

10W, AC/DC converter



## FEATURES

- Universal 85-264VAC or 100-370VDC input voltage
- Operating temperature range: -25°C to +70°C
- Output short circuit, over-current, over-voltage protections
- Design to meet UL60950 (industrial level)
- EN60601(Medical safety according to EN60601-1 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. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

## Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current(Vo/Io)	Efficiency (230VAC, %/Typ.)	Max. Capacitive Load (uF)
EN	LD10-20B03	10W	3.3V/2000mA	71	15000
	LD10-20B05		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

Note: 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	--	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-blow			
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	--	%/°C
Stand-by Power Consumption		--	0.5	--	W

Short Circuit Protection		Continuous, self-recover			
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: * 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	4000	--	--	VAC
Operating Temperature		-25	--	+70	°C
Storage Temperature		-25	--	+105	
Storage Humidity		--	--	95	%RH
Soldering Temperature	Wave-soldering, Max. 10 seconds	255	260	265	°C
	Manual-welding, Max. 5 seconds	350	360	370	
Switching Frequency		--	65	--	KHz
Power Derating	+55°C to +70°C	2.0	--	--	% / °C
	-25°C to 0°C	2.0	--	--	
Safety Standard		EN60601-1 safety approved; Design refer to IEC60601-1, UL60950-1			
Safety Class		CLASS II			
MTBF		MIL-HDBK-217F@25°C > 300,000 h			

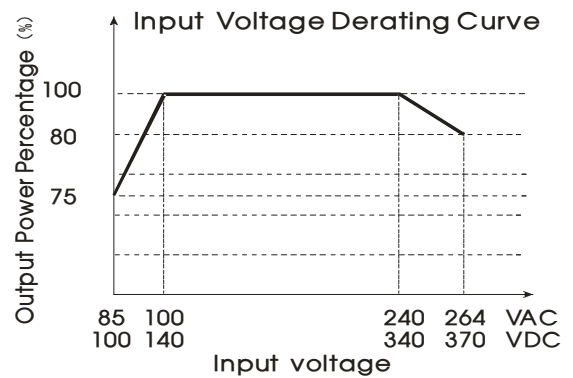
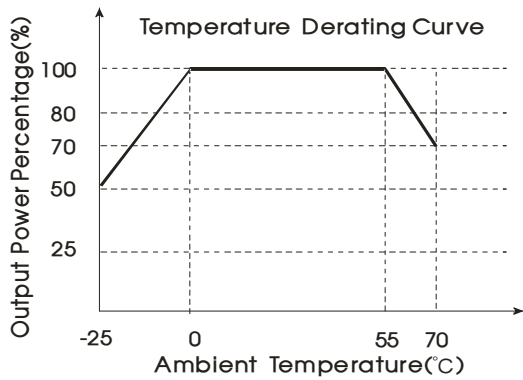
## Physical Specifications

Casing Material	Black flame-retardant and heat-resistant plastic (UL94V-0)	
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	line to line ±1kV (See Fig. 1 for typical application circuit)	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 V.r.m.s	perf. Criteria A
	MS	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	

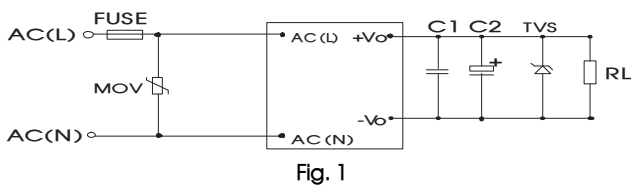
Product Characteristic Curve



Note: ① With an AC input between 85-100VAC/240-264VAC and a DC input between 100-140VDC/340-370VDC, 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



