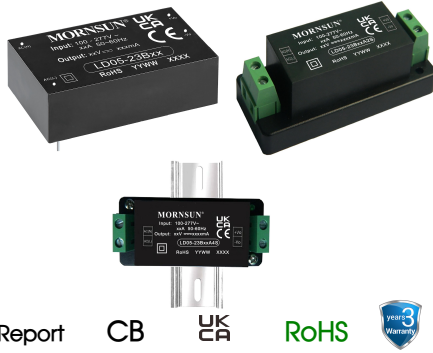


5W, AC-DC converter



## FEATURES

- Universal 85-305VAC or 100-430VDC input voltage
- Accepts AC or DC input (dual-use of same terminal)
- High I/O isolation test voltage up to 4000VAC
- High efficiency, high power density
- Output short circuit, output over-current, over-voltage protection
- EMI performance meets CISPR32/EN55032 CLASS B

LD05-23Bxx 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, instruments, telecommunication and civil applications. For harsh EMC environment, the application circuit in the datasheet is strongly recommended.

## Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 230VAC (%) Typ.	Max. Capacitive Load* (uF)
EN	LD05-23B03	4.2W	3.3V/1250mA	74	4000
IEC/EN	LD05-23B05	5W	5V/1000mA	78	4000
IEC/EN	LD05-23B09		9V/550mA	78	1000
IEC/EN	LD05-23B12		12V/420mA	80	820
IEC/EN	LD05-23B15		15V/333mA	82	820
EN	LD05-23B24	5.5W	24V/230mA	83	470

Note: 1. \* Test without external circuit.  
2. 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	--	305	VAC
	DC input	100	--	430	VDC
Input frequency		47	--	63	Hz
Input current	115VAC	--	--	0.12	A
	230VAC	--	--	0.07	
Inrush current	115VAC	--	10	--	
	230VAC	--	20	--	
Recommended External Input Fuse (Special package series include fuse)		1A/300V, slow-blow, required			
Hot Plug		Unavailable			

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	3.3V output	--	±3	--	%
	Others	--	±2	--	
Line Regulation	Full load	--	±0.5	--	
Load Regulation	10% - 100% load	--	±1	--	mV
Ripple & Noise*	20MHz bandwidth (peak-peak value)	3.3V/5V output	60	120	
			50	100	
Temperature Drift Coefficient		--	±0.02	--	%/°C
Stand-by Power Consumption		--	--	0.3	W

Short Circuit Protection		Continuous, self-recover			
Over-current Protection		≥ 110%Io self-recover			
Over-voltage Protection		Over-voltage shutdown			
Minimum Load		0	--	--	%
Hold-up Time	115VAC input	--	12	--	ms
	230VAC input	--	80	--	

Note: \* The "parallel cable" method is used for ripple and noise test, please refer to AC-DC Converter Application Notes for specific information.

## General Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output	Electric Strength Test for 1 min., leakage current < 5mA	4000	--	--	VAC
Operating Temperature			-25	--	+70	℃
Storage Temperature			-25	--	+105	
Storage Humidity			--	--	95	%RH
Welding Temperature		Wave-soldering	260±5℃; time: 5 - 10s			
		Manual-welding	360±10℃; time: 3 - 5s			
Switching Frequency			--	--	85	kHz
Power Derating		+55℃ to +70℃	2	--	--	% / ℃
		-25℃ to 0℃	2	--	--	
		85VAC - 110VAC	2	--	--	% / VAC
		277VAC - 305VAC	0.71	--	--	
Safety Standard		3V/24V	EN/BS EN62368-1 safety approved			
		5V/12V	IEC/EN/BS EN62368-1 safety approved & design refer to UL62368-1			
		9V/15V	IEC60950-1, EN/BS EN62368-1 safety approved & design refer to UL60950-1			
Safety Class			CLASS II			
MTBF			MIL-HDBK-217F@25℃ >300,000 h			

## Mechanical Specifications

Casing Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)	
Dimension	Horizontal package/A2S chassis mounting/A4S Din-Rail mounting	Refer to the Dimensions
Weight	Horizontal package/A2S chassis mounting/A4S Din-Rail mounting	30g/52g/70g (Typ.)
Cooling method	Free air convection	

