AC/DC 200W Enclosed Switching Power Supply

LM200-20BxxR2(-C, -Q, -CQ, -QQ, -CQQ) Series

MORNSUN®

IS13252(Part 1):2010/ IEC 60950-1:2005 R-41202800 www.bis.gov.in

3 years Warranty

UL62368-1 IEC62368-1 GB4943.1 EN62368-1 EN61558-1 EN60335-1 BS EN62368-1 BS EN61558-1 BS EN60335-1

FEATURES

- Universal 90 - 132VAC/180 - 264VAC input voltage
- DC input range: 240 - 370VDC(Switch in position of 230)
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: - 40℃ to +85℃
- High I/O isolation test voltage up to 4000VAC, operating altitude up to 5000m
- Compact size, high power density
- High efficiency, high reliability
- Output short circuit, over-current, over-voltage, over-temperature protection
- OVC Ⅲ (designed to meet EN62477)

LM200-20BxxR2 series is the ultra-small Mornsun second-generation new industrial standard enclosed power supply, which has innovated the industrial power supply standard from the aspect of dimension, performance, technology and structure. It features universal AC input and at the same time accepts DC input voltage, cost-effective, low no load power consumption, high efficiency, high reliability and double or reinforced insulation. These converters offer excellent EMC performance and meet IEC/EN61000-4, CISPR32/EN55032, UL/EN/IEC/BS EN62368, EN/IEC60335, EN61558, EN62477, GB4943 standards and they are widely used in areas of industrial, LED, street light control, electricity, security, telecommunications, smart home etc. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

Selection Guide

Certification	Part No.*	Output Power (W) Steady state	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range ADJ (V)	Efficiency at 230VAC (%) Typ.	Max. Capacitive Load (uF)
UL/IEC/ CQC/EN/BIS	LM200-20B12R2	204	12V/17A	11.4-13.8	89	4000
	LM200-20B15R2	210	15V/14A	14.25-17.25	89	3300
	LM200-20B24R2	211.2	24V/8.8A	22.8-27.6	91	1500
	LM200-20B36R2	212.4	36V/5.9A	34.2-41.4	91.5	1500
	LM200-20B48R2	211.2	48V/4.4A	43.2-52.8	92	470
UL/IEC/ CQC/EN	LM200-20B54R2	210.6	54V/3.9A	51.3-56.7	92	330

Note: *1. Use suffix "C" for terminal with protective cover, suffix "Q" for bottom conformal coating and "QQ" for both sides conformal coating;
2. The product picture is for reference only. For details, please refer to the actual product.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range (by switch)	AC input	Low voltage (switch in position of 115)	90	--	132	VAC
		High voltage (switch in position of 230)	180	--	264	
	DC input	Switch in position of 230	240	--	370	VDC
Input Voltage Frequency			47	--	63	Hz
Input Current	115VAC		--	--	5	A
	230VAC		--	--	3	
Inrush Current	115VAC	Cold start	--	60	80	
	230VAC		--	60	80	
Leakage Current	240VAC		<0.75mA			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit

Output Voltage Accuracy	Full load range	12V/15V	--	±1.5	--	%
		24V/36V/48V/54V	--	±1.0	--	
Line Regulation	Rated load		--	±0.5	--	
Load Regulation	0% - 100% load	12V/15V	--	±1.0	--	
		24V/36V/48V/54V	--	±0.5	--	
Output Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	12V/15V/24V	--	150	--	mV
		36V/48V/54V	--	200	--	
Temperature Coefficient			--	--	±0.03	%/℃
Minimum Load			0	--	--	%
Stand-by Power Consumption	230VAC, 25℃		--	--	0.75	W
Hold-up Time	115VAC		8	--	--	ms
	230VAC		16	--	--	
Short Circuit Protection	Recovery time <5s after the short circuit disappear.		Hiccup, continuous, self-recover			
Over-current Protection			120% - 250% Io, hiccup, self-recover after fault elimination			
Over-voltage Protection	12V		⩽16.2VDC (hiccup or clamp, self-recover after fault elimination)			
	15V		⩽21VDC (hiccup or clamp, self-recover after fault elimination)			
	24V		⩽33.6VDC (hiccup or clamp, self-recover after fault elimination)			
	36V		⩽46.8VDC (hiccup or clamp, self-recover after fault elimination)			
	48V		⩽60VDC (hiccup or clamp, self-recover after fault elimination)			
	54V		⩽63VDC (hiccup or clamp, self-recover after fault elimination)			
Over-temperature Protection			Output voltage turn off, self-recover after fault elimination			

Note: *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.