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

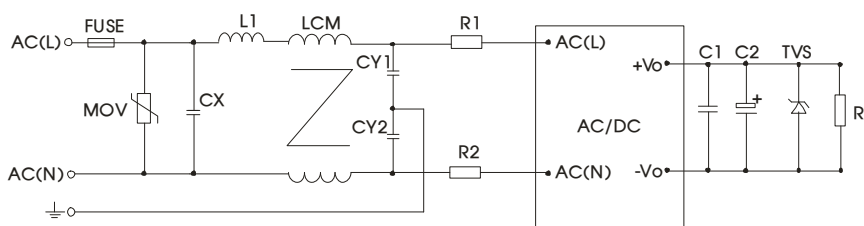
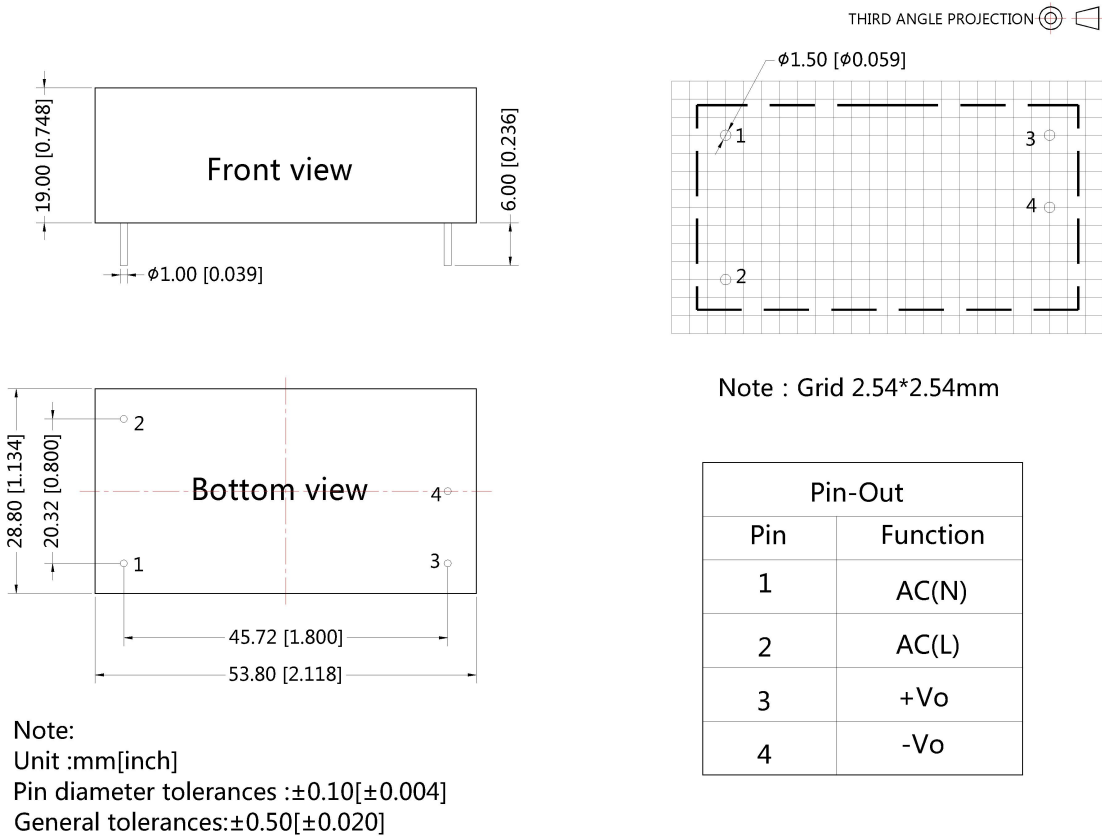


