

3W, AC/DC converter



UL US CE RoHS

LD03-10Bxx 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 is UL & CE certified, and widely used in industrial, electricity, instruments, telecommunication and civil applications.

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

## FEATURES

- Universal input voltage range: 85~264VAC/100~370VDC
- AC and DC dual-use(Input from the same terminal)
- High efficiency, high power density
- Output short circuit protections
- Meets UL60950, EN60950 standards
- PCB mounting, Chassis mounting, Din-Rail mounting available

## Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current(Vo/Io)	Efficiency (230VAC, %/Typ.)	Max. Capacitive Load (μF)
UL/CE	LD03-10B03	3W	3.3V/700mA	63	8000
	LD03-10B05		5V/600mA	72	6000
	LD03-10B09		9V/330mA	74	700
	LD03-10B12		12V/250mA	76	700
	LD03-10B15		15V/200mA	76	700
	LD03-10B24		24V/125mA	78	68

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	264	VAC
	DC input	100	--	370	VDC
Input Frequency		47	--	63	Hz
Input Current	110VAC	--	65	--	mA
	230VAC	--	30	--	
Inrush Current	110VAC	--	10	--	A
	230VAC	--	20	--	
Recommended External Input Fuse(Special package series include fuse)		0.5A/250V, slow fusing, necessary			
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	--	

Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	30	60	mV
Temperature Coefficient		--	±0.02	--	%/°C
Stand-by Power Consumption		--	0.35	--	W
Short Circuit Protection		Hiccup, continuous, self-recovery			
Hold-up Time	230VAC input	--	50	--	ms

Note: \* Rely test method is adopted to test the ripple and noise, please see AC-DC Converter Application Notes for specific operation methods.

### General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output Test time: 1min	3000	--	--	VAC
Operating Temperature		-25	--	+70	°C
Storage Temperature		-25	--	+105	
Storage Humidity		--	--	95	%RH
Switching Frequency		--	100	--	KHz
Power Derating	+55°C~+70°C	2.0	--	--	%/°C
	+0°C~-25°C	2.0	--	--	
Safety Standard		IEC60950/EN60950/UL60950			
Safety Certification		EN60950/UL60950			
Safety Class		CLASS II			
MTBF		MIL-HDBK-217F@25°C > 300,000 h			

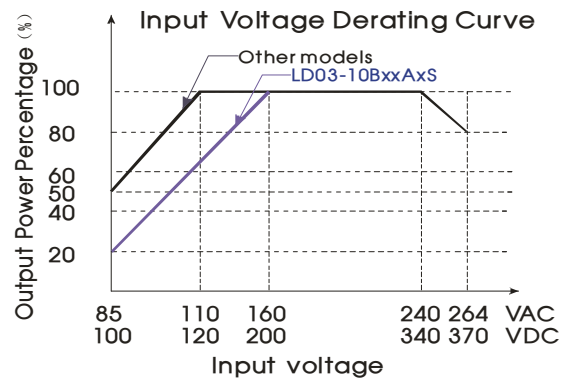
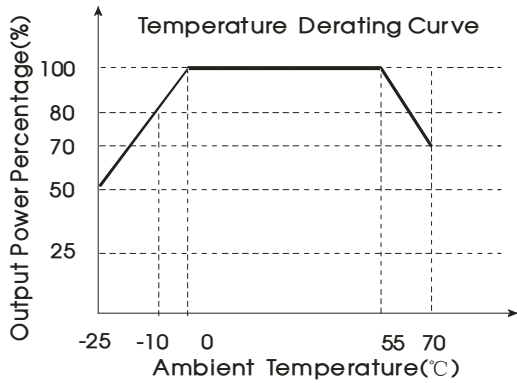
### Physical Specifications

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	21g/43g /65g (Typ.)
Cooling Method	Free convection	

