AC/DC 200W Enclosed Switching Power Supply

LMF200-20Bxx, LMF200-20Bxx-C, LMF200-20Bxx-Q Series

MORNSUN

RoHS

FEATURES

- Universal 85 - 264VAC or 120 - 373VDC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating temperature range: -30℃ to +70℃
- Built-in active PFC function, PFC>0.95
- High I/O isolation test voltage up to 4000VAC
- Output short circuit, over-current, over-voltage, over-temperature protection
- Safety according to IEC/EN/UL62368, EN60335, GB4943 (UL/CE/CCC pending)
- Compact size with a low 1U profile
- LED indicator for power on
- Withstand 300VAC surge input for 5s
- Emissions meets CISPR32/EN55032 CLASS B
- Start-up delay time less than 5 seconds at -30℃

LMF200-20Bxx 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/EN/UL62368, EN60335, GB4943 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)
UL/CE/CCC (Pending)	LMF200-20B05	200.0	5V/40A	4.5 - 5.5	83.5	5000
	LMF200-20B12	200.4	12V/16.7A	10 - 13.2	85.0	4000
	LMF200-20B15	201.0	15V/13.4A	13.5 - 18	86.0	3300
	LMF200-20B24	201.6	24V/8.4A	20 - 26.4	86.0	1500
	LMF200-20B48	201.6	48V/4.2A	41 - 55	88.0	470

Note: *Use suffix "C" for terminal with protective cover and suffix "Q" for conformal coating.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input		85	--	264	VAC
	DC input		120	--	373	VDC
Input Voltage Frequency			47	--	63	Hz
Input Current	115VAC		--	2.5	3.0	A
	230VAC		--	1.3	2.0	
Input Inrush Current	115VAC	Cold Start	--	35	--	
	230VAC		--	65	--	
Power Factor	115VAC	At 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	5V	--	±2	--	%
		12V/15V/24V/48V	--	±1	--	
Line Regulation	Rated Load	5V	--	±0.5	--	
		12V/15V	--	±0.3	--	
		24V/48V	--	±0.2	--	
Load Regulation	230VAC, 0% - 100% load	5V	--	±1	--	
		12V/15V/24V/48V	--	±0.5	--	
Output Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	5V/12V/15V/24V	--	150	--	mV
		48V	--	240	--	
Temperature Coefficient			--	±0.03	--	%/℃
Minimum Load			0	--	--	%
Hold-up Time	Full Load	115VAC	--	8	--	ms
		230VAC	--	8	--	
Short Circuit Protection	Recovery time <5s after the short circuit disappear.		Hiccup , continuous, self-recovery			
Over-current Protection*			105%-150% Io, self-recovery			
Over-voltage Protection	5V		⩽ 7.0V (Output voltage turn off, re-power on for recovery)			
	12V		⩽ 16.2V (Output voltage turn off, re-power on for recovery)			
	15V		⩽ 21.8V(Output voltage turn off, re-power on for recovery)			
	24V		⩽ 32.4V(Output voltage turn off, re-power on for recovery)			
	48V		⩽ 60.0V(Output voltage turn off, re-power on for recovery)			
Over-temperature Protection*	Over-temperature Protection Activation		--	--	80	℃
	Over-temperature Protection Deactivation		55	--	--	

Note: 1. *The "Tip and barrel method" is used for ripple and noise test, 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 <10mA		2000	--	--	VAC
	Input-output	Electric Strength Test for 1min., leakage current <10mA		4000	--	--	
	output -⏚	Electric Strength Test for 1min., leakage current <10mA		500	--	--	
Insulation Resistance	Input -⏚	500VDC, 25±5℃, Humidity < 95%RH, non-condensing		100	--	--	MΩ
	Input - output			100	--	--	
	output -⏚			100	--	--	
Operating Temperature				-30	--	+70	℃
Storage Temperature				-40	--	+85	
Operating Humidity*		Non-condensing		20	--	90	%RH
Storage Humidity		Non-condensing		10	--	95	
Switching Frequency				--	--	--	kHz
Power Derating		Operating temperature derating	-30℃ to +45℃	0	--	--	%/℃
			+45℃ to +70℃	2.0	--	--	
		Input voltage derating	85VAC -100VAC@50Hz	2.0	--	--	%/VAC

