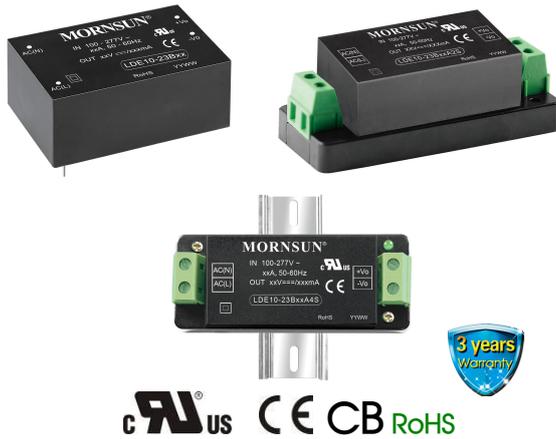


10W, AC/DC converter



FEATURES

- Universal 85 - 305V AC and wide 100 - 430V DC Input
- Operating ambient temperature range : -40°C to +70°C
- High I/O Isolation test voltage up to 4000VAC
- Regulated output, low output ripple & noise
- Output short circuit, over-current and over-voltage protection
- High efficiency, high reliability
- Plastic case meets flammability per UL94V-0
- EMI performance meets CISPR32 / EN55032 CLASS B
- IEC/EN/UL62368 safety approval

LDE10-23xx series is one of Mornsun's compact size power converters. It features universal AC input and at the same time accepts DC input voltage, low power consumption, high efficiency, high reliability and double or reinforced insulation. It offers excellent EMC performance and for extremely harsh EMC environment, we recommend using the application circuit show in this datasheet. The converters meet IEC/EN61000-4, CISPR32/EN55032, IEC/EN/UL62368 standards and are widely used in LED, street lamp control, industrial, medical, electricity, instrumentation, telecommunications applications.

Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 230VAC (%) Typ.	Capacitive Load (μF)Max.
UL/CE/CB	LDE10-23B03	6.6W	3.3V/2000mA	72	26400
	LDE10-23B05		5V/2000mA	76	9440
	LDE10-23B09		9V/1100mA	79	3600
	LDE10-23B12		12V/900mA	81	2000
	LDE10-23B15		15V/700mA	81	1170
	LDE10-23B24		24V/450mA	82	370

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	--	--	0.23	A
	230VAC	--	--	0.15	
Inrush Current	115VAC	--	15	--	
	230VAC	--	30	--	
Leakage Current	230VAC/50Hz	0.25mA RMS Max.			
Recommended External Input Fuse		2A/300V slow-blow required			
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	0% - 100% load	--	±1	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	--	100	mV
Temperature Coefficient		--	±0.02	--	%/°C
Stand-by Power Consumption	230VAC/ Io=0	--	--	0.5	W

Short Circuit Protection		Hiccup, continuous, self-recovery			
Over-current Protection		110% - 300%Io, self-recovery			
Over-voltage Protection	3.3VDC/5VDC	≤9VDC(Output voltage clamp or hiccup)			
	9VDC	≤15VDC(Output voltage clamp or hiccup)			
	12VDC	≤20VDC(Output voltage clamp or hiccup)			
	15VDC	≤25VDC(Output voltage clamp or hiccup)			
	24VDC	≤35VDC(Output voltage clamp or hiccup)			
Minimum Load		0	--	--	%
Hold-up Time	115VAC input	--	8	--	ms
	230VAC input	--	75	--	

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 1min., leakage current < 5mA	4000	--	--	VAC
Operating Temperature		-40	--	+70	°C
Storage Temperature		-40	--	+85	
Storage Humidity		--	--	95	%RH
Soldering Temperature	Wave-soldering	260 ± 5°C; time: 5 - 10s			
	Manual-soldering	360 ± 10°C; time: 3 - 5s			
Switching Frequency		--	100	--	KHz
Power Derating	-40°C ~ -25°C	2.67	--	--	% / °C
	+55°C ~ +70°C	2.67	--	--	
	85VAC - 100VAC	1.0	--	--	% / VAC
	277VAC - 305VAC	0.54	--	--	
Safety Standard		IEC62368/EN62368/UL62368			
Safety Certification		IEC62368/EN62368/UL62368			
Safety Class		CLASS II			
MTBF		MIL-HDBK-217F@25°C > 300,000 h			

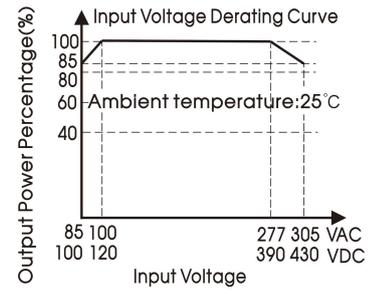
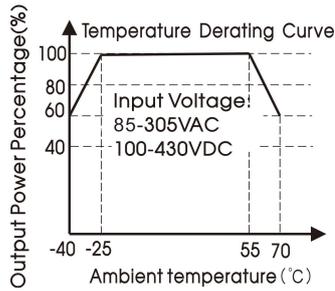
Mechanical Specifications

Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)
Dimension	53.80 x 28.80 x 19.00mm
Weight	48g (Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B
	RE	CISPR32/EN55032	CLASS B
Immunity	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 ground ±4KV (See Fig. 2 for recommended circuit) perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s perf. Criteria A
Voltage dip, short interruptions and voltage variations	IEC/EN61000-4-11	0%, 70% perf. Criteria B	

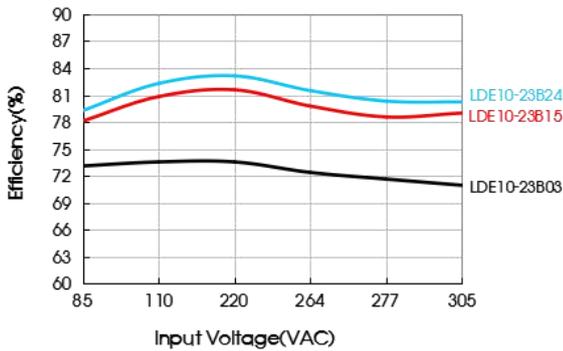
Product Characteristic Curve



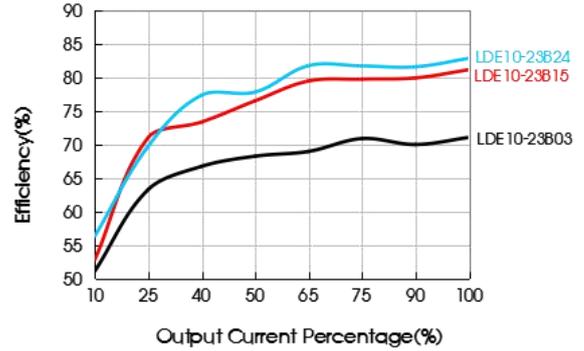
Note: ① With an AC input between 85-100VAC/ 277-305VAC and a DC input between 100-120VDC/390-430VDC , the output power must be derated as per temperature derating curves;

② This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.

Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load (Vin=230VAC)



Design Reference

1. Typical application

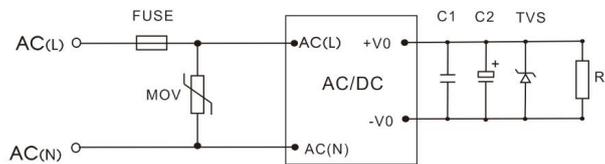


Fig. 1: Typical circuit diagram

Part No.	C1	C2	FUSE	MOV	TVS
LDE10-23B03	1μF/50V	470μF /10V	2A/300V slow-blow required	S14K350	SMBJ7.0A
LDE10-23B05		470μF /10V			SMBJ7.0A
LDE10-23B09		220μF /25V			SMBJ15A
LDE10-23B12		220μF /25V			SMBJ20A
LDE10-23B15		220μF /25V			SMBJ20A
LDE10-23B24		100μF /35V			SMBJ30A

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 and TVS is a recommended suppressor diode to protect the application in case of a converter failure.

2. EMC compliance recommended circuit

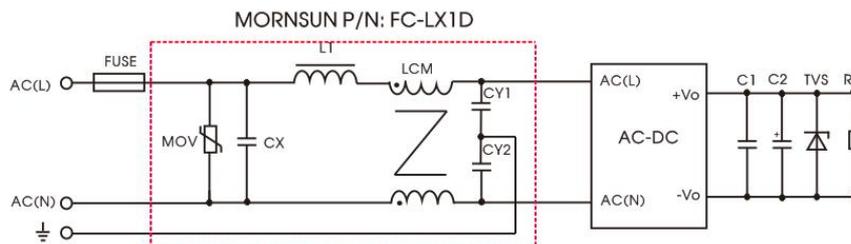
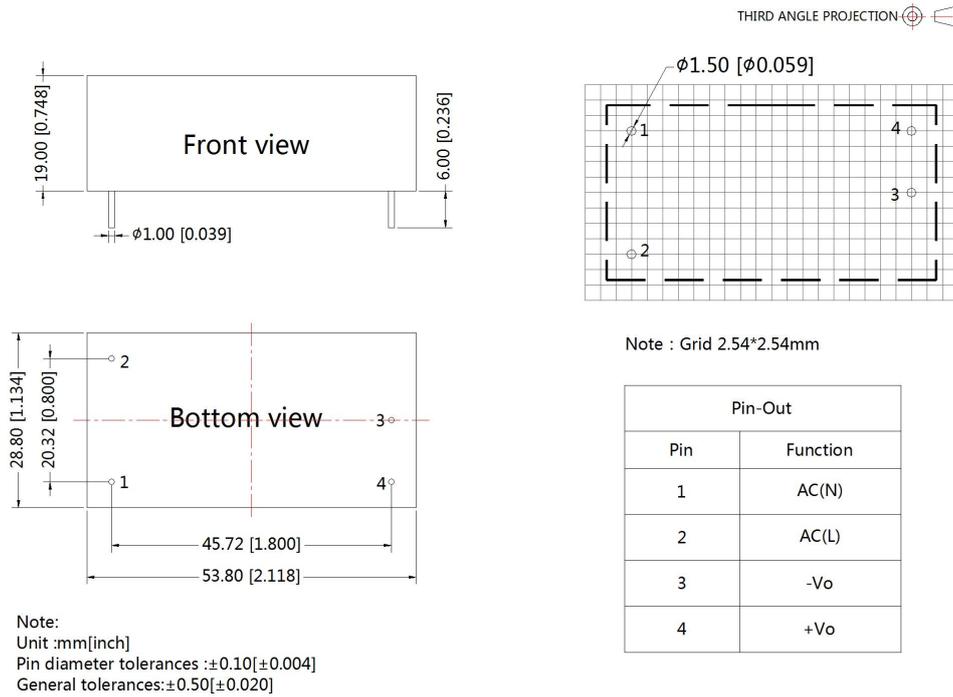