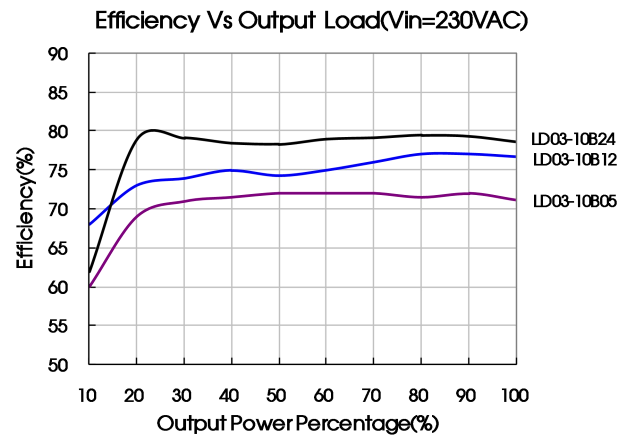
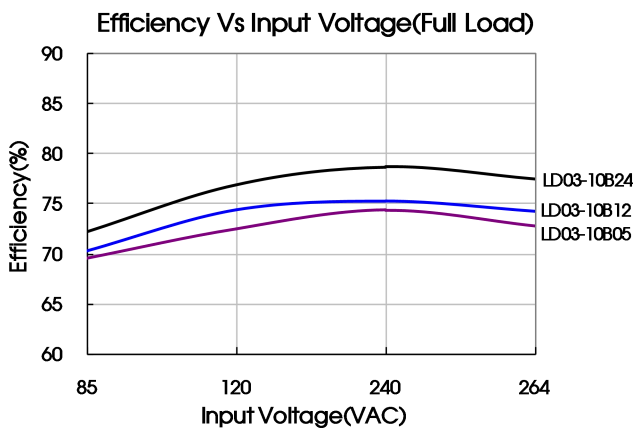
### EMC Specifications

EMI	CE	CISPR22/EN55022, CLASS A	
		CISPR22/EN55022, CLASS B (See Fig. 2 for recommended circuit)	
	RE	CISPR22/EN55022, CLASS A	
		CISPR22/EN55022, CLASS B (See Fig. 2 for recommended circuit)	
EMS	ESD	IEC/EN61000-4-2 ±6KV/8KV	perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4 ±2KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN 61000-4-5 ±1KV/±2KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6 10Vr.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

Product Characteristic Curve



Note: ①When input 85~160VAC/240~264VAC/100~200VDC/340~370VDC (LD03-10BxxAxS series), 85~110VAC/240~264VAC/100~120VDC/340~370VDC (other series), it need to be voltage derated on basis of temperature derating;  
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

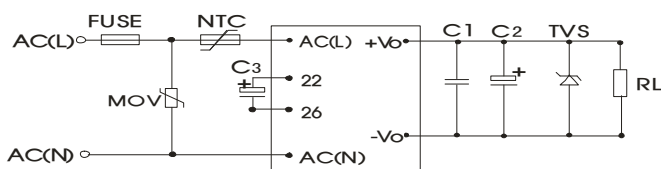


Fig. 1

Model	C1(μF)	C2(μF)	C3	TVS tube
LD03-10B03	1	150	6.8μF /400V	SMBJ7.0A
LD03-10B05		150		SMBJ7.0A
LD03-10B09		120		SMBJ12A
LD03-10B12		120		SMBJ20A
LD03-10B15		120		SMBJ20A
LD03-10B24		68		SMBJ30A

Note:  
1. Output filtering capacitor C2 and input filtering capacitor C3 are electrolytic capacitors, it is recommended to use high frequency and low impedance electrolytic capacitor. For capacitance and current of capacitor please refer to manufacture's datasheet. Output 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 10D-9; External input MOV is recommended to use S14K300.

2. LD03 models: Terminals 22 and 26 are internal rectification and filtering terminals. To protect the models further, it must connect an electrolytic capacitor C3 (it is recommended to be 6.8μF/400V). The special package LD03-10BxxAxS has no external capacitor pin. When the operating voltage is below 160VAC, it need to derate, refer to "Input Voltage Derating Curve".