## Electromagnetic Compatibility (EMC)

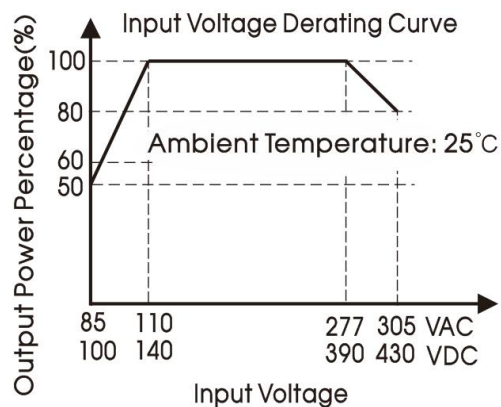
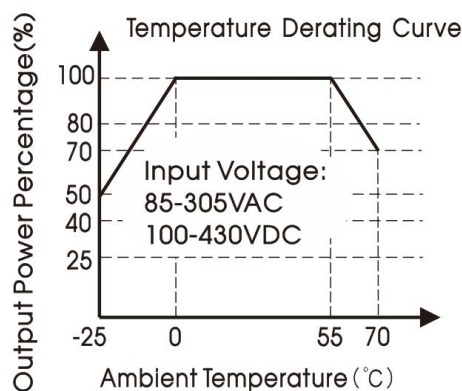
EMI	CE	CISPR32/EN55032	CLASS B	
	RE	CISPR32/EN55032	CLASS B	
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV	perf. Criteria B
		IEC/EN61000-4-4	±4KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±1KV	perf. Criteria B
		IEC/EN61000-4-5	line to line ±2KV/line to PE ±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 dip, short  
interruption and  
voltage variation

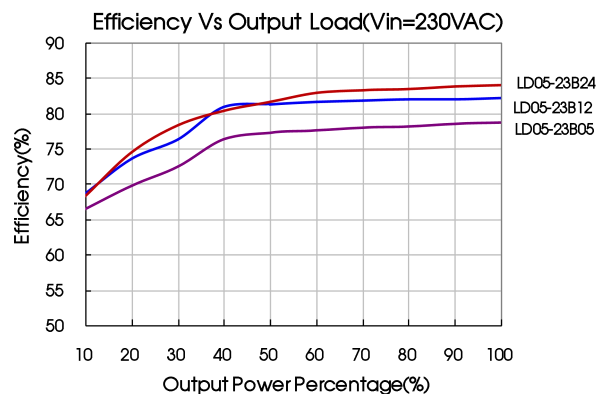
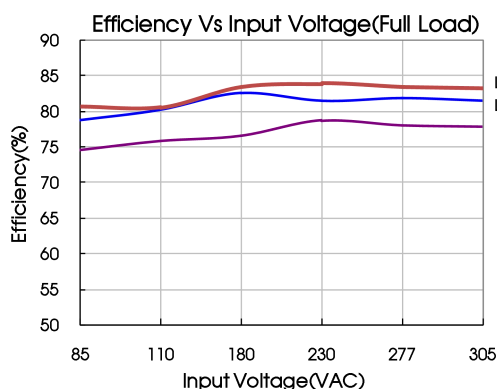
IEC/EN61000-4-11 0%, 70%

perf. Criteria B

## Product Characteristic Curve



Note: 1. With an AC input between 85-110V/277-305VAC and a DC input between 100-140VDC/390-430VDC, the output power must be derated as per temperature derating curves;  
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.



## Design Reference

### 1. Typical application circuit

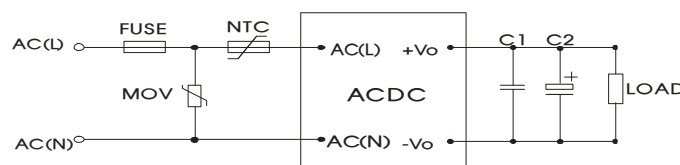


Fig. 1

Model	FUSE	C1(μF)	MOV	NTC	C2(μF)
LD05-23B03	1A/300V, slow-blow, required	1	S14K350	12D-5	220
LD05-23B05					220
LD05-23B09					100
LD05-23B12					100
LD05-23B15					100
LD05-23B24					47

#### Output Filter Components:

We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2 (refer to manufacture's datasheet). Choose a Capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C1 is a ceramic capacitor used for filtering high-frequency noise.

