10W, AC/DC converter

FEATURES

- Universal input voltage range: 85~264VAC/100~370VDC
- Operating temperature range: -25℃ to +70℃
- Output short circuit, over-current, over-voltage protections
- UL60950(industrial level), EN60601(Medical safety according to EN 60601 -1 3rd edition) approval
- Mounting: PCB mounting, Chassis mounting, Din-Rail mounting available

LD10-20Bxx 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, meets IEC/EN61000-4, CISPR11/EN55011, UL60950 and EN60601 standards, and widely used in industrial, medical, 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	LD10-20B03	6.6W	3.3V/2000mA	71	15000
	LD10-20B05	10W	5V/2000mA	76	12000
	LD10-20B09		9V/1100mA	80	6000
	LD10-20B12		12V/900mA	81	2000
	LD10-20B15		15V/700mA	82	1500
	LD10-20B24		24V/450mA	83	500

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	110VAC	--	230	--	mA
	230VAC	--	150	--	
Inrush Current	110VAC	--	10	--	A
	230VAC	--	20	--	
Recommended External Input Fuse(Special package series include fuse)		2A/250V, slow fusing			
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	10%-100% load	--	±1	--	

Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	50	100	mV
Temperature Coefficient		--	±0.02	--	%/℃
Stand-by Power Consumption		--	0.5	--	W
Short Circuit Protection		Continuous, self-recovery			
Over-current Protection		110%~200%Io			
over-voltage protections	3.3VDC/5VDC	≤7.5VDC			
	9VDC	≤15VDC			
	12VDC/15VDC	≤20VDC			
	24VDC	≤30VDC			
Hold-up Time	230VAC input	--	80	--	ms
Note: * Ripple and noise are measured by "parallel cable" method, please see AC-DC Converter Application Notes for specific operation.					

General Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output		4000	--	--	VAC
Operating Temperature			-25	--	+70	℃
Storage Temperature			-25	--	+105	
Storage Humidity			--	--	95	%RH
Switching Frequency			--	65	--	KHz
Power Derating		+55℃~+70℃	2.0	--	--	%/℃
		-25℃~0℃	2.0	--	--	
Safety Standard			IEC60601/EN60601/UL60950			
Safety Certification			EN60601/UL60950			
Safety Class			CLASS II			
MTBF			MIL-HDBK-217F@25℃ > 300,000 h			

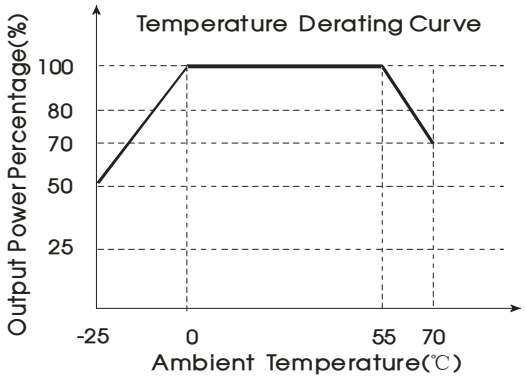
Physical Specifications

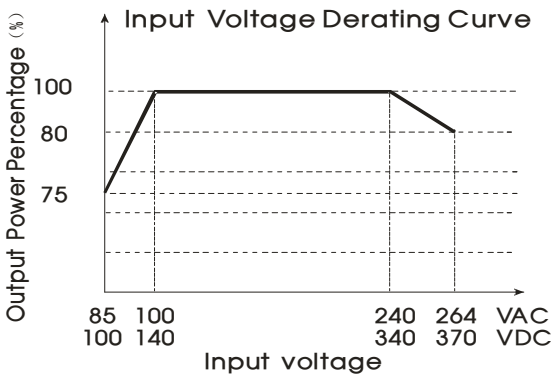
Casing Material		Black flame-retardant and heat-resistant plastic (UL94-V0)
Dimension	Horizontal package/A2 chassis mounting/A4 Din-Rail mounting/ A2S chassis mounting/A4S Din-Rail mounting	Refer to the Dimensions
Weight	Horizontal package/A2 chassis mounting/A4 Din-Rail mounting/ A2S chassis mounting/A4S Din-Rail mounting	50g/100g /140g/70g/90g (Typ.)
Cooling Method		Free convection

EMC Specifications

EMI	CE	CISPR11/EN55011, CLASS A CISPR11/EN55011, CLASS B (See Fig. 2 for recommended circuit)	
	RE	CISPR11/EN55011, CLASS A CISPR11/EN55011, 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/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 ±1KV (See Fig. 1 for typical application circuit)	perf. Criteria B
		IEC/EN61000-4-5 ±2KV/±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 dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11 0%-70%	perf. Criteria B

