

### FEATURES

- Universal 176 - 285VAC or 240 - 400VDC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -40°C to +85°C
- High efficiency, low ripple & noise
- AC OK, DC OK function
- High I/O isolation test voltage up to 3000VAC
- Output short circuit/over-current/over-voltage protection, over-temperature protection, input over-voltage/under-voltage protection
- Operating altitude up to 3000m
- Safety according to EN62368, GB4943
- 3 years warranty



LM550-12Dxx 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, cost-effective, low no load power consumption, high efficiency, high reliability and double or reinforced insulation. The converter offer excellent EMC performance and meet IEC/EN61000-4, CISPR32/EN55032, EN62368, GB4943 standards and they are widely used in areas of industrial, communication etc.

### Selection Guide

Part No.*	Cooling Method	Output Power (W)	Nominal Output Voltage and Current		Efficiency at 230VAC (%) Typ.	Max. Capacitive Load (uF)	
			Vo1/Io1	Vo2/Io2		Vo1	Vo2
LM550-12D2812-40	Add surface heat sink	552	28V/18A	12V/4A	94	2200	3500
LM550-12D3012-40		552	30V/16.8A	12V/4A	94	2000	3500
LM550-12D4812-40		552	48V/10.5A	12V/4A	94	1100	3500
LM550-12D2809-50		549	28V/18A	9V/5A	94	2200	3500
LM550-12D4809-50		549	48V/10.5A	9V/5A	94	1100	3500

Note: \*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)	200	--	240	VAC
	AC input	176	--	285	
	DC input	240	--	400	VDC
Input Voltage Frequency	Rated input (Certified voltage)	50	--	60	Hz
	AC input	47	--	63	
Input Current	Rated input (Certified voltage)	--	--	7.5	A
	230VAC	--	--	7	
Inrush Current	230VAC Cold start	--	30	35	
Start-up Delay Time	230VAC, rated load	--	--	1.5	s
Input Fuse	Built-in fuse	--	12.5	--	A
Input Under-voltage Protection	Under-voltage protection start (Input voltage drops from high to low), each output with 50% Io	145	--	165	VAC
	Under-voltage protection release (Input voltage rises from low to high), each output with 50% Io	160	--	175	
Input Over-voltage Protection	Under-voltage protection start (Input voltage rises from low to high), each output with 50% Io	286	--	305	
	Under-voltage protection release (Input voltage drops from high to low), each output with 50% Io	265	--	285	
Hot Plug				Unavailable	

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	28/30/48V	--	±1	±2	%
		9V/12V	--	±2	±3	
Line Regulation	Rated load	28/30/48V (200-285VAC)	--	±1	--	
		9V/12V	--	±2	--	
Load Regulation	0% - 100% load	28/30/48V	--	±1.5	--	
		9V/12V	--	±2	--	
Minimum Load			0	--	--	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	28/30V	--	100	200	mV
		48V	--	100	250	
		9V/12V	--	80	150	
Temperature Coefficient			--	±0.02	--	%/°C
Hold-up Time	230VAC, rated load		--	15	--	ms
Short Circuit Protection			Hiccup mode, continuous, self-recover			
Over-current Protection	<200VAC		≥110% Io, hiccup, self-recover			
	≥200VAC		≥130% Io, hiccup, self-recover			
Over-voltage Protection	28/30V		≤40VDC (Hiccup, self-recover)			
	48V		≤60VDC (Hiccup, self-recover)			
Over-temperature Protection			Hiccup, self-recover after over-temperature fault elimination			

