AC/DC 50W Enclosed Switching Power Supply

LM50-23BxxR2S(-Q, -QQ) Series

MORNSUN®

RoHS

FEATURES

- Universal 80 - 305VAC or 100 - 430VDC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -40℃ to +85℃
- Low standby power consumption, high efficiency
- High I/O isolation test voltage up to 4000VAC
- Low ripple & noise
- Output short circuit, over-current, over-voltage protection
- OVC Ⅲ (meet EN62477)
- Operating altitude up to 5000m
- 3 years warranty

LM50-23BxxR2S 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/IEC/EN/BS EN62368, EN60335, EN61558, EN62477, GB4943 standards and it is widely used in areas of industrial, street light control, 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

Part No.*	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range (V)	Efficiency at 230VAC (%) Typ.	Capacitive Load (uF) Max.
LM50-23B05R2S	50	5V/10A	4.75-5.75	86	8500
LM50-23B12R2S	50.4	12V/4.2A	11.4-13.8	87	2000
LM50-23B15R2S	51	15V/3.4A	14.25-17.25	87	1500
LM50-23B24R2S	52.8	24V/2.2A	22.8-27.6	89.5	1000
LM50-23B36R2S	52.2	36V/1.45A	34.2-41.4	90	470
LM50-23B48R2S	52.8	48V/1.1A	43.2-52.8	90.5	220
LM50-23B54R2S	50	54V/0.925A	48.6-59.4	90.5	100

Note: *1. Use suffix "Q" for conformal coating and "QQ" for both sides conformal coating.
2. If the terminal cover is required, please order "PJA-031" for self-installation.
3. 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	AC input		80	--	305	VAC
	DC input		100	--	430	VDC
Input Voltage Frequency			47	--	63	Hz
Input Current	115VAC		--	--	1.2	A
	230VAC		--	--	0.8	
Inrush Current	115VAC	Cold start	--	30	--	
	230VAC		--	60	--	
Leakage Current	277VAC		<0.75mA			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	5V	--	±2	--	%
		12V/15V/24V/36V/48V/54V	--	±1	--	
Line Regulation	Rated load		--	±0.5	--	

Load Regulation	0% - 100% load	5V	--	±1	--	
		12V/15V/24V/36V/48V/54V	--	±0.5	--	
Ripple & Noise*	230VAC, Rated load; 20MHz bandwidth (peak-to-peak value)	5V	--	65	150	mV
		12V/15V	--	65	150	
		24V	--	80	150	
		36V/48V/54V	--	120	240	
Temperature Coefficient			--	±0.03	--	%/℃
Minimum Load			0	--	--	%
Stand-by Power Consumption	230VAC		--	--	0.5	W
Hold-up Time	115VAC		--	6	--	ms
	230VAC		--	30	--	
Short Circuit Protection	Recovery time <3s after the short circuit disappear.		Hiccup, continuous, self-recover			
Over-current Protection	230VAC, Rated load		120% - 300% Io, hiccup, self-recover			
Over-voltage Protection	5V		≤7.3VDC		Hiccup or clamp, self-recover	
	12V		≤16.2VDC			
	15V		≤21.75VDC			
	24V		≤33.6VDC			
	36V		≤48.6VDC			
	48V		≤60.0VDC			
	54V		≤70.0VDC			

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 - ⏚			1250	--	--	
Insulation Resistance	Input - ⏚	At 500VDC		100	--	--	MΩ
	Input - output			100	--	--	
	Output - ⏚			100	--	--	
Operating Temperature				-40	--	+85	℃
Storage Temperature				-40	--	+85	
Operating Humidity		Non-condensing		20	--	90	%RH
Storage Humidity				--	--	95	
Switching Frequency				--	90	--	kHz
Power Derating		5V	-40℃ to -30℃	5	--	--	%/℃
			+40℃ to +70℃	1.33	--	--	
			+70℃ to +85℃	2	--	--	
		Others	-40℃ to -30℃	5	--	--	
			+50℃ to +70℃	2	--	--	
			+70℃ to +85℃	2	--	--	
	85VAC - 100VAC			1.25	--	--	%/VAC
	277VAC - 305VAC			0.71	--	--	
Safety Standard				Design refer to UL/IEC/BS EN/EN62368-1, GB4943.1, IS13252 (Part1), BS EN/EN60335-1, BS EN/EN61558-1, EN62477-1			
Safety Class				CLASS I			

