



RoHS

FEATURES

- Universal85 - 305VAC or 120 - 430VDC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -40°C to +85°C
- Low ripple & noise 250mVmax
- High efficiency up to 96%
- Active PFC, power factor >0.98
- High I/O isolation test voltage up to 4000VAC
- Output short circuit/over-current/over-voltage protection, over-temperature protection
- 150% peak load output for 1.5 second
- Supports 2+1 parallel current sharing
- Operating altitude up to 5000m
- Meet the IP67 protection level
- 10G seismic resistance
- 6 years warranty

LMF600-23BxxHE series is one of Mornsun's high reliability waterproof enclosed AC-DC switching power supplies, the protection level meets IP67, and is suitable for outdoor harsh conditions. It features universal AC input and at the same time accepts DC input voltage, with cost-effective, high efficiency, high reliability and reinforced isolation. These converters offer excellent EMC performance and meet UL/EN/IEC/BS EN62368, EN60335, EN61558, GB4943 standards and they are widely used in areas of industrial, street light control, security, pit, telecommunications, 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)
--	LMF600-23B12HE	480	12V/40A	10.2-12.6	93	10000
	LMF600-23B24HE	600	24V/25A	20.4-25.2	95	8000
	LMF600-23B36HE	601.2	36V/16.7A	30.6-37.8	95.5	6000
	LMF600-23B42HE	600.6	42V/14.3A	35.7-44.1	96	4800
	LMF600-23B48HE	600	48V/12.5A	40.8-50.4	96	4000

Note:  
 1. The above models include Standby output: 5V/0.5A.  
 2. 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.  
 3. 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	Rated input (Certified voltage)		100	--	277	VAC
	AC input		85	--	305	
	DC input		120	--	430	VDC
Input Voltage Frequency	Rated input (Certified voltage)		50	--	60	Hz
			47	--	63	
Input Current	Rated input (Certified voltage)		--	--	7	A
	115VAC		--	--	7	
	230VAC		--	--	3.3	
	277VAC		--	--	2.9	
Inrush Current	230VAC	Cold start	--	65	--	
Input Fuse	Built-in fuse		--	8	--	
Start-up Delay Time			--	--	2	s

Power Factor	115VAC	PF ≥0.99
	230VAC	PF ≥0.98
Hot Plug		Unavailable

### Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	12V	--	±3	--	
		24V/36V/42V/48V	--	±1	--	
		5V Auxiliary source	--	±5	--	
Line Regulation	Rated load	12V/24V/36V/42V/48V	--	±0.5	--	%
		5V Auxiliary source	--	±5	--	
Load Regulation	0% - 100% load	12V	--	±2	--	
		24V/36V/42V/48V	--	±0.5	--	
		5V Auxiliary source	--	±5	--	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	12V/24V	--	--	150	mV
		36V/42V/48V	--	--	250	
		5V Auxiliary source	--	--	100	
Temperature Coefficient			--	0.03	--	%/°C
Minimum Load			0	--	--	%
Hold-up Time	115VAC/230VAC		--	15	--	ms
Output Peak Power	230VAC input, 150% Io		--	1.5	--	s
Short Circuit Protection	Recovery time 3s after the short circuit disappear.		Constant current mode, continuous, self-recover after the load abnormal conditions are removed			
Over-current Protection			105% -125% Io, constant current mode, self-recover after fault clearance			
Over-voltage Protection	12V		≤16V (output voltage hiccup)			
	24V		≤30V (output voltage hiccup)			
	36V		≤43.5V (output voltage hiccup)			
	42V		≤50V (output voltage hiccup)			
	48V		≤56.5V (output voltage hiccup)			
Over-temperature Protection			Output voltage shutdown, restored by restarting after over-temperature fault clearance			

Note:  
 1.\*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.  
 2. 5V Standby only general performance and protection functions are tested.