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 (Before testing the isolation and insulation resistance, remove the φ4 screw ①)	1500	--	--	VAC
	Input - output		3000	--	--	
	Output - ⊕		500	--	--	
Insulation Resistance*	Input - ⊕	Ambient temperature: 25 ± 5°C Relative humidity: < 95%RH, no condensation Test voltage: 500VDC	100	--	--	MΩ
	Input - output		100	--	--	
	Output - ⊕		100	--	--	
Operating Temperature			-40	--	+85	°C
Storage Temperature			-45	--	+85	
Operating Humidity	Non-condensing		--	--	95	%RH
Storage Humidity			--	--	95	
Power Derating	Operating temperature derating (With heat sink)	-40°C to -25°C	2.67	--	--	% / °C
		+55°C to +70°C	3.33	--	--	
		+70°C to +85°C	1.33	--	--	
	Altitude derating	2000m - 3000m	5	--	--	°C/Km
Leakage Current	240VAC, 60Hz	Input - ⊕	<3.5mA			
		Input - output	<0.25mA			
Safety Standards			Design refer to EN62368-1, GB4943.1			
Safety Class			CLASS I			
MTBF	MIL-HDBK-217F@25°C		≥300,000 h			
Warranty	Ambient temperature: <85°C		3 years			

Note:  
 1. The power derating curve is the test installed with 450mm x 450mm x 3mm aluminum heat sink. The specific derating specifications need to be adjusted based on actual conditions after customer tests.  
 2.\* The built-in gas discharge tube protects the power supply from asymmetric interference variables (e.g. EN 610v00-4-5). Each power supply sustained voltage test will cause a very high load on the power supply. Therefore, unnecessary load or damage to the power supply caused by high test voltage should be avoided.

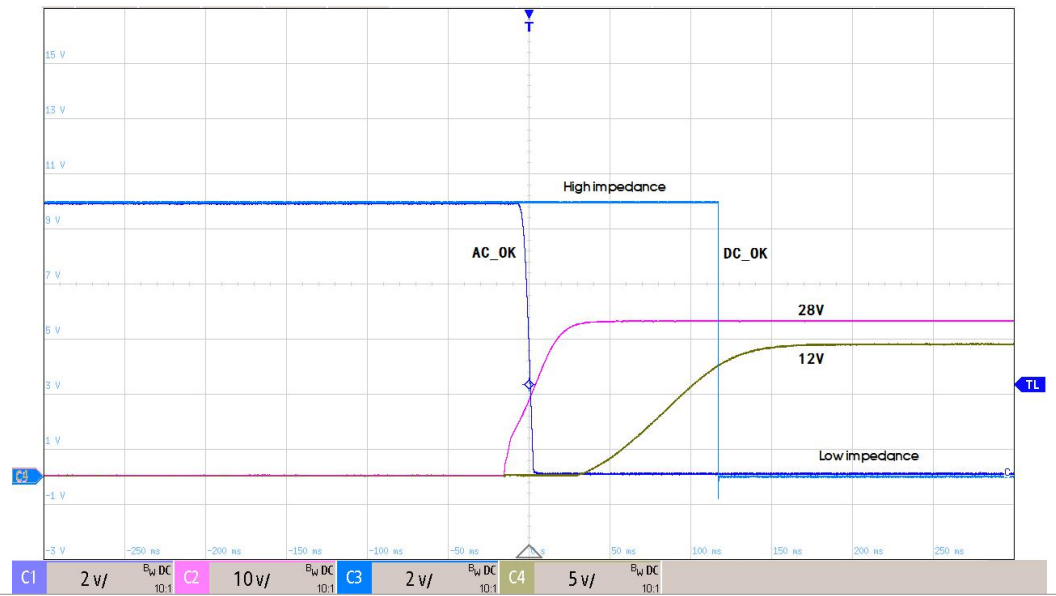
avoided. Disconnect the device's built-in gas discharge tube if necessary to use a higher test voltage. Reconnect the gas discharge tube after successful completion of the test.

### Functional Specifications

Item	Operating Conditions	Standard
LED Signal	Normal output	Green on
	Abnormal output, protected	Light off
	Power off (AC without Input)	
DC_OK Signal	DC normal output	Low impedance
	DC abnormal output	High impedance
AC_OK Signal	AC normal input	Low impedance
	AC abnormal input	High impedance