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		85VAC -100VAC@60Hz	1.67	--	--	
		100VAC - 264VAC	0	--	--	
		120VDC - 140VDC	1.25	--	--	%/VDC
		140VDC - 373VDC	0	--	--	
Safety Standard			Meet IEC/EN/UL62368/EN60335/GB4943			
Safety Class			CLASS I			
MTBF	MIL-HDBK-217F@25℃		>250,000 h			
Note: It is recommended to use part number with "Q" for applications in harsh environments such as salt spray, chemical, humidity.						

Mechanical Specifications

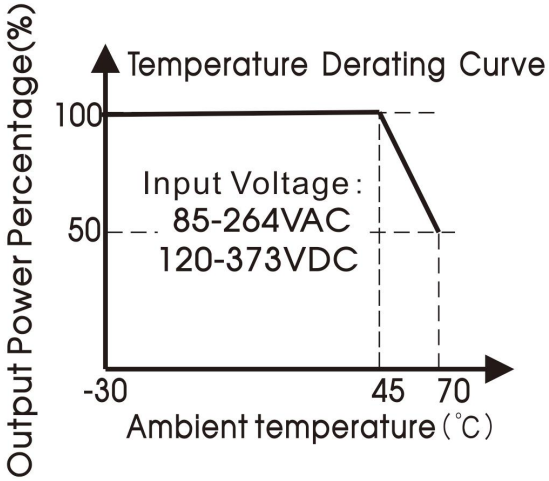
Case Material	Metal (AL1100, SGCC)
Dimensions	215.00 x 115.00 x 30.00 mm
Weight	775g (Typ.)
Cooling Method	Free air convection

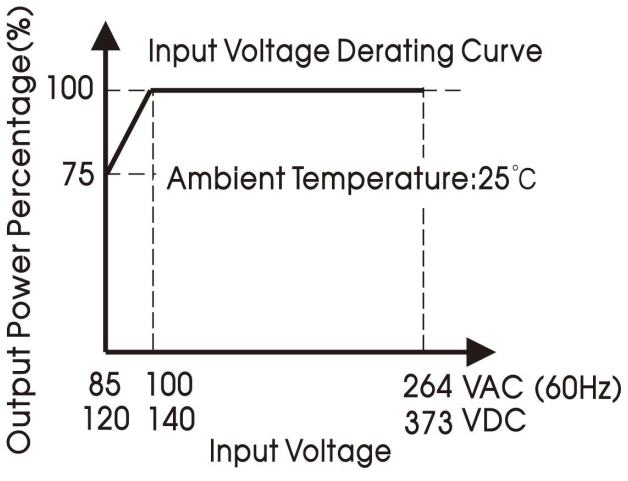
Electromagnetic Compatibility (EMC)

Emissions(EMI)	CE	CISPR32/EN55032 CLASS B	
	RE	CISPR32/EN55032 CLASS B	
	Harmonic current	IEC/EN61000-3-2 CLASS A	
	Voltage Flicker	IEC/EN61000-3-3	
Immunity(EMS)	ESD	IEC/EN 61000-4-2 Contact ±6KV /Air ±8KV	Perf. Criteria B
	RS	IEC/EN 61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4 ±4KV	perf. Criteria B
	Surge	IEC/EN 61000-4-5 ±2KV/±4KV	perf. Criteria B
	CS	IEC/EN61000-4-6 10 Vr.m.s	perf. Criteria A
	DIP	IEC/EN61000-4-11 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 (LxWxH, 450mmx450mmx3mm). Power supply should be combined with final equipment for EMC confirmation.

Product Characteristic Curve





Note: ①With an input voltage between 85-100VAC and a DC input between 120-140VDC, the output power must be derated as per the temperature derating curves;
②This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.

