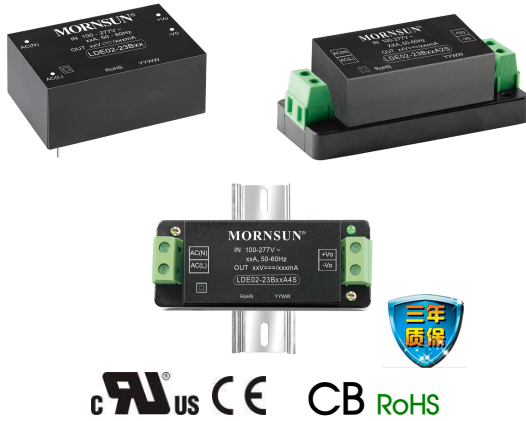


2W, ULTRA SMALL SIZE AC/DC converter



FEATURES

- Wide Input voltage Range: 85 - 305VAC/120 - 430VDC
- AC and DC dual-use(input from the same terminal)
- High Isolation voltage up to 4K VAC
- Operating temperature range: -40°C to +70°C
- High power density, high efficiency, green power
- Output short circuit, over-output current protections
- Meets CISPR32/EN55032 CLASS B
- Meet IEC62368, UL62368, EN62368 standards(Pending)
- PCB mounting, Chassis mounting, Din-Rail mounting available

LDE02-23Bxx series— is a compact size power converter offered by Mornsun. It features Wide input voltage, taking both DC and AC input voltage, low power consumption, high efficiency, high reliability, safer isolation. Offers good EMC performance, and meets the international UL62368 and EN62368 standards, 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.

Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current(Vo/Io)	Efficiency (230VAC, %/Typ.)	Max. Capacitive Load (μF)
UL/CE/CB (Pending)	LDE02-23B03	2W	3.3V/600mA	65	4000
	LDE02-23B05		5V/400mA	70	4000
	LDE02-23B09		9V/222mA	72	2200
	LDE02-23B12		12V/167mA	76	2200
	LDE02-23B15		15V/133mA	76	1000
	LDE02-23B24		24V/83mA	78	680

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	305	VAC
	DC input	120	--	430	VDC
Input Frequency		47	--	63	Hz
Input Current	115VAC	--	--	0.11	A
	230VAC	--	--	0.031	
Inrush Current	115VAC	--	7	--	
	230VAC	--	14	--	
Leakage Current		--	--	0.25	mA
Recommended External Input Fuse		1A/300V, slow fusing, necessary			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	3.3V output	--	±6	--	%
	Other output	--	±5	--	
Line Regulation	Full load	--	±2	--	
Load Regulation	10%-100% load	--	±5	--	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	100	200	mV
Temperature Coefficient		--	±0.04	--	%/°C
Stand-by Power Consumption		--	--	0.2	W
Short Circuit Protection		Hiccup, Continuous, self-recovery			

Over-current Protection		120% - 450% Io self-recovery			
Min. Load		10	--	--	%
Hold-up Time	230VAC input	--	50	--	ms
Note: * Ripple and Noise are measured by the method of parallel lines, 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 (leakage current <5mA)	4000	--	--	VAC
Operating Temperature		-40	--	+70	°C
Storage Temperature		-40	--	+105	
Storage Humidity		--	--	95	%RH
Power Derating	-40°C to -25°C	3.3	--	--	% / °C
	+55°C to +70°C	3.3	--	--	
	85VAC - 100VAC	1.33	--	--	%/VAC
Safety Standard		IEC62368/EN62368/UL62368			
Safety Certification		IEC62368/EN62368/UL62368(Pending)			
Safety Class		CLASS II			
MTBF		MIL-HDBK-217F@25°C > 300,000 h			

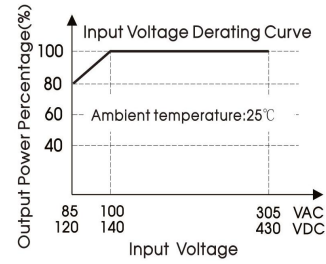
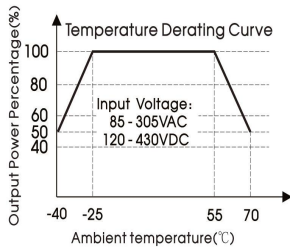
Physical Specifications

Casing Material	Black flame-retardant and heat-resistant plastic (UL94-V0)	
Dimension	Horizontal package	33.70*22.20*18.00 mm
	A2S chassis mounting	76.00*31.50*26.80mm
	A4S Din-Rail mounting	76.00*31.50*31.40mm
Weight	Horizontal package	20g (Typ.)
	A2S chassis mounting	40g(Typ.)
	A4S Din-Rail mounting	60g(Typ.)
Cooling Method	Free air convection	

EMC Specifications

EMI	CE	CISPR32/EN55032	CLASS B	
	RE	CISPR32/EN55032	CLASS B	
EMS	ESD	IEC/EN 61000-4-2	Contact ±6KV/Air ±8KV	perf. Criteria B
	RS	IEC/EN 61000-4-3	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	line to line ±1KV/line to ground ±2KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s	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 Input voltage should be derated based on temperature derating when it is 85-100VAC/120-140VDC;
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

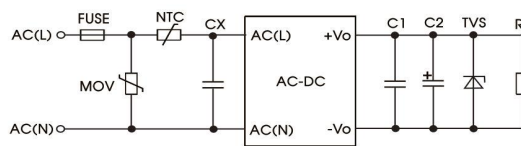


Fig. 1

Model	FUSE	MOV	NTC	CX	C1(μF)	C2(μF)	TVS
LDE02-23B03	1A/300V, slow fusing, necessary	S14K350	10D-11	0.47μF/305VAC	1	330	SMBJ7.0A
LDE02-23B05						220	SMBJ7.0A
LDE02-23B09						100	SMBJ12A
LDE02-23B12						100	SMBJ20A
LDE02-23B15						100	SMBJ20A
LDE02-23B24						100	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 voltage reduced to at least 80%. C1 is ceramic capacitor, which is used to filter high-frequency noise. TVS is a recommended component to protect post-circuits if converter fails.