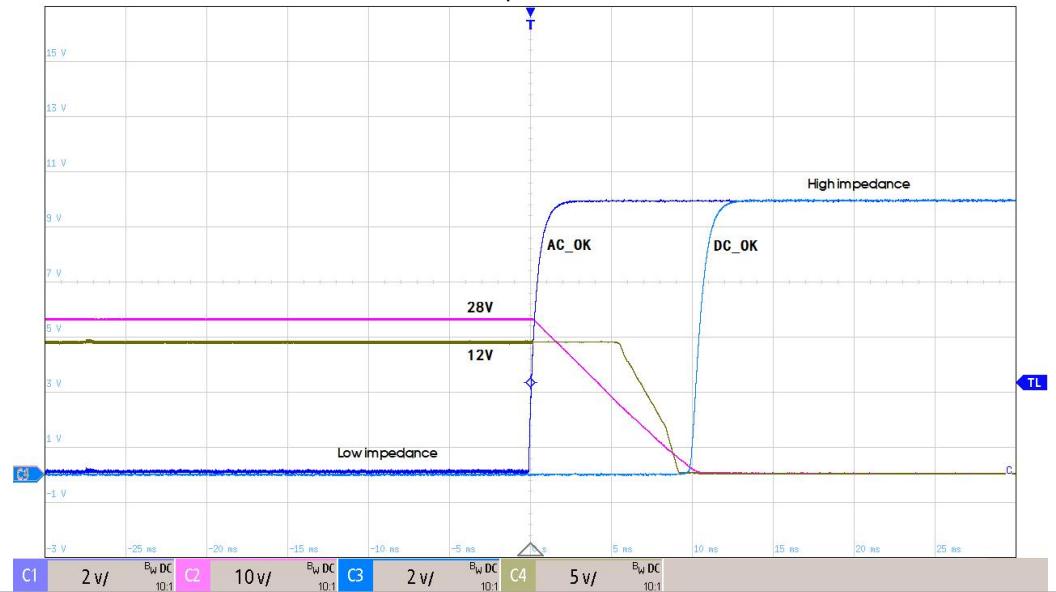
Test conditions:  $T_c=25^{\circ}\text{C}$ ,  $V_{in}=230\text{VAC}$ , rated load, AC\_OK/DC\_OK signal terminal is connected to 10VDC voltage source through  $4.3\text{K}\Omega$  resistor, and the test point is AC\_OK/DC\_OK signal terminal.

Power-on sequence waveform:



AC\_OK, DC\_OK Sequence Chart

Power-off sequence waveform:



Note: The AC\_OK, DC\_OK signal end allows the external voltage <math><40\text{V}</math> and the inflow current <math><10\text{mA}</math>.

### Environmental Characteristics

Item	Operating Conditions	Standard
Sinusoidal Vibration	10 - 500Hz, 2g, three directions of X, Y, Z axis	GB2423.10, IEC60068-2-6
High Temperature Aging	+55℃, 12h, full load	GB2423.2, IEC60068-2-2
Normal Temperature Aging	+25℃, 24h, full load	GB2423.1, IEC60068-2-1
Temperature Cycle	-25℃ to +55℃, 12h	GB2423.22, IEC60068-2-14
Hot And Humid	+85℃, 85%RH, 12h	GB2423.50, IEC60068-2-67
Long-term Short-circuit	+85℃, 4h	Self-recover after over-temperature fault elimination
Input ON/OFF Test	+55℃, 4h, 3s ON, 3s OFF	Through AC SOURCE programming control, the power supply is not damaged, not locked, after the end of the switch, if the power supply is turned on, the power supply can automatically return to normal work

### General Specifications

Case Material	Metal (AL5052, SGCC)
Dimensions	240.00mm x 81.00mm x 40.00mm
Weight	780g (Typ.)
Cooling Method	Windless environment, add surface heat sink (See installation diagram)

