



## FEATURES

- Universal 85 - 264VAC or 120 - 373VDC 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
- Withstand 300VAC surge input for 5s
- High I/O isolation test voltage up to 3000VAC
- Safety according to IEC/EN/UL62368, EN60335, GB4943
- Emissions compliant to CISPR32/EN55032 CLASS B
- Withstand 5G vibration test
- Operating altitude up to 5000m

LM50-10Dxx series of power converter design features two isolated output versions, which can independently supply two different loads in the system that need to be isolated from each other. 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 to low-cost ratio 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
CE	LM50-10D0512-20	54W	+5V/6.0A	+12V/2.0A	0.3-6.0A	0.2-3.0A	83	6000	2000
	LM50-10D0524-14	53.6W	+5V/4.0A	+24V/1.4A	0.4-6.0A	0.14-2.0A	84	4000	1000

Note: \* Working current range: If any one of the 3 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	--	373	VDC
Input Frequency		47	--	63	Hz
Input Current	115VAC	--	--	1.3	A
	230VAC	--	--	0.8	
Inrush Current	115VAC	Cold start		--	
	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	--	
		Vo2	LM50-10D0512-20	--	±8.0	--
			LM50-10D0524-14	-4.0	--	+8.0
Line Regulation	Full load	Vo1	--	±0.5	--	
		Vo2	LM50-10D0512-20	--	±1.5	--
			LM50-10D0524-14	--	±1.5	--
Load Regulation	10% - 100% load (Balanced load)	Vo1	--	±0.5	--	
		Vo2	LM50-10D0512-20	--	±5.0	--
			LM50-10D0524-14	--	±5.0	--

Ripple & Noise*	20MHz bandwidth (peak-peak value)	Vo1	--	80	--	mV	
		Vo2	LM50-10D0512-20	--	120		--
			LM50-10D0524-14	--	150		--
Temperature Coefficient	Vo1	--	±0.03	--	%/°C		
Voltage Adjustable Range*	Rated input voltage	4.75	--	5.50	VDC		
Switching Delay Time	Rated input voltage	--	--	3.0	s		
Output Voltage Rise Time	115/230VAC	--	--	30	ms		
Hold-up Time	115VAC	5	--	--			
	230VAC	30	--	--			
Min. Load		Refer to the working current range					
Short Circuit Protection	Recovery time <5s after the short circuit disappear	Hiccup, continuous, self-recovery					
Over-current Protection	2 outputs with equal-scale load	110% - 230% I <sub>o</sub> , self-recovery					
Over-voltage Protection		5.75VDC ≤ Vo1 ≤ 6.75VDC, Clamp					
Note: 1.*The "Tip and barrel method" is used for ripple and noise test, (47uF electrolytic capacitor and 104 ceramic capacitor) please refer to AC-DC Converter Application Notes for specific information, 2.*When Vo1 working in the adjustable range, the output power please refer to power derating curve and should not be exceed the rated output power.							

## General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Isolation Voltage	Input - Output	3000	--	--	VAC	
	Input - 	2000	--	--		
	Output - 	500	--	--		
	Output Vo1 - Output Vo2	500	--	--	VDC	
Insulation Resistance	Input - Output	100	--	--	MΩ	
	Input - 	100	--	--		
	Output - 	100	--	--		
Operating Temperature	Refer to derating curve	-30	--	+70	°C	
Storage Temperature		-40	--	+85		
Storage Humidity	Non-condensing	--	--	95	%RH	
Power Derating	Input voltage derating	85VAC - 115VAC	0.66	--	--	%VAC
		115VAC - 264VAC	0	--	--	
		120VDC - 160VDC	0.5	--	--	%VDC
		160VDC - 373VDC	0	--	--	
	Operating temperature derating	-30°C to +45°C	--	--	--	%°C
+45°C to +70°C	2.0	--	--			
Safety Standard		Meet IEC/EN/UL62368/EN60335/GB4943				
Safety Class		CLASS I				
MTBF	MIL-HDBK-217F@25°C	> 300,000 h				

