

# MORNSUN®

## LD10 SERIES 10W, AC-DC CONVERTER

**LD10 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, CISPR22/EN55022, UL60950 and EN60601 standards, and widely used in industrial, medical, electricity, instruments, telecommunication and civil applications. For harsh EMC environment, this series of products must use the refered application circuit.

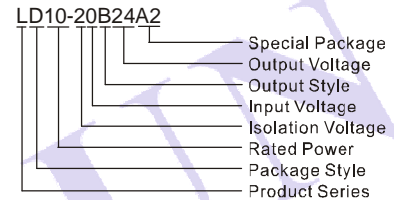


RoHS CE E235235

### PRODUCT FEATURES

1. Universal input :85 ~ 264VAC/120~370VDC
2. AC and DC dual-use(input from the same terminal)
3. High efficiency, high power density
4. Output over voltage, short circuit and over temperature protection
5. Low ripple and noise
6. Low loss, green power
7. Meet UL60950 and EN60601 standards
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 (Vo1/Io1)	Ripple and Noise (typ)	Efficiency (%) (typ)	Standby Power (typ)
UL/CE	LD10-20B03	53.8X28.8X19.0mm	10W	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

### 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

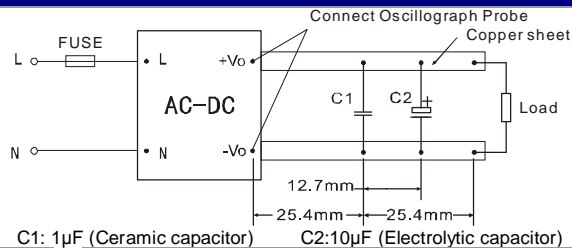
### OUTPUT SPECIFICATIONS

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)	LD10-20B03	8000
	LD10-20B05	8000
	LD10-20B09	560
	LD10-20B12	1200
	LD10-20B15	1000
	LD10-20B24	200

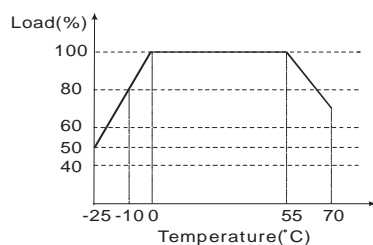
## COMMON SPECIFICATIONS

Temperature ranges	Operating	-25°C ~ +70°C		
	Power derating (55°C~70°C)	2% / °C		
	Power derating (-25°C~0°C)	2% / °C		
	Storage	-40°C ~ +105°C		
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	CISPR22/EN55022 CLASS A(without external circuit) / CLASS B(with typical applications Figure 3)	
		RE	CISPR22/EN55022 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 ±2 KV (without external circuit)	perf. Criteria B
			IEC/EN 61000-4-4 ±4 KV (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/EN61000-4-6 10 Vr.m.s	perf. Criteria A
		PFM	IEC/EN61000-4-8 10A/m	perf. Criteria A
Voltage dips, short and interruptions immunity	IEC/EN61000-4-11 0%-70%	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	53.8X28.8X19.0mm		
	Chassis mounting with Screw Terminals	96.1X54.0X27.5mm		
	DIN-Rail mounting	96.1X54.0X32.1mm		
Weight		50g(PCB mounting)		
		100g(Chassis mounting with Screw Terminals) 140g(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%.				

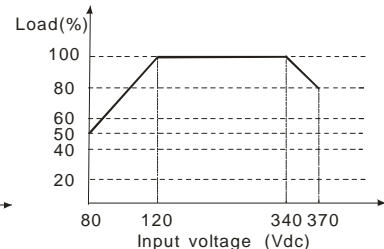
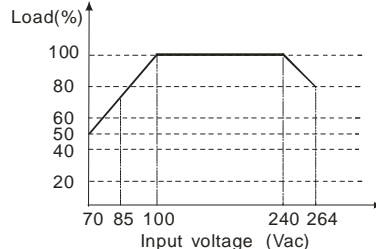
## ANEAR MEASURE



## TEMPERATURE VS LOAD



## INPUT VOLTAGE VS LOAD



# TYPICAL APPLICATIONS

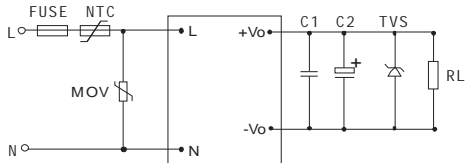


Figure 1: LD10 application