### Electromagnetic Compatibility (EMC)

Emissions	CE (Input port)	CISPR32/EN55032	150K - 30MHz	CLASS A
	RE	CISPR32/EN55032	30MHz - 1GHz	CLASS A
	Voltage flicker	EN61000-3-3		--
Immunity	ESD	IEC/EN61000-4-2	Contact ±8KV/Air ±8KV	perf. Criteria A
	RS	IEC/EN61000-4-3	3V/m	perf. Criteria A
	EFT (Input port)	IEC/EN61000-4-4	±2KV	perf. Criteria A
	Surge (Input port)	IEC/EN61000-4-5	line to line ±2KV/line to PE ±4KV	perf. Criteria A
		IEC/EN61000-4-5	line to line/line to PE 5KA (5 times)	perf. Criteria A
	CS	IEC/EN61000-4-6	0.15 - 80MHz, 3Vr.m.s	perf. Criteria A
	Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11	0% of 100Vac, 0Vac, 20ms	perf. Criteria B
70% of 100Vac, 70Vac, 500ms			perf. Criteria B	
0% of 200Vac, 0Vac, 20ms			perf. Criteria B	
70% of 200Vac, 140Vac, 500ms			perf. Criteria B	

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. This power supply does not meet the harmonic current requirements specified in EN61000-3-2.

Please do not use this power supply under the following conditions:

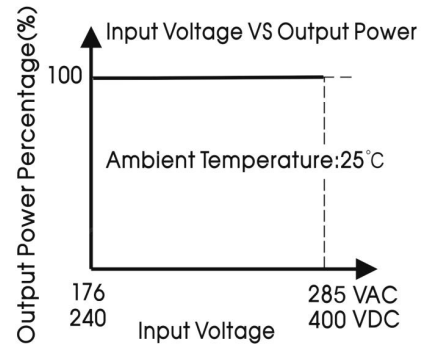
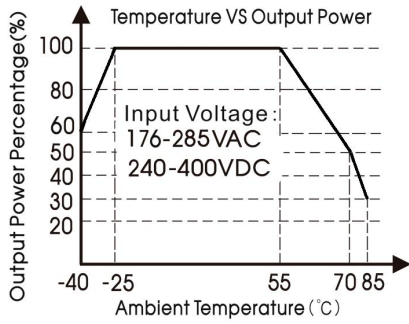
- (1) The terminal equipment is used in the European Union.
- (2) Supporting terminals are connected to a public power grid with 220VAC or a higher voltage that comply with the requirements of EN61000-3-2.
- (3) The power supply is installed in terminal equipment with average or continuous input power greater than 75W.
- (4) The power supply belong to a part of lighting system.

Exception: The power supply used in the following terminal equipment does not need to meet EN61000-3-2.

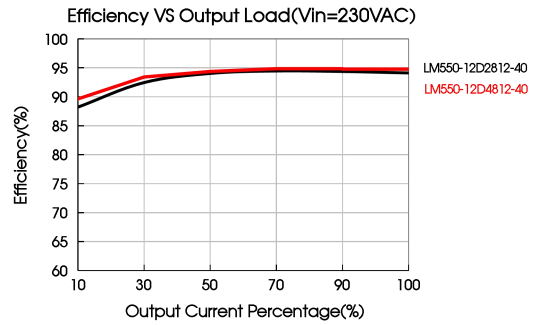
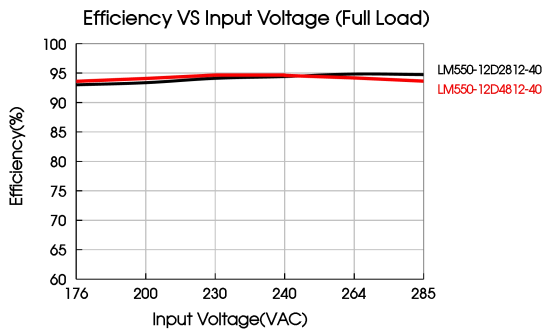
- (1) Professional equipment with a total rated input power greater than 1000W.
- (2) Symmetrically controlled heating element with a rated power less than or equal to 200W.

3. If no harmonic current is required or customers can solve harmonic current problems by themselves, this product can be used.