2. EMC solution-recommended circuit

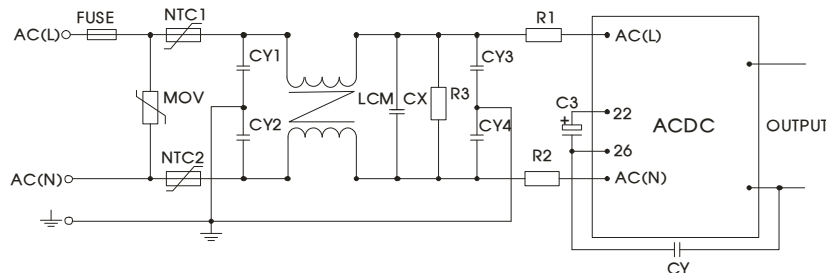


Fig 2

EMC solution-recommended circuit PCB layout

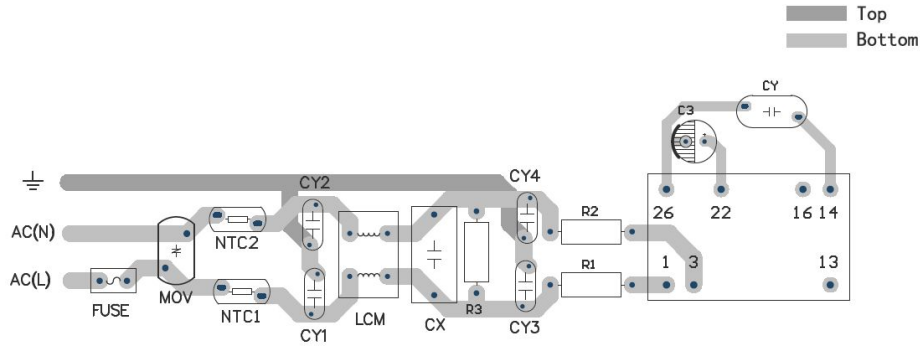


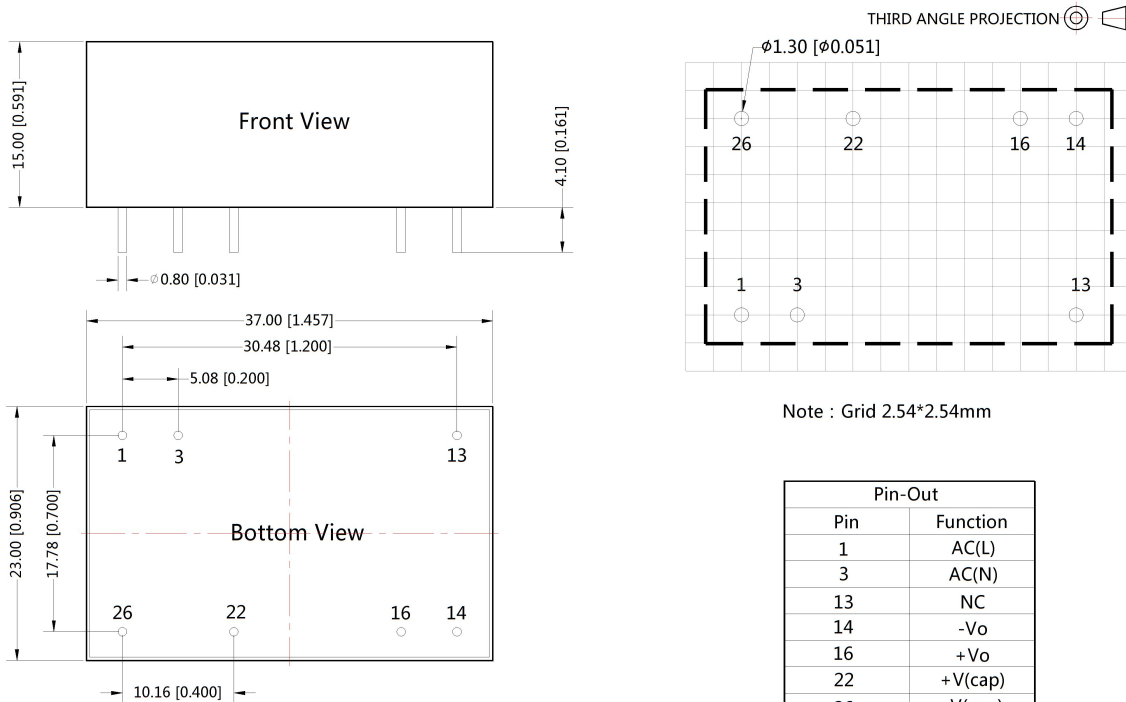
Fig 3

Note: Suggestions for safety regulation and wiring width: wire width  $\geq 3\text{mm}$ , distance between wires  $\geq 6\text{mm}$ , and distance between wire and ground  $\geq 6\text{mm}$

