

LD10-20BXXMU SERIES 10W, AC-DC CONVERTER

LD series ----is a compact size power converter offered by Mornsun for PCB mount installation applications. 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 IEC61000, IEC60950, UL60950, and UL60601 standards, and widely used in industrial, medical, electricity, instruments, telecommunication and civil applications. For harsh EMC environment, this series of products must use the referred application circuit.

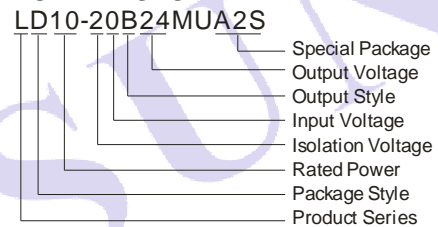


PRODUCT FEATURES

1. Universal Input :85 ~ 264VAC,50/60Hz
2. AC and DC all in one (input from the same terminal)
3. Low Ripple and Noise
4. Over output voltage protection , short circuit protection and thermal protection
5. High efficiency, High power density
6. Low loss, green power
7. Multiple models available
8. Industrial, medical level specifications
9. Certificate UL60601、EN60601
10. Mounting: PCB mounting, Chassis mounting with Screw Terminals, DIN-Rail mounting

RoHS E235235

PART NUMBER SYSTEM



SELECTION GUIDE

Approval	Model	Package	Power	Output (Vo/Io)	Ripple and Noise (typ)	Efficiency (%) (typ)	Standby Power (typ)
UL/CE	LD10-20B03MU	53.8X28.8X19.0mm	6.6W	3.3V/2000mA	50mV	70	0.4W
	LD10-20B05MU		10W	5V/2000mA		74	0.4W
	LD10-20B09MU			9V/1100mA		76	0.45W
	LD10-20B12MU			12V/900mA		76	0.4W
	LD10-20B15MU			15V/700mA		78	0.5W
	LD10-20B24MU			24V/450mA		80	0.6W

INPUT SPECIFICATIONS

Input Voltage Range	85~264VAC, 120~370VDC
Input Frequency	47~440Hz
Input Current	110VAC 230mA, typ 230VAC 150mA, typ
Inrush Current	110VAC 10A, typ 230VAC 20A, typ
Leakage current	0.1mA (typ) @ Vin=230Vac
Recommended External Input Fuse (Special package series include fuse)	2A/250V Slow-Blow

OUTPUT SPECIFICATIONS

Voltage set accuracy	±2% (3.3V: ±3%)
Input variation	±0.5% (typ)
Load variation (10% to 100%)	±1% (typ)
Ripple & noise (p-p)	(20MHz Bandwidth) 50mV (typ) 100mV (max)
Short circuit protection	Continuous, and auto resume
Over current protection	≥110% Io

Maximum capacitive load (μF)	LD10-20B03MU	8000
	LD10-20B05MU	8000
	LD10-20B09MU	2000
	LD10-20B12MU	1200
	LD10-20B15MU	1000
	LD10-20B24MU	200

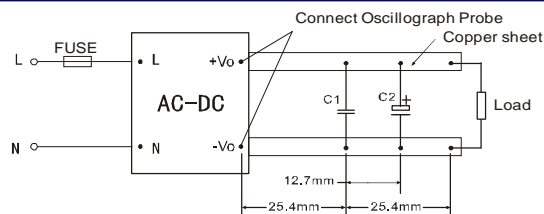
COMMON SPECIFICATIONS

Temperature ranges		Operating		-25°C ~ +70°C	
		Power derating	(+55°C ~ +70°C)	1.5%/°C	
			(-25°C ~0°C)	2%/°C	
		Storage:		-40°C ~ +105°C	
		Case temperature:		+95°C max	
Hold-up time		(Vin=230VAC)		50ms(typ)	
Humidity				95%(max)	
Temperature coefficient				0.02%/°C	
Switching frequency				60kHz(typ)	
Isolation voltage(Input-Output)				4000VAC/1Min	
EMC	EMI	CE	CISPR11/EN55011, CLASS A (without external circuit) /CLASS B(with typical applications Figure 3)		
		RE	CISPR11/EN55011, CLASS A (without external circuit) /CLASS B(with typical applications Figure 3)		
	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 (without external circuit)		perf. Criteria B
			IEC/EN 61000-4-4 ±4KV (with typical applications Figure 3)		perf. Criteria B
		Surge	IEC/EN 61000-4-5 ±1KV (without external circuit)		perf. Criteria B
			IEC/EN 61000-4-5 ±2KV/±4KV (with typical applications Figure 3)		perf. Criteria B
		CS	IEC/EN 61000-4-6	10 Vr.m.s	perf. Criteria A
		Voltage dips、short and interruptions immunity		IEC/EN 61000-4-11	0%-70%
Safety standards		IEC60601,EN/UL60601,UL60950			
Safety approvals		UL60601			
Safety Class		CLASS II			
Case material		UL94V-0			
Install		PCB mounting, Chassis mounting with Screw Terminals, DIN-Rail mounting			
MTBF		>300,000H @25°C			
Package		PCB mounting A2Chassis mounting with Screw Terminals A4DIN-Rail mounting A2SChassis mounting with Screw Terminals A4SDIN-Rail mounting		53.8x28.8x19.0mm 96.1X54.0X27.5mm 96.1X54.0X32.1mm 76.0X31.5X27.8mm 76.0X31.5X32.4mm	
Weight		50g(PCB mounting) 100g(A2 Chassis mounting with Screw Terminals) 140g(A4 DIN-Rail mounting) 70g(A2S Chassis mounting with Screw Terminals) 90g(A4S DIN-Rail mounting)			

