AC/DC Converter
LD20-10Bxx Series

MORNSUN®

20W, AC-DC converter

FEATURES

- Universal Input:85~264VAC/100~370VDC
- AC and DC dual-use(input from the same terminal)
- High efficiency, low power consumption, meet energy star standards
- Low ripple & noise
- Compact size
- Output short circuit, over-current, over–voltage protection
- Mounting: PCB mounting, Chassis mounting, DIN-Rail mounting available
- UL60950, EN60950 approval

c UL us CE RoHS

LD20-10Bxx series ----- a 20W compact size power converter offered by MORNSUN, ultra-slim volume. It features universal input voltage, taking both DC and AC input voltage, low power consumption, low ripple& noise, high efficiency, high reliability, 3000VAC safer isolation. It offers good EMC performance, meet IEC/EN61000-4, CISPR22/EN55022, UL60950 and EN60950 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	Model	Output Power	Nominal Output Voltage and Current(Vo/Io)	Efficiency (230VAC,%/Typ.)	Max. Capacitive Load (μF)
UL/CE	LD20-10B03	11.88W	3.3V/3600mA	74	10000
	LD20-10B05	18W	5V/3600mA	78	10000
	LD20-10B12	20W	12V/1660mA	82	5400
	LD20-10B15		15V/1330mA	83	2700
	LD20-10B24		24V/833mA	83	1500

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	--	440	Hz
Input current	115VAC	--	370	--	mA
	230VAC	--	240	--	
Inrush current	115VAC	--	10	--	A
	230VAC	--	20	--	
Recommended External Input Fuse (Special package series include fuse)		3.15A/250V, slow fusing, necessary			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	0%-100%	LD20-10B03	--	±3	--	%
		Other models	--	±2	--	
Line Regulation	Full load		--	±0.5	--	
Load Regulation	0%-100% load		--	±1	--	

Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	50	120	mV
Temperature Coefficient		--	±0.02	--	%/°C
Stand-by Power Consumption		--	--	0.3	W
Short Circuit Protection		Continuous, self-recovery			
Over-current Protection		110%-250%Io, self-recovery			
Over-voltage Protection		Zener clamp diode			
Min. Load		0	--	--	%
Hold-up Time	115VAC input	--	10	--	ms
	230VAC input	--	55	--	

Note: * Ripple and noise tested with "parallel cable" method, Testing at rated load. 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
Welding Temperature		Wave-soldering		260±5℃; time:5~10s			
		Manual-welding		360±10℃; time:3~5s			
Switching Frequency				--	100	--	kHz
Power Derating		+40℃~+70℃	LD20-10B03/05	2.66	--	--	%/℃
			Others	2.33	--	--	
		-25℃~0℃		1.0	--	--	
Safety Standard				IEC60950/EN60950/UL60950			
Safety-regulated Certification				EN60950/UL60950			
Safety Class				CLASS II			
MTBF				MIL-HDBK-217F@25°C > 300,000 h			

