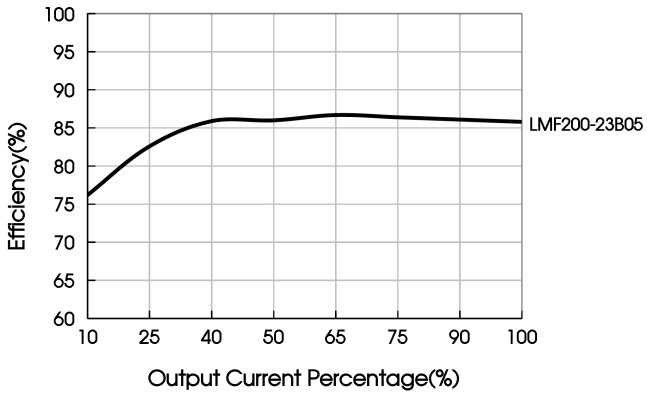


Note: 1. With an AC input voltage between 85-100VAC/85-115VAC and a DC input between 120-140VDC/120-160VDC the output power must be derated as per the temperature derating curves;
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.
3. The power supply is considerated a component as part of system, under the conditions of full power application, the product should be assembled on a metal plate (L x W x H greater than 450mm x 450mm x 3mm).

Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load(Vin=230VAC)



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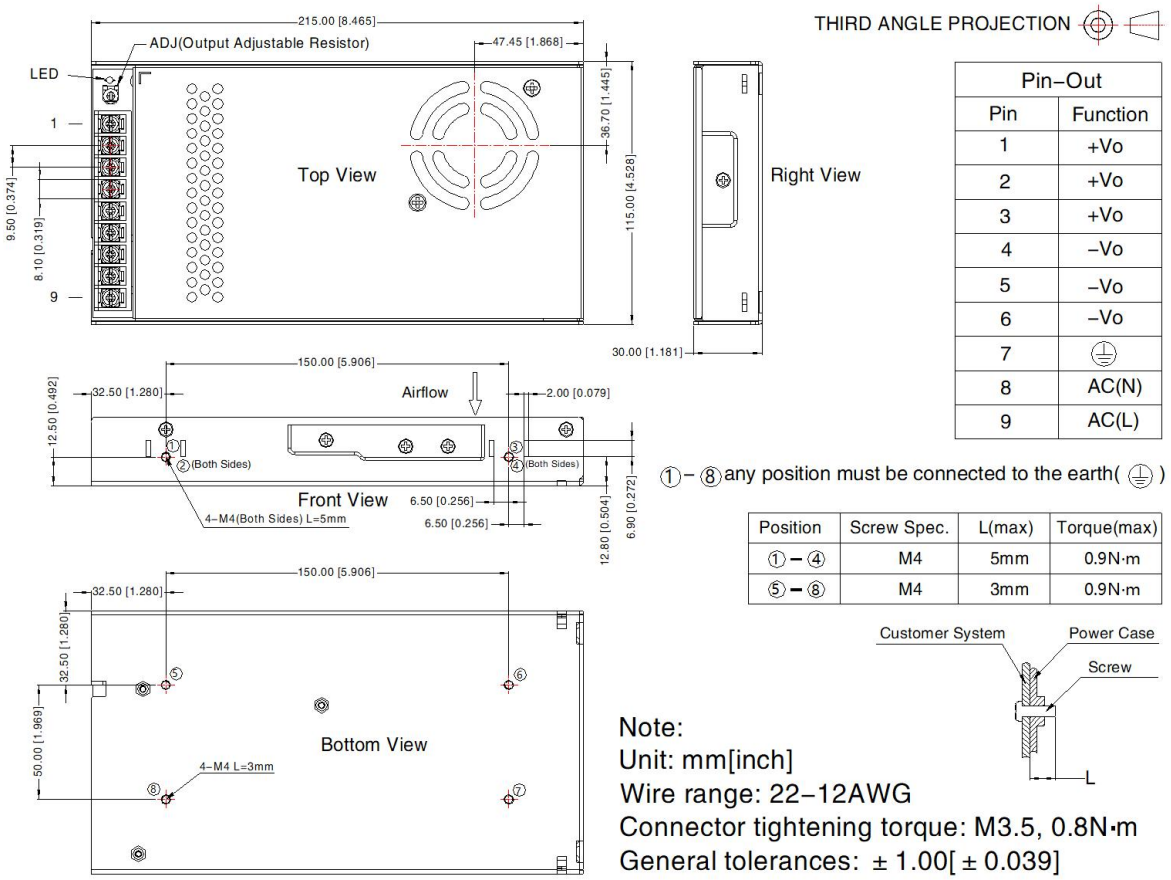
Dimensions and Recommended Layout