Note:1. Ripple and Noise were measured by the method of anear measure (more details refer to the anear measure).

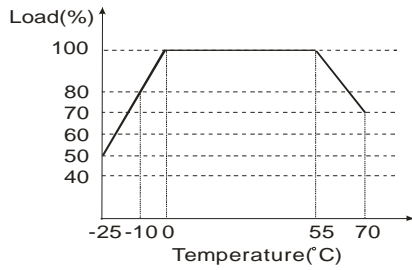
2. Unless otherwise specified, all specifications above are measured at rated input voltage and rated output load, TA=25°C, humidity < 75%.

ANEAR MEASURE

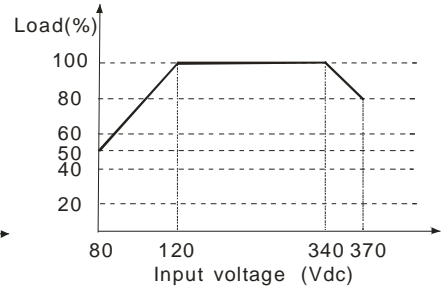
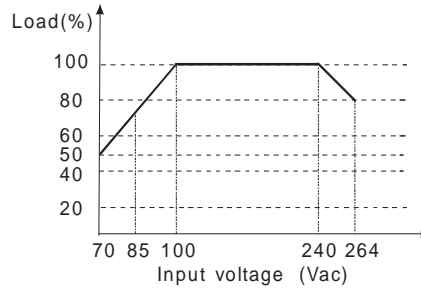


Note: C1: 1μF (ceramic capacitor) C2: 10μF (electrolytic capacitor)

TEMPERATURE VS LOAD



INPUT VOLTAGE VS LOAD



TYPICAL APPLICATIONS

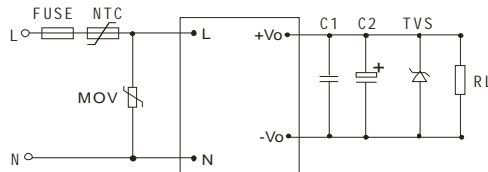


Figure 1: LD10 application circuit

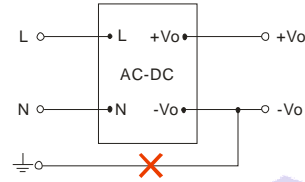


Figure 2: Note: This application is not supported for this series.

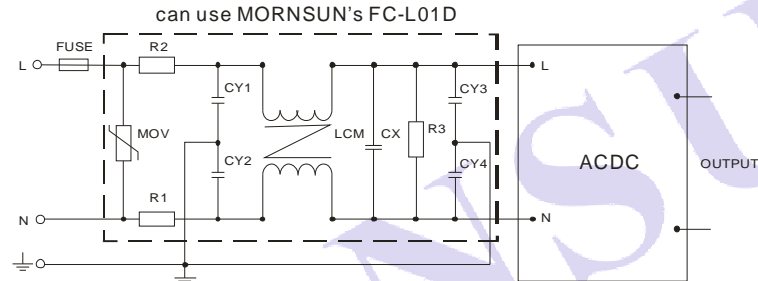


Figure 3: LD10 series Recommended circuit for application require higher EMC standard (external circuit output same as above)