Product Characteristic Curve





Note: ①When input 85~100VAC/240~264VAC/100~140VDC/340~370VDC, it need to be voltage derated on basis of temperature derating;
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

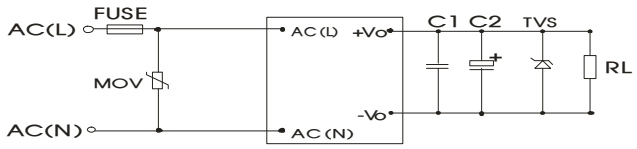


Fig. 1

Model	C1(μF)	C2(μF)	TVS tube
LD10-20B03	1μF/50V	220μF /10V	SMBJ7.0A
LD10-20B05		220μF /10V	SMBJ7.0A
LD10-20B09		120μF /25V	SMBJ12A
LD10-20B12		120μF /25V	SMBJ20A
LD10-20B15		120μF /25V	SMBJ20A
LD10-20B24		68μF /35V	SMBJ30A

Note: Output filtering capacitors C1 is ceramic capacitor, it is used to filter high frequency noise. C2 is electrolytic capacitors, It is recommended to use high frequency and low impedance electrolytic capacitors. For capacitance and current of capacitor please refer to manufacture's datasheet. Voltage derating of capacitor should be 80% or above. TVS is a recommended component to protect post-circuits (if converter fails). External input MOV is recommended to use S14K300.

2. EMC solution-recommended circuit

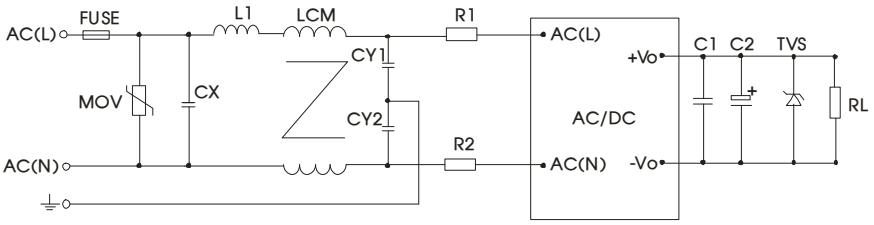
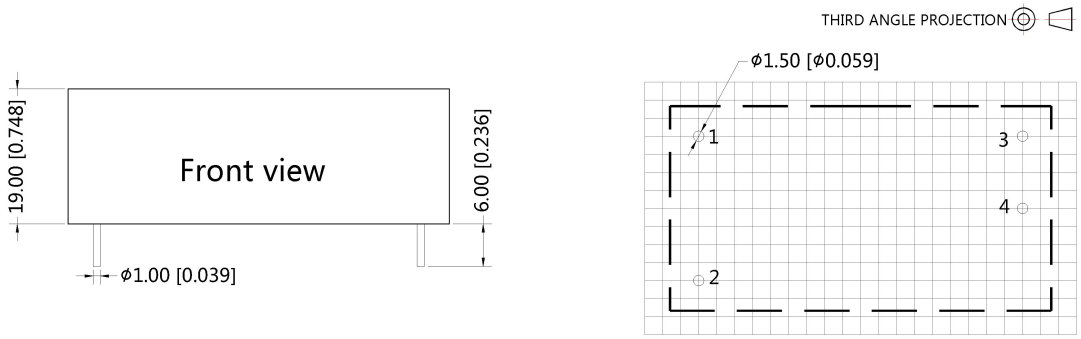


Fig 2

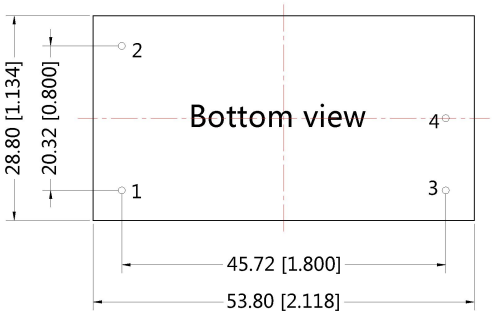
Element model	Recommended value
MOV	S14K300
CX	0.1μF/275VAC
L1	4.7μH/2.0A
CY1/ CY2	1nF/400VAC
LCM	2.2 mH，recommended to use MORNSUN's FL2D-10-222
R1	12Ω/3W
FUSE	2A/250V，slow fusing

