AC/DC Enclosed Switching Power Supply

LMF320-20Bxx, LMF320-20Bxx-C, LMF320-20Bxx-Q Series

MORNSUN®

CE CCC RoHS 3 years Warranty

FEATURES

- Universal 85 - 264VAC or 120 - 370VDC 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
- EN62368, GB4943 safety approved, safety according to IEC/UL62368
- Compact size with a low 1U profile
- LED indicator for power on
- Built-in DC fan
- Emissions meets CISPR32/EN55032 CLASS B
- Start-up delay time less than 5 seconds at -30℃

LMF320-20Bxx 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, IEC62368, UL62368, EN62368, 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)
CE/CCC	LMF320-20B05	300	5V/60A	4.5-5.5	81	5000
	LMF320-20B12	320.4	12V/26.7A	10-13.2	84	5000
	LMF320-20B15	321	15V/21.4A	13.5-18	85	5000
	LMF320-20B24	321.6	24V/13.4A	20-26.4	86	5000
	LMF320-20B48	321.6	48V/6.7A	41-56	86.5	5000

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	--	370	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	At 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	5V	--	±2	--	%
		12V/15V/24V/48V	--	±1	--	

Line Regulation	Rated Load	5V	--	±0.5	--	
		12V/15V	--	±0.3	--	
		24V/48V	--	±0.2	--	
Load Regulation	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	--	200	--	
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-recovery			
Over-current Protection*			105% - 150% Io, self-recovery			
Over-voltage Protection	5V		≤6.75V (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 start		--	--	85	℃
	Over-temperature protection release		50	--	--	

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℃, 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 <10mA		2000	--	--	VAC
	Input - output			4000	--	--	
	Output - ⏚			500	--	--	
Insulation Resistance	Input - ⏚	At 500VDC, 25±5℃, Humidity < 95%RH, non-condensing		100	--	--	MΩ
	Input - output			100	--	--	
	Output - ⏚			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 0℃	0	--	--	%/℃
			+50℃ to +70℃	2.5	--	--	
		Input voltage derating	85VAC - 100VAC@50Hz	2.0	--	--	%/VAC
			85VAC - 100VAC@60Hz	1.33	--	--	
			120VDC - 140VDC	1.25	--	--	%/VDC
Safety Standard				Meet IEC/EN/UL62368/GB4943			
Safety Certification				EN62368/GB4943			
Safety Class				CLASS I			
MTBF		MIL-HDBK-217F@25℃		>250,000 h			

Mechanical Specifications

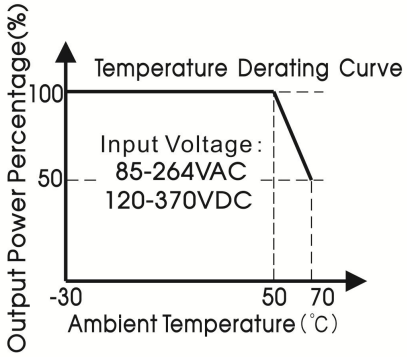
Case Material	Metal (AL1100, SGCC)
Dimensions	215.00 x 115.00 x 30.00mm
Weight	750g (Typ.)
Cooling Method	Forced air cooling

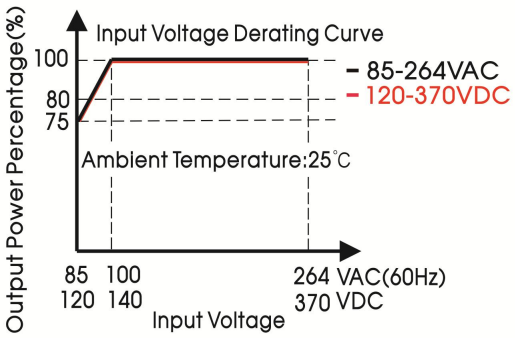
Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B	
	RE	CISPR32/EN55032 CLASS B	
	Harmonic current	IEC/EN61000-3-2 CLASS A	
	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

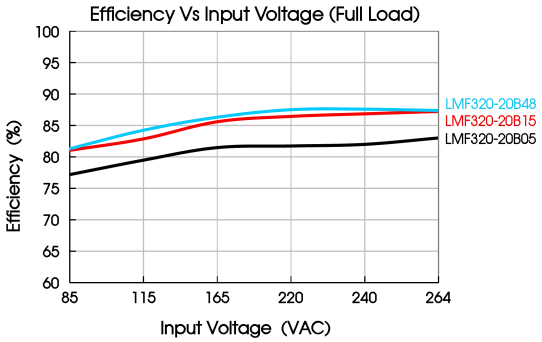
Note: 1. One magnetic bead (nickel-zinc ferrite) should be coupled with the output load line during CE/RE testing.
2. The power supply is considerated a component as part of system, all EMC items are tested on a metal plate (L x W x H, 450mm x 450mm x 3mm). Power supply should be combined with final equipment for EMC confirmation.

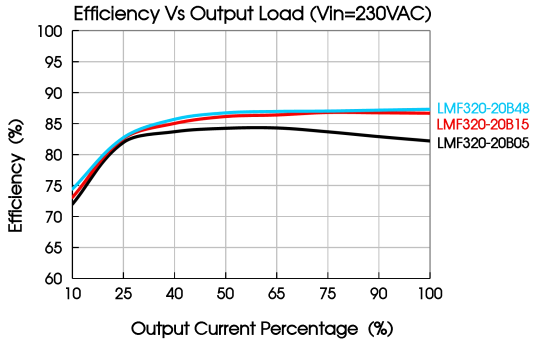
Product Characteristic Curve





Note: 1. With an AC input voltage between 85-100VAC 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.