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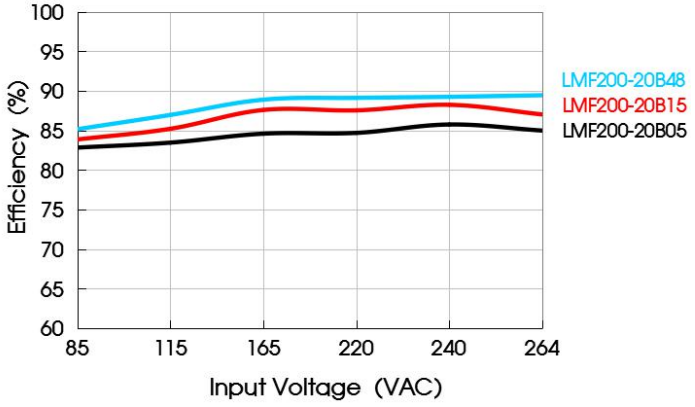
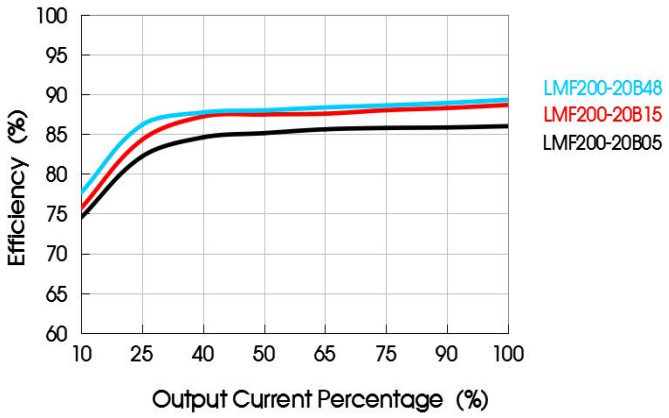
Efficiency Vs Input Voltage (Full Load)

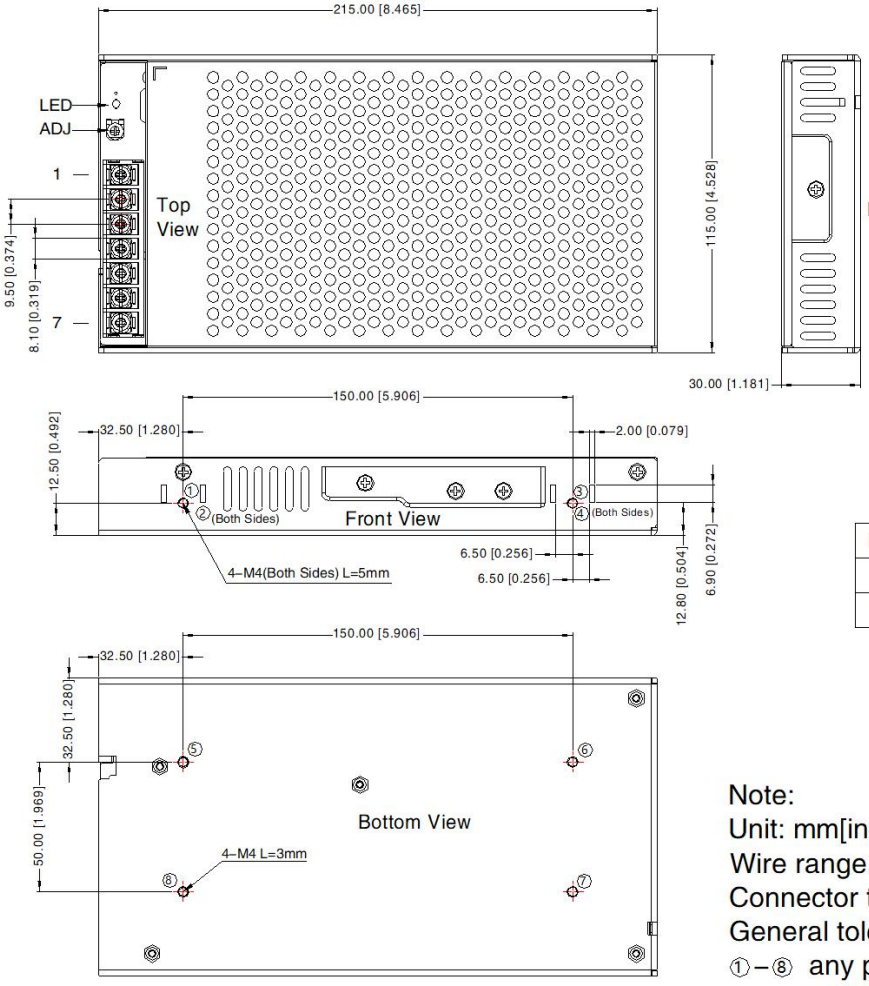


Efficiency Vs Output Load (Vin=230VAC)



