

Universal input voltage Isolated & Regulated
single output AC-DC Converter



RoHS

FEATURES

- compact, light Weight
- Universal input voltage range:
85~264VAC/100~370VDC
- AC and DC dual-use(input from the same terminal)
- Efficiency up to 73%
- Output short circuit, over-current protections
- MTBF >300,000 Hours
- Industrial level specifications
- PCB mounting, Chassis mounting, Din-Rail mounting available

LD03-00Bxx 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 widely used in AC electric supply where needs safety isolation, mini-power, single output and specially occasions where request compact size and simple external circuit. For harsh EMC environment, this series of products must use the referred application circuit.

Selection Guide

Part No.	Output Power	Nominal Output Voltage and Current(Vo/Io)	Efficiency (230VAC, %/Typ.)	Max. Capacitive Load (μF)
LD03-00B05	2.5	5V/500mA	70	6000
LD03-00B12	3	12V/250mA	72	1000
LD03-00B24	2.8	24V/120mA	73	270

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			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		—	±1	±3	%
Line Regulation	Full load	—	±0.5	—	
Load Regulation	10%-100% load	—	±1	—	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	—	50	100	mV
Temperature Coefficient		—	±0.03	—	%/°C
Stand-by Power Consumption	LD03-00B05	—	0.2	—	W
	LD03-00B12	—	0.4	—	
	LD03-00B24	—	0.7	—	
Short Circuit Protection		Hiccup, continuous, self-recovery			

Over-current Protection		$\geq 110\% I_o$			
Starting-time		—	1	—	s

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	2500	--	--	VAC
Operating Temperature			-20	--	+85	℃
Storage Temperature			-25	--	+105	
Storage Humidity			--	--	95	%RH
Switching Frequency		100% load, input rated voltage	40	100	150	KHz
Power Derating		+55℃～+85℃	1.33	--	--	% /℃
		-20℃～0℃	2.0	--	--	
MTBF			MIL-HDBK-217F@25℃ > 300,000 h			

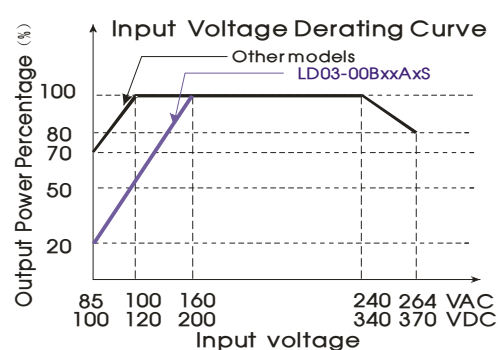
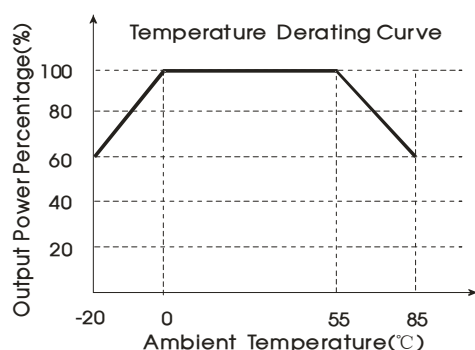
Physical Specifications

