10W, AC/DC converter



RoHS

FEATURES

- Universal input voltage range: 85~305VAC/122~430VDC
- AC and DC dual-use(input from the same terminal)
- Regulated output, low ripple and noise
- Input under-voltage, output short circuit, over-voltage, over-current protections
- High efficiency, high power density
- Low loss, green power
- Plastic case, meet UL94V-0

LD10-13Bxx series---- is a compact size power converter offered by Mornsun. It features universal input voltage, taking both DC and AC input voltage, low power consumption, high efficiency, high reliability, safer isolation. It offers good EMC performance, and widely used in LED, street lamp control, industrial, office and civil applications.

Note: Please refer to Design Reference when module being used in a bad EMC environment.

Selection Guide

Part No.	Output Power	Nominal Output Voltage and Current(Vo/Io)	Efficiency (230VAC, %/Typ.)	Max. Capacitive Load (μF)
LD10-13B03	6.6W	3.3V/2000mA	72	20000
LD10-13B05	10W	5V/2000mA	76	20000
LD10-13B09		9V/1100mA	78	6000
LD10-13B12		12V/900mA	80	5000
LD10-13B15		15V/700mA	80	3000
LD10-13B24		24V/450mA	80	800

Input Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range		AC input	85	--	305	VAC
		DC input	122	--	430	VDC
Input Frequency			47	--	440	Hz
Input Current		110VAC	--	--	230	mA
		230VAC	--	--	150	
Inrush Current		110VAC	--	13	--	A
		230VAC	--	26	--	
Under-voltage Protection	Start-up Voltage	AC input	65	--	90	V
		DC input	92	--	122	
	Shut-down Voltage	AC input	55	--	75	
		DC input	79	--	105	
Leakage Current		230VAC/50Hz	--	--	0.25	mA
Recommended External Input Fuse			2A/300V, slow fusing			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	3.3V output	--	±3	--	%
	Other output	--	±2	--	
Line Regulation	Full load	--	±0.5	--	
Load Regulation	10%-100% load	--	±1	--	

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Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	50	100	mV
Temperature Coefficient		--	±0.02	--	%/℃
Stand-by Power Consumption	LD10-13B24	--	--	0.35	W
	Other models	--	--	0.3	
Short Circuit Protection		Continuous, self-recovery			
Over-voltage Protection	3.3/5VDC output	--	--	7.5	VDC
	9VDC output	--	--	15	
	12/15VDC output	--	--	20	
	24VDC output	--	--	30	
Over-current Protection		≥110% Io			
Min Load		0	--	--	%
Hold-up Time	230VAC input	--	80	--	ms

Note: * Ripple and noise tested with "parallel cable" method, please see *AC-DC Converter Application Notes* for specific operation methods.

General Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	Tested for 1 minute, leakage current< 5mA	3000	--	--	VAC
Operating Temperature			-40	--	+70	℃
Storage Temperature			-40	--	+105	
Storage Humidity			--	--	95	%RH
Switching Frequency			--	100	--	KHz
Power Derating		+55℃~+70℃	3.75	--	--	%/℃
		-40℃~-10℃	2.0	--	--	
MTBF			MIL-HDBK-217F@25℃ > 300,000 h			

Physical Specifications

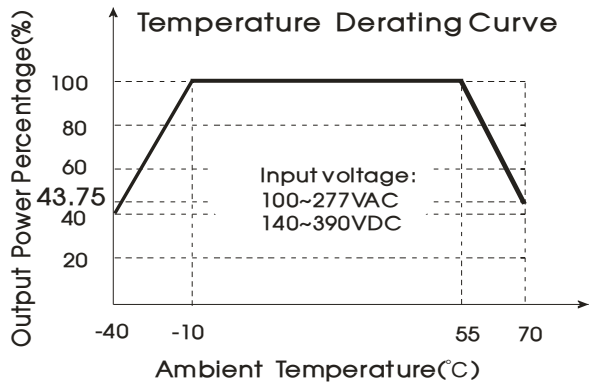
Casing Material		Black flame-retardant and heat-resistant plastic (UL94-V0)
Dimension	Horizontal package/A2S chassis mounting/ A4S Din-Rail mounting	Refer to the Dimensions
Weight	Horizontal package/A2S chassis mounting/ A4S Din-Rail mounting	50g (Typ.)
Cooling Method		Free convection

