

# MORNSUN®

## LD10 SERIES 10W, AC-DC CONVERTER

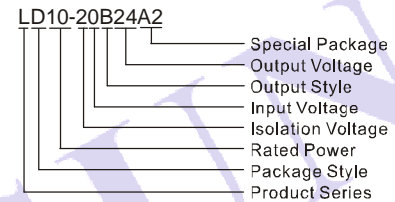
**LD series** ----is a compact size power converter offered by Mornsun. It features universal input voltage, taking both DC and AC input voltage, low power consumption, high efficiency, high reliability, safer isolation. It offers good EMC performance, meets IEC61000, UL60950 and IEC60950 standards, and is UL & CE certified, and widely used in industrial, medical, electricity, instruments, telecommunication and civil applications.



### PRODUCT FEATURES

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

### PART NUMBER SYSTEM



### SELECTION GUIDE

Approval	Model	Package	Power	Output (Vo/Io1)	Ripple and Noise (typ)	Efficiency (%) (typ)	Standby Power (typ)
UL/CE	LD10-20B03	53.5X28.5X19.0mm	6.6W	3.3V/2000mA	50mV	70	0.4W
	LD10-20B05			5V/2000mA		74	0.4W
	LD10-20B09			9V/1100mA		76	0.45W
	LD10-20B12			12V/900mA		76	0.4W
	LD10-20B15			15V/700mA		78	0.5W
	LD10-20B24			24V/450mA		80	0.6W

Note : 1. Ripple and Noise were measured by the method of parallel lines;

2. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.

### 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 Type

### OUTPUT SPECIFICATIONS

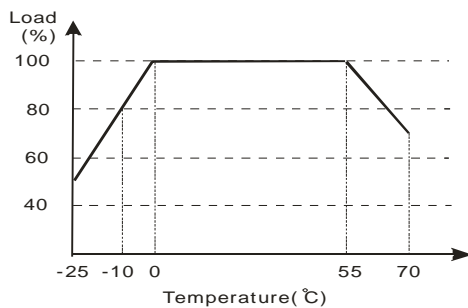
Voltage set accuracy	±2% (3.3V: ±3%)(typ)
Input variation	±0.5% (typ)
Load variation (10% to 100%)	±1% (typ)
Ripple& noise(p-p)	(20MHz Bandwidth) 50mV(typ)      100mV (max)
Short circuit protection	Continuous, and auto resume
Over current protection	≥110% Io

Maximum capacitive load ( $\mu\text{F}$ )	LD10-20B03	8000
	LD10-20B05	8000
	LD10-20B09	560
	LD10-20B12	1200
	LD10-20B15	1000
	LD10-20B24	200

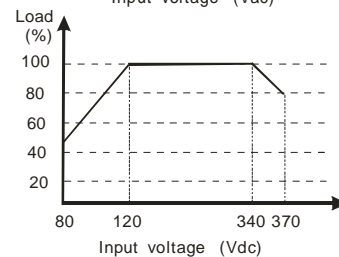
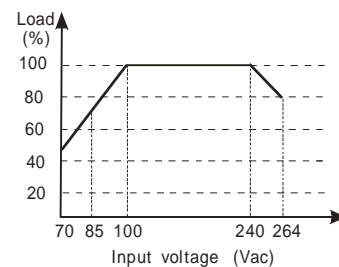
## COMMON SPECIFICATIONS

Temperature ranges	Operating		-25°C ~ +70°C	
	Power derating	(above 55°C)	2% / °C	
		(below 0°C)	2% / °C	
	Storage		-40°C ~ +105°C	
Case temperature		+95°C max		
Hold-up time	( $V_{in}=230\text{VAC}$ )	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 B	
		*RE	CISPR11/EN55011, CLASS B	
	EMS	ESD	IEC/EN 61000-4-2	Air $\pm 15\text{KV}$ / Contact $\pm 8\text{KV}$ perf. Criteria B
		RS	IEC/EN 61000-4-3	10V/m perf. Criteria A
		*EFT	IEC/EN 61000-4-4	$\pm 4\text{ kV}$ perf. Criteria B
		*Surge	IEC/EN 61000-4-5	$\pm 2\text{KV}/\pm 4\text{KV}$ perf. Criteria B
Safety standards		IEC60601, EN60601, UL60950		
Safety approvals		EN60601, UL60950		
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 Chassis mounting with Screw Terminals DIN-Rail mounting	53.5X28.5X19.0mm 96.1X54.0X27.5mm 96.1X54.0X32.1mm		
Weight		50g(PCB mounting) 100g(Chassis mounting with Screw Terminals)		
Note: * EMC application circuit is required.				