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

LD10-20Bxx Dimensions and Recommended Layout



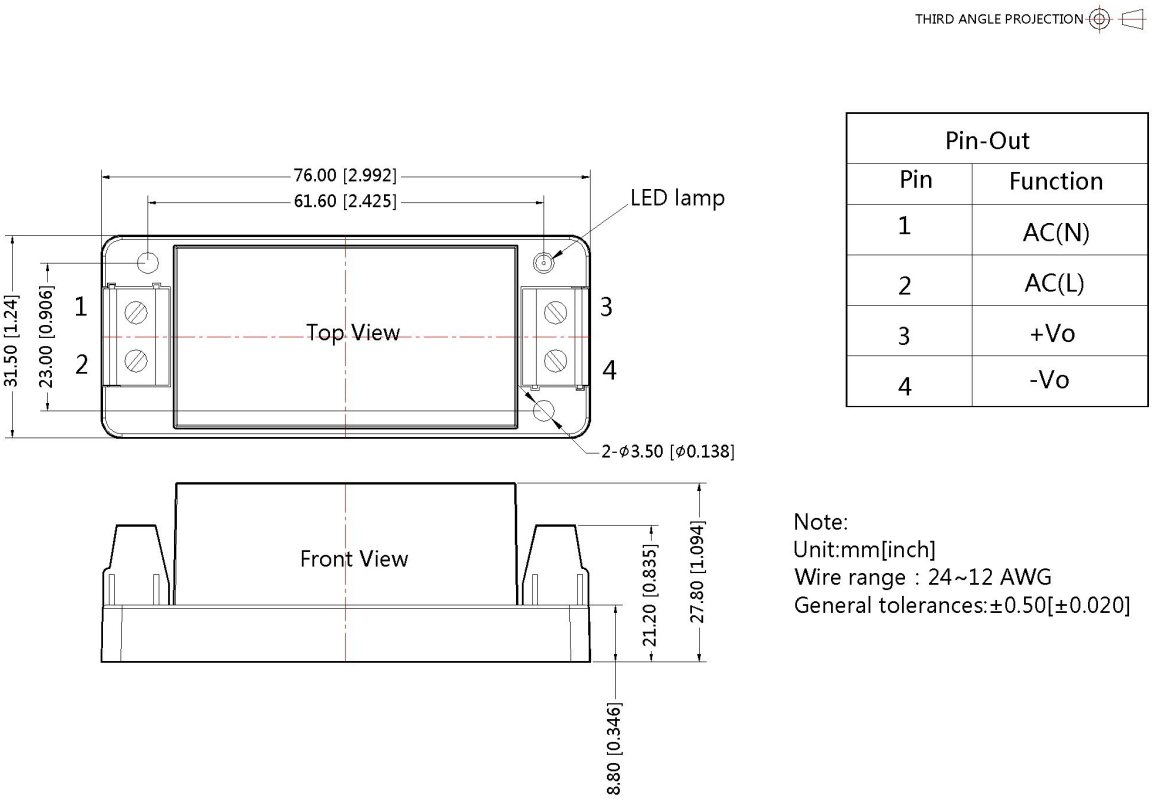
Note : Grid 2.54*2.54mm



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]