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

EMC Specifications

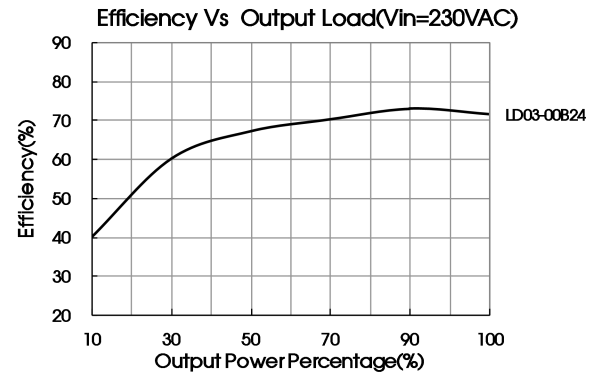
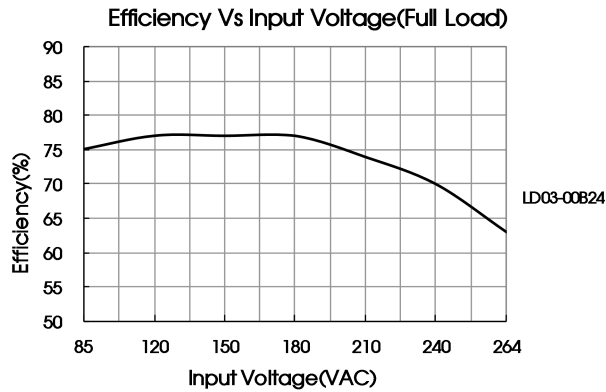
EMI	CE	CISPR22/EN55022, CLASS A			
		CISPR22/EN55022, CLASS B (See Fig. 2 for recommended circuit)			
	RE	CISPR22/EN55022, CLASS A			
		CISPR22/EN55022, CLASS B (See Fig. 2 for recommended circuit)			
EMS	ESD	IEC/EN61000-4-2 ±6KV/8KV			Perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m			perf. Criteria A
	EFT	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: ① When input 85~160VAC/240~264VAC/100~200VDC/340~370VDC (LD03-00BxxAxS series), 85~100VAC/240~264VAC/100~120VDC/340~370VDC (other series), it need to be voltage derated on basis of temperature derating;

② This 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

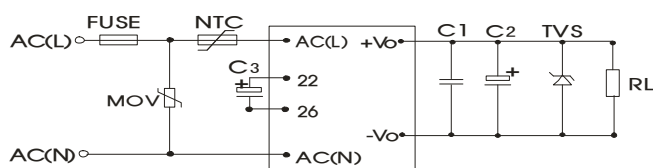


Fig. 1

Model	C1	C2	C3	TVS tube
LD03-00B05	1μF	330μF/16V	6.8F /400V	SMBJ7.0A
LD03-00B12		220μF/25V		SMBJ20A
LD03-00B24		150μF/35V		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. Input filtering capacitor, 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 LD03-00BxxAxS has no external capacitor pin. When the operating voltage is below 160VAC, it need to derate, refer to "Input Voltage Derating Curve".

3. To make sure the product work at perfect operation status with full loading external capacitor C1, C2 is necessary. C1 is ceramic capacitor, C2 is filtering capacitor.

