AC/DC 150W Enclosed Switching Power Supply

LM150-20Axx Series

MORNSUN®

RoHS

FEATURES

- Special power supply for laser galvanometer industry
- Universal 85 - 264VAC or 120 - 373VDC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -30℃ to +70℃
- High I/O isolation test voltage up to 4000VAC
- High efficiency, low ripple & noise
- Output short circuit, over-current, over-voltage protection
- Operating altitude up to 5000m
- 3 years warranty

LM150-20Axx series is one of Mornsun's dual output non-isolation enclosed AC-DC switching power supply. It features universal AC input and at the same time accepts DC input voltage, cost-effective, high efficiency, high reliability and double or reinforced insulation. These converters offer excellent EMC performance and meet IEC/EN61000-4, CISPR32/EN55032, UL/EN62368 standards and they are not only used in the professional laser galvanometer industry, but also widely used in current sensors, motors and other fields.

Selection Guide

Certification	Part No.*	Cooling Method	Output Power (W)	Nominal Output Voltage and Current		Output Voltage Adjustable Range (V) (Vo1)*	Efficiency at 230VAC (%) Typ.	Max. Capacitive Load (uF)	
				Vo1/Io1	Vo2/Io2			Vo1	Vo2
BIS	LM150-20A15	Air cooling	150	+15V/5A	-15V/5A	13.5V-16.5V	86	6000	6000
	LM150-20A24			+24V/3.125A	-24V/3.125A	21.6V-26.4V	88	2400	2400

Note:
1. The product picture is for reference only. For details, please refer to the actual product;
2. Under any steady-state 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.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input		85	--	264	VAC
	DC input		120	--	373	VDC
Input Voltage Frequency			47	--	63	Hz
Input Current	115VAC		--	--	4	A
	230VAC		--	--	2	
Inrush Current	115VAC	Cold start	--	30	--	
	230VAC		--	60	--	
Start-up Delay Time	rated load		--	--	1	s
Input Fuse	Built-in fuse		--	6.3	--	A
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions			Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range (Balanced load)	Vo1		--	±1	--	%
		Vo2		--	±3	--	
Line Regulation	Rated load (Balanced load)	Vo1		--	±0.5	--	
		Vo2		--	±3	--	
Load Regulation	10% - 100% load (Balanced load)	Vo1		--	±1	--	
		Vo2		--	±3	--	
Cross Regulation	Full input voltage range (no-balanced load)			--	--	10	
Minimum Load				10	--	--	
Ripple & Noise*	20MHz bandwidth	15V	Vo1	--	--	100	mV

	(peak-peak value)		Vo2	--	--	150	
		24V	Vo1/Vo2	--	--	150	
Temperature Coefficient				--	±0.03	--	%/℃
Hold-up Time	115VAC			--	8	--	ms
	230VAC			--	20	--	
Short Circuit Protection	Recovery time <5s after the short circuit disappear.			Hiccup, continuous, self-recover			
Over-current Protection				125% - 200% Io, hiccup, self-recover			
Over-voltage Protection	15V output	Vo1		≤21.75V (Hiccup, self-recover)			
	24V output	Vo1		≤33.6V (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 AC-DC Converter 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 - ⏚	Ambient temperature: 25 ± 5℃ Relative humidity: < 95%RH, no condensation Test voltage: 500VDC			50	--	--	MΩ
	Input - output				50	--	--	
	Output - ⏚				50	--	--	
Operating Temperature					-30	--	+70	℃
Storage Temperature					-40	--	+85	
Operating Humidity		Non-condensing			--	--	95	%RH
Storage Humidity					--	--	75	
Switching Frequency					--	65	--	kHz
Power Derating		Operating temperature derating	-30℃ to -25℃	≤100VAC input	5	--	--	%/℃
			+50℃ to +70℃		2.5	--	--	
		Input voltage derating	85VAC - 100VAC		2	--	--	
		Altitude derating	2000m - 5000m		5	--	--	℃/Km
Leakage Current		240VAC, 60Hz	Touch current		<0.5mA			
Safety Standards					IS13252 (Part1) safety approved; design refer to UL/EN62368-1			
Safety Class					CLASS I			
MTBF		MIL-HDBK-217F@25℃			≥300,000 h			
Warranty		Ambient temperature: <50℃			3 years			