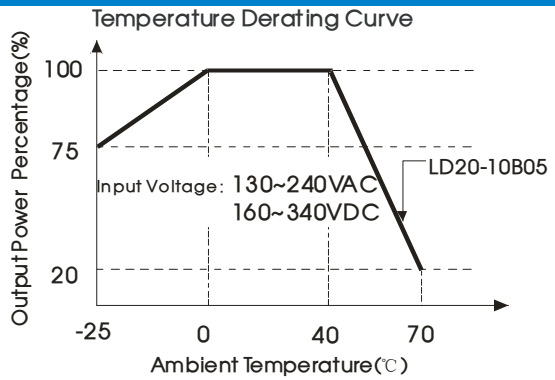
Physical Specifications

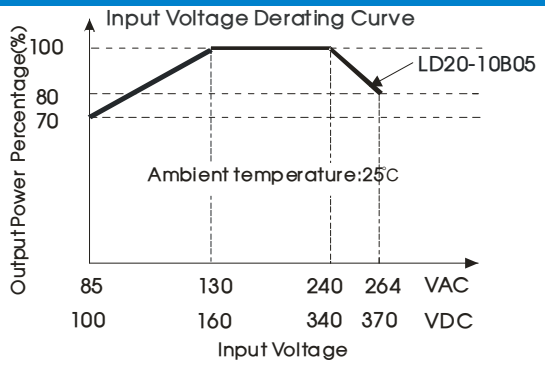
Casing Material		Black flame-retardant and heat-resistant plastic (UL94-V0)
Package Dimensions	Horizontal package	53.80*28.80*23.50 mm
	A2 chassis package	96.10*54.00*32.00 mm
	A4 Din-Rail package	96.10*54.00*36.60 mm
	A2S chassis package	76.00*31.50*32.30 mm
	A4S Din-Rail package	76.00*31.50*36.90 mm
Weight	Horizontal package/ A2 chassis package/ A4 Din-Rail package/ A2S chassis package/ A4S Din-Rail package	60g/110g/150g/80g/100g (Typ.)
Cooling method		Free convection

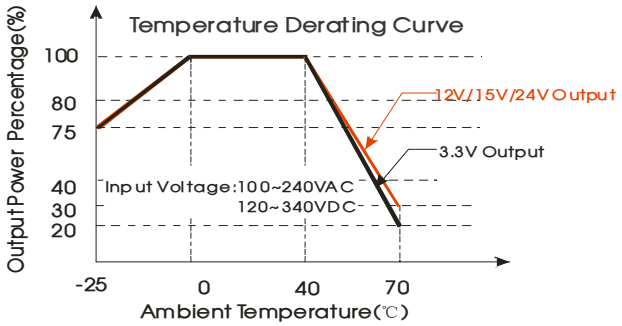
EMC Specifications

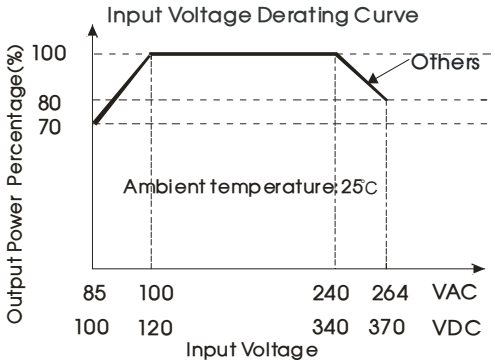
EMI	CE	CISPR22/EN55022, CLASS B	
	RE	CISPR22/EN55022, CLASS B	
EMS	ESD	IEC/EN61000-4-2 ±6KV/±8KV	Perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±4KV	perf. Criteria B
	Surge	IEC/EN61000-4-5 ±2KV	perf. Criteria B
		IEC/EN61000-4-5 ±4KV/±6KV (See Fig. 2 for recommended 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
	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-11 0%-70%	perf. Criteria B

Product Characteristic Curve

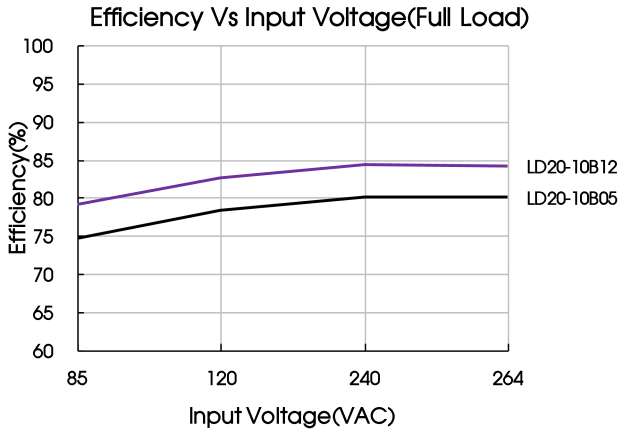


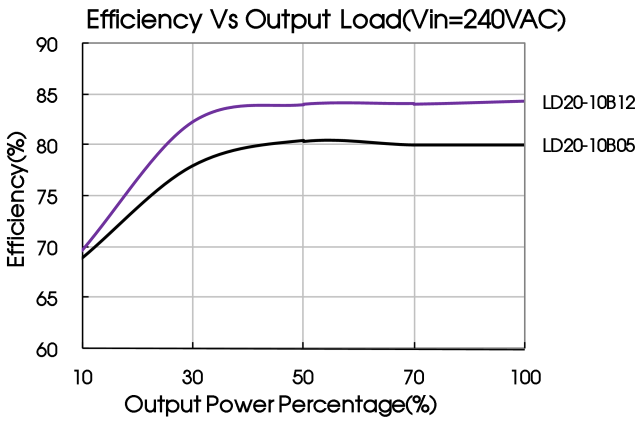






Note: ①Input voltage should be derated based on temperature derating when it is 85~100VAC/240~264VAC/100~120VDC/340~370VDC (LD20-10B05:85~130VAC/240~264VAC/100~160VDC/340~370VDC);
②This product is suitable for use in natural air cooling environments, if in a closed environment, please contact our company's FAE.





