



## FEATURES

- Universal 85-264VAC or 120-370VDC input voltage
- Input withstand 305VAC/5s
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -40°C to +85°C (-30°C full load)
- High I/O isolation voltage up to 4000VAC
- Output voltage adjustable
- Output short circuit, over-current, over-voltage protection
- Surge immunity meets Level 4
- Installing in system of Safety Class I is available
- Design refer to UL/IEC62368, EN60335

LO35-20Bxx-M 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, low power consumption, high efficiency, high reliability, reinforced isolation. These converters offer excellent EMC performance and design refer to IEC/EN61000-4, CISPR32/EN55032, UL/EN/IEC/BS EN62368, EN60335 standards and they are widely used in areas of industrial, office and civil applications.

## Selection Guide

Certification	Part No.	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range ADJ (V)*	Efficiency at 230VAC (%) Typ.	Capacitive Load (μF) Max.
EN	LO35-20B05-M	30	5V/6A	4.5-5.5	85	15000
	LO35-20B12-M	36	12V/3A	10.8-13.5	89	6500
	LO35-20B15-M	36	15V/2.4A	13.5-16.5	88	5000
	LO35-20B24-M	36	24V/1.5A	21.6-27	89	1200
	LO35-20B36-M	36	36V/1A	32.4-39.6	89	800
	LO35-20B48-M	36	48V/0.75A	43.2-52.8	90	390

Note: \*The actual adjustment range may extend outside the values stated, care should be exercised to ensure that the output voltage and power levels remain within the published maximum values.

## 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	--	--	0.75	A
	230VAC	--	--	0.5	
Inrush Current	230VAC Cold start	--	40	--	
Input Temporary Over-voltage	Rated load output, 305VAC input	5s/time, interval 10s, product without damaging			
Hot Plug		Unavailable			

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	5V	±2	--	%
		Other output	±1	--	
Line Regulation	Rated load	--	±0.5	--	%
Load Regulation	230VAC	5V	±1	--	
		Other output	--	±0.5	--

Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	5V	--	40	60	mV
		12V/15V	--	70	100	
		24V/36V	--	80	180	
		48V	--	100	200	
Stand-by Power Consumption	Room temperature, 230VAC input	5V/12V/15V/24V	--	0.3	0.4	W
		36V/48V	--	0.4	0.5	
Temperature Coefficient			--	±0.02	--	%/°C
Short Circuit Protection			Hiccup, continuous, self-recovery			
Over-current Protection			130% - 300% Io, self-recover			
Over-voltage Protection	5V	≤7.5V	Output voltage hiccup			
	12V	≤20V				
	15V	≤20V				
	24V	≤32V				
	36V	≤47V				
	48V	≤60V				
Minimum Load		0	--	--	%	
Hold-up Time	115VAC input	--	16	--	ms	
	230VAC input	--	50	--		

Note: \*The "Tip and barrel method" is used for ripple and noise test: by using a 12 twisted pair-wire terminated with a 0.1uF & 47uF parallel capacitor, please refer to Enclosed Switching Power Supply Application Notes for specific information.

## General Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Isolation	Input - output	Electric Strength Test for 1min., leakage current <5mA	4000	--	--	VAC
	Input - ⊕		2000	--	--	
	Output - ⊕		500	--	--	
Insulation Resistance	Input - output	Test voltage: 500VDC	100	--	--	MΩ
	Input - ⊕					
	Output - ⊕					
Operating Temperature		-40	--	+85	°C	
Storage Temperature		-40	--	+85		
Storage Humidity	Non-condensing	--	--	95	%RH	
Operating Humidity		--	--	90		
Altitude*		--	--	4000	m	
Output Power Derating	Operating temperature derating	-40°C to -30°C	5	--	--	% / °C
		+50°C to +70°C	2.5	--	--	
		+70°C to +85°C	1.67	--	--	
	Input voltage derating	85VAC - 100VAC	0.67	--	--	
Leakage Current	240VAC	<0.5mA RMS				
Safety Standard		EN62368-1, BS EN62368-1 (Report); Design refer to UL/IEC62368-1, EN60335-1				
Safety Class		CLASS I				
MTBF	MIL-HDBK-217F@25°C	≥300,000 h				

Note: \*For operation of altitude between 2000-4000m, please consult Mornsun FAE.