### 2. EMC solution-recommended circuit

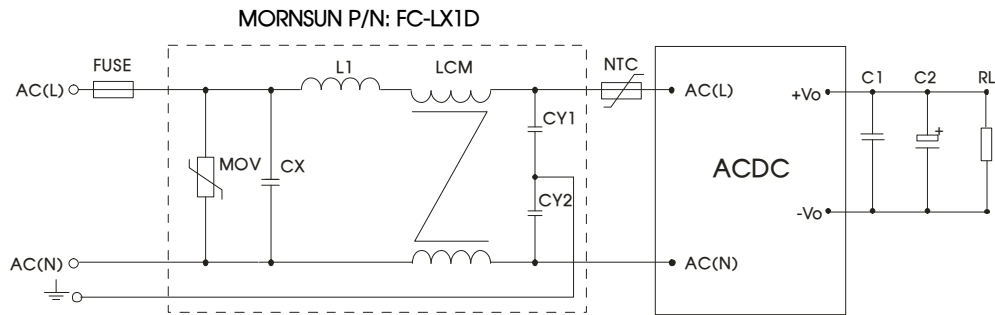
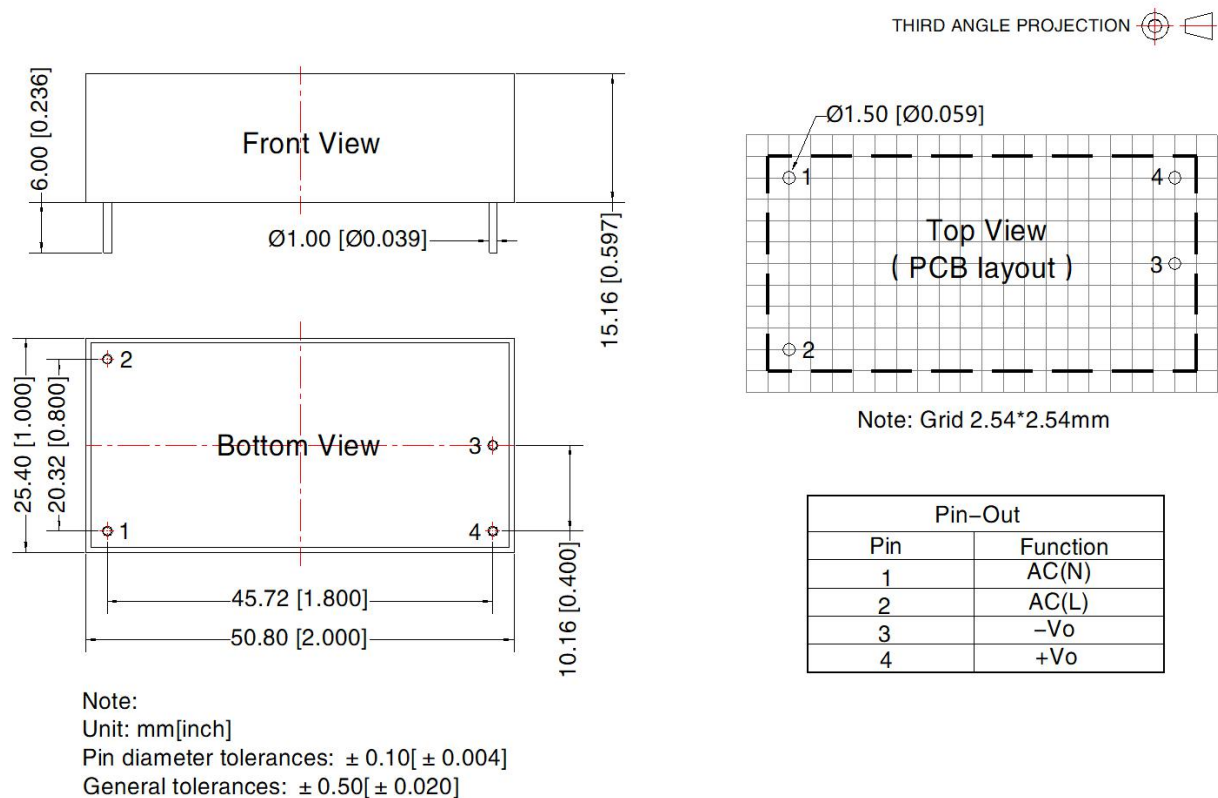


