

# AC/DC 35W Enclosed Switching Power Supply

## LM35-23Bxx, LM35-23Bxx-C, LM35-23Bxx-Q Series

# MORNSUN®



### FEATURES

- Universal 85 - 305VAC or 120 - 430VDC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -30°C to +70°C
- 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
- OVCIII (designed to meet EN61558)
- Operating altitude up to 5000m



LM35-23Bxx series 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, 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, IEC/UL/EN62368, EN60335, EN61558, 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)
EN/IEC/CCC/ BIS	LM35-23B05	35	5V/7A	4.5-5.5	86	8000
	LM35-23B12	36	12V/3A	10.2-13.8	88	1500
	LM35-23B15		15V/2.4A	13.5-18	86	1000
	LM35-23B24		24V/1.5A	21.6-28.8	87	750

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	--	305	VAC
	DC input	120	--	430	VDC
Input Voltage Frequency		47	--	63	Hz
Input Current	115VAC	--	--	0.8	A
	230VAC	--	--	0.6	
Inrush Current	115VAC	--	30	--	
	230VAC	--	50	--	
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	±1	--	
Line Regulation	Rated load	--	±0.5	--	
Load Regulation	0% - 100% load	5V	±1	--	
		12V/15V/24V	±0.5	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	5V	80	--	mV
		12V/15V	120	--	
		24V	150	--	
Temperature Coefficient		--	±0.03	--	%/°C

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Minimum Load		0	--	--	%
Stand-by Power Consumption		--	--	0.3	W
Hold-up Time	115VAC	8	--	--	ms
	230VAC	30	--	--	
Short Circuit Protection	Recovery time <5s after the short circuit disappear.		Hiccup or turn off, continuous, self-recover		
Over-current Protection	230VAC, Rated load	Normal temperature, High temperature	110% - 200% Io, self-recover		
		Low temperature	≥110% Io, self-recover		
Over-voltage Protection	5V	≤6.3VDC (Hiccup, self-recover)			
	12V	≤16.2VDC (Hiccup, self-recover)			
	15V	≤21.75VDC (Hiccup, self-recover)			
	24V	≤33.6VDC (Hiccup, self-recover)			
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 Test	Input - ⊕	Electric strength test for 1min., leakage current <10mA	2000	--	--	VAC	
	Input - output		4000	--	--		
	Output - ⊕		1250	--	--		
Insulation Resistance	Input - ⊕	At 500VDC	100	--	--	MΩ	
	Input - output		100	--	--		
	Output - ⊕		100	--	--		
Operating Temperature			-30	--	+70	°C	
Storage Temperature			-40	--	+85	°C	
Operating Humidity	Non-condensing		20	--	90	%RH	
Storage Humidity			--	--	95		
Switching Frequency			--	65	--	kHz	
Power Derating	Operating temperature derating	-30°C to -25°C	85VAC-100VAC	5	--	--	% / °C
		+50°C to +70°C		2	--	--	
	Input voltage derating	85VAC-100VAC		1.33	--	--	% / VAC
		277VAC-305VAC		0.71	--	--	
Safety Standard			IEC/EN/BS EN62368-1, GB4943.1, IS13252 (Part 1) & EN60335-1, EN61558-1 safety approved; Design refer to UL62368-1, IEC60335-1, IEC61558-1				
Safety Class			CLASS I				
MTBF	MIL-HDBK-217F@25°C		>300,000 h				

## Mechanical Specifications

Case Material	Metal (AL1100, SGCC)
Dimensions	99.00 x 82.00 x 30.00 mm
Weight	170g (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	
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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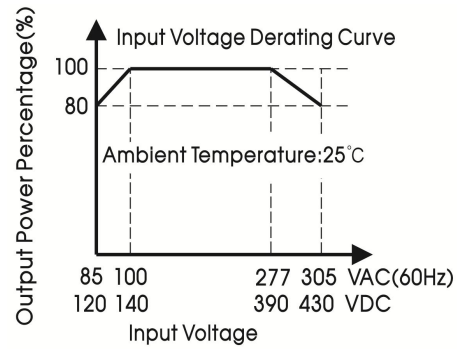
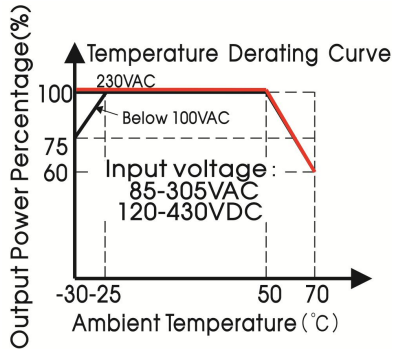
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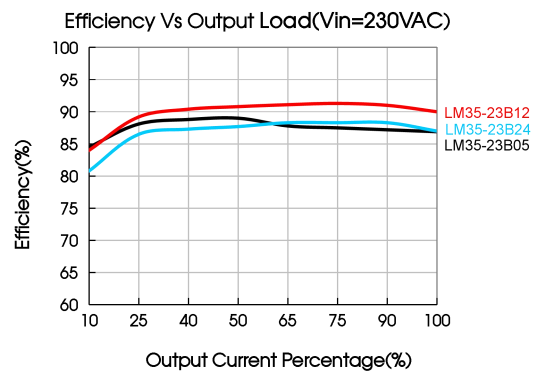
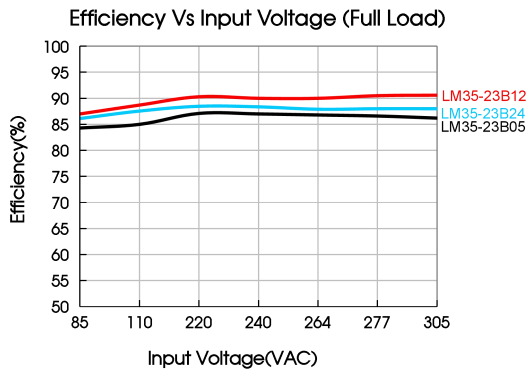
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EFT	IEC/EN 61000-4-4 ±2KV	perf. Criteria A
Surge	IEC/EN 61000-4-5 line to line ±2KV/line to PE ±4KV	perf. Criteria A
CS	IEC/EN61000-4-6 10 Vr.m.s	perf. Criteria A
Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11 0%, 70%	perf. Criteria B