General Specifications

Item		Operating Conditions		Min.	Typ.	Max.	Unit
Isolation	Input - ⏚	Electric strength test for 1min., leakage current <5mA		2000	--	--	VAC
	Input - output			4000	--	--	
	Output - ⏚			500	--	--	
Insulation Resistance	Input - ⏚	At 500VDC		100	--	--	MΩ
	Input - output			100	--	--	
	Output - ⏚			100	--	--	
Operating Temperature				-40	--	+85	℃
Storage Temperature				-40	--	+85	
Storage Humidity		Non-condensing		10	--	95	%RH
Operating Humidity				20	--	90	
Power Derating		Operating temperature derating	-40℃ to -30℃	5	--	--	%/℃
			+50℃ to +70℃	2.5	--	--	
			+70℃ to +85℃	1.33	--	--	
		Input voltage derating	90VAC - 100VAC	3.5	--	--	%/VAC
Safety Standard		12V/15V/24V/36V/48V		UL/IEC62368-1, GB4943.1, IS13252 (Part1) safety approved & BS EN/EN60335-1, BS EN/EN61558-1, BS EN/EN62368-1 (report)			
		54V		UL/IEC62368-1, GB4943.1 safety approved & BS EN/EN60335-1, BS EN/EN61558-1, BS EN/EN62368-1 (report)			

Safety Class		CLASS I
MTBF	MIL-HDBK-217F@25℃	>300,000 h

Mechanical Specifications

Case Material	Metal (AL5052, SGCC)
Dimensions	159.00 x 97.00 x 30.00 mm
Weight	415g (Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS A	
	RE	CISPR32/EN55032	CLASS A	
Immunity	ESD	IEC/EN61000-4-2	Contact ±6KV /Air ±8KV	perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV	perf. Criteria A
	Surge	IEC/EN61000-4-5	line to line ±2KV/line to PE ±4KV	perf. Criteria A
	CS	IEC/EN61000-4-6	10Vr.m.s	perf. Criteria A
	PFMF	IEC/EN61000-4-8	30A/m	perf. Criteria A
	Voltage dip, short interruption and voltage	IEC/EN61000-4-11	0%, 70%	perf. Criteria B

Remark:

1. This power supply does not meet the harmonic current requirements specified in EN61000-3-2.

Please do not use this power supply under the following conditions:

(1) The terminal equipment is used in the European Union.

(2) Supporting terminals are connected to a public power grid with 220VAC or a higher voltage that comply with the requirements of EN61000-3-2.

(3) The power supply is installed in terminal equipment with average or continuous input power greater than 75W.

(4) The power supply belong to a part of lighting system.

Exception: The power supply used in the following terminal equipment does not need to meet EN61000-3-2.

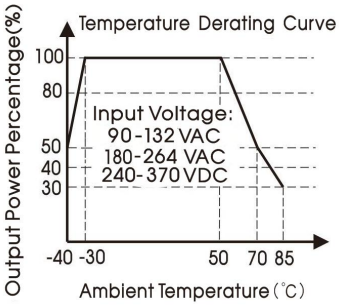
(1) Professional equipment with a total rated input power greater than 1000W.

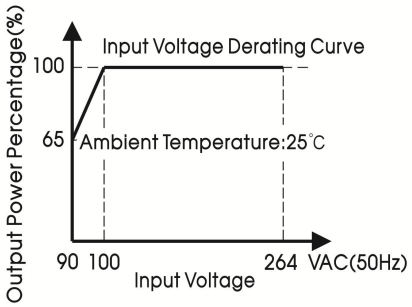
(2) Symmetrically controlled heating element with a rated power less than or equal to 200W.

2. If no harmonic current is required or customers can solve harmonic current problems by themselves, this product can be used.

3. If the EMC performance needed to be improved, please add EMC filter FC-L06Wx series (see wiring diagram 1). Details of specific indicators please refer to filter datasheet.