Fig. 2

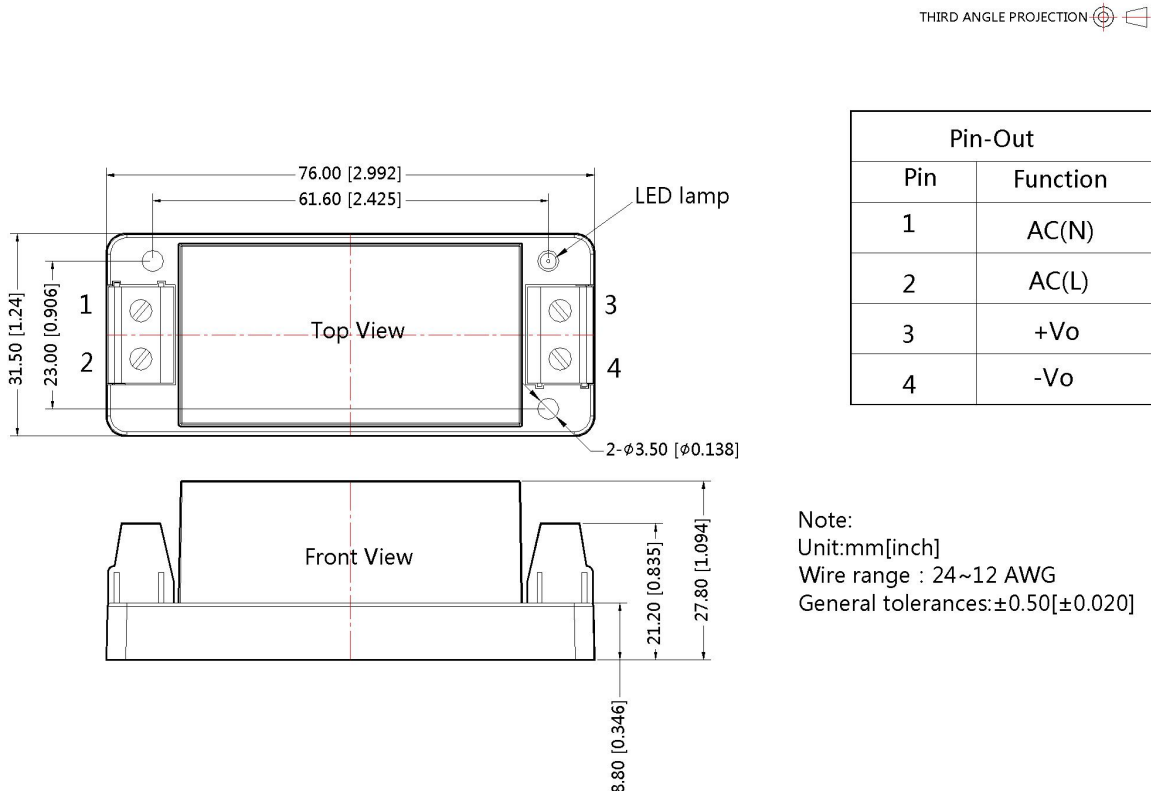
Element model	Recommended value
MOV	S14K300
CX	0.1uF/275VAC
L1	4.7uH/2.0A
CY1/ CY2	1nF/400VAC
LCM	2.2 mH, P/N: FL2D-10-222 (MORNSUN) is recommended
R1	12Ω/3W
FUSE	2A/250V, slow-blow