Fig 2: EMC circuit for harsh requirements

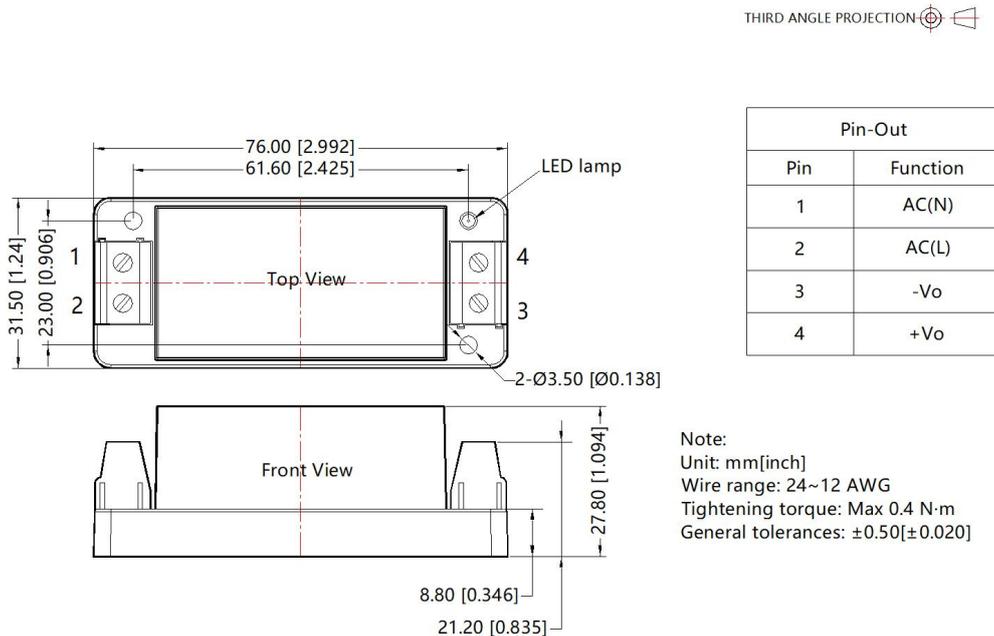
Component	Recommended value
FUSE	3.15A/300V slow-blow required
MOV	S14K350
CY1, CY2	1000pF/400VAC
CX	FC-LX1D (2KV/4KV EMC Filter)
L1	0.1uF/310VAC
LCM	4.7uH/2A
	2.2mH, we recommend using part no. FL2D-10-222 (MORNSUN)

3. For additional information please refer to application notes on www.mornsun-power.com

Dimensions and Recommended Layout

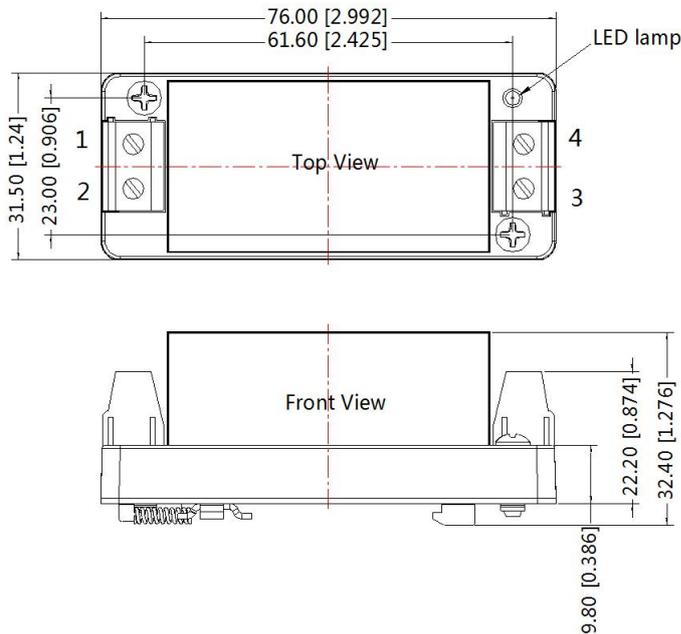


LDE10-23BxxA2S Chassis mounting Dimensions



LDE10-23BxxA4S 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: ±1.00[±0.039]

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220005 (Horizontal package); 58220022(A2S/A4S package);
2. 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;
3. All index testing methods in this datasheet are based on our company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. 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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