2. EMC solution-recommended circuit

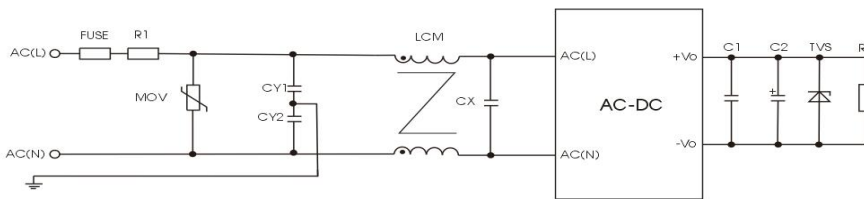


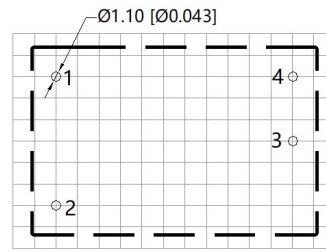
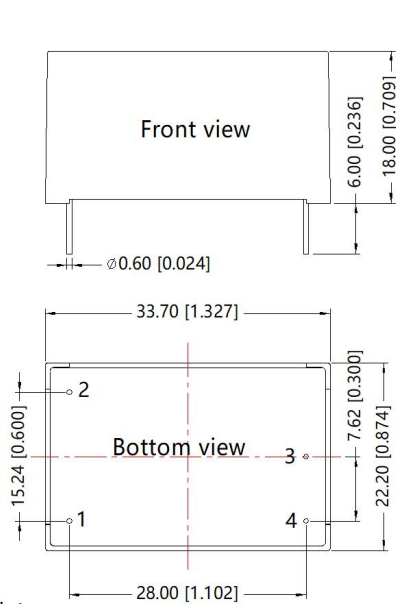
Fig 2

Components	Recommend Parameter
MOV	S14K350
CY1	2.2nF/400VAC
CY2	2.2nF/400VAC
CX	0.47μF/305VAC
LCM	10 mH, recommended to use MORNSUN's FL2D-Z5-103
R1	47Ω/3w
FUSE	1A/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

LDE02-23Bxx Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



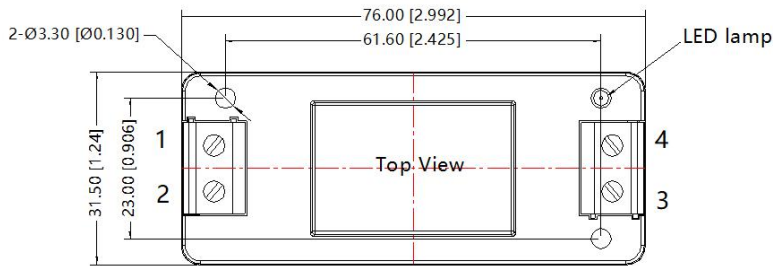
Note : Grid 2.54*2.54mm

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

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

LDE02-23BxxA2S Din-Rail mounting Dimensions

THIRD ANGLE PROJECTION

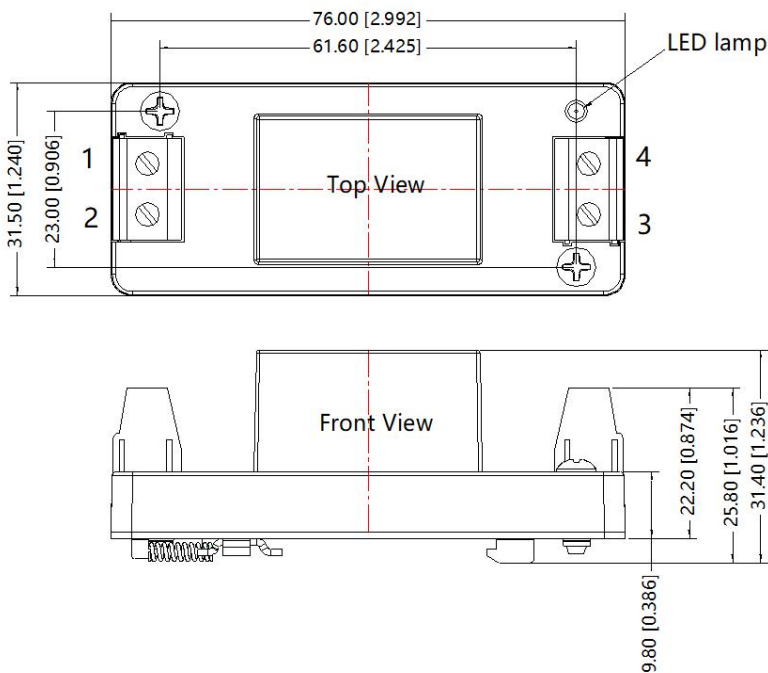


Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	-Vo
4	+Vo

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

LDE02-23BxxA4S 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: $\pm 1.00[\pm 0.039]$

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58220014(DIP 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 $T_a=25^\circ\text{C}$, 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. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. 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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