AC/DC 350W Enclosed Switching Power Supply

LM350-10Bxx(-Q) Series

MORNSUN®

Report

EN62368-1
EN60335-1
EN61558-1
EN61558-2 -16

BS EN 62368-1
BS EN60335-1
BS EN61558-1
BS EN61558-2 -16

GB4943.1

RoHS

FEATURES

- Selectable AC input range: 90 - 132VAC/180 - 264VAC
- DC input range: 240 - 370VDC
- Operating ambient temperature range: - 30℃ to +70℃
- LED indicator for power on
- Output short circuit, over-current, over-voltage, over-temperature protection
- Built-in DC fan for forced air cooling
- Operating up to 5000m altitude
- 3 years warranty

LM350-10Bxx series is one of Mornsun's enclosed AC-DC switching power supply. They feature selectable AC input and at the same time accept DC input voltage, cost-effective, low no load power consumption, high efficiency and high reliability. These power supply offer excellent EMC performance and meet IEC/EN61000-4, CISPR32/EN55032, UL/IEC/EN62368, EN60335, GB4943 standards and they are widely used in areas of industrial, LED, street light control, 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 (uF)
EN/BS EN/CQC/BIS	LM350-10B05	300	5V/60A	4.5-5.5	83.5	10000
EN/BS EN/CQC	LM350-10B12	348	12V/29A	10.2-13.8	85	4000
	LM350-10B15	348	15V/23.2A	13.5-18	86	3300
	LM350-10B24	350.4	24V/14.6A	21.6-28.8	87	1500
	LM350-10B36	349.2	36V/9.7A	32.4-39.6	88	1500
	LM350-10B48	350.4	48V/7.3A	43.2-52.8	88.5	470

Note:
1. *Use suffix "Q" for conformal coating.
2. If the terminal cover is required, please order "PJA-049" for self-installation.
3. Under any conditions, the total power of the product should not exceed the rated power. When the output voltage is increased, the total output power cannot exceed the rated output power, when the output voltage is decreased, the output current cannot exceed the rated output current;
4. 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	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		--	6.8	8	A
	230VAC		--	3.4	4	
Inrush Current	115VAC	Cold start	--	60	--	
	230VAC		--	60	--	
Leakage Current	240VAC		--	--	0.75	mA
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	5V	--	±3	--	%
		12V	--	±1.5	--	
		15V/24V/36V/48V	--	±1	--	
Line Regulation	Rated load		--	±0.5	--	

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Load Regulation	0% - 100% load	5V	--	±2	--	
		12V	--	±1	--	
		15V/24V/36V/48V	--	±0.5	--	
Output Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	5V/12V/15V/24V	--	--	150	mV
		36V/48V	--	--	200	
Temperature Coefficient			--	±0.02	--	%/℃
Minimum Load			0	--	--	%
Stand-by Power Consumption	230VAC, 25℃		--	--	1	W
Hold-up Time	115VAC		--	12	--	ms
	230VAC		--	16	--	
Short Circuit Protection	Recovery time <8s after the short circuit disappear		Hiccup, continuous, self-recover			
Over-current Protection			110% - 180% Io, self-recover			
Over-voltage Protection	5V		5.75V-6.75V (Hiccup, self-recover)			
	12V		13.8V-16.2V (Hiccup, self-recover)			
	15V		18V-21V (Hiccup, self-recover)			
	24V		28.8V-33.6V (Hiccup, self-recover)			
	36V		41.4V-46.8V (Hiccup, self-recover)			
	48V		55.2V-62.4V (Hiccup, self-recover)			
Over-temperature Protection			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, details please refer to Enclosed Switching Power Supply Application Notes.

General Specifications

Item		Operating Conditions		Min.	Typ.	Max.	Unit
Isolation Test	Input - ⏚	Electric strength test for 1min., leakage current <3mA		2000	--	--	VAC
	Input - output	Electric strength test for 1min., leakage current <5mA		3000	--	--	
	Output - ⏚	Electric strength test for 1min., leakage current <3mA		500	--	--	
Insulation Resistance	Input - ⏚	Ambient temperature: 25 ± 5℃ Relative humidity: < 95%RH, no condensation Test voltage: 500VDC		100	--	--	MΩ
	Input - output			100	--	--	
	Output - ⏚			100	--	--	
Operating Temperature				-30	--	+70	℃
Storage Temperature				-40	--	+85	
Fan On/Off Control		Fan On, temperature for Rth3		50	--	--	
		Fan Off, temperature for Rth3		--	--	40	
Operating Humidity		Non-condensing		20	--	90	%RH
Storage Humidity				10	--	95	
Switching Frequency				--	65	--	kHz
Power Derating		Operating temperature derating	+50℃ to +70℃	2	--	--	%/℃
		Input voltage derating	90VAC - 100VAC	2	--	--	%/VAC
			100VAC -132VAC	0	--	--	
			180VAC - 264VAC	0	--	--	
			240VDC - 370VDC	0	--	--	%/VDC
Safety Standard				GB4943.1, IS 13252 (Part1) safety approved & EN/BS EN61558-1, EN/BS EN61558-2-16, EN/BS EN60335-1, EN/BS EN62368-1(Report); Design refer to UL/IEC62368-1			
Safety Class				CLASS I			
MTBF	MIL-HDBK-217F@25℃			≥300,000 h			