MTBF	MIL-HDBK-217F@25℃	≥300,000 h
Warranty		3 years

Mechanical Specifications

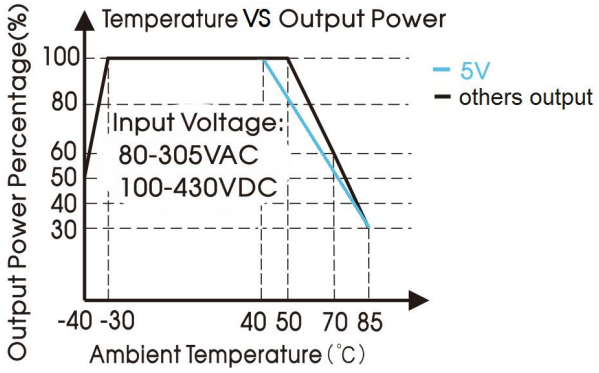
Case Material	Metal (AL5052, SGCC)
Dimensions	99.00 x 65.00 x 30.00 mm
Weight	150g (Typ.)
Cooling Method	Free air convection

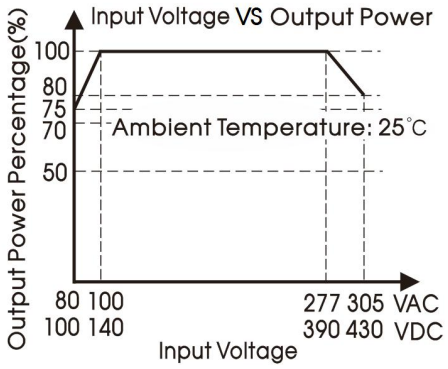
Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B		
	RE	CISPR32/EN55032 CLASS B		
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	±4KV	perf. Criteria A
	Surge	IEC/EN 61000-4-5	line to line ±2KV/line to PE ±4KV	perf. Criteria A
	CS	IEC/EN61000-4-6	10Vr.m.s	perf. Criteria A
	MS	IEC/EN61000-4-8	30A/m	perf. Criteria A
	Voltage variation*	IEC61000-6-2/IEC61000-4-11	70% Un, 25/30 cycle(50/60Hz) 40% Un, 10/12 cycle(50/60Hz) 0% Un, 1 cycle	perf. Criteria B
	Voltage interruption*	IEC61000-6-2/IEC61000-4-11	0% Un, 250/300 cycle(50/60Hz)	perf. Criteria C

Note: *Un is the maximum input nominal voltage.