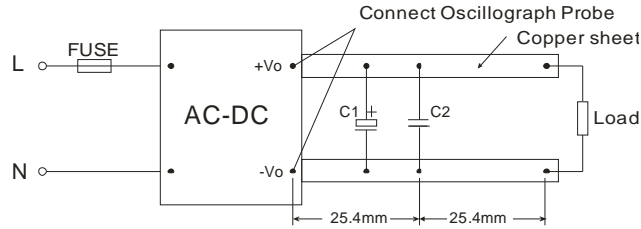
## TEMPERATURE VS LOAD



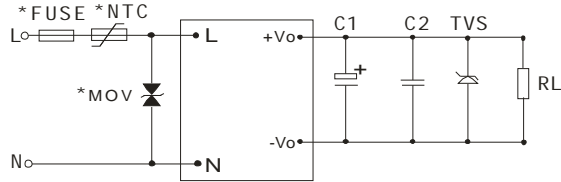
## INPUT VOLTAGE VS LOAD



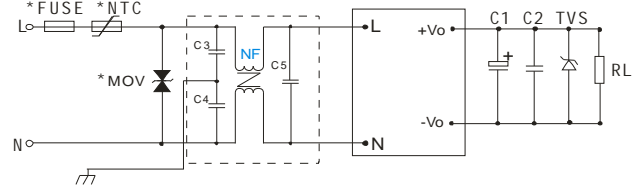
## ANEAR MEASURE



## TYPICAL APPLICATIONS



(Figure 1) LD10 EMC Application chart 1



(Figure 2) LD10 EMC Application chart 2

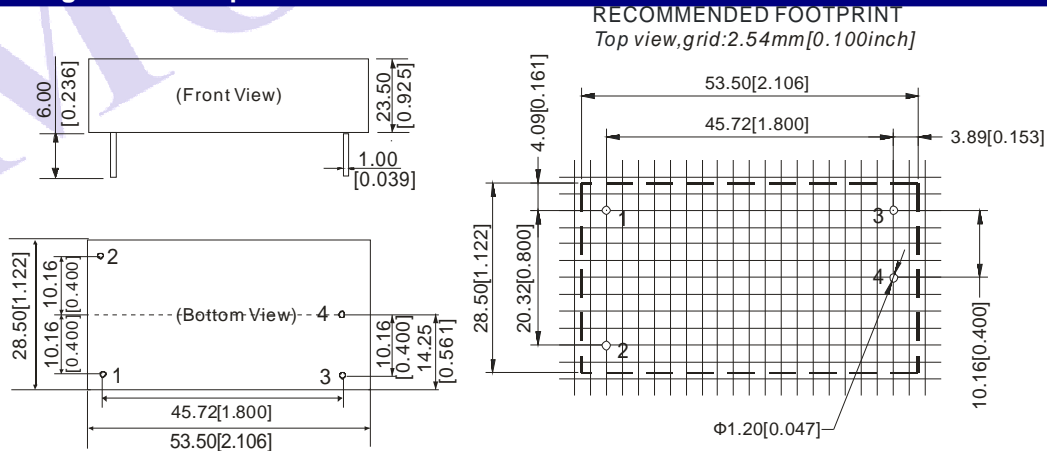
### EXTERNAL CAPACITORS TYPICAL VALUE(Unit: $\mu\text{F}$ )