### Mechanical Specifications

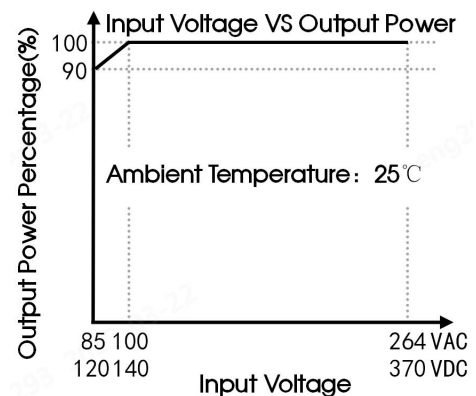
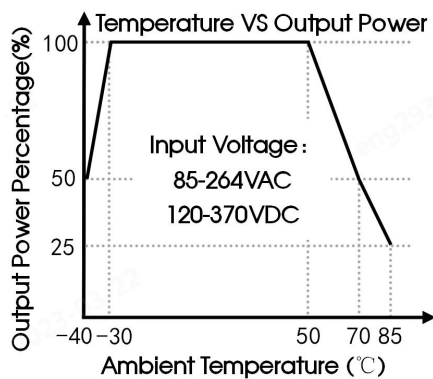
Dimension	76.20 x 50.80 x 27.00mm
Weight	70g (Typ.)
Cooling Method	Air cooling

### 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/EN61000-4-2	Contact $\pm 4KV$ /Air $\pm 8KV$	Perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m	Perf. Criteria A
	EFT	IEC/EN61000-4-4	$\pm 2KV$	Perf. Criteria A
	Surge	IEC/EN61000-4-5	Line to line $\pm 2KV$ /line to PE $\pm 4KV$	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 dips, short interruption and voltage variations	IEC/EN61000-4-11	100% dip 1 periods, 30% dip 25 periods (50Hz), 30 periods (60Hz)	Perf. Criteria B

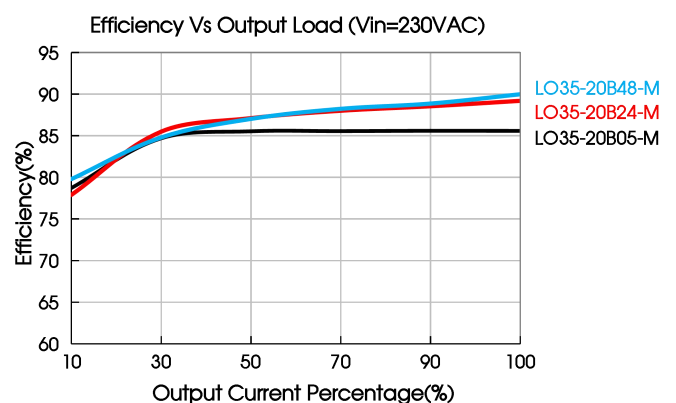
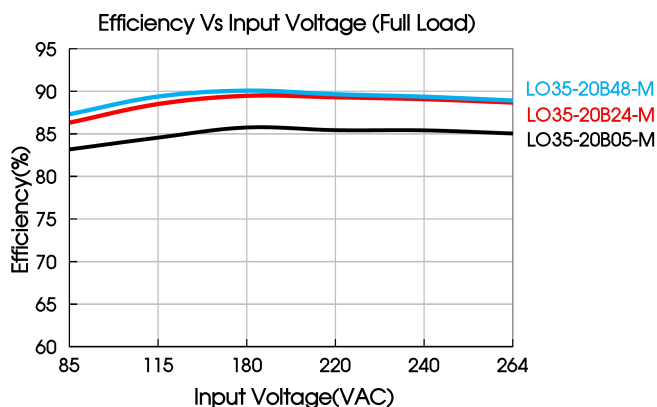
Note: All EMC performance are been tested on a metal plate with a thickness of 1mm and a length of 360mm x 360mm.