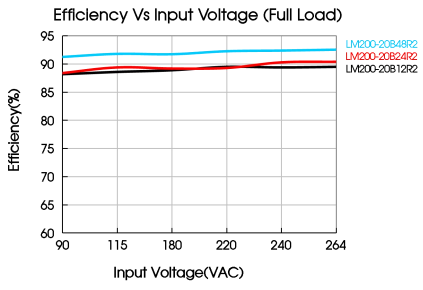
Product Characteristic Curve

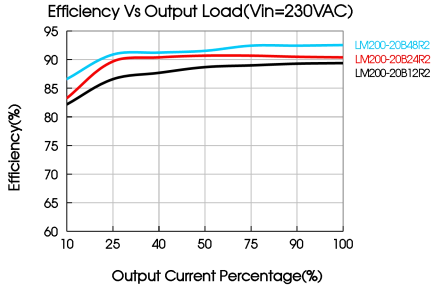




Note: 1. With an input voltage between 90-100VAC the output power must be derated as per the temperature derating curves;

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





FC-L06Wx & LM200-20BxxR2 Wiring Diagram

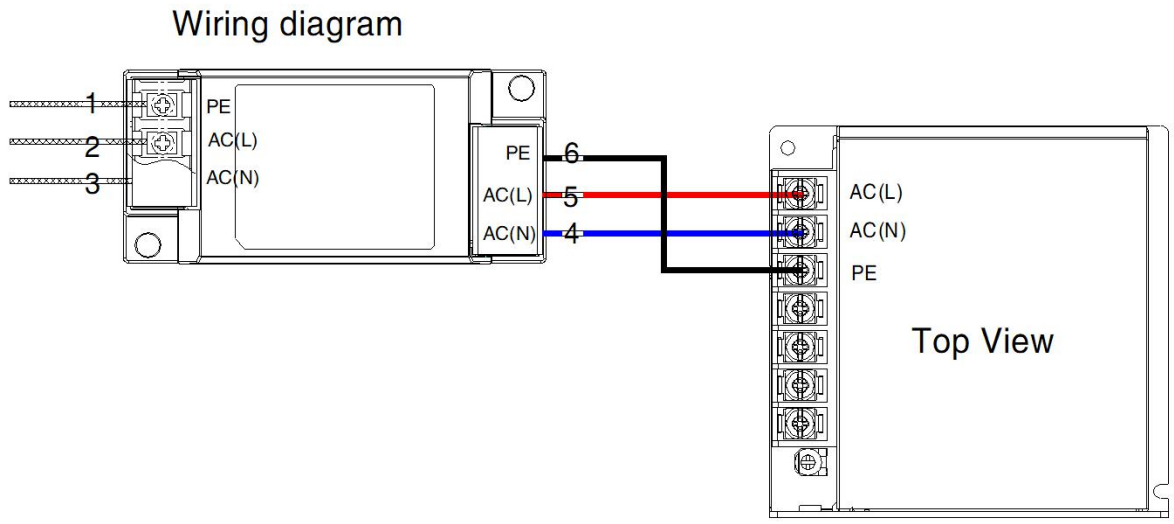
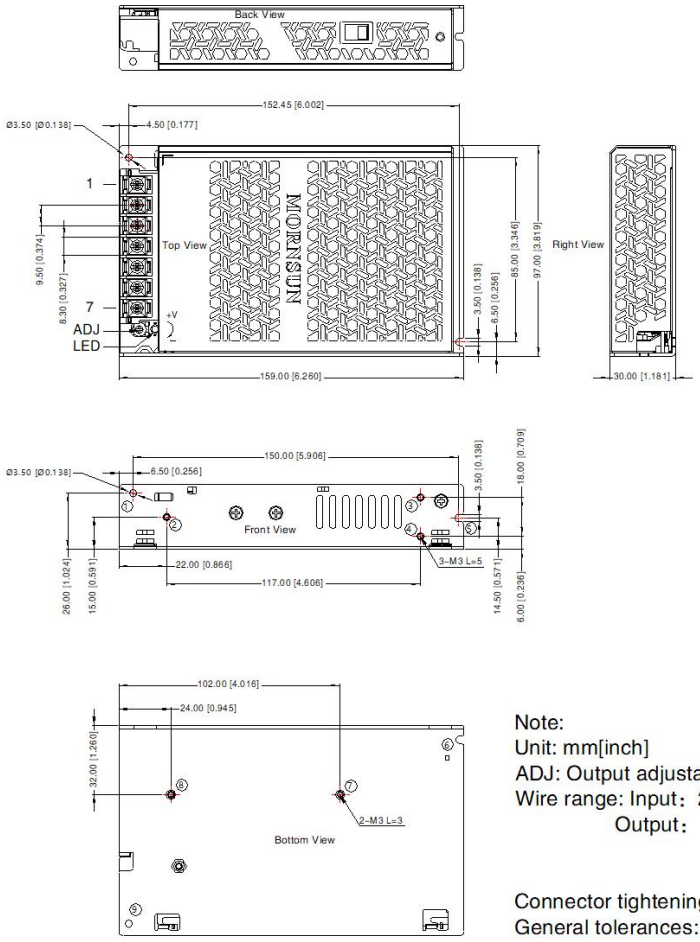