Product Characteristic Curve

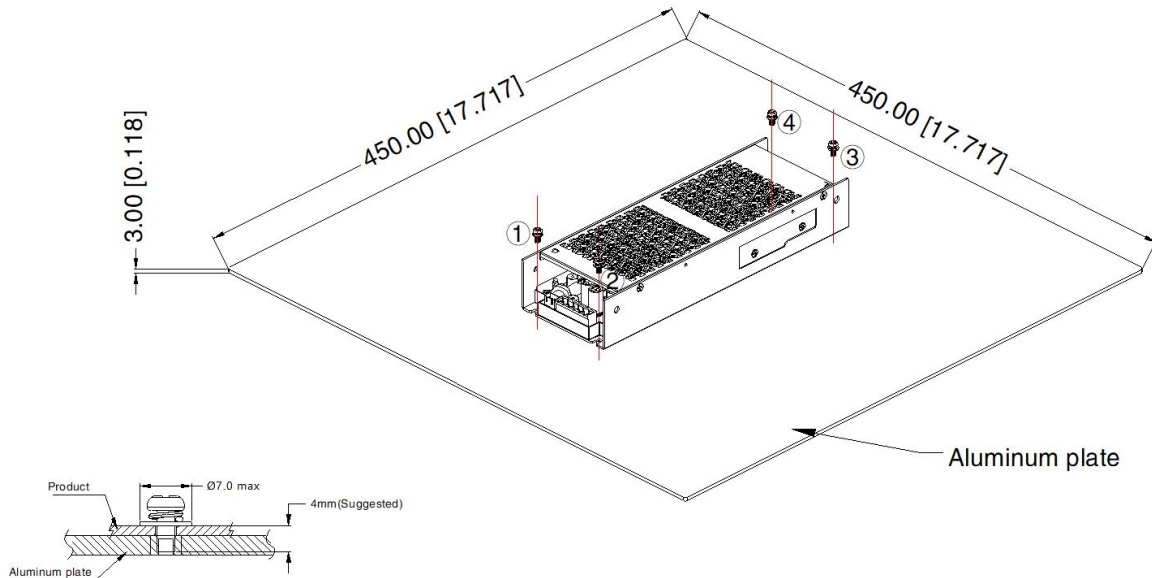


Note: This product is suitable for applications using windless environment and add surface heat sink; for applications in closed environment please consult Mornsun FAE.