### Product Characteristic Curve



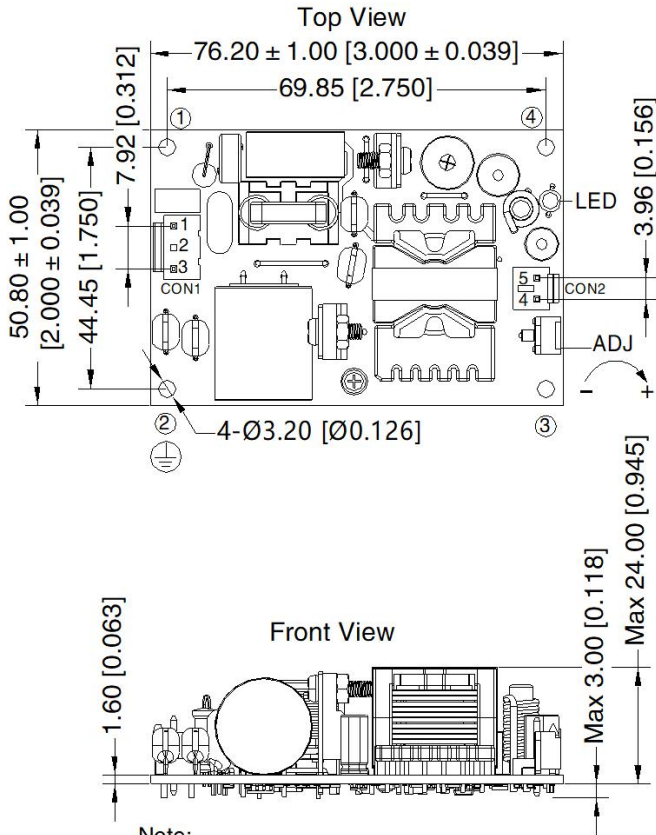
Note: 1. With an AC input voltage between 85-100VAC and a DC input between 120-140VDC the output power must be derated as per the temperature derating curves;

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




Dimensions and Recommended Layout

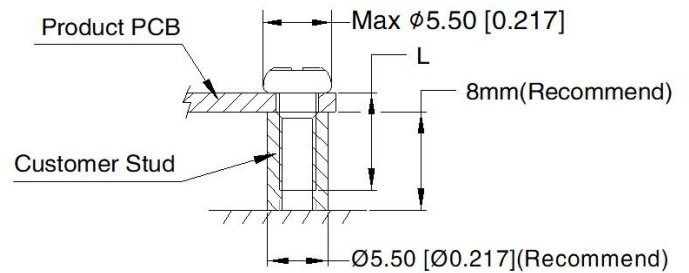
THIRD ANGLE PROJECTION 



Pin-Out			
Connectors	Pin	Mark	Client Connectors
CON1	1	AC(L)	Housing: JST VHR Contact: JSTSVH-21T-P1.1 or equivalent
	2	No Pin	
	3	AC(N)	
CON2	4	+Vo	Housing: JST VHR Contact: JSTSVH-21T-P1.1 or equivalent
	5	-Vo	

② Must be connected to the earth 

Position	Screw Spec.	L(Recommend)	Torque(max)
① - ④	M3	6mm	0.4N · m



Note:  
Unit: mm[inch]  
General tolerances:  $\pm 0.50[\pm 0.020]$   
The layout of the device is for reference only,  
please refer to the actual product

Note:

- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58220060;
- 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;
- The room temperature derating of  $3.5^\circ\text{C}/1000\text{m}$  is needed for operating altitude greater than 2000m;
- All index testing methods in this datasheet are based on our company corporate standards;
- 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;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- The output voltage can be adjusted by the ADJ, clockwise to increase;
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
- 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.

Mornsun Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Huangpu District, Guangzhou, P. R. China  
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com