Model	C1	C2	TVS
LD10-20B03	220 $\mu\text{F}$ /10V	0.1 $\mu\text{F}$ /50V	P6KE6.8A
LD10-20B05	220 $\mu\text{F}$ /10V	0.1 $\mu\text{F}$ /50V	P6KE6.8A
LD10-20B09	120 $\mu\text{F}$ /25V	0.1 $\mu\text{F}$ /50V	P6KE12A
LD10-20B12	120 $\mu\text{F}$ /25V	0.1 $\mu\text{F}$ /50V	P6KE20A
LD10-20B15	120 $\mu\text{F}$ /25V	0.1 $\mu\text{F}$ /50V	P6KE20A
LD10-20B24	68 $\mu\text{F}$ /35V	0.1 $\mu\text{F}$ /50V	P6KE30A

**Note:**

- Output filtering capacitors C1 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. C2 is ceramic capacitor, it is used to filter high frequency noise. TVS is a recommended component to protect post-circuits (if converter fails).
- MOV is required to LD10 models, model: 471KD14, it is used to protect the device under surge.
- It is recommended to connect FUSE, the parameter is 2A/250V slow blow. External input NTC model is recommended to use 5D-9.
- If common requirement to EMC performance (EN55011, CLASS A), refer to figure 1, if higher requirement to EMC performance (EN55011, CLASS B), refer to figure 2.  
 C3,C4: Y capacitor, recommended parameter 2200pF/400V;  
 C5: X capacitor, recommended parameter 0.1 $\mu\text{F}$  /275V;  
 NF: common model choke, recommended inductance is about 10mH-30mH.

## PCB mounting with solder pins

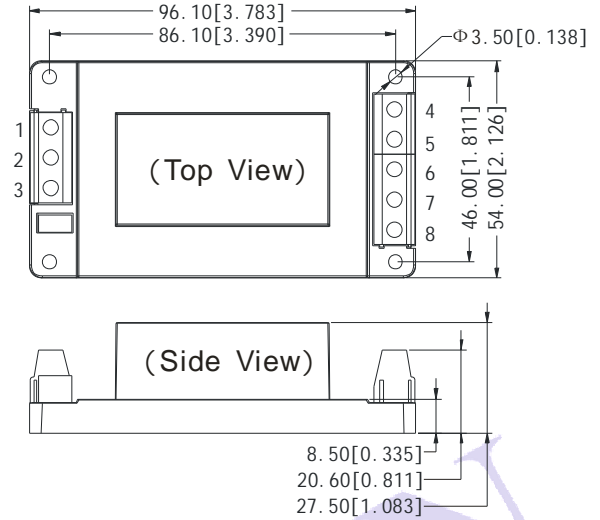
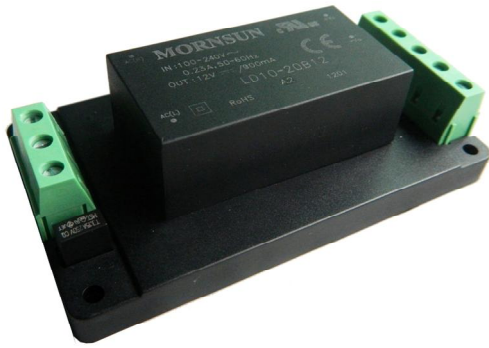


### FOOTPRINT DETAILS

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

Note:  
 Third Angle Projection  
 Unit:mm[inch]  
 Pin diameter: 1.00 $\pm$  0.10mm[0.039 $\pm$  0.004inch]  
 General tolerances: $\pm$  0.50mm[ $\pm$  0.020inch]  
 Weight: 50 $\pm$  3g