Design Reference

1. Typical application circuit

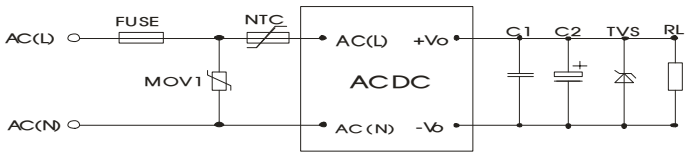


Fig. 1

Model	FUSE	NTC	MOV1	C1	C2	TVS
LD20-10B03	3.15A/250V, slow fusing, necessary	10D-11	S20K300	1μF/50V	220μF/16V	SMBJ7.0A
LD20-10B05					220μF/16V	SMBJ7.0A
LD20-10B12					120μF/25V	SMBJ20A
LD20-10B15					120μF/25V	SMBJ20A
LD20-10B24					68μF/35V	SMBJ30A

Note:

① Output filtering capacitor C2 is electrolytic capacitor, it is recommended to apply electrolytic capacitor with high frequency and low resistance. For capacitance and current of capacitor please refer to manufacture's datasheet. Capacitance 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.

②The product in the application must connect external electrolytic capacitors C2, to achieve lower ripple noise and better dynamic load performance.

③When the product's output terminal is connected to high frequency switch type load, electrolytic capacitor C2's selection is as following:

Model	C2
LD20-10B03	470μF/16V (Solid capacitor)
LD20-10B05	470μF/16V (Solid capacitor)
LD20-10B12	390μF/25V
LD20-10B15	390μF/25V
LD20-10B24	220μF/35V

2. EMC solution-recommended circuit

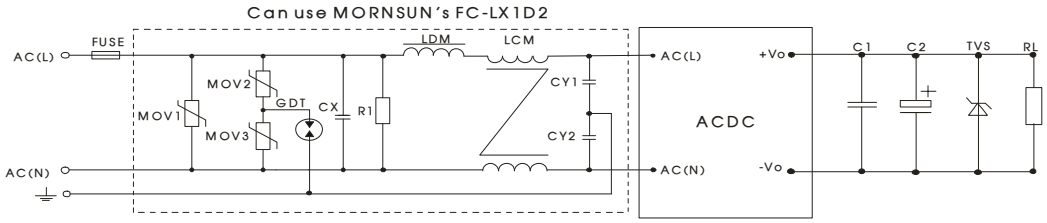


Fig 2

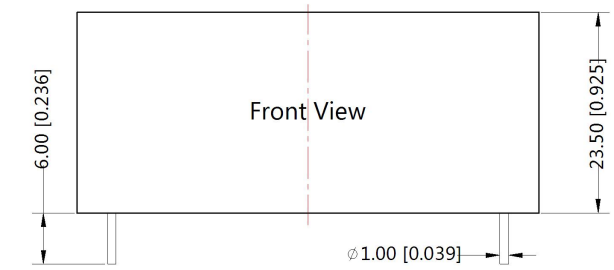
Note: Output external circuit refer to the typical application circuit.

