

## FEATURES

- Universal 85 - 264VAC or 120 - 370VDC Input voltage
- Operating ambient temperature range: -30°C to +70°C
- High efficiency, high reliability and long life
- LED indicator for power on
- Output short circuit, over-current, over-voltage protection
- High I/O isolation test voltage up to 3000VAC
- Safety according to IEC/UL62368, EN60335, GB4943
- Emissions compliant to CISPR32/EN55032 CLASS B
- Withstand 5G vibration test
- Operating altitude up to 5000m

This LM50-10A12 of power converter design features 2 output versions, which can independently supply 2 different loads in the system. The products can be used in harsh working environments with an ambient temperature range from -30°C to +70°C, without the need of a fan for further heat dissipation. In addition, the converters EMC immunity performance meets the requirements of IEC61000 standard and meet emission standard CISPR32/EN55032, class B without any external components, thus providing excellent EMC protection. The products also meet IEC/EN/UL62368, EN60335, GB4943 safety standards. The converters integrate a variety of protection features and offer a high-performance with cost-effective providing the best power solution for a variety of industries such as industrial control equipment, instrumentation and smart home and building equipment application.

## Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current (Vo/Io)		Working Current Range*		Efficiency at 230VAC (%) Typ.	Max. Capacitive Load (μF)	
			Vo1/Io1	Vo2/Io2	Io1	Io2		Vo1	Vo2
EN	LM50-10A12	50.4W	+12VDC/2.1A	-12VDC/2.1A	0.3-3.0A	0.2-2.5A	83	2200	2000

Note: \*Working current range: If any one of the 2 outputs arrive at the maximum current, the total output power cannot exceed the rated power and working time < 3s.

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	264	VAC
	DC input	120	--	370	VDC
Input Frequency		47	--	63	Hz
Input Current	115VAC	--	--	1.3	A
	230VAC	--	--	0.8	
Inrush Current	115VAC	--	30	--	
	230VAC		50	--	
Leakage Current	240VAC	<2.0mA			
Hot Plug		Unavailable			

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	Vo1	±2.0	--	%
		Vo2	±8.0	--	
Line Regulation	Full load	Vo1	±0.5	--	
		Vo2	±1.5	--	
Load Regulation	10% - 100% load (Balanced load)	Vo1	±1.0	--	
		Vo2	±5.0	--	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	Vo1	120	--	mV
		Vo2	120	--	
Temperature Coefficient	Vo1	--	±0.03	--	%/°C
Voltage Adjustable Range Vo1	Rated input voltage	--	--	--	VDC
Switching Delay Time	Rated input voltage	--	--	3.0	s

Output Voltage Rise Time	115/230VAC	--	--	50	ms
Hold-up Time	115VAC	5	--	--	
	230VAC	30	--	--	
Minimum Load		Refer to the working current range			
Short Circuit Protection*	Recovery time <5s after the short circuit disappear	Hiccup, continuous, self-recover			
Over-current Protection	Dual output with balanced load	110% ≤ I <sub>o</sub> ≤ 230%, self-recover			
Over-voltage Protection		13.8 ≤ V <sub>o1</sub> ≤ 16.2VDC (Output clamp)			

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 Voltage	Input - output	Electric strength test for 1min., leakage current <10mA	3000	--	--	VAC
	Input - ⊕		2000	--	--	
	output - ⊕		500	--	--	
Insulation Resistance	Input - output	Testing voltage: 500VDC	100	--	--	MΩ
	Input - ⊕		100	--	--	
	output - ⊕		100	--	--	
Operating Temperature	Refer to derating curve		-30	--	+70	°C
Storage Temperature			-40	--	+85	
Storage Humidity	Non-condensing		10	--	95	%RH
Operating Humidity			20	--	90	
Power Derating	Input voltage derating	85VAC - 115VAC	0.66	--	--	%VAC
		115VAC - 264VAC	0	--	--	
		120VDC - 160VDC	0.5	--	--	%VDC
		160VDC - 370VDC	0	--	--	
	Operating temperature derating	-30°C to +45°C	0	--	--	% / °C
+45°C to +70°C		2.0	--	--		
Safety Standard			EN62368-1 (Report) Design refer to IEC/UL62368-1, EN60335-1, GB4943.1			
Safety Certification			EN62368			
Safety Class			CLASS I			
MTBF	MIL-HDBK-217F@25°C		> 300,000 h			

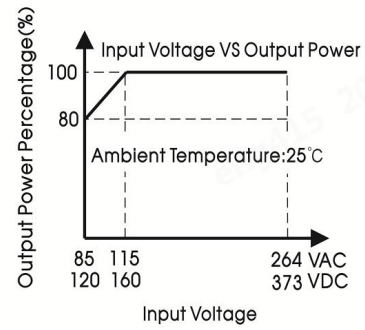
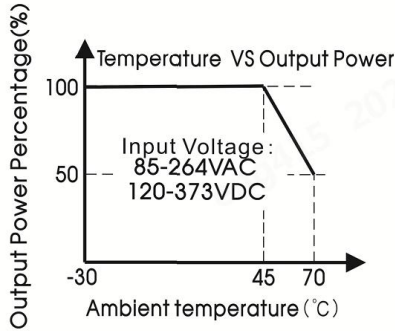
## Physical Specifications