Environmental Characteristics

Item	Operating Conditions	Standard
High and Low Temperature Working	+70℃, -30℃	GB2423.1, IEC60068-2-1
Sinusoidal Vibration	10-500Hz, 5g, 60 minutes in each direction of X, Y, Z axis	GB2423.10, IEC60068-2-6
Low Temperature Storage	-40℃	GB2423.1, IEC60068-2-1
High Temperature Storage	+85℃	GB2423.2, IEC60068-2-2
Packaging Drop	1m, one corner, three edges and six sides	GB2423.8, IEC68-2-32

General Specifications

Case Material	Metal (AL1100, SGCC)
Dimensions	159.00 x 97.00 x 30.00mm
Weight	450g (Typ.)

Cooling Method	Air cooling

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B		
	RE	CISPR32/EN55032 CLASS B		
Immunity	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m	
	EFT	IEC/EN61000-4-4	±4KV	
	Surge	IEC/EN61000-4-5	line to line ±2KV/line to PE ±4KV	
	CS	IEC/EN61000-4-6	10Vr.m.s	
	PMS	IEC/EN61000-4-8	30A/m	
	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:

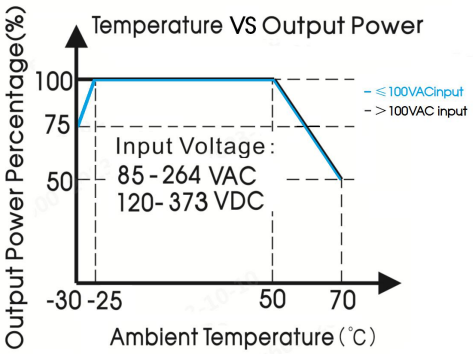
1. perf. Criteria:

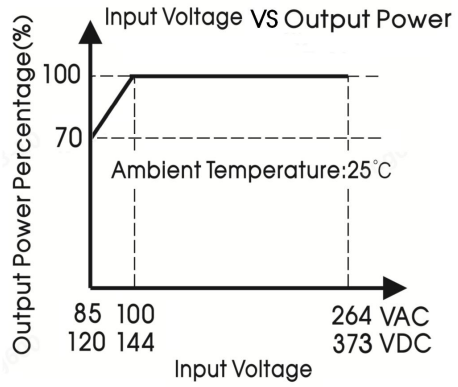
A: The equipment shall continue to operate as intended without operator intervention;

B: After the test, the equipment shall continue to operate as intended without operator intervention.

2. *Un is the maximum input nominal voltage.

Product Characteristic Curve

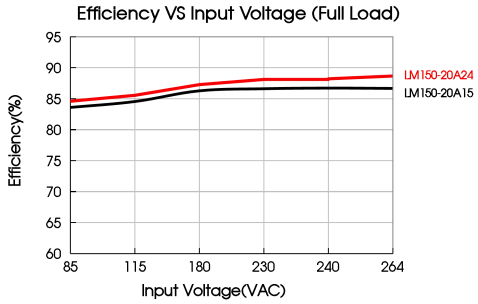


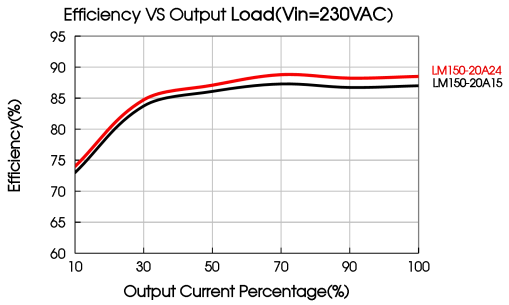


Note:

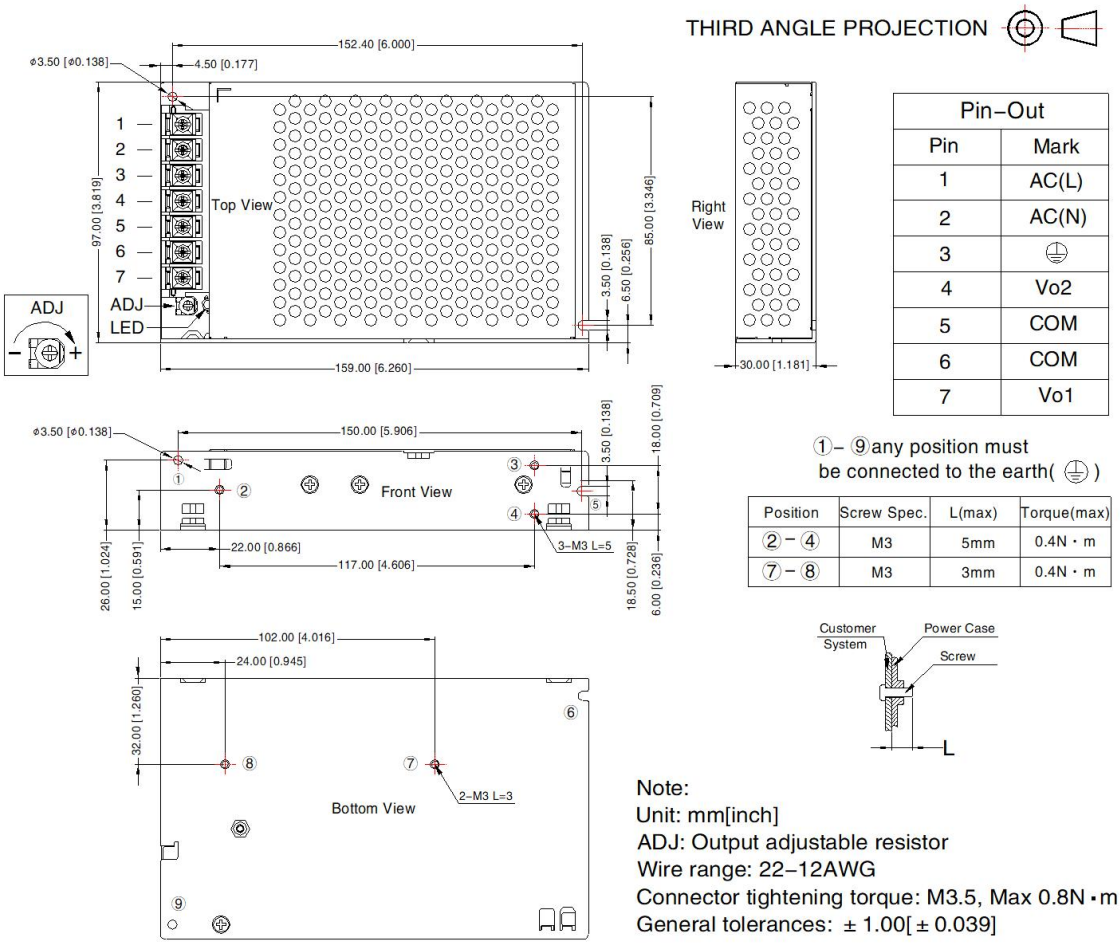
1. With an AC input voltage between 85-100VAC and a DC input between 120-144VDC the output power must be derated as per the temperature derating curves;

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	Mark
1	AC(L)
2	AC(N)
3	⏚
4	Vo2
5	COM
6	COM
7	Vo1

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

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: 22–12AWG
Connector tightening torque: M3.5, Max 0.8N·m
General tolerances: ± 1.00[± 0.039]

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220111;
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 PE (⏚) 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 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. 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