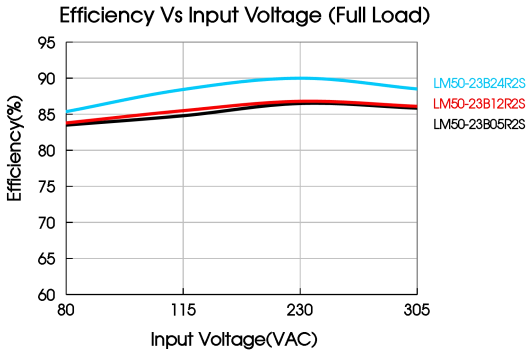
Product Characteristic Curve

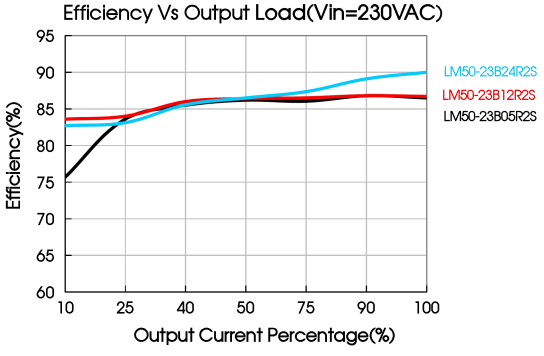




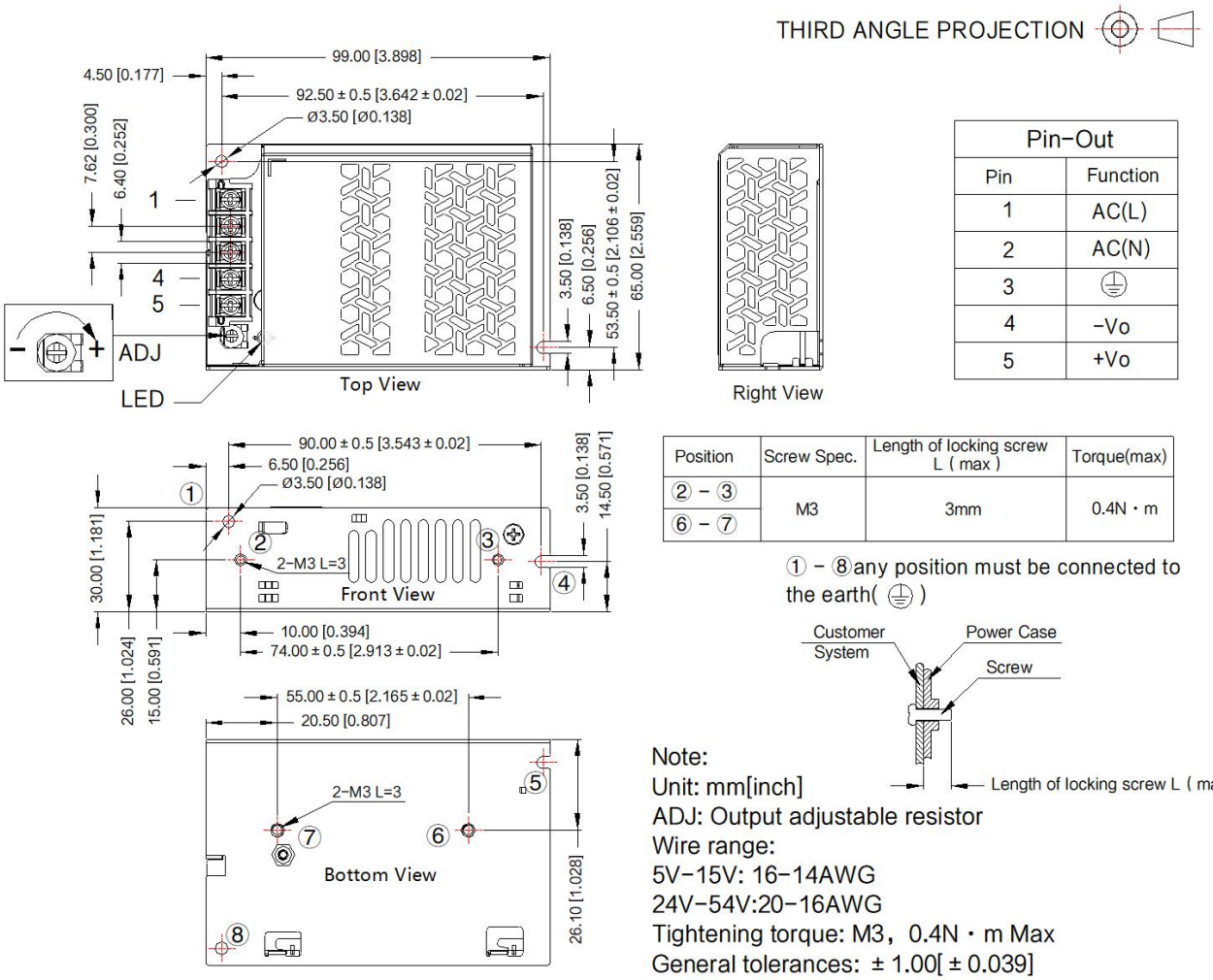
Note: 1. With an AC input voltage between 80 -100VAC /277-305VAC and a DC input between 100 -140VDC/390-430VDC the output power must be derated as per the temperature derating curves;

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





Dimensions and Recommended Layout



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

Position	Screw Spec.	Length of locking screw L (max)	Torque(max)
② - ③	M3	3mm	0.4N · m
⑥ - ⑦			

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

Note:
Unit: mm[inch]
ADJ: Output adjustable resistor
Wire range:
5V-15V: 16-14AWG
24V-54V:20-16AWG
Tightening torque: M3，0.4N · m Max
General tolerances: ± 1.00[± 0.039]

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220267;
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 room 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 increase;
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 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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