2. EMC solution-recommended circuit

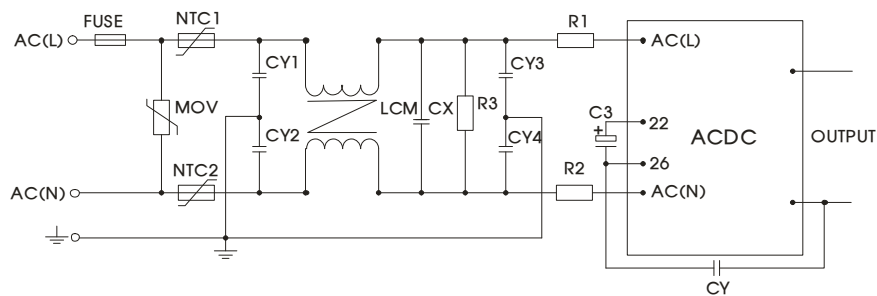


Fig 2

EMC solution-recommended circuit PCB layout

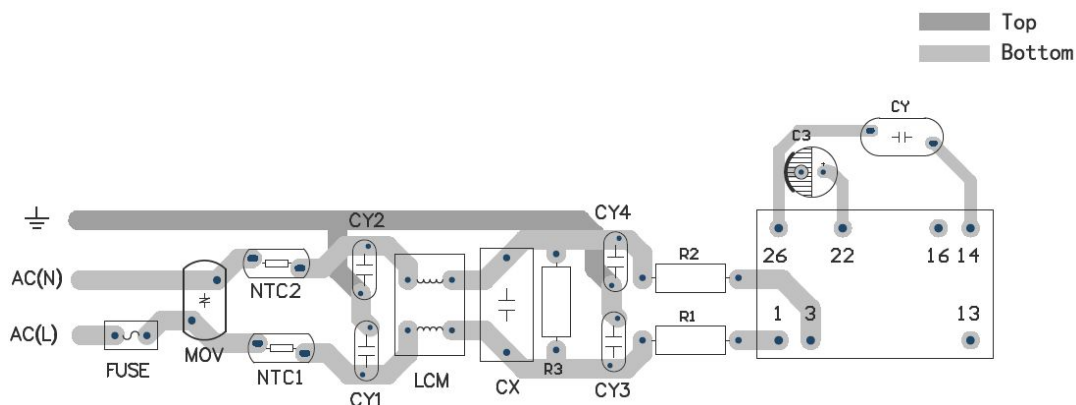


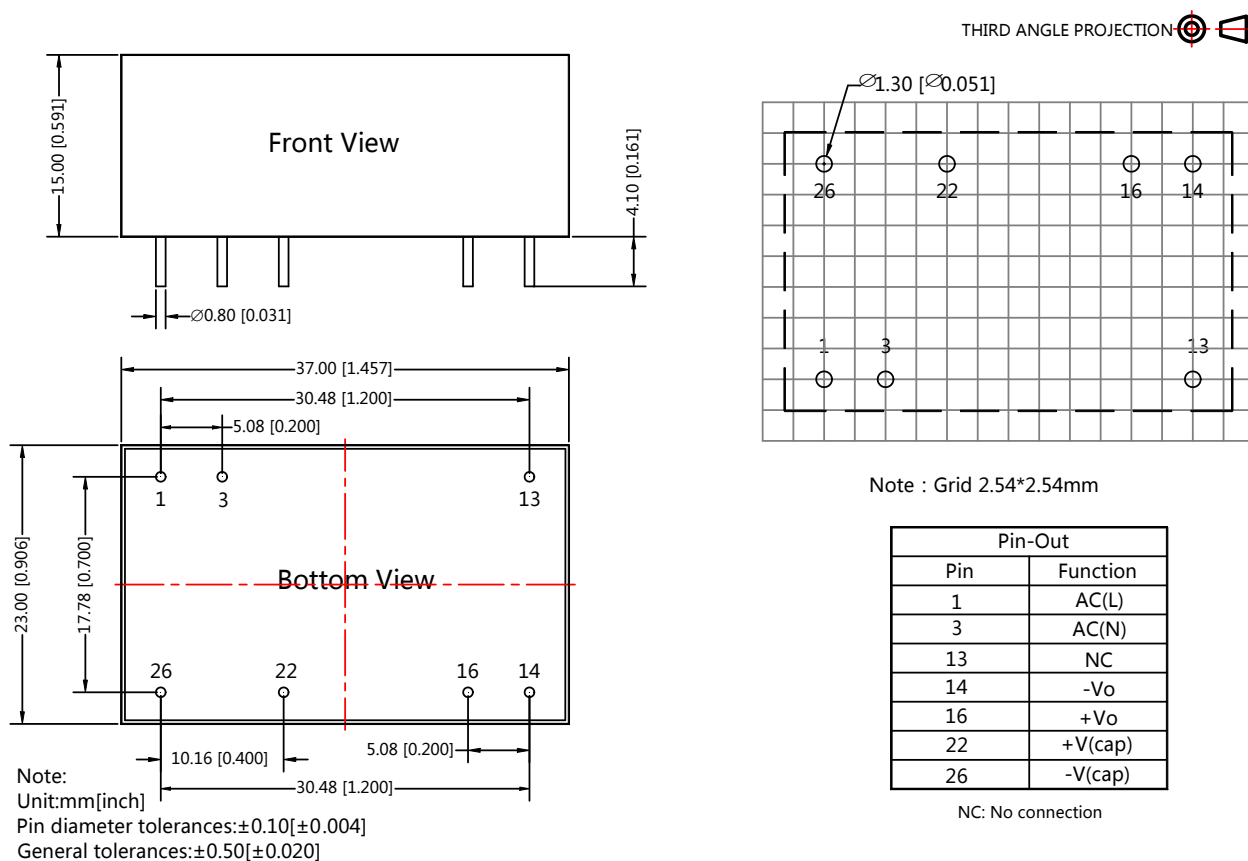
Fig 3

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

Element model	Recommended value
MOV	S14K300
R1/R2	24 Ω /3W
R3	1M Ω /2W
CY1/ CY2/ CY3/ CY4	1000pF/400VAC
CX	0.22 μ F/275VAC
LCM	10~30 mH, recommended to use MORNSUN's FL2D-Z5-103
CY	1000pF/400VAC
NTC1/ NTC2	5D-9
FUSE	0.5A/250V, slow fusing, necessary

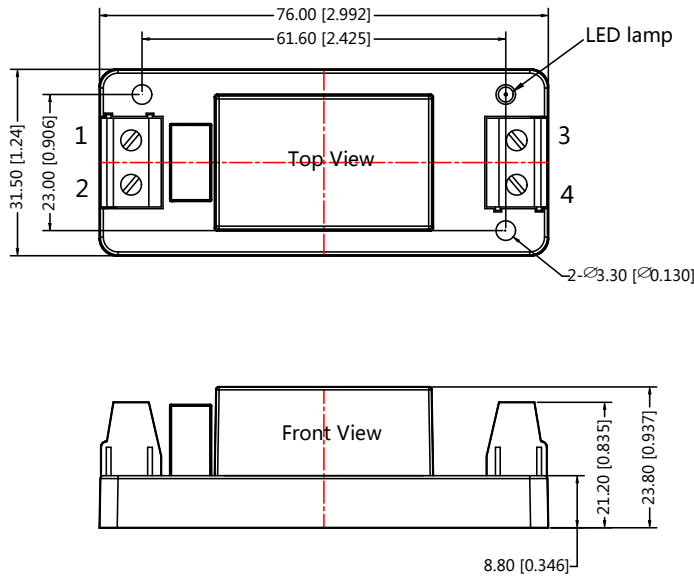