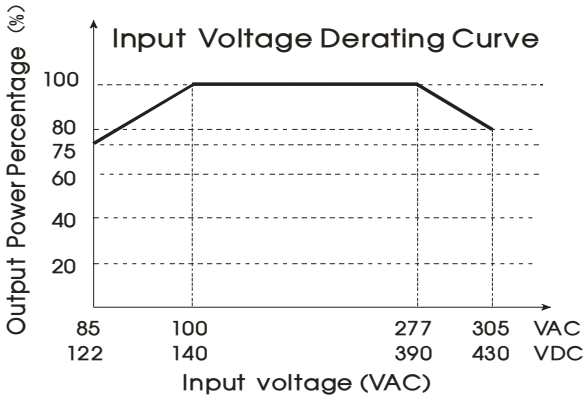
EMC Specifications

EMI	CE	CISPR22/EN55022, CLASS B	
	RE	CISPR22/EN55022, CLASS B	
EMS	ESD	IEC/EN61000-4-2 Contact ±6KV /Air ±8KV	Perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4 ±2kV	perf. Criteria B
		IEC/EN 61000-4-4 ±4kV (See Fig. 2 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN 61000-4-5 ±1KV	perf. Criteria B
		IEC/EN 61000-4-5 ±2KV/±4KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6 10 Vr.m.s	perf. Criteria A
	PFM	IEC/EN61000-4-8 10A/m	perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11 0%-70%	perf. Criteria B

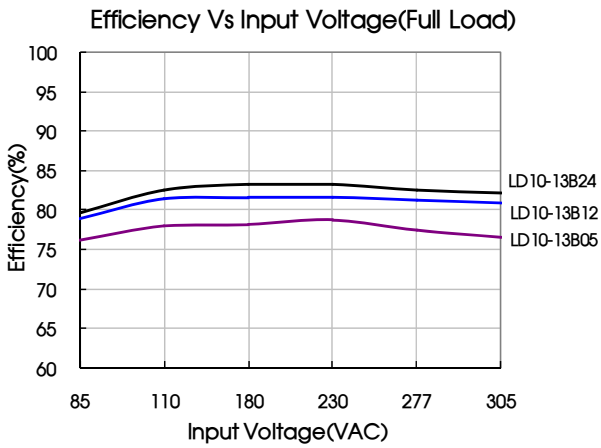
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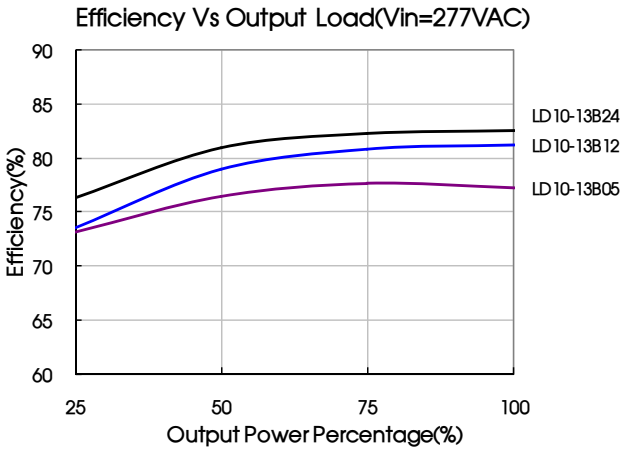
Product Characteristic Curve





Note: ①Input voltage should be derated based on temperature derating when it is 85~100VAC/277~305VAC/122~140VDC/390~430VDC;
②This product is suitable for use in natural air cooling environments, if in a closed environment, please contact our company's FAE.





Design Reference

1. Typical application circuit

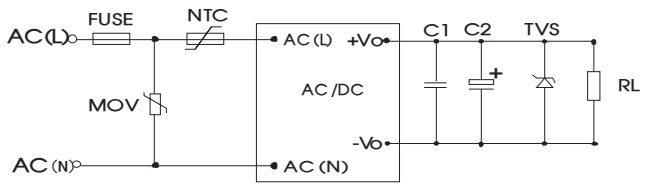


Fig. 1

Model	C1	C2	TVS tube
LD10-13B03	1μF /50V	470μF /10V	SMBJ7.0A
LD10-13B05	1μF /50V	470μF /10V	SMBJ7.0A
LD10-13B09	1μF /50V	220μF /25V	SMBJ15A
LD10-13B12	1μF /50V	220μF /25V	SMBJ20A
LD10-13B15	1μF /50V	220μF /25V	SMBJ20A
LD10-13B24	1μF /50V	100μF /35V	SMBJ30A

Note: Output filtering capacitor C2 is electrolytic capacitor, it is recommended to use high frequency and low impedance electrolytic capacitor. For capacitance and current of capacitor please refer to manufacture's datasheet. Capacitor withstand voltage derating should be 80% or above. C1 is ceramic capacitor, which is used to filter high-frequency noise. TVS is a recommended component to protect post-circuits if converter fails. External input NTC is recommended to use 5D-9. External input MOV is recommended to use S14K350.