Fig. 2

Element model	Recommended value
MOV	S14K350
CX	0.1uF/310VAC
L1	4.7uH/2.0A
CY1	1nF/400VAC
CY2	1nF/400VAC
NTC	12D-5
LCM	2.2mH, P/N: FL2D-10-222 (MORNSUN) is recommended
FUSE	2A/300V, slow-blow, required
FC-LX1D	EMC filter

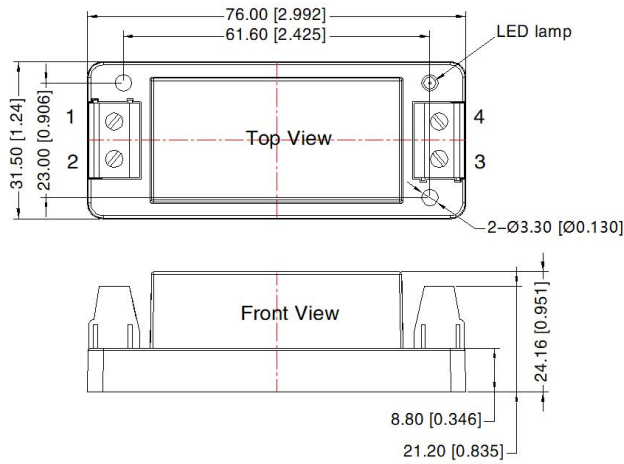
3. For additional information please refer to application notes on [www.mornsun-power.com](http://www.mornsun-power.com).

### Dimensions and Recommended Layout



LD05-23BxxA2S Chassis mounting Dimensions

THIRD ANGLE PROJECTION 

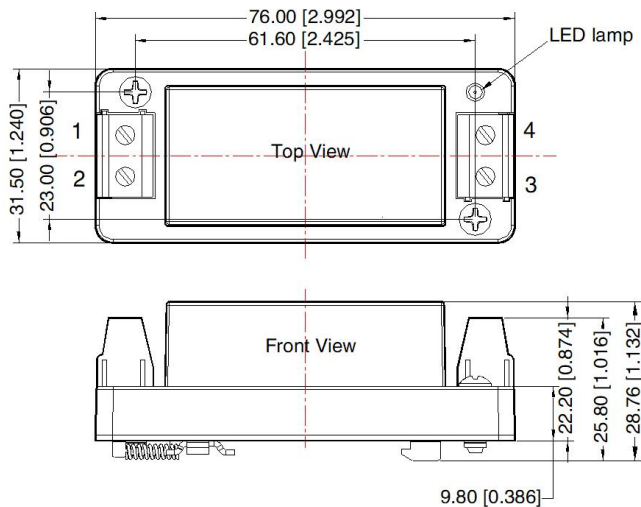


Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	-Vo
4	+Vo

Note:  
Unit: mm[inch]  
Wire range: 24-12 AWG  
Tightening torque: Max 0.4 N · m  
General tolerances:  $\pm 0.50 [\pm 0.020]$

LD05-23BxxA4S 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  
Tightening torque: Max 0.4 N · m  
Installed on DIN RAIL TS35  
General tolerances:  $\pm 0.50 [\pm 0.020]$

Note:

- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58220250 (Horizontal package), 58220022(A2S/A4S package);
- 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;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^{\circ}\text{C}$ , humidity <75% with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on our company corporate standards;
- 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";
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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