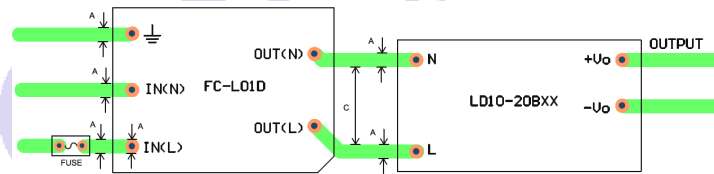


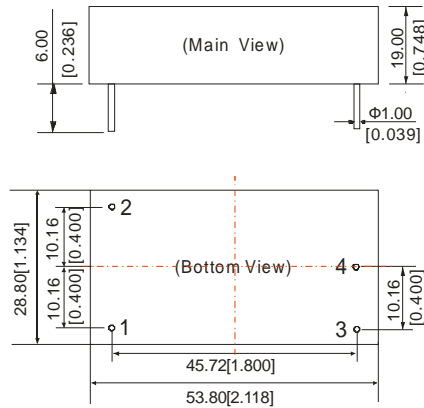
Figure 4: EMC application circuit PCB layout
Safety and recommend wiring: linewidth $A \geq 3\text{mm}$, $C \geq 9\text{mm}$

EXTERNAL CAPACITORS TYPICAL VALUE			
Model	C1	C2	TVS
LD10-20B03MU	1 μF /50V	220 μF /10V	SMBJ7.0A
LD10-20B05MU	1 μF /50V	220 μF /10V	SMBJ7.0A
LD10-20B09MU	1 μF /50V	120 μF /25V	SMBJ12A
LD10-20B12MU	1 μF /50V	120 μF /25V	SMBJ20A
LD10-20B15MU	1 μF /50V	120 μF /25V	SMBJ20A
LD10-20B24MU	1 μF /50V	68 μF /35V	SMBJ30A

Note:

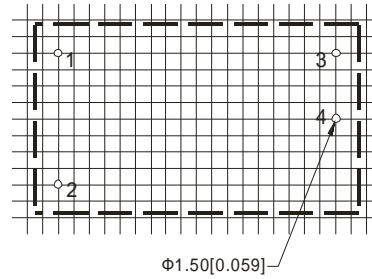
- Output filtering capacitors C1 is ceramic capacitor, it is used to filter high frequency noise. C2 is electrolytic capacitors. It is recommended to use high frequency and low impedance electrolytic capacitors. For capacitance and current of capacitor please refer to manufacture's datasheet. Voltage derating of capacitor should be 80% or above. TVS is a recommended component to protect post-circuits (if converter fails). External input NTC model is recommended to use 5D-9.
- For standard EMC requirement, please refer to figure 1, if higher EMC requirement, please refer to figure 3 or figure 4.
MOV: Varistor, model: 561KD14, it is used to protect the device under surge;
R1, R2: 2 Ω /3W Winding resistor;
R3: 1M Ω /2W;
CY1, CY2, CY3, CY4: 1000pF/400VAC;
CX: 0.22 μF /275VAC;
LCM: 10mH-30mH, can use MORNSUN's FL2D-z5-103;
FC-L01D: MORNSUN's 2KV/4KV Surge protector.
- FUSE: It must be connected to FUSE, LD10 is recommended to use 2A/250V.

OUTLINE DIMENSIONS & PIN CONNECTIONS



Note:
Unit: mm[inch]
Pin diameter tolerances: $\pm 0.10\text{mm} [\pm 0.004\text{inch}]$
General tolerances: $\pm 0.50\text{mm} [\pm 0.020\text{inch}]$

RECOMMENDED FOOTPRINT



Note: grid 2.54*2.54mm.

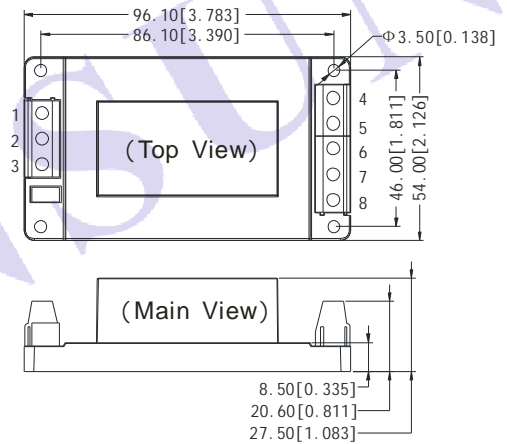
FOOTPRINT DETAILS

PIN	FUNCTION
1	N
2	L
3	+Vo
4	-Vo

LD10-20BXXMUA2 CHASSIS MOUNTING WITH SCREW TERMINALS

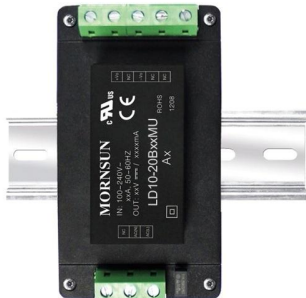


Footprint Details								
Pin	1	2	3	4	5	6	7	8
Function	NC	AC(N)	AC(L)	+Vo	NC	-Vo	NC	NC