Case Material	Metal (AL1100, SGCC)
Dimension	99.00mm x 97.00mm x 30.00mm
Weight	235g (Typ.)
Cooling Method	Free air convection

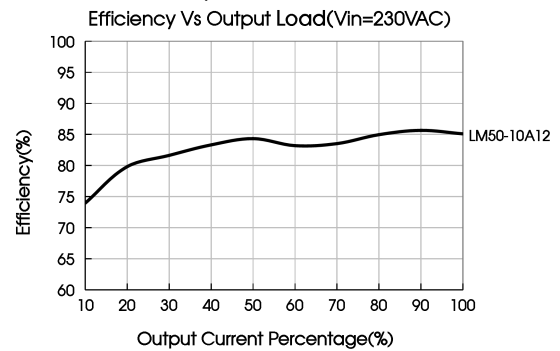
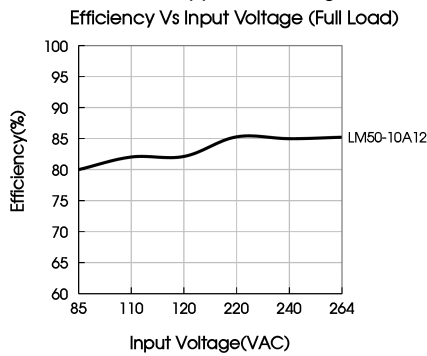
## EMC Specifications

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 ±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/EN 61000-4-5	line to line ±2KV/line to ground ±4KV	perf. Criteria A
	CS	IEC/EN61000-4-6	10 V <sub>r.m.s</sub>	perf. Criteria A
	Voltage dips, short interruptions and voltage variations	IEC/EN61000-4-11	0%, 70%	perf. Criteria B

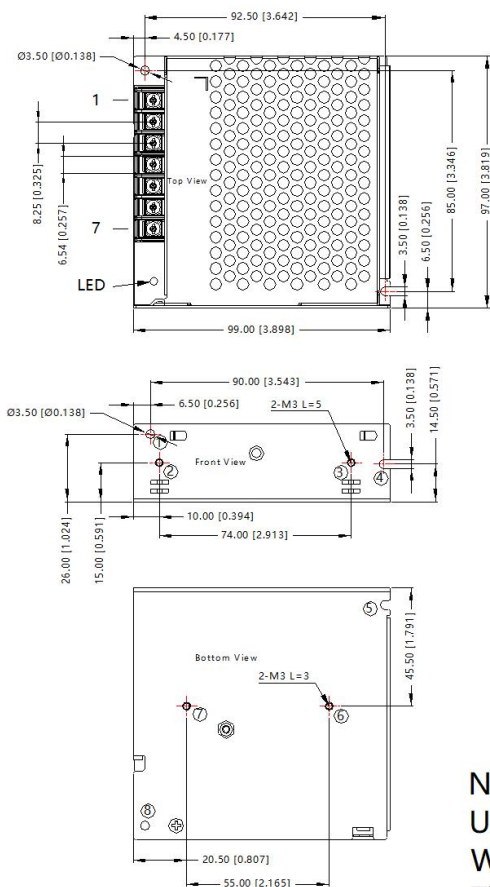
### Product Characteristic Curve



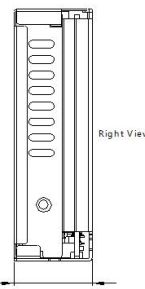
- Note: 1. With an AC input voltage between 85 -115VAC and a DC input between 120-160VDC the output power must be derated as per the temperature derating curves;
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.



### Dimensions and Recommended Layout

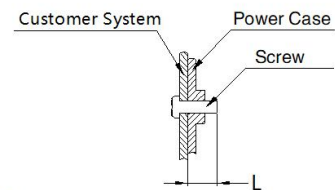


THIRD ANGLE PROJECTION



Pin-Out	
Pin	Function
1	AC(L)
2	AC(N)
3	⊥
4	NC
5	Vo2
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]
  - Wire range: 22-14AWG
  - Tightening torque: M3 , 0.5N·m
  - General tolerances:  $\pm 1.00[\pm 0.039]$
  - ① - ⑧ any position must be connected to PE

Note:

1. For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58220066;
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 ambient 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. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
10. The power supply is considered a component which will be installed into a final equipment. All EMC tests should be confirmed with the final equipment. Please consult our FAE for EMC test operation instructions.

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