### Product Characteristic Curve

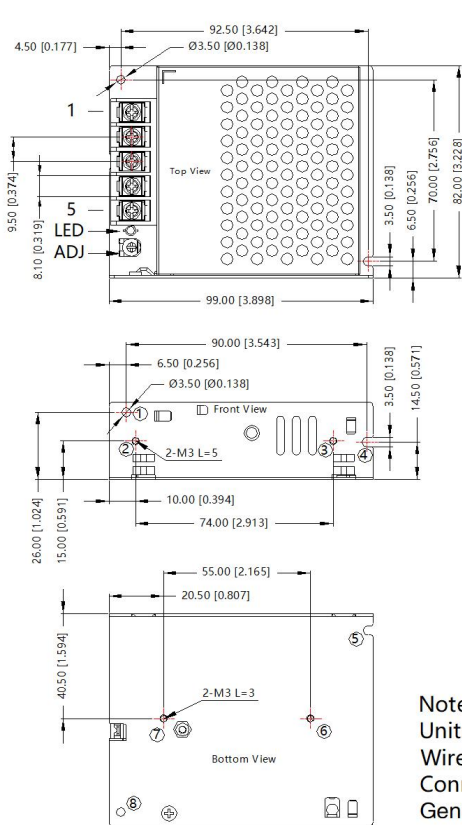


- Note: 1. With an AC input voltage between 85 -100VAC and a DC input between 120-140VDC the output power must be derated as per the temperature derating curves;
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.

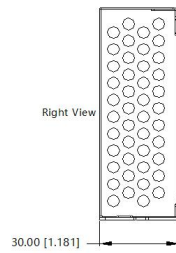


Dimensions and Recommended Layout

LM35-23Bxx, LM35-23Bxx-Q Series



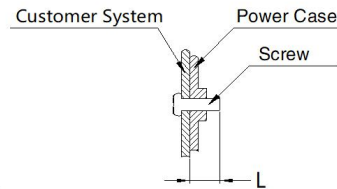
THIRD ANGLE PROJECTION



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

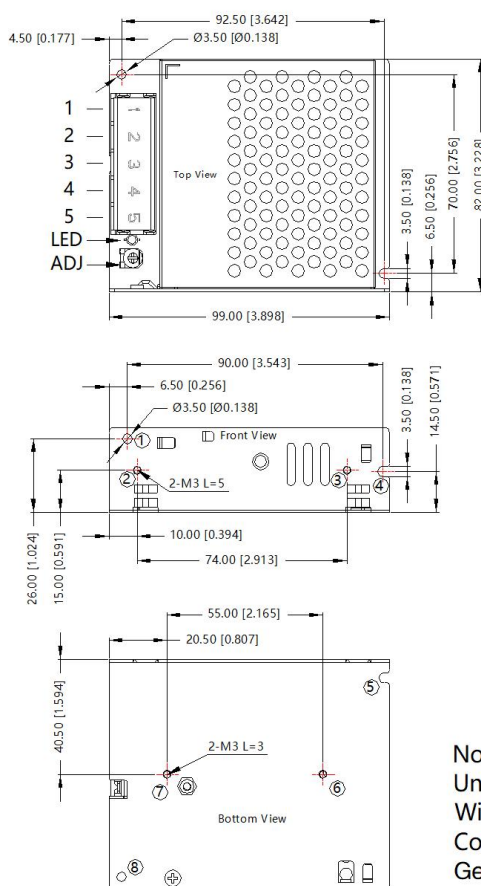
①-③ any position must be connected to the earth (⊕)

Position	Screw Spec.	L(max)	Torque(max)
② - ③	M3	5mm	0.4N·m
⑥ - ⑦	M3	3mm	0.4N·m

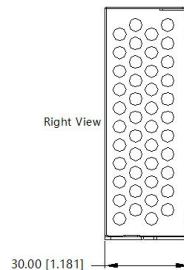


Note:  
Unit: mm[inch]  
Wire range: 22-12AWG  
Connector tightening torque: M3.5, 0.8N·m  
General tolerances: ± 1.00[± 0.039]

LM35-23Bxx-C Series



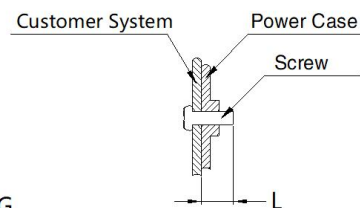
THIRD ANGLE PROJECTION



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

①-③ any position must be connected to the earth (⊕)

Position	Screw Spec.	L(max)	Torque(max)
② - ③	M3	5mm	0.4N·m
⑥ - ⑦	M3	3mm	0.4N·m



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](http://www.mornsun-power.com). Packaging bag number: 58220118;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^{\circ}\text{C}$ , humidity<75%RH with nominal input voltage and rated output load;
3. The room temperature derating of  $5^{\circ}\text{C}/1000\text{m}$  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 ( $\oplus$ ) 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.

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