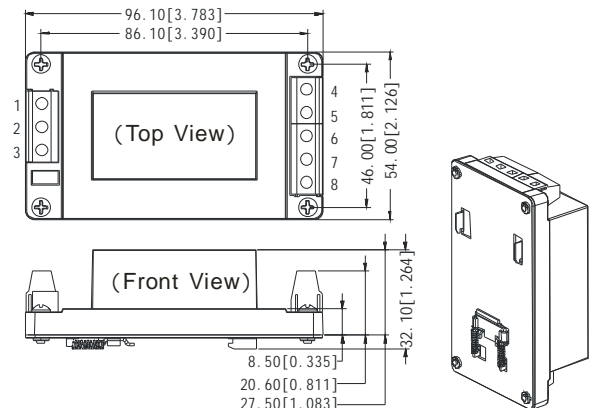


Note:
Unit: mm[inch]
General tolerances: $\pm 0.50\text{mm} [\pm 0.020\text{inch}]$

LD10-20BXXMUA4 DIN-RAIL MOUNTING

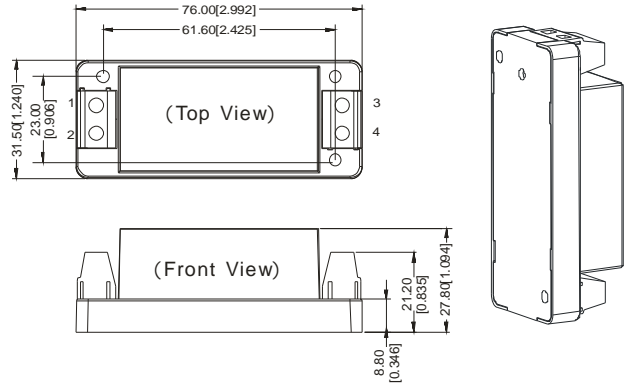


Footprint Details								
Pin	1	2	3	4	5	6	7	8
Function	NC	AC(N)	AC(L)	+Vo	NC	-Vo	NC	NC



Note:
Unit: mm[inch]
General tolerances: $\pm 0.50\text{mm} [\pm 0.020\text{inch}]$

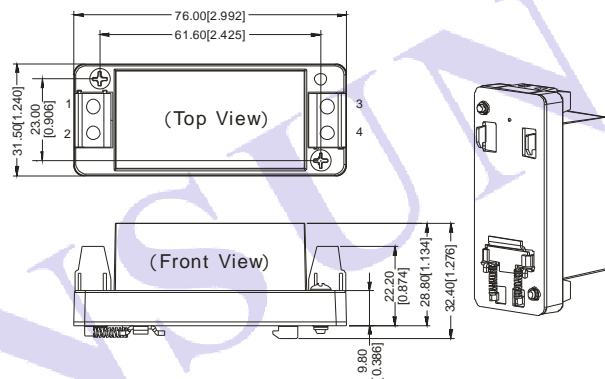
LD10-20BXXMUA2S CHASSIS MOUNTING WITH SCREW TERMINALS



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

Note:
Unit: mm[inch]
General tolerances: $\pm 0.50\text{mm}[\pm 0.020\text{inch}]$

LD10-20BXXMUA4S DIN-RAIL MOUNTING

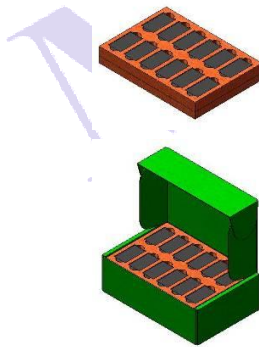


Footprint Details				
Pin	1	2	3	4
Function	AC(N)	AC(L)	+Vo	-Vo

Note:
Unit: mm[inch]
General tolerances: $\pm 0.50\text{mm}[\pm 0.020\text{inch}]$

PACKAGE DIAGRAM

PCB mounting Series



Inner packaging box
dimensions: L*W*H=255*170*80mm
Packaging quantity: 24pcs
Outer packaging box
dimensions: L*W*H=405*380*305mm
Packaging quantity: 144pcs

Special Package Series(A2/A4)



Inner packaging box dimensions:
L*W*H=365*350*105mm
Packaging quantity: 24pcs
Outer packaging box dimensions:
L*W*H=390*360*245mm
Packaging quantity: 48pcs

Special Package Series(A2S/A4S)



Inner packaging box dimensions:
L*W*H=365*350*105mm
Packaging quantity: 48pcs
Outer packaging box dimensions:
L*W*H=390*360*245mm
Packaging quantity: 96pcs

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Specifications subject to change without notice
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