LMF200-23B05, LMF200-23B05-Q



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

①-⑧any position must be connected to the earth(⏚)

Position	Screw Spec.	L(max)	Torque(max)
①-④	M4	5mm	0.9N·m
⑤-⑧	M4	3mm	0.9N·m

Note:
Unit: mm[inch]
Wire range: 22-12AWG
Connector tightening torque: M3.5, 0.8N·m
General tolerances: ± 1.00[± 0.039]

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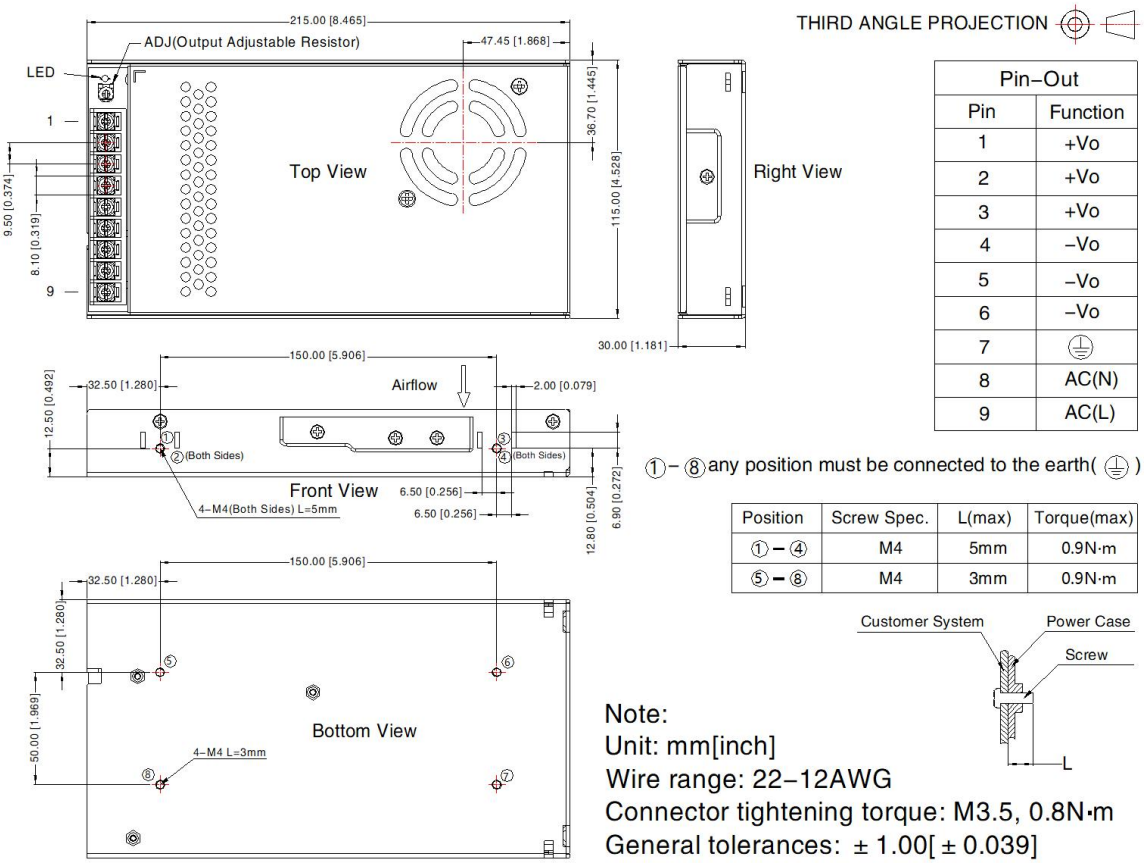
LMF200-23B05-C, LMF200-23B05-PCQ



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Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220115;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
3. The ambient temperature derating of 5℃/1000m is needed for operating altitude greater than 2000m;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. 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;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. The out case needs to be connected to the earth (⏚) of system when the terminal equipment in operating;
9. The output voltage can be adjusted by the ADJ, clockwise to decrease;
10. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
11. 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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