2. EMC solution-recommended circuit

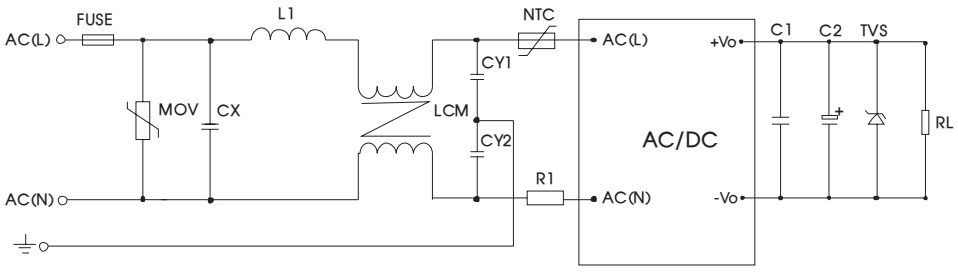


Fig 2

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EMC solution-recommended circuit PCB layout

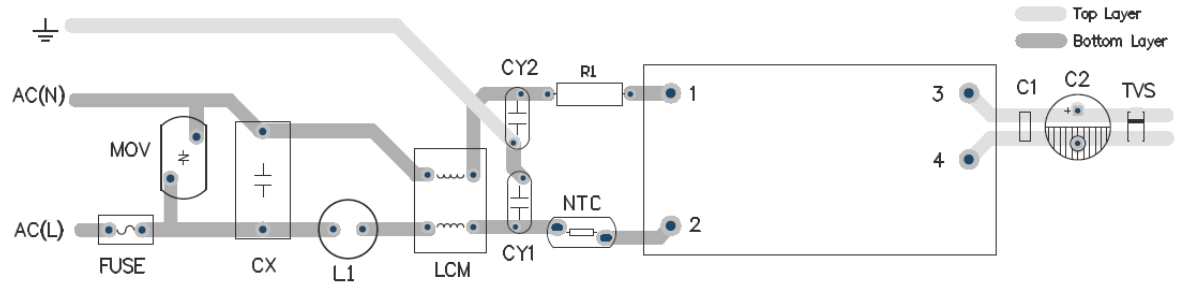


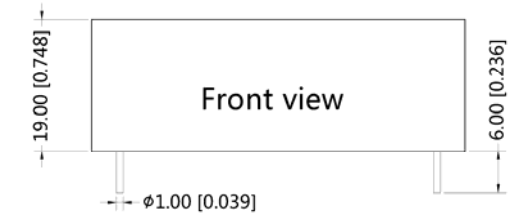
Fig 3

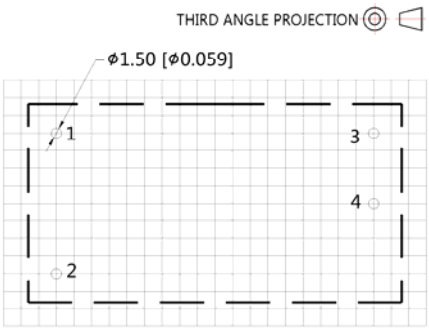
Note: Suggestions for safety regulation and wiring width: wire width ≥3mm, distance between wires ≥6mm, and distance between wire and ground ≥6mm

Element model	Recommended value
MOV	S14K350
CX	0.1μF/310VAC
L1	4.7uH/2.0A
CY1	1nF/400VAC
CY2	1nF /400VAC
NTC	10D-10
LCM	2.2mH, recommended to use MORNSUN's FL2D-10-222
R1	12Ω/3W (wirewound)
FUSE	2A/300V, slow blow, it must be connected to FUSE

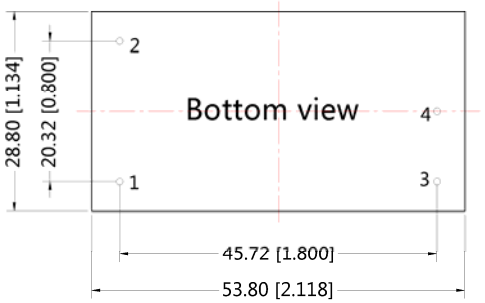
3. For more information about Mornsun EMC Filter products, please visit www.mornsun-power.com to download the Selection Guide of EMC Filter

Dimensions and Recommended Layout





Note : Grid 2.54*2.54mm



Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]

Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	+Vo
4	-Vo

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Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com . Packing bag number: 58220005;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25 ℃, humidity<75% with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our Company's corporate standards;
5. The performance parameters of the product models listed in this manual are as above, but some parameters of non-standard model products may exceed the requirements mentioned above. Please contact our technicians directly for specific information;
6. We can provide product customization service;
7. Specifications are subject to change without prior notice.

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