Fig. 1：EMC application circuit with higher requirement

Dimensions and Recommended Layout

LM200-20BxxR2(-Q、-QQ) Series

THIRD ANGLE PROJECTION

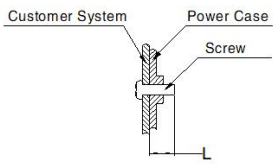


Pin–Out	
Pin	Mark
1	AC(L)
2	AC(N)
3	⏚
4	–Vo
5	–Vo
6	+Vo
7	+Vo

①– ⑨any position must be connected to the earth(⏚)

Switch	AC Input	DC Input
115V	90–132VAC	— — —
230V	180–264VAC	240–370VDC

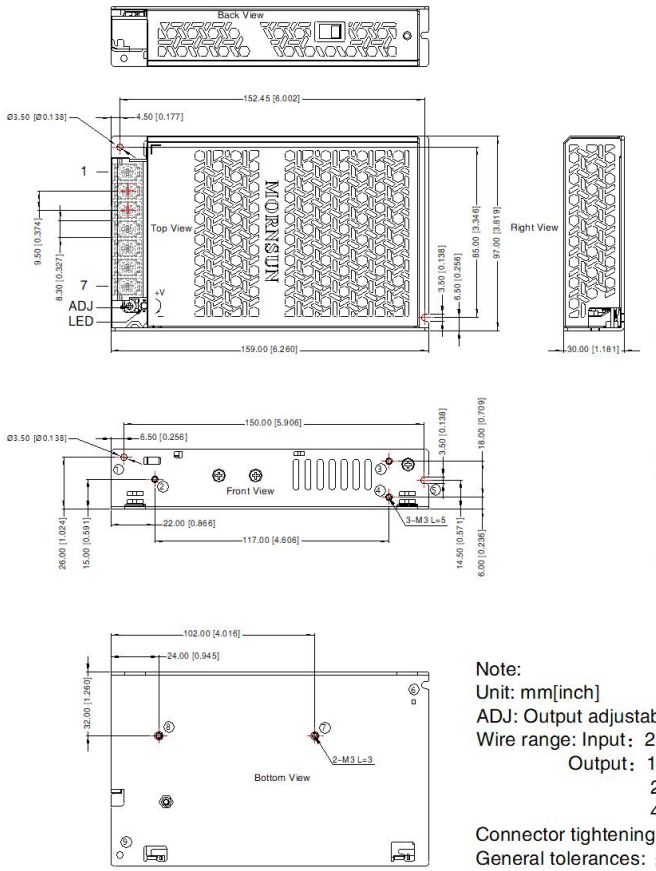
Position	Screw Spec.	L(max)	Torque(max)
②–④	M3	5mm	0.4N · m
⑦–⑧	M3	3mm	0.4N · m



Note:
Unit: mm[inch]
ADJ: Output adjustable resistor
Wire range: Input：28–10AWG(16–10AWG for pin3)
Output：12V, 15V：12–10AWG
24V, 36V：16–10AWG
48V, 54V：20–10AWG
Connector tightening torque: M3.5, 0.8N · m max.
General tolerances: ± 1.00[± 0.039]

LM200-20BxxR2-C (-CQ、-CQQ) Series

THIRD ANGLE PROJECTION



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

①- ⑨any position must be connected to the earth(⏚)

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115V	90-132VAC	- - -
230V	180-264VAC	240-370VDC

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②-④	M3	5mm	0.4N・m
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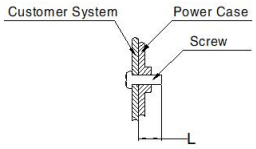

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General tolerances: ± 1.00[± 0.039]

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220329;
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. The output voltage can be adjusted by the ADJ, clockwise to increase;
10. If product involves multi-brand materials and there are differences in color etc, please refer to the standards of each manufacturer;
11. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
12. 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.

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