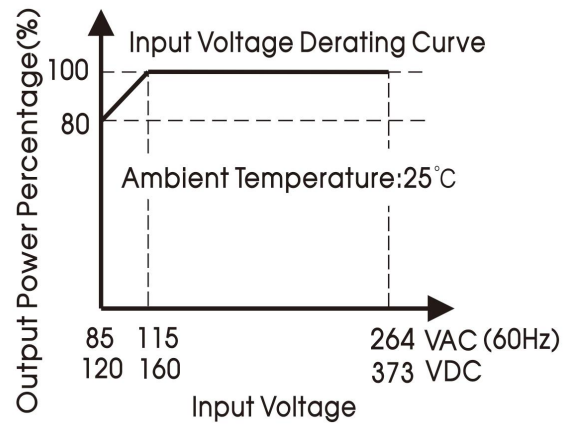
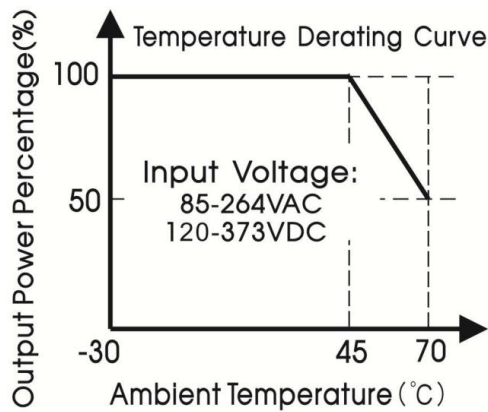
## Physical Specifications

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

### EMC Specifications

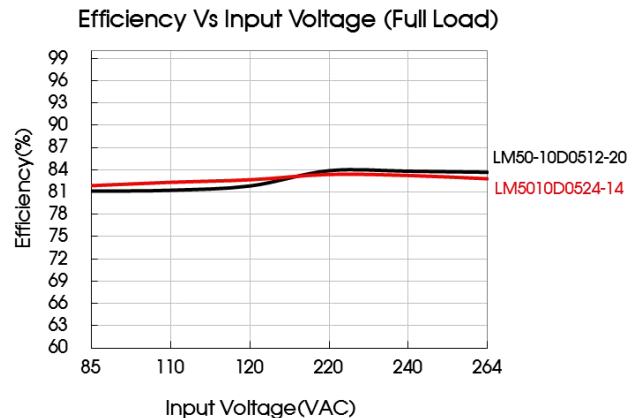
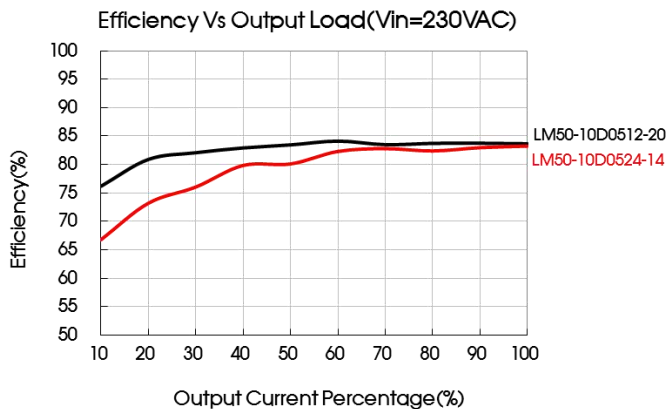
Emissions	CE	CISPR32/EN55032 CLASS B		
	RE	CISPR32/EN55032 CLASS B		
	Harmonic current	IEC/EN61000-3-2 CLASS A		
Immunity	ESD	IEC/EN61000-4-2	Contact $\pm 6\text{KV}$ /Air $\pm 8\text{KV}$	Perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	$\pm 2\text{KV}$	perf. Criteria A
	Surge	IEC/EN 61000-4-5	Line to Line $\pm 2\text{KV}$ /Line to Ground $\pm 4\text{KV}$	perf. Criteria A
	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A
	Voltage dips, short interruptions and voltage variations	IEC/EN61000-4-11	0%,70%	perf. Criteria B