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

LD10-20Bxx Dimensions and Recommended Layout

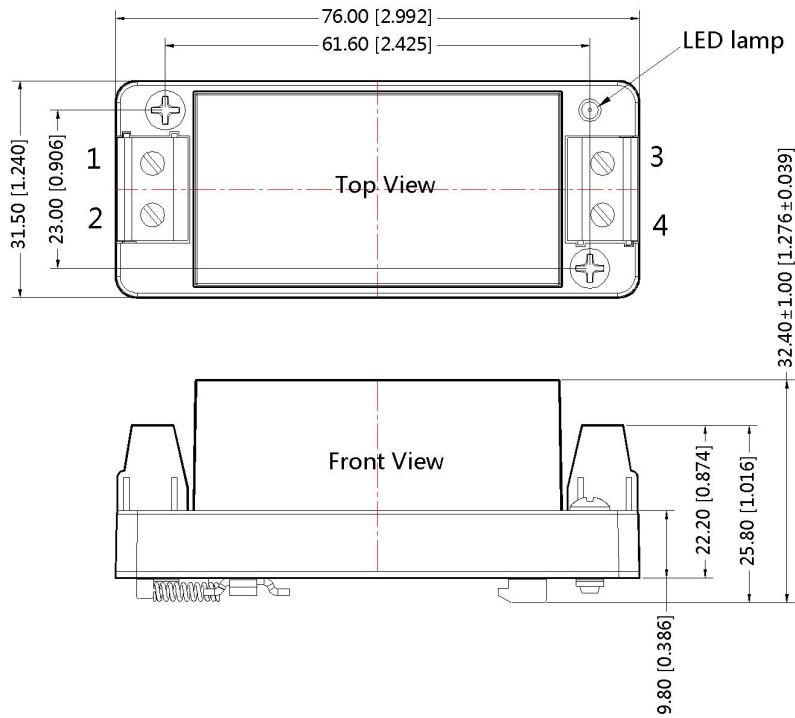


LD10-20BxxA2S Chassis mounting Dimensions



LD10-20BxxA4S Din-Rail mounting Dimensions

THIRD ANGLE PROJECTION 

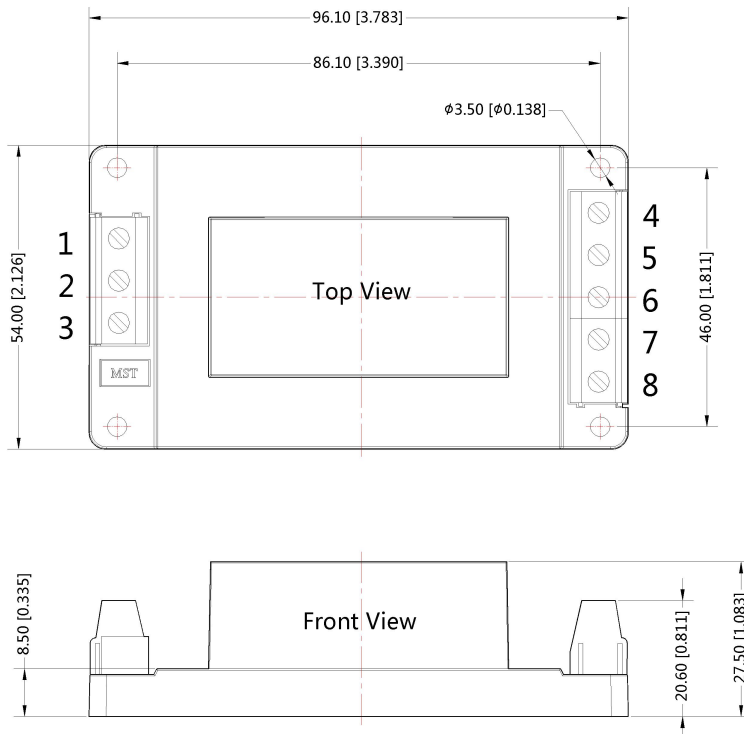


Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	+Vo
4	-Vo

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

LD10-20BxxA2 Chassis mounting Dimensions

THIRD ANGLE PROJECTION 

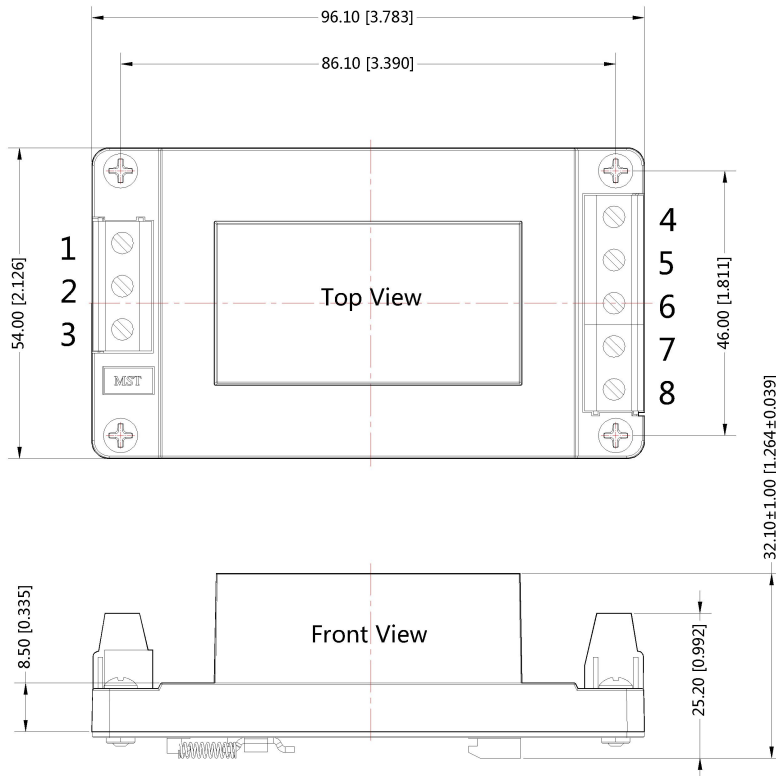


Pin-Out	
Pin	Function
1	NC
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	-Vo
7	NC
8	NC

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. For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging 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 °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. 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, please contact our technicians directly for specific information;
7. Specifications are subject to change without prior notice.
8. Products are related to laws and regulations: see "Features" and "EMC";
9. 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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