3. For more information about Mornsun EMC Filter products, please visit www.mornsun-power.com to download the Selection Guide of EMC Filter

Dimensions and Recommended Layout



LD03-00BxxA2S Chassis mounting Dimensions

THIRD ANGLE PROJECTION 

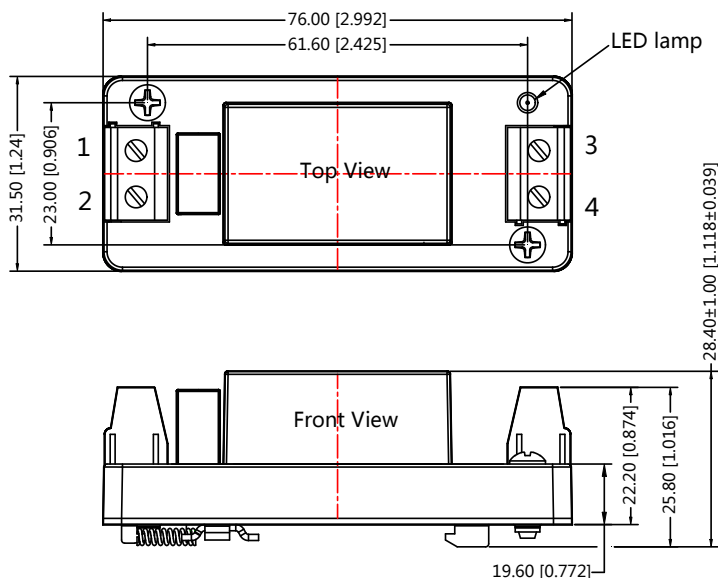


Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	+Vo
4	-Vo

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

LD03-00BxxA4S 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. 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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