### Product Characteristic Curve

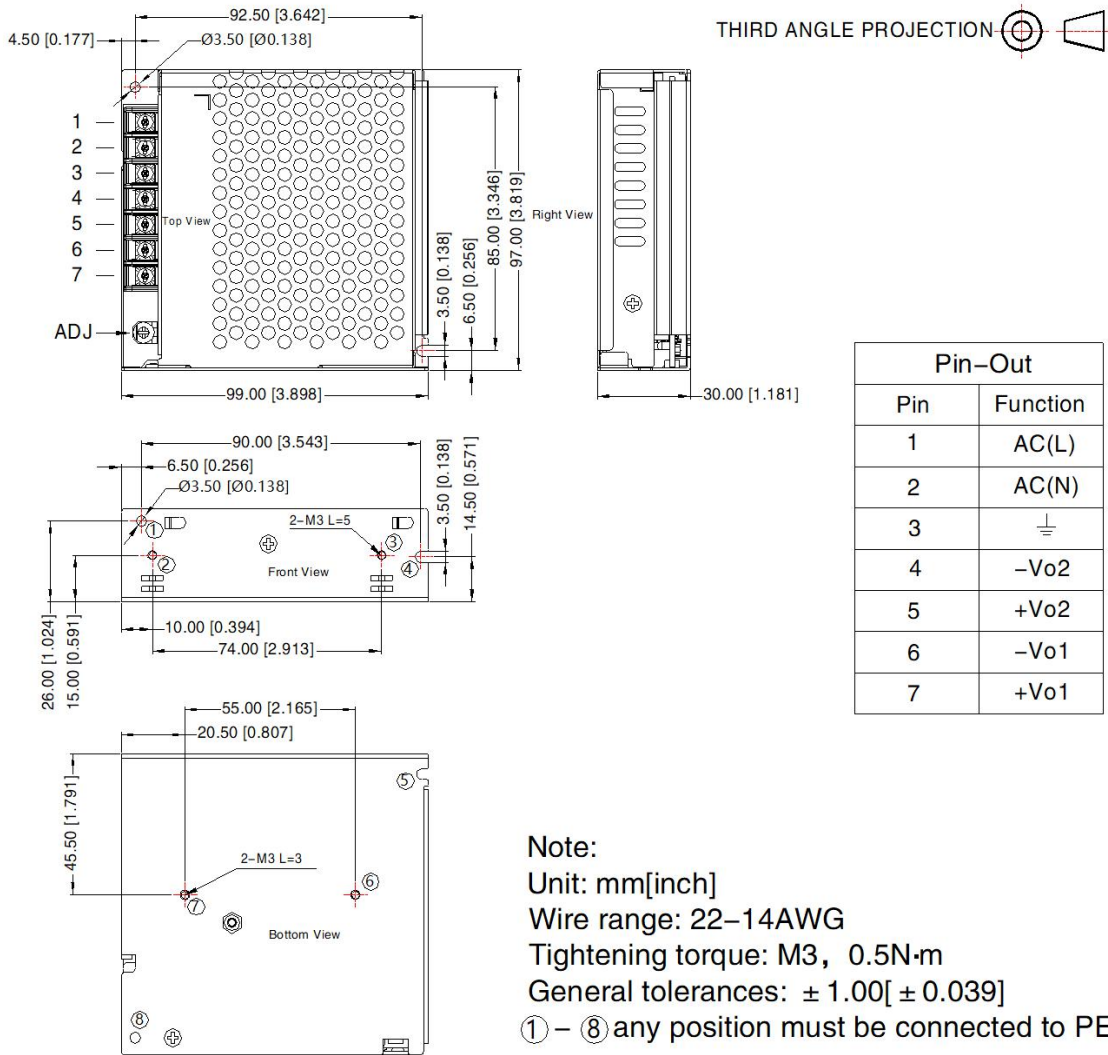


Note: ① With an input voltage between 85-115VAC and a DC input between 120-160VDC the output power must be derated as per the temperature derating curves.

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



Dimensions and Recommended Layout



- Note:
- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58220066;
  - 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 ambient 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;
  - 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 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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