



FEATURES

- Special switching power supply designed for professional laser galvanometer industry
- Universal 165 - 264VAC or 180 - 370VDC Input voltage
- Operating ambient temperature range: -30℃ to +70℃
- Low standby power consumption, high efficiency
- Output short circuit, over-current, over-voltage protection
- High I/O isolation test voltage up to 3000VAC
- Operating altitude up to 5000m
- Design refer to IEC/UL62368, EN60335, EN61558, GB4943

LM60-12A15 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, IEC/UL/EN62368, GB4943 standards and they are not only specific used in the laser galvanometer industry, but also widely used in current sensors, motors and other fields.

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)	
			(Vo1/Io1)	(Vo2/Io2)			Vo1	Vo2
EN/BS/BIS	LM60-12A15	60	+15V/2.0A	-15V/2.0A	14.25-15.75	82	4000	2000

Note: *Use suffix "C" for terminal with protective cover.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input		165	--	264	VAC
	DC input		180	--	370	VDC
Input Voltage Frequency			47	--	63	Hz
Input Current	230VAC		--	--	1	A
Inrush Current	230VAC	Cold start	--	60	--	
Leakage Current	240VAC		<0.75mA			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	Vo1	--	±1.0	--	%
		Vo2	--	±3.0	--	
Line Regulation	Rated load	Vo1	--	±1.0	--	
Load Regulation	10% - 100% Load (Balanced load)	Vo1	--	±1.0	--	
		Vo2	--	±3.0	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)		--	100	--	mV
Temperature Coefficient	Vo1		--	±0.03	--	%/℃
Start-up Delay Time	Rated input voltage		--	--	3.0	s

AC/DC 60W Enclosed Switching Power Supply

LM60-12A15, LM60-12A15-C

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Hold-up Time	230VAC	20	--	--	ms
Minimum Load		10	--	--	%
Short Circuit Protection	Recovery time <5s after the short circuit disappear.	Hiccup, continuous, self-recover			
Over-current Protection	Dual output with balanced load	110%-200%Io, hiccup, self-recover			
Over-voltage Protection	Vo1	≤22VDC (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 - output	Electric strength test for 1min, leakage current <5mA		3000	--	--	VAC
	Input - ⊕			1500	--	--	
	Output - ⊕			500	--	--	
Insulation Resistance	Input - output	Environment temperature: 25±5℃ Relative humidity: <95%RH, non-condensing Testing voltage: 500VDC		50	--	--	M Ω
	Input - ⊕			50	--	--	
	Output - ⊕			50	--	--	
Operating Temperature				-30	--	+70	℃
Storage Temperature				-40	--	+85	
Storage Humidity		Non-condensing		10	--	95	%RH
Operating Humidity				20	--	90	
Power Derating		Operating temperature derating	+50℃ to +70℃	2.5	--	--	%/℃
Safety Standard				IS13252 (Part1) safety approved & EN62368-1, BS EN 62368-1(Report) Design refer to IEC/UL62368-1, EN60335-1, EN61558-1, GB4943.1			
Safety Class				CLASS I			
MTBF		MIL-HDBK-217F@25℃		>300,000 h			

Mechanical Specifications

Case Material	Metal (AL1100, SGCC)
Dimensions	99.00mm x 97.00mm x 30.00 mm
Weight	240g (Typ.)
Cooling Method	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 ±1KV/line to ground ±2KV	perf. Criteria A	
	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A	
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%, 70%	perf. Criteria B	