## LD10XA2 Chassis mounting with Screw Terminals



Footprint Details

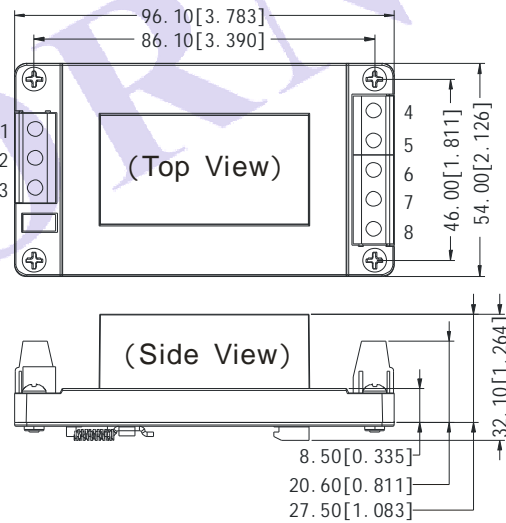
Pin	1	2	3	4	5	6	7	8
Function	NC	AC(N)	AC(L)	+Vo	NC	-Vo	NC	NC

Note:

Unit: mm[inch]

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

## LD10XA4 DIN-Rail mounting



Note:

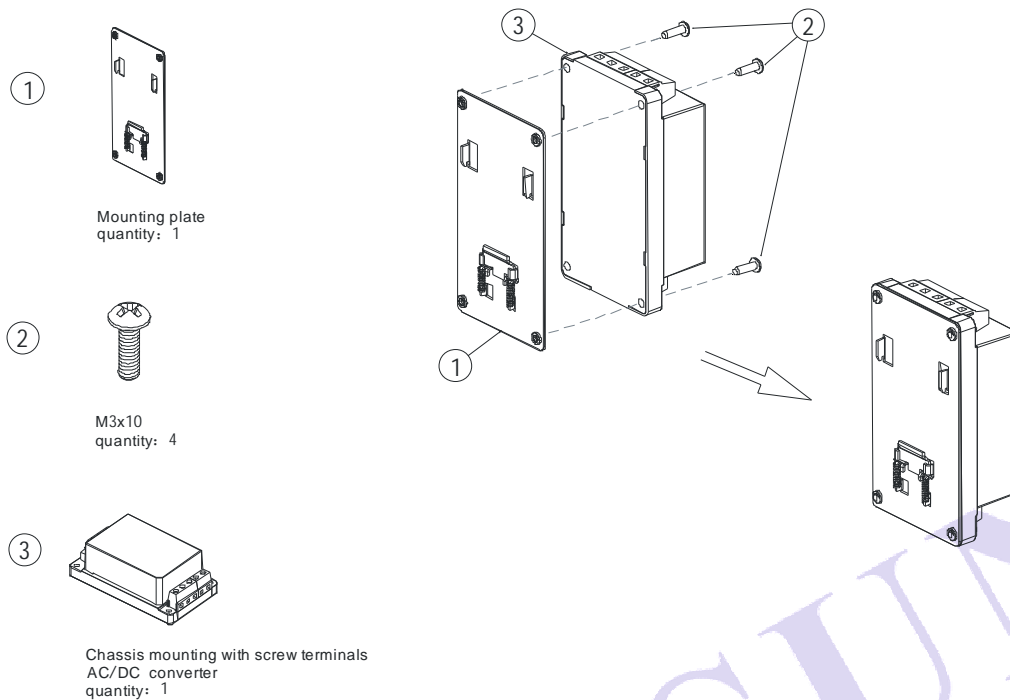
Unit: mm[inch]

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

Footprint Details

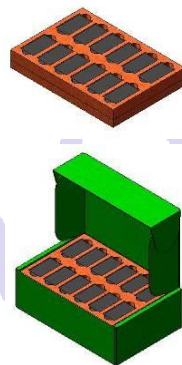
Pin	1	2	3	4	5	6	7	8
Function	NC	AC(N)	AC(L)	+Vo	NC	-Vo	NC	NC

## LD10XXA4 DIN-Rail Mount



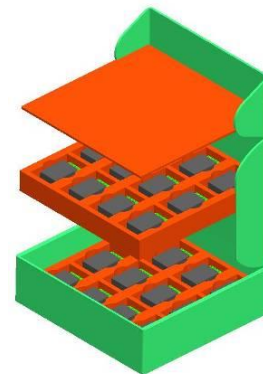
## PACKAGE DIAGRAM

### 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



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

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