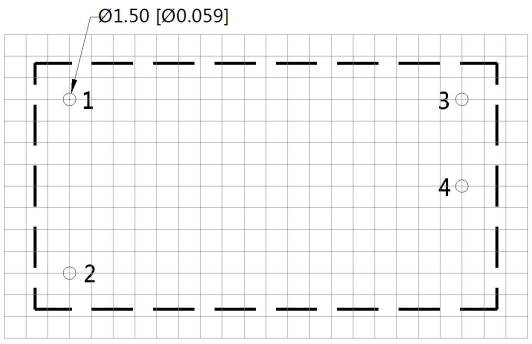
Element model	Recommended value
MOV1	S20K300
MOV2	S10K300
MOV3	S10K300
CX	0.22μF/275VAC
CY1/CY2	2.2nF/400VAC
R1	1MΩ/2W
LDM	4.7uH
LCM	10mH, recommended to use MORNSUN's FL2D-Z5-103
GDT4	EM3600XS
FUSE	3.15A/250V, slow fusing, necessary
FC-LX1D2	EMC filter

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

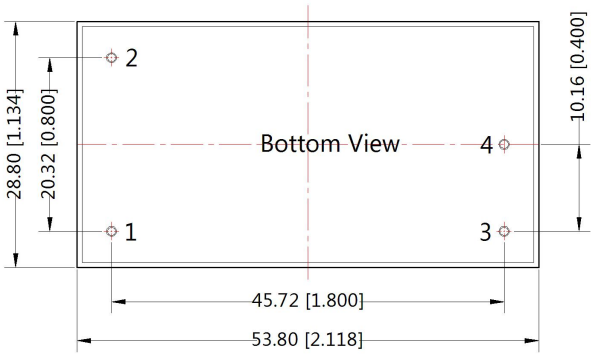
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





Note:Grid 2.54*2.54mm

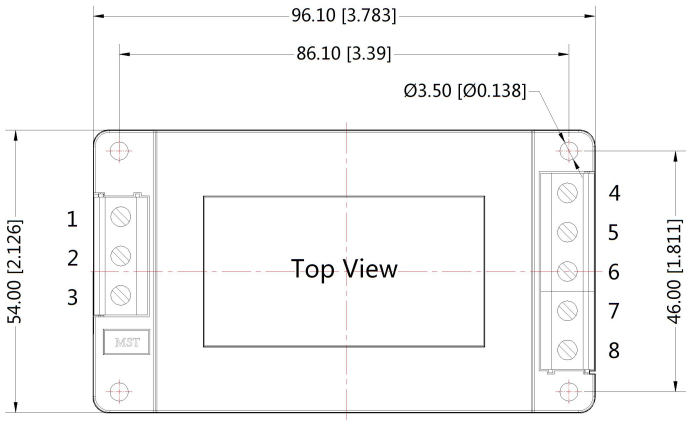


Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	+Vo
4	-Vo

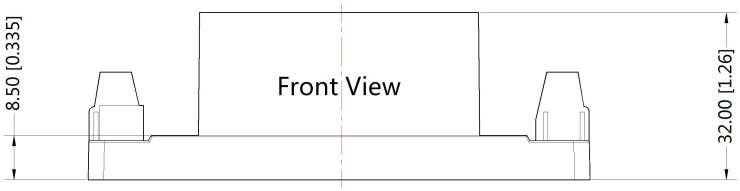
Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]

LD20-10BxxA2 Dimensions

THIRD ANGLE PROJECTION



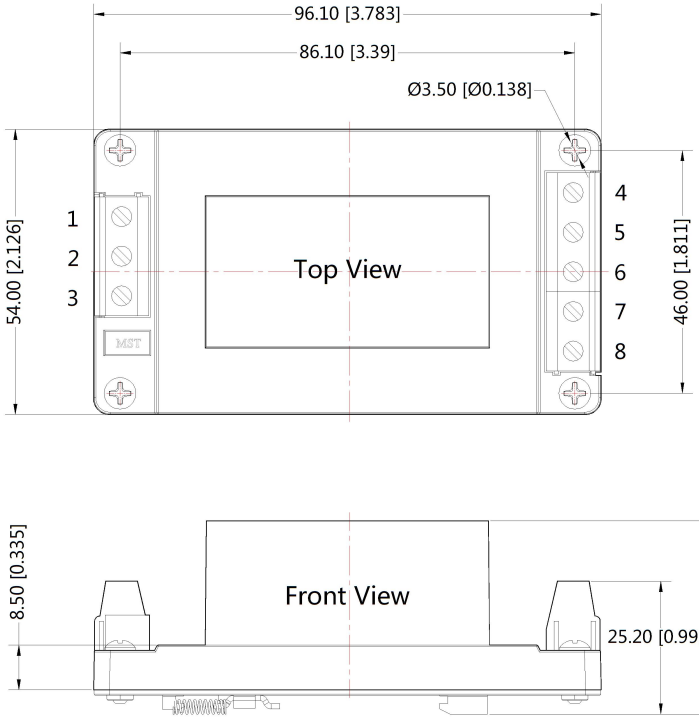
Pin	Function
1	NC
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	-Vo
7	NC
8	NC



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

LD20-10BxxA4 Dimensions

THIRD ANGLE PROJECTION

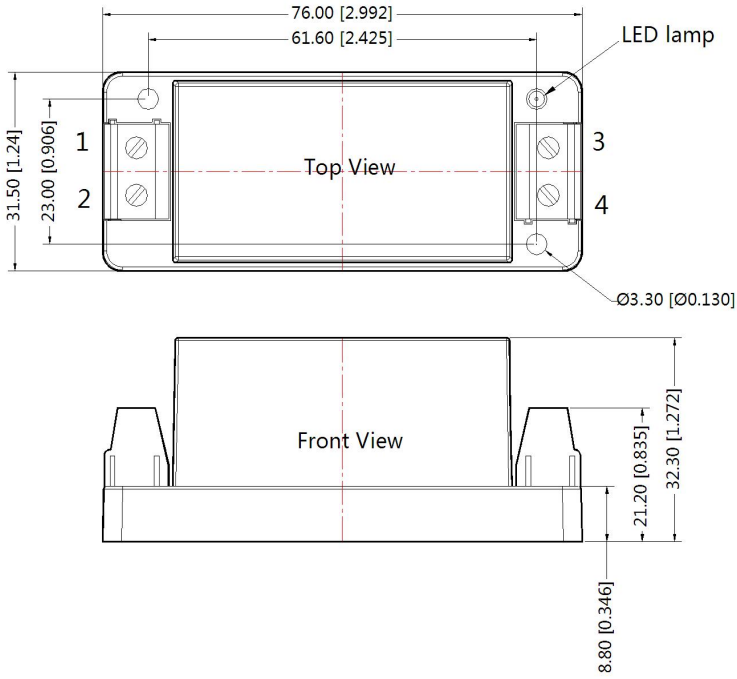


Pin	Function
1	NC
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	-Vo
7	NC
8	NC

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

LD20-10BxxA2S Dimensions

THIRD ANGLE PROJECTION

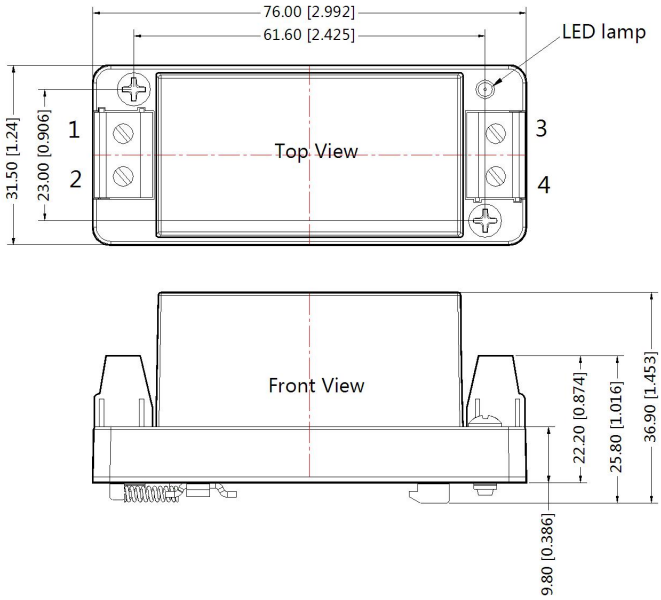


Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	+Vo
4	-Vo

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

LD20-10BxxA4S 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]

Note:

1. Packing Information please refer to 'Product Packaging Information'. The Packing bag number of Horizontal package : 58220011, the Packing bag number of A2/A4 package:58220010, the Packing bag number of A2S/ A4S package:58220022;
2. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25°C, humidity<75% when inputting nominal voltage and outputting rated load;
3. All index testing methods in this datasheet are based on our Company's corporate standards;
4. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technician for specific information;
5. We can provide product customization service;
6. Specifications of this product are subject to changes without prior notice.

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