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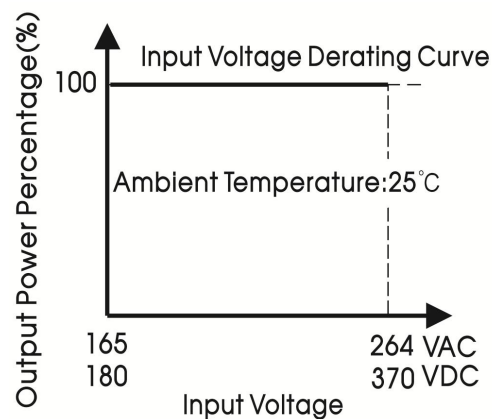
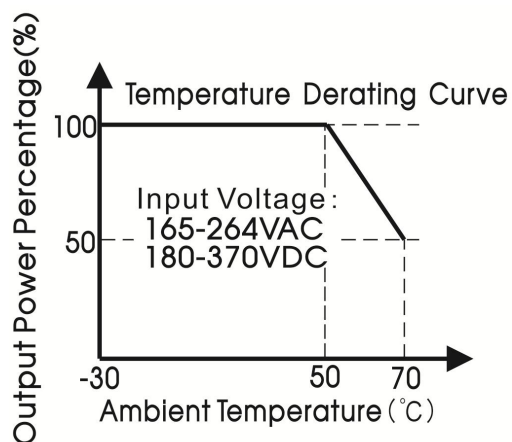
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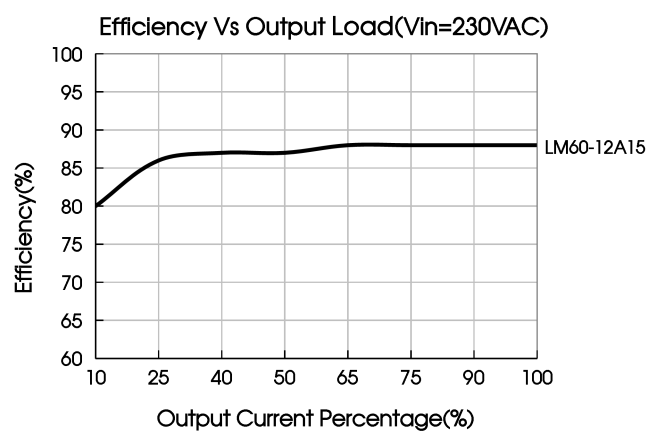
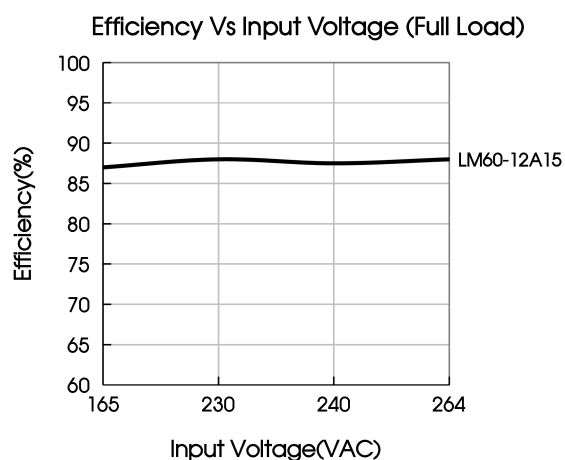
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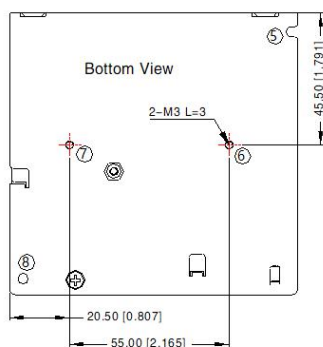
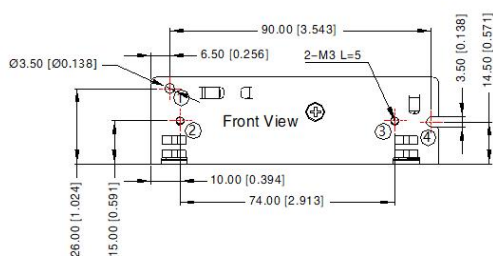
Product Characteristic Curve