### 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 - ⊕		1500	--	--	
Insulation Resistance	Input - ⊕	Ambient temperature: 25 ± 5°C Relative humidity: < 95%RH, no condensation Test voltage: 500VDC	100	--	--	MΩ
	Input - output		100	--	--	
	Output - ⊕		100	--	--	
Leakage Current	277VAC	Touch current	--	--	0.5	mA
Operating Temperature			-40	--	+85	°C
Storage Temperature			-40	--	+85	
Operating Humidity	Non-condensing		10	--	95	%RH
Storage Humidity			20	--	95	

Switching Frequency	100% load	--	65	--	kHz
Power Derating	Operating temperature derating	+55℃ to +70℃	2.67	--	%/℃
		+70℃ to +85℃	3	--	%/VAC
Power Derating	Input voltage derating	85VAC - 115VAC	0.83	--	%/VDC
	Altitude derating	2000m - 5000m	5	--	℃/km
Safety Standards	Design refer to UL/EN/IEC/BS EN62368-1, EN60335-1, EN61558-1, GB4943.1				
Safety Class	CLASS I				
MTBF	MIL-HDBK-217F@25℃	≥300,000 h			
Warranty	Case temperature: <75℃	6 years			

### Functional Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Remote Control Switch	All Input Voltage, all load range Range	Power On	PS_ON (wire 4 white) and GND (wire 4 black) >2-5V or open circuit		
		Power Off	PS_ON (wire 4 white) and GND (wire 4 black) <0-0.5V or short circuit		
Parallel Current Sharing		Support direct parallel use, achieve 2+1 parallel current sharing			
Current Sharing Accuracy	When units in parallel, each power supply needs to carry a rated load of more than 50%	--	±5	--	%

### Environmental Characteristics

Item	Operating Conditions	Standard
Low Temperature Working	-40℃	GB2423.1, IEC60068-2-1
High Temperature Working	+85℃	GB2423.2, IEC60068-2-2
Low Temperature Storage	-40℃	GB2423.1, IEC60068-2-1
High Temperature Storage	+85℃	GB2423.2, IEC60068-2-2
Temperature Shock	-40℃ to +85℃	GB2423.22, IEC60068-2-14
Temperature Cycle	-25℃ to +55℃	GB2423.22, IEC60068-2-14
Hot and Humid	+85℃, 85%RH	GB2423.50, IEC60068-2-67
Sinusoidal Vibration	10 - 500Hz, 10G, 12 minutes/cycle, 72 minutes in each direction of X, Y, Z axis	GB2423.10, IEC60068-2-6
High Temperature/Low-pressure Synthetical Test		GB/T 2423.26
Packaging Drop		ISTA 3A-2008

### General Specifications

Case Material	Metal (AL6063)
Dimensions	280.00 x 144.00 x 48.50 mm
Weight	3400g (Typ.)
Cooling Method	Natural air cooling

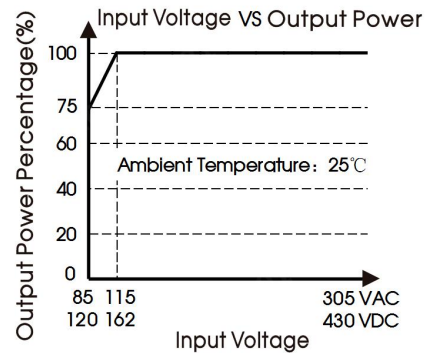
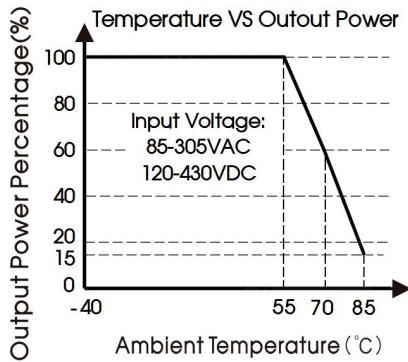
### Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B
	RE	CISPR32/EN55032	CLASS B
	Harmonic current	IEC/EN61000-3-2	CLASS A and CLASS D
	Voltage flicker	EN61000-3-3	
Immunity	ESD	IEC/EN61000-4-2	Contact ±8KV/Air ±15KV perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m perf. Criteria A
	EFT (Input port)	IEC/EN61000-4-4	±4KV perf. Criteria A
	Surge (Input port)	IEC/EN61000-4-5	line to line ±4KV/line to PE ±4KV perf. Criteria A