Installation Diagram

LM550-12Dxx-40 Series

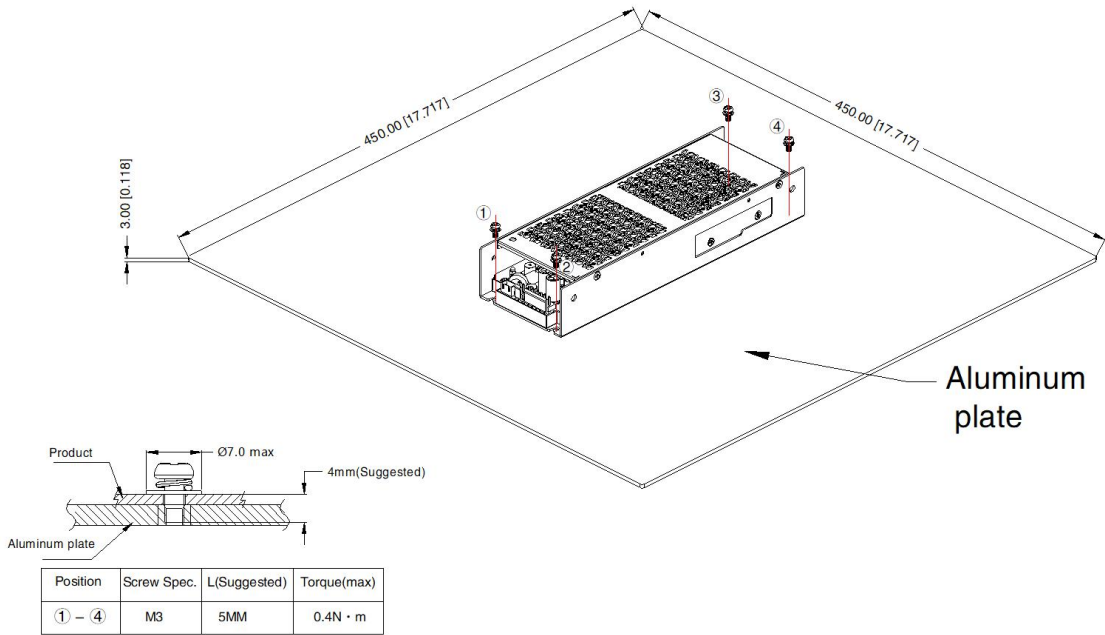


Position	Screw Spec.	L(Suggested)	Torque(max)
① - ④	M3	5MM	0.4N · m

Note: 1. In order to meet the "Derating Curve", the product testing must be installed onto an aluminum plate. The size of the suggested aluminum plate is shown as above. And for optimizing thermal performance, it is necessary to apply thermal grease on the bottom of the product.  
2. It is suggested to install the product with M3 x 5 combination screws, and the product must be firmly installed at the center of the aluminum plate.