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



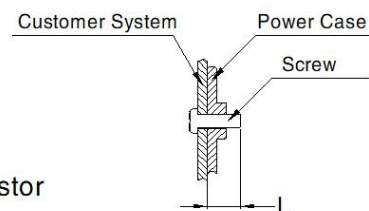
LM60-12A15



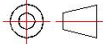
Pin-Out	
Pin	Function
1	AC(L)
2	AC(N)
3	
4	Vo2
5	COM
6	COM
7	Vo1

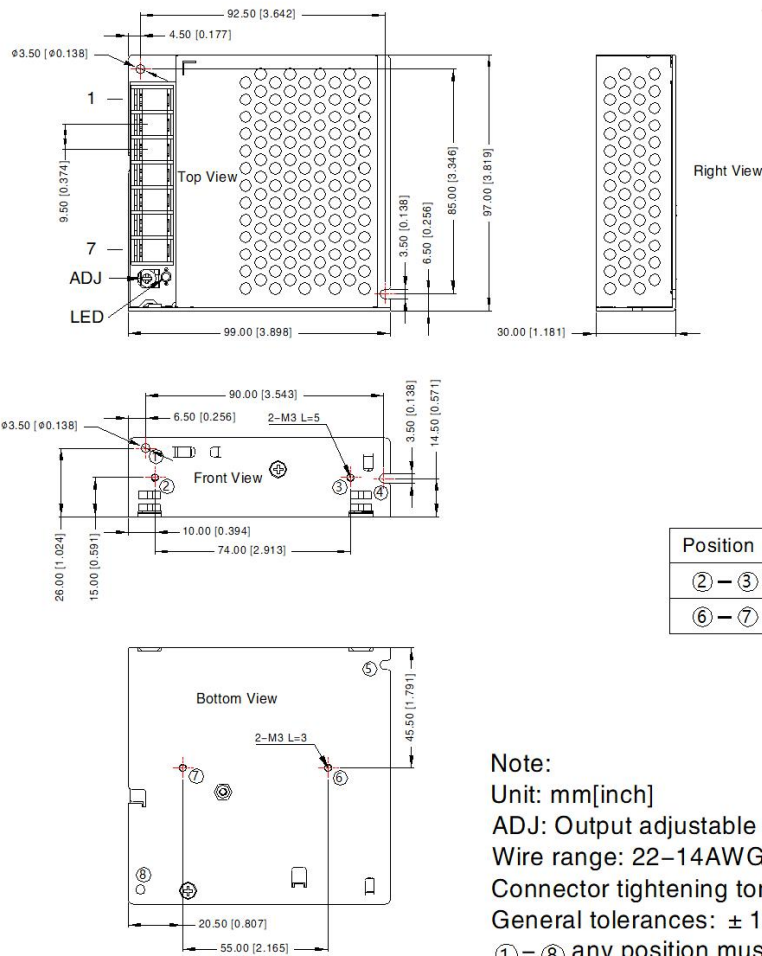
Position	Screw Spec.	L(max)	Torque(max)
②－③	M3	5mm	0.4N・m
⑥－⑦	M3	3mm	0.4N・m

①-⑧ any position must be connected to PE



LM60-12A15-C

THIRD ANGLE PROJECTION 



Pin-Out	
Pin	Function
1	AC(L)
2	AC(N)
3	
4	Vo2
5	COM
6	COM
7	Vo1

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]

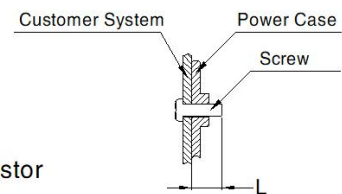
ADJ: Output adjustable resistor

Wire range: 22-14AWG

Connector tightening torque: M3, Max 0.4N · m

General tolerances: $\pm 1.00[\pm 0.039]$

①-⑧ any position must be connected to PE



Note:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220119;
- 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 $5^{\circ}\text{C}/1000\text{m}$ 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 out case needs to be connected to PE () of system when the terminal equipment in operating;
- The output voltage can be adjusted by the ADJ, clockwise to decrease;
- 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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