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Warranty	Ambient temperature: <70℃	3 years

Mechanical Specifications

Case Material	Metal (AL1100, SGCC)
Dimensions	215.00 mm x 115.00 mm x 30.00mm
Weight	700g (Typ.)
Cooling Method	Forced air cooling

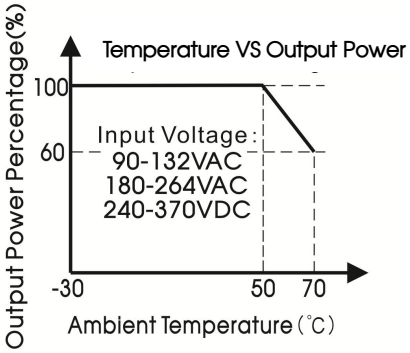
Electromagnetic Compatibility (EMC)

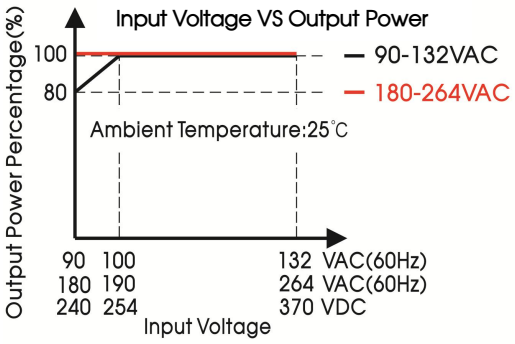
Emissions	CE	CISPR32/EN55032 CLASS A		
	RE	CISPR32/EN55032 CLASS A		
Immunity	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV	perf. Criteria A
	Surge	IEC/EN61000-4-5	line to line ±2KV/line to PE ±4KV	perf. Criteria A
	CS	IEC/EN61000-4-6	10Vr.m.s	perf. Criteria A
	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

Remark:

1. One magnetic beed should be coupled with the output load line during CE/RE testing.
2. It can meet a higher EMC level when equipped with Mornsun FC-L06WX series filter.
3. The power supply does not meet the requirements of harmonic current stipulated in EN61000-3-2; This power supply is not suitable for the following situations.
   1) The terminal equipment is used in the European Union;
   2) The terminal equipment is connected to public mains supply with 220VAC or greater rated nominal voltage that mandatory to meet 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;
   In addition, the power supply can be used in the following terminals which do not need to meet EN61000-3-2;
   (1) Professional equipment with total fixed input power greater than 1000W;
   (2) symmetrical controlled heating element with rated power less than or equal to 200W.
4. If no harmonic current is required or customers can solve harmonic current problems by themselves, this product can be used.
5. *Un is the maximum input nominal voltage.

Product Characteristic Curve





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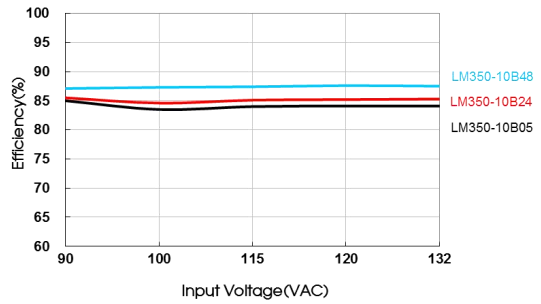
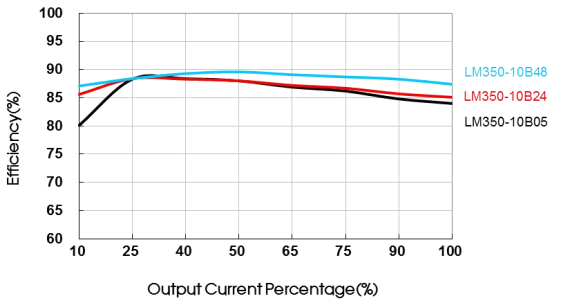
Note: 1. With an AC input voltage between 90-100VAC and a DC input between 180-190VDC the output power must be derated as per the temperature derating curves;