Element model	Recommended value
MOV	S14K300
NTC1/ NTC2	5D-9
R1/R2	24 $\Omega$ /3W
R3	1M $\Omega$ /2W
CY1/ CY2/ CY3/ CY4	1000pF/400VAC
CX	0.22 $\mu$ F/275VAC
LCM	10~30 mH, recommended to use MORNSUN's FL2D-z5-103
CY	Y capacitor, recommended parameter 1000pF/400VAC, recommended external, to meet EMC higher require.
FUSE	0.5A/250V, slow fusing, necessary

3.For more information about Mornsun EMC Filter products, please visit [www.mornsun-power.com](http://www.mornsun-power.com) to download the Selection Guide of EMC Filter

Dimensions and Recommended Layout



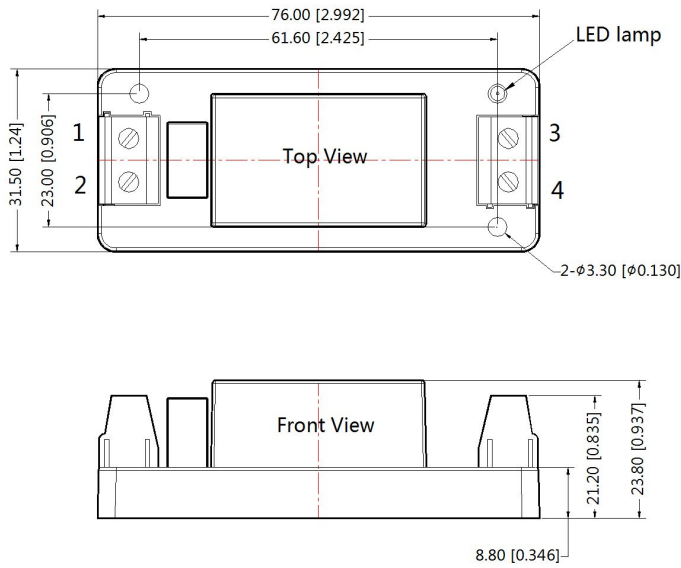
Note:  
Unit:mm[inch]  
Pin diameter tolerances: $\pm 0.10[\pm 0.004]$   
General tolerances: $\pm 0.50[\pm 0.020]$

Pin-Out	
Pin	Function
1	AC(L)
3	AC(N)
13	NC
14	-Vo
16	+Vo
22	+V(cap)
26	-V(cap)

NC:No connection

LD03-10BxxA2S Chassis mounting Dimensions

THIRD ANGLE PROJECTION 

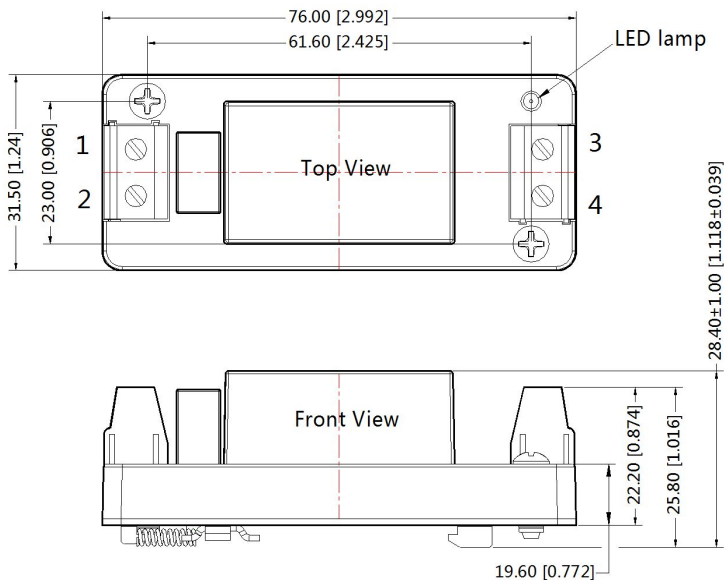


Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	+Vo
4	-Vo

Note:  
Unit:mm[inch]  
Wire range : 24~12 AWG  
General tolerances:±0.50[±0.020]

LD03-10BxxA4S Din-Rail mounting Dimensions

THIRD ANGLE PROJECTION 



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

Note:  
Unit:mm[inch]  
Wire range : 24~12 AWG  
Installed on DIN RAIL TS35  
General tolerances:±0.50[±0.020]

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from [www.mornsun-power.com](http://www.mornsun-power.com). Packing bag number: 58220001(Horizontal package), 58220022(A2S/A4S package);;
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  $T_a=25\text{ }^{\circ}\text{C}$ , 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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