MS	IEC/EN61000-4-6	10Vr.m.s	perf. Criteria A
CS	IEC/EN61000-4-8	30A/m	perf. Criteria A
Voltage variations *	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
Short interruptions *	IEC61000-6-2/IEC61000-4-11	0% Un, 250/300 cycle(50/60Hz)	perf. Criteria C

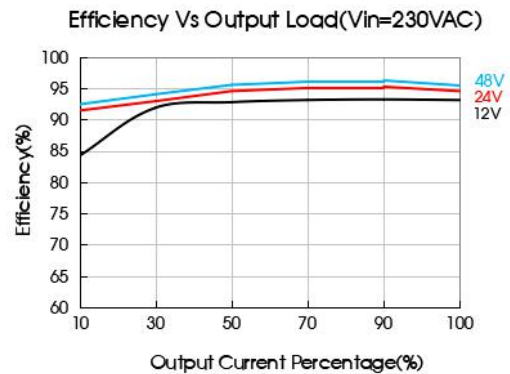
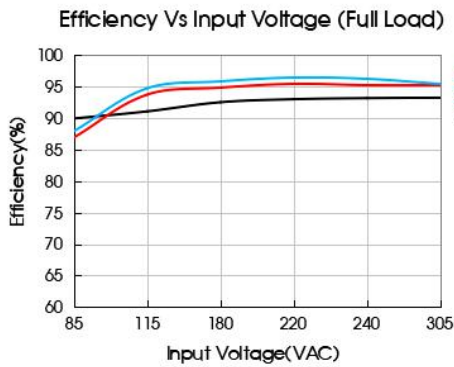
Note:  
 1. perf. Criteria:  
 A: The equipment shall continue to operate as intended without operator intervention;  
 B: After the test, the equipment shall continue to operate as intended without operator intervention;  
 C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions and/or information stored in non-volatile memory or protected by backup batteries should not be lost.  
 D: Irrecoverable reduction or loss of function due to damage to the device (or components).  
 2. \*Un is the maximum input nominal voltage.

### Product Characteristic Curve



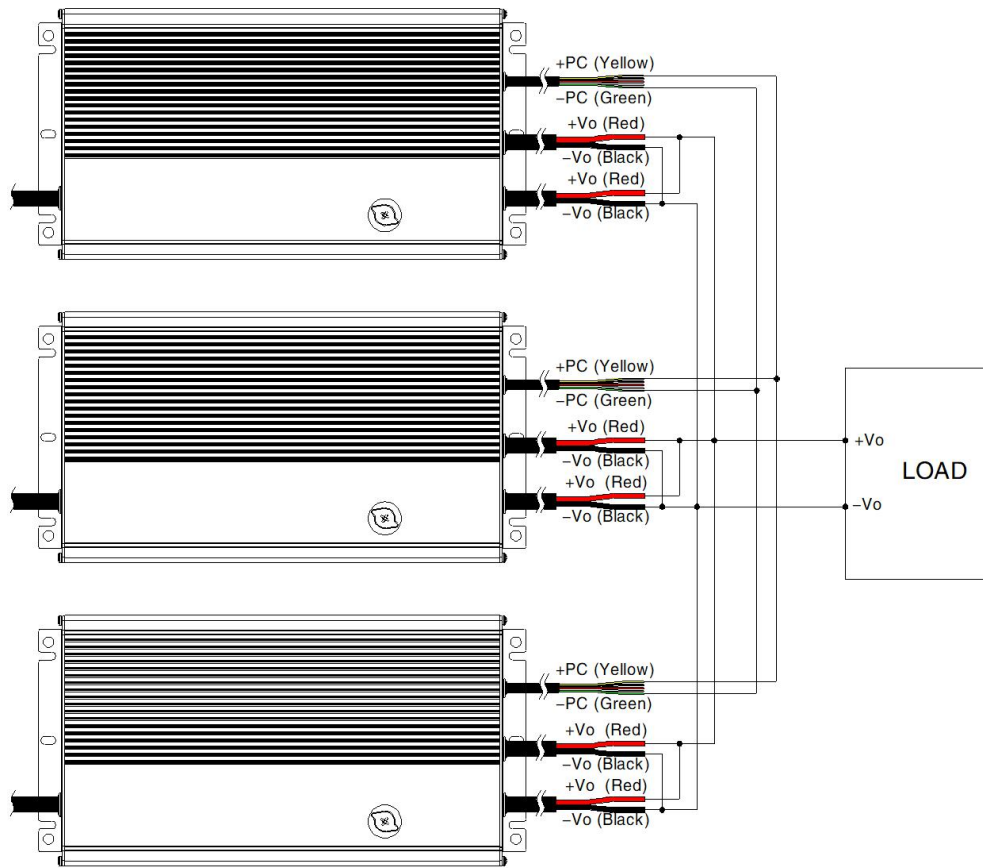
Note: 1. With an AC input voltage between 85 -115VAC and a DC input between 120-162VDC the output power must be derated as per the temperature derating curves;

