

# AC/DC 35W Enclosed Switching Power Supply

## LM35-10Dxx, LM35-10Dxx-Q Series

# MORNSUN®



### FEATURES

- Universal 85 - 264VAC or 120 - 370VDC Input voltage
- Operating ambient temperature range: -30℃ to +70℃
- High efficiency, high reliability and long lifetime
- LED indicator for power on
- Output short circuit, over-current, over-voltage protection
- High I/O Isolation test voltage up to 3000VAC
- Withstand 5G vibration test
- Operating altitude up to 5000m
- Design refer to IEC/UL62368, EN60335, GB4943
- 3 years warranty



This LM35-10Dxx series of power converter design features dual 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℃ to +70℃, 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 and high 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. <sup>①</sup>	Output Power	Nominal Output Voltage and Current		Working Current Range <sup>②</sup>		Efficiency <sup>③</sup> (%) Typ.	Max. Capacitive Load (uF)	
			Vo1/Io1	Vo2/Io2	Io1	Io2		Vo1	Vo2
EN/BIS	LM35-10D0512-10	32W	+5V/4.0A	+12V/1.0A	0.4-5.0A	0.1-1.5A	81	4000	1000
	LM35-10D0524-10	35W	+5V/2.2A	+24V/1.0A	0.22-4.0A	0.1-1.3A	83	2200	1000

Note:  
1. <sup>①</sup>Use suffix "Q" for conformal coating.  
2. <sup>②</sup>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.  
3. <sup>③</sup>The typical efficiency tested under input voltage at 230VAC.  
4. 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	AC input		85	--	264	VAC	
	DC input		120	--	370	VDC	
Input Frequency			47	--	63	Hz	
Input Current	115VAC		--	--	0.75	A	
	230VAC		--	--	0.5		
Inrush Current	115VAC	Cold start	--	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	LM35-10D0512-10		--	
			LM35-10D0524-10		+8.0	
		Vo2	-4.0	--	+8.0	
Line Regulation	Full load	Vo1	--	±0.5	--	%
		Vo2	LM35-10D0512-10		--	
			LM35-10D0524-10		--	
		Vo2	--	±1.5	--	

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Load Regulation	10% - 100% load (Dual output with balanced load)	Vo1		--	±0.5	--	
		Vo2	LM35-10D0512-10	--	±5.0	--	
			LM35-10D0524-10	--	±5.0	--	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	Vo1		--	80	--	mV
		Vo2	LM35-10D0512-10	--	150	--	
			LM35-10D0524-10	--	150	--	
Temperature Coefficient	Vo1			--	±0.03	--	%/℃
Voltage Adjustable Range (Vo1)*	Rated input voltage			4.75	--	5.50	VDC
Start-up Delay Time	Rated input voltage			--	--	2.0	s
Output Voltage Rise Time	The output Vo1/Vo2 rise time from 10%Vo to 90%Vo at rated voltage 115V/60Hz & 230V/50Hz, rated output load, ambient temperature			--	--	30	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% - 220%Io, self-recover			
Over-voltage Protection				5.75VDC ≤Vo1 ≤6.75VDC (output clamp)			
Note: 1. *The "Tip and barrel method" is used for ripple and noise test, output parallel 47uF electrolytic capacitor and 104 ceramic capacitor, please refer to Enclosed Switching Power Supply 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	Vo1 - Vo2	Electric Strength Test for 1min., leakage current <10mA		500	--	--	VDC
	Input - Output			3000	--	--	VAC
	Input - ⊕			2000	--	--	
	Output - ⊕			500	--	--	
Insulation Resistance	Input - Output	Environment temperature: 25±5℃ , Relative humidity: <95%RH, non-condensing Testing voltage: 500VDC		100	--	--	M Ω
	Input - ⊕			100	--	--	
	Output - ⊕			100	--	--	
Operating Temperature				-30	--	+70	℃
Storage Temperature				-40	--	+85	
Operating Humidity		Non-condensing		20	--	90	%RH
Storage Humidity				10	--	95	
Power Derating	Input voltage derating	85VAC - 115VAC		0.667	--	--	%VAC
		115VAC - 264VAC		0	--	--	
		120VDC - 160VDC		0.5	--	--	%VDC
		160VDC - 370VDC		0	--	--	
	Operating temperature derating	+50℃ to +70℃		2.5	--	--	%/℃
Safety Standard				IS13252 (Part1) safety approved & EN/BS EN 62368-1(Report); Design refer to UL/IEC62368-1, EN60335-1, GB4943.1			
Safety Class				CLASS I			
MTBF		MIL-HDBK-217F@25℃		>300,000 h			

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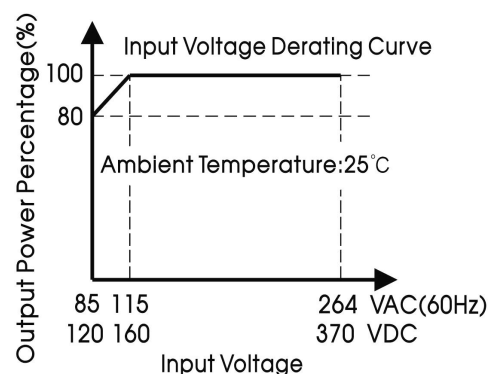
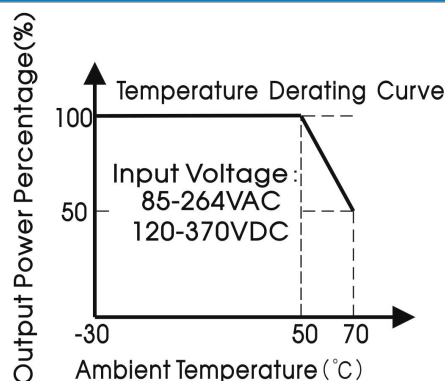
### Physical Specifications