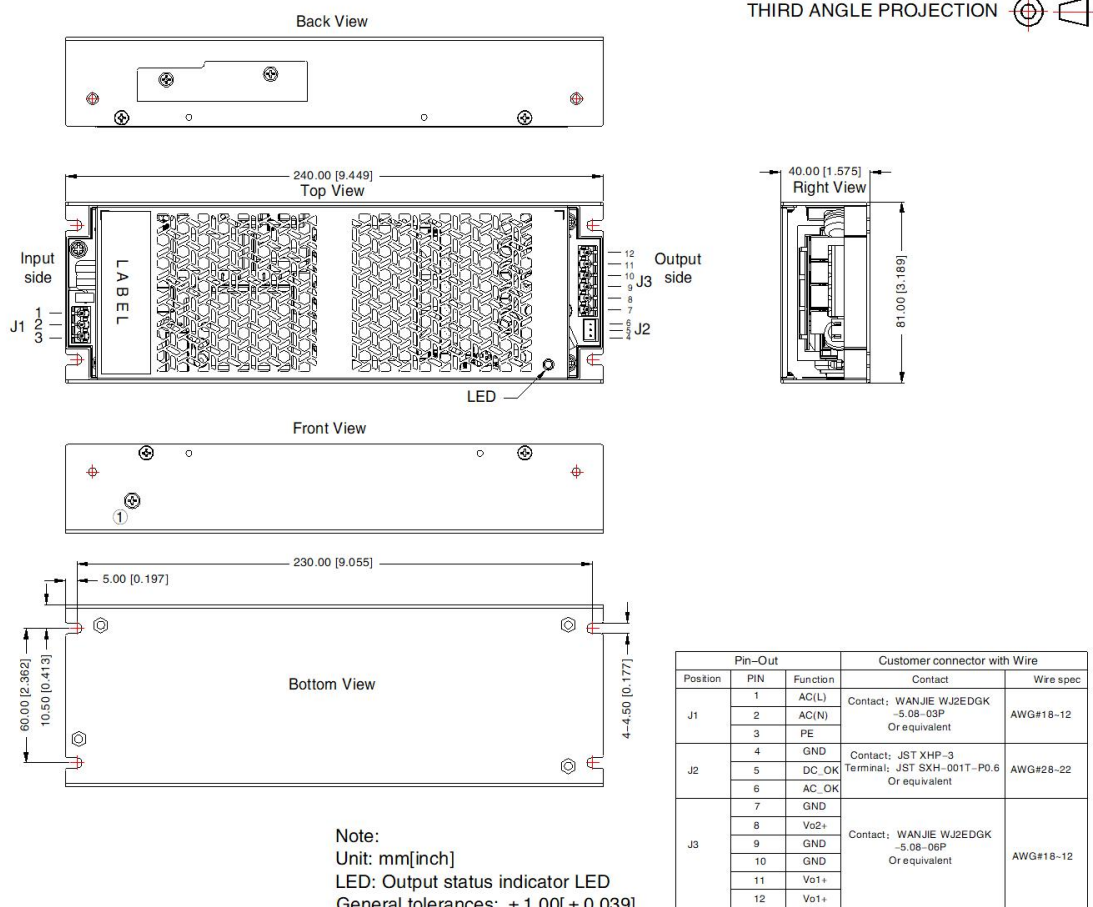
LM550-12Dxx-50 Series



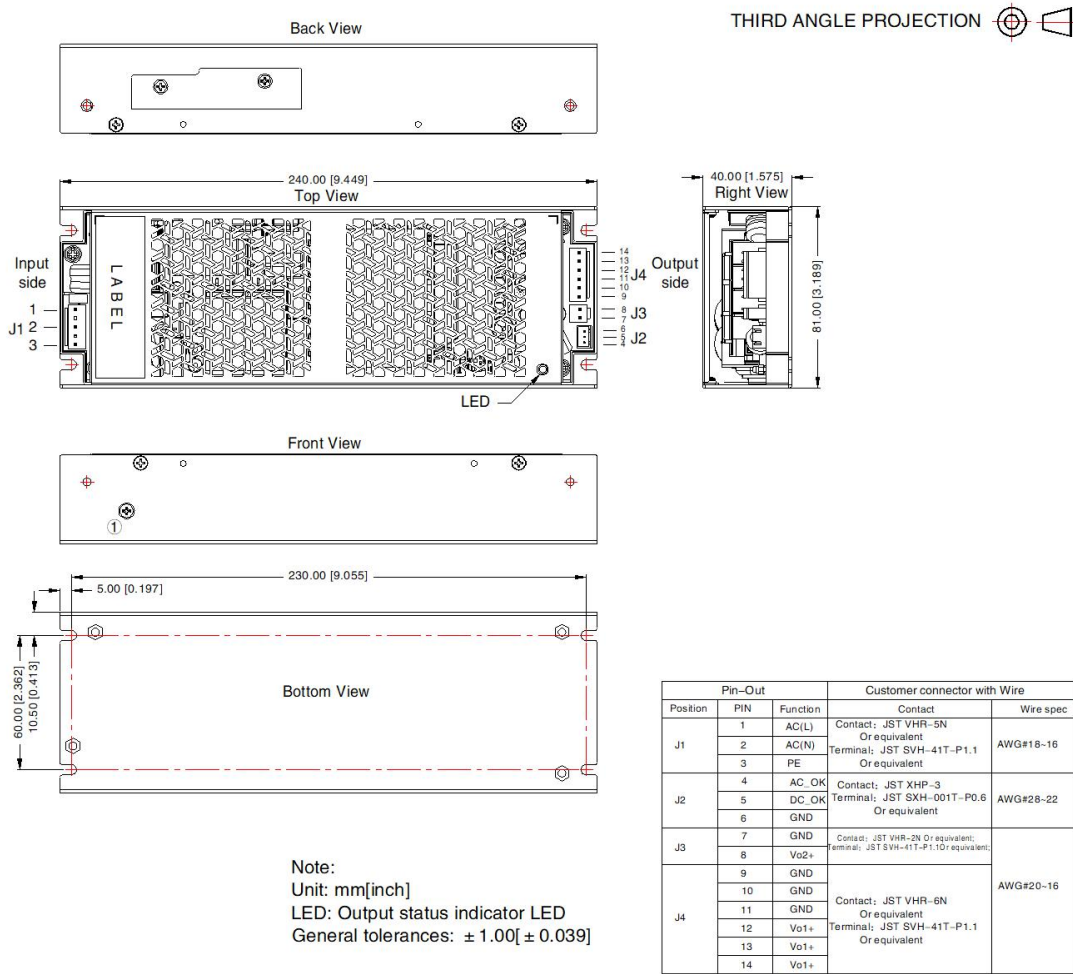
**Note:** 1. In order to meet the "Derating Curve", the product testing must be installed onto an aluminum plate. The size of the suggested aluminum plate is shown as above. And for optimizing thermal performance, it is necessary to apply thermal grease on the bottom of the product.  
2. It is suggested to install the product with M3 x 5 combination screws, and the product must be firmly installed at the center of the aluminum plate.

Dimensions and Recommended Layout

LM550-12Dxx-40 Series



LM550-12Dxx-50 Series



Note:

- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58220660;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity <75%RH with nominal input voltage and rated output load;
- The room temperature derating of 5°C/1000m 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;
- If product involves multi-brand materials and there are differences in color etc, please refer to the standards of each manufacturer;
- 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.

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