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

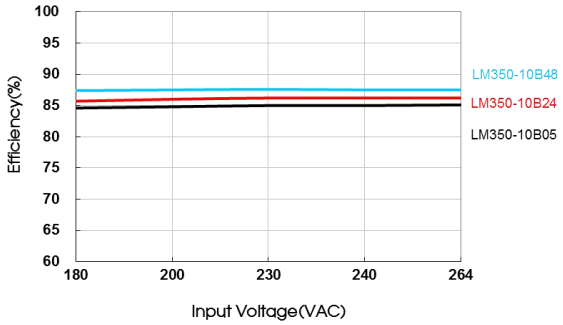
Efficiency Vs Input Voltage (Full Load)



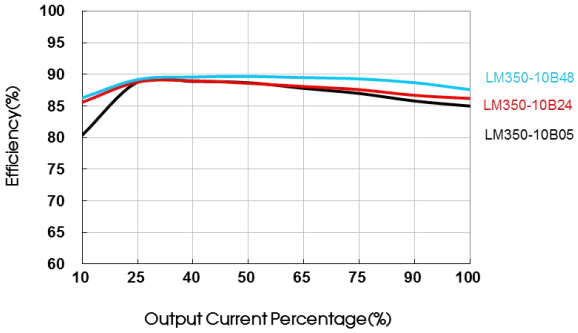
Efficiency Vs Output Load(Vin=115VAC)



Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load(Vin=230VAC)



Note:
The product is equipped with a built-in cooling fan. Keep the air intake clear of debris. If the environment cannot meet this requirement, a fanless model is recommended.

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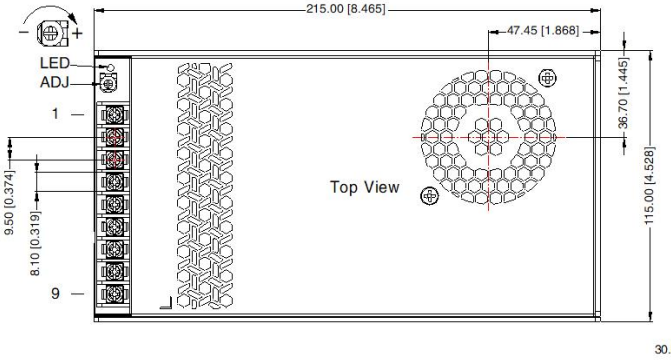
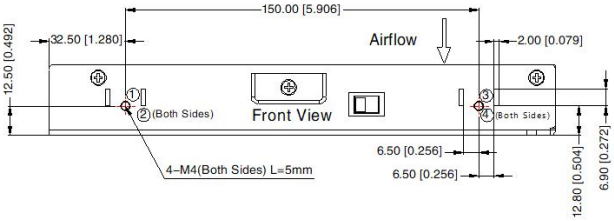
Dimensions and Recommended Layout



THIRD ANGLE PROJECTION

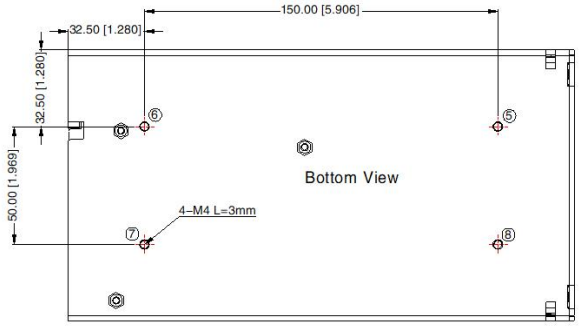
Pin–Out	
Pin	Mark
1	+Vo
2	+Vo
3	+Vo
4	–Vo
5	–Vo
6	–Vo
7	⏚
8	AC(N)
9	AC(L)

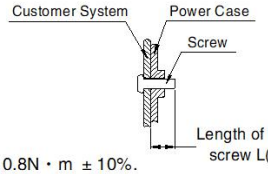


①–⑧any position must be connected to the earth(⏚)

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

Position	Screw Spec.	Length of locking screw L(max)	Recommended torque
①–④	M4	5mm	0.9N · m ± 10%
⑤–⑧	M4	3mm	0.9N · m ± 10%





Note:
Unit: mm[inch]
ADJ: Output adjustable resistor
Wire range: 22–12AWG
Connector tightening torque: M3.5, 0.8N · m ± 10%.
General tolerances: ± 1.00[± 0.039]
The product features a fan–based cooling function, and the air inlet must be protected against foreign object ingestion. If the environmental conditions cannot meet these requirements, it is advisable to consider fanless products as an alternative.

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220891;
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 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.

Mornsun Guangzhou Science & Technology Co., Ltd.

Address: No. 8 Nanyun 4th Road, Huangpu District, Guangzhou, China

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

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