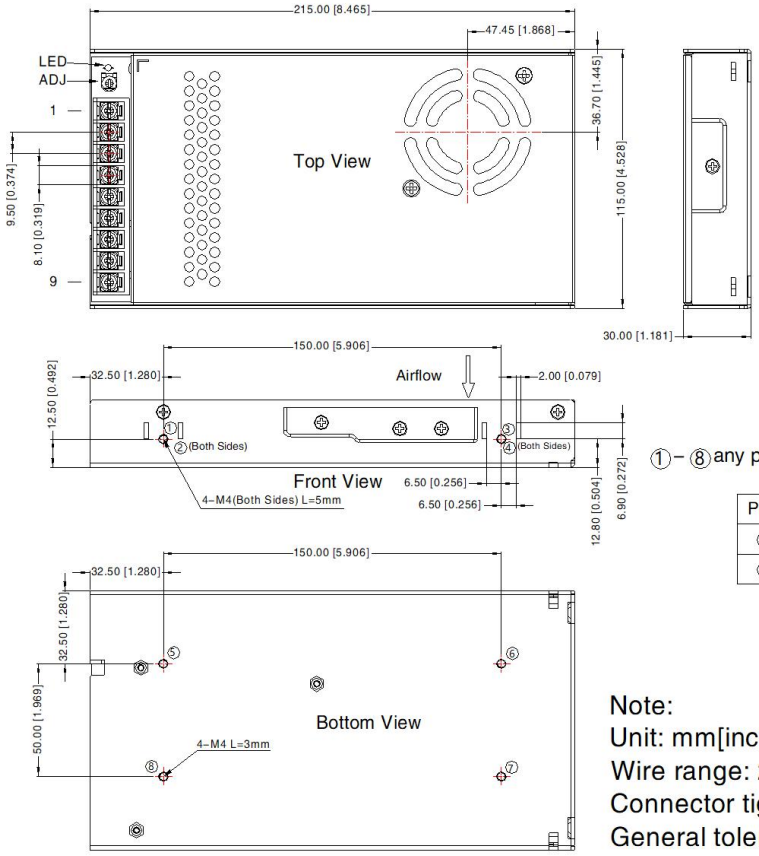




Dimensions and Recommended Layout

LMF320-20Bxx, LMF320-20Bxx-Q Series

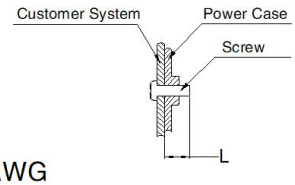
THIRD ANGLE PROJECTION



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

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

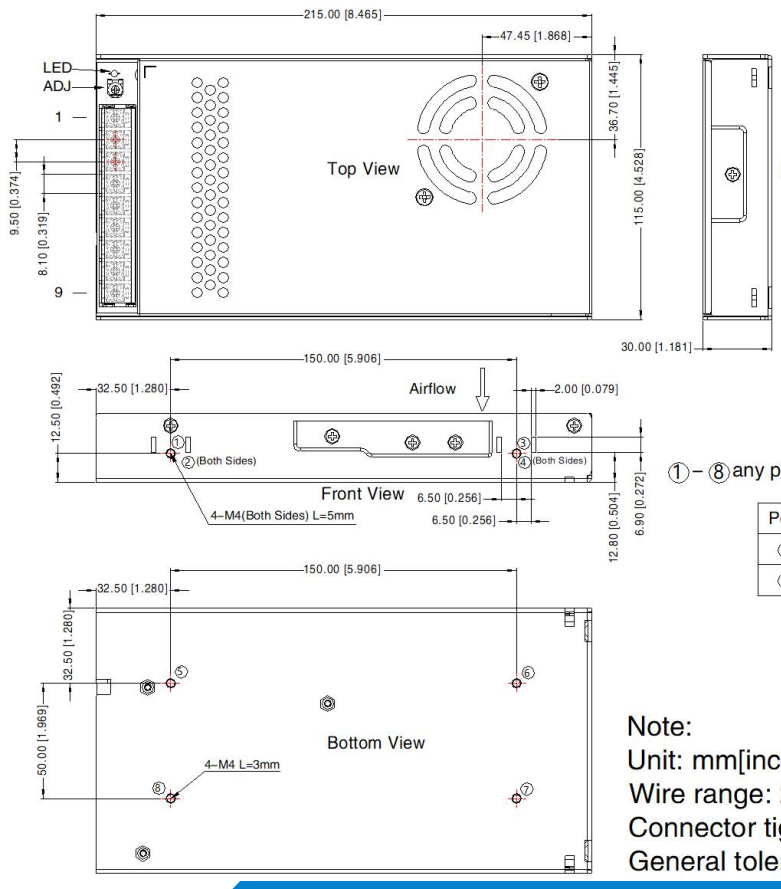
Position	Screw Spec.	L(max)	Torque(max)
①-④	M4	5mm	0.9N·m
⑤-⑧	M4	3mm	0.9N·m



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

LMF320-20Bxx-C Series

THIRD ANGLE PROJECTION



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

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

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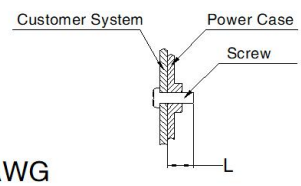

Note:
Unit: mm[inch]
Wire range: 22-12AWG
Connector tightening torque: M3.5, 0.8N·m
General tolerances: ± 1.00[± 0.039]

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 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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