Case Material	Metal (AL1100, SGCC)
Dimension	99.00 x 97.00 x 30.00 mm
Weight	210g (Typ.)
Cooling Method	Free air convection

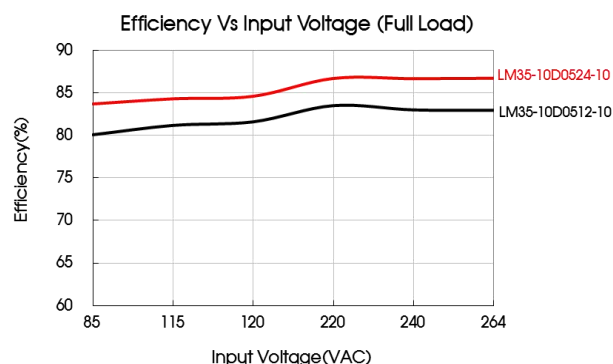
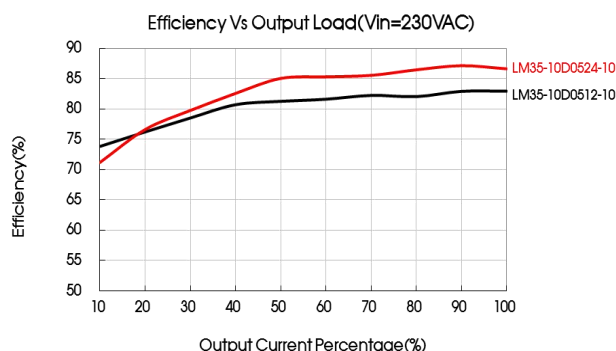
### EMC Specifications

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/EN61000-4-5	line to line $\pm 2\text{kV}$ /line to PE $\pm 4\text{kV}$	perf. Criteria A
	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A
	Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11	0%, 70%	perf. Criteria B

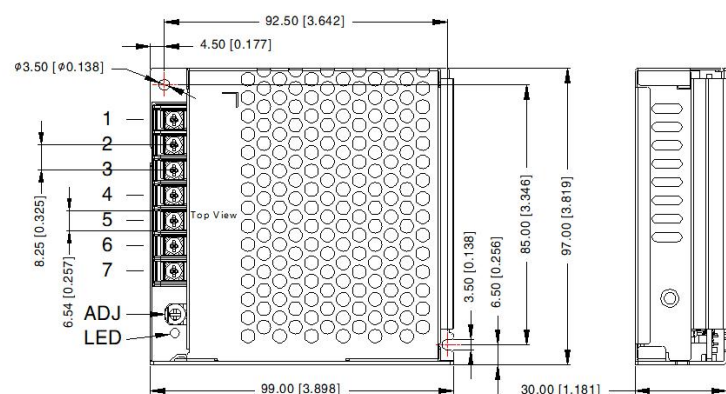
### Product Characteristic Curve



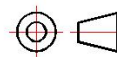
- Note:
- With an AC input voltage between 85 -115VAC and a DC input between 120 -160VDC the output power must be derated as per the temperature derating curves;
  - This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.



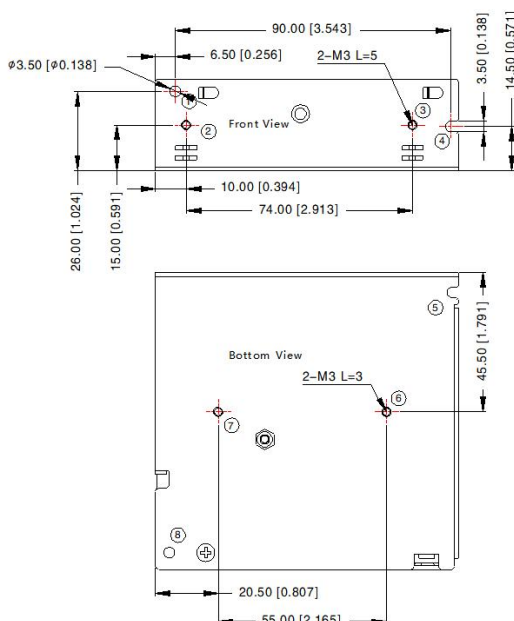
### Dimensions and Recommended Layout



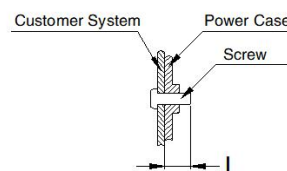
THIRD ANGLE PROJECTION



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



Position	Screw Spec.	L(max)	Torque(Recommend)
② - ③	M3	5mm	0.4N · m ± 10%
⑥ - ⑦	M3	3mm	0.4N · m ± 10%



Note:

Unit: mm[inch]

Wire range: 22-14AWG

Tightening torque: M3, 0.5N.m ± 10%

General tolerances: ± 1.00[± 0.039]

①-⑧ any position must be connected to the earth

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  $T_a=25^{\circ}\text{C}$ , humidity<75%RH with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on our company corporate standards;
- In order to improve the efficiency, there will be audible noise generated when work at light load, 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;
- CAUTION: Double pole, neutral fusing. Disconnect mains before servicing. / "ATTENTION: Double pôle/fusible sur le neutre. Débrancher l'alimentation avant l'entretien;
- 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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