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



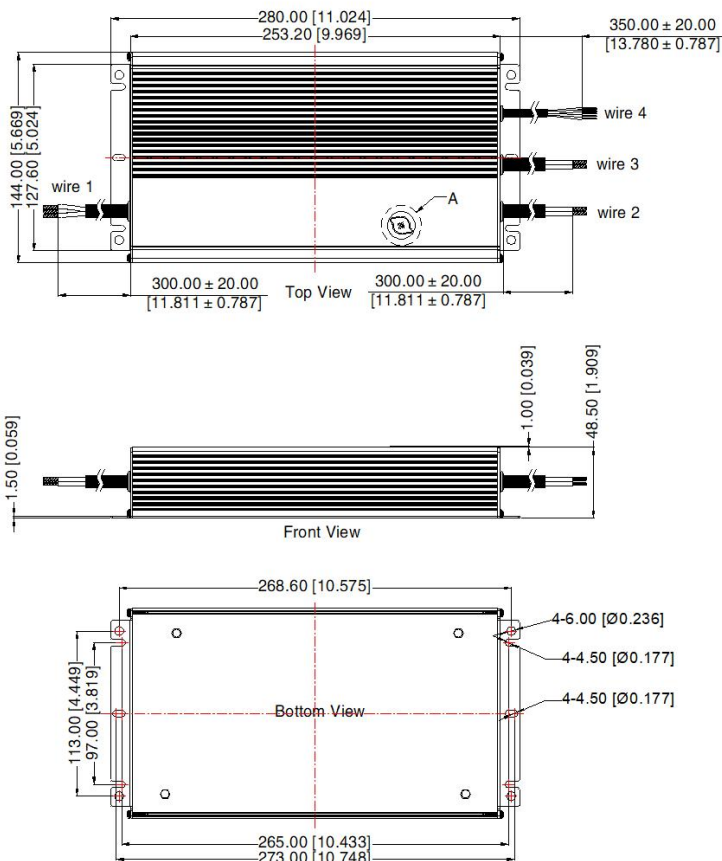
### Parallel Function Description

1. The wiring method of parallel operation is shown in the figure below(PC parallel connection).
2. The output voltage difference between the parallel units should be as small as possible.
3. Supports 2+1 parallel to increase power and current sharing, please consult our FAE for details.
4. The power supply should be connected to the load with short and thick parallel wires.

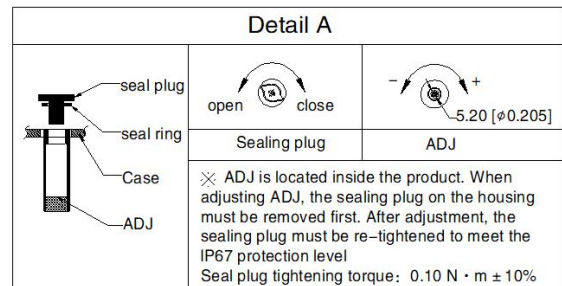


Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Pin-Out				
No.	Remarks	Specification	Colour	Mark
wire 1	Input wire	SJTW 16AWG*3C	Green	Yellow
			Brown	AC(L)
			Blue	AC(N)
wire 2	Output wire	SJTW 14AWG*2C	Red	+Vo
			Black	-Vo
wire 3	Output wire	SJTW 14AWG*2C	Red	+Vo
			Black	-Vo
wire 4	Control wire	AWM 22AWG*5C	Red	5V
			Black	GND
			White	PS ON
			Yellow	+PC
			Green	-PC



Note:  
 Unit: mm[inch]  
 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: 58220765;
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 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.

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