Dimensions and Recommended Layout

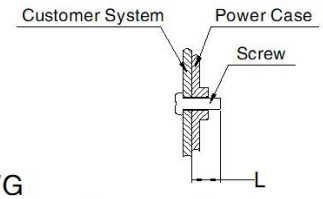
LMF200-20Bxx, LMF200-20Bxx-Q Series



THIRD ANGLE PROJECTION

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

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: M4，1.2N·m
General tolerances: ±1.00[±0.039]
①–⑧ any position must be connected to PE

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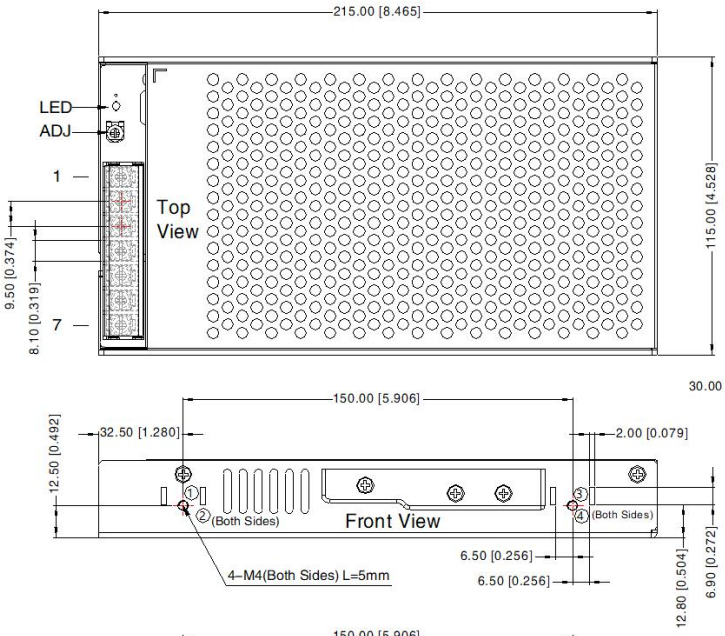
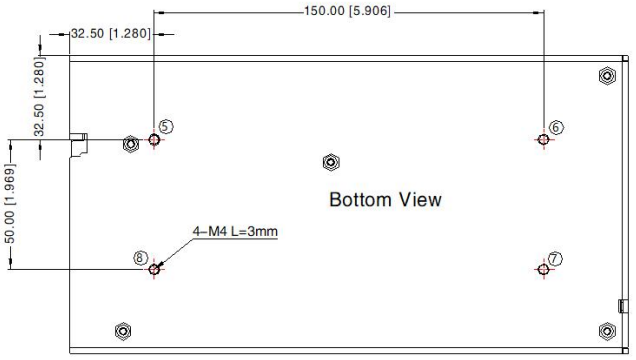
LMF200-20Bxx-C Series

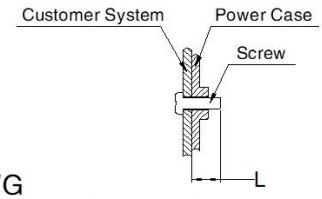


THIRD ANGLE PROJECTION

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



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
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General tolerances: ± 1.00[± 0.039]
①–⑧ any position must be connected to PE

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 PE(⏚) of system when the terminal equipment in operating;
9. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
10. The power supply is considered a component which will be installed into a final equipment. All EMC tests should be confirmed with the final equipment. Please consult our FAE for EMC test operation instructions.

Mornsun Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Huangpu District, Guangzhou, P. R. China

TTel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com

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