LD10-20BxxA2S Chassis mounting Dimensions

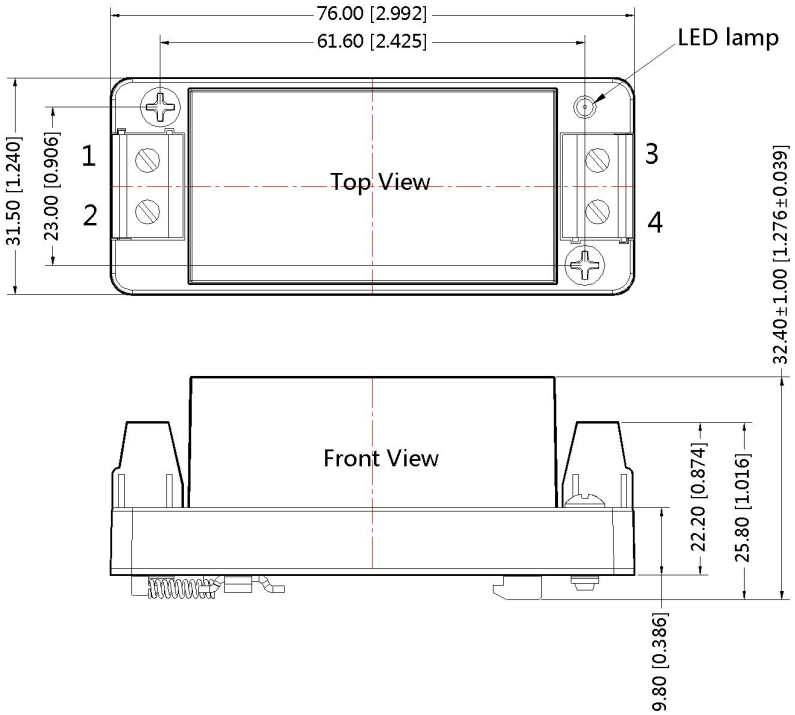


Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	+Vo
4	-Vo

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

LD10-20BxxA4S Din-Rail mounting Dimensions

THIRD ANGLE PROJECTION

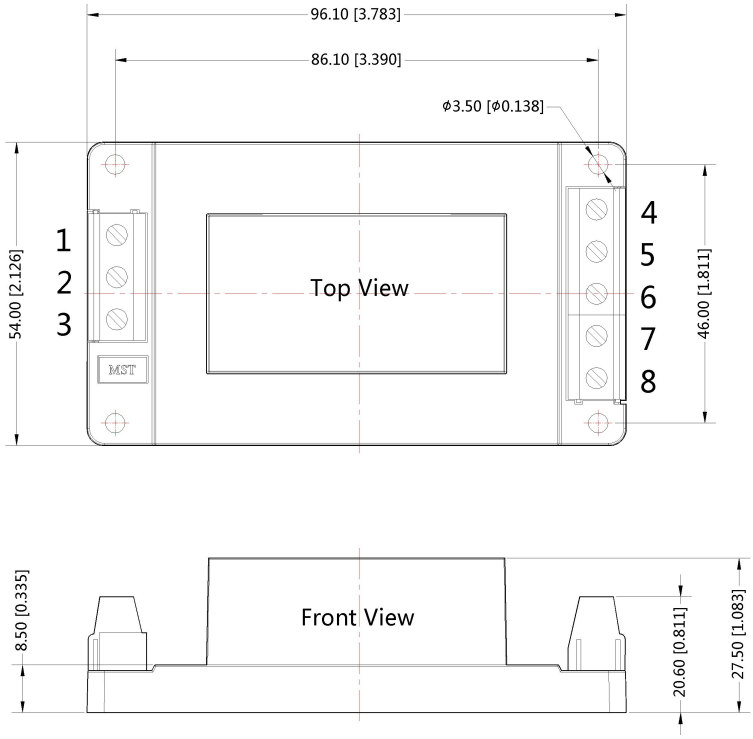


Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	+Vo
4	-Vo

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

LD10-20BxxA2 Chassis mounting Dimensions

THIRD ANGLE PROJECTION

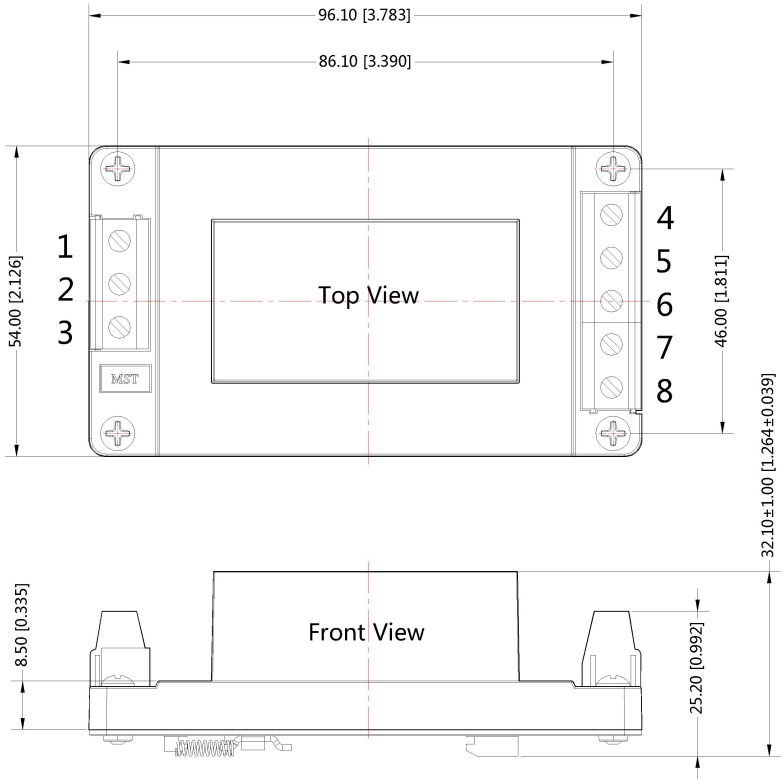


Pin-Out	
Pin	Function
1	NC
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	-Vo
7	NC
8	NC

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

LD10-20BxxA4 Din-Rail mounting Dimensions

THIRD ANGLE PROJECTION



Pin-Out	
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]

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58220005(Horizontal package), 58220022(A2S/A4S package), 58220010(A2/A4 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 Ta=25 ℃, 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.

MORNSUN Guangzhou Science & Technology Co., Ltd.
Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Luogang District, Guangzhou, P. R. China
Tel: 86-20-38601850-8801 Fax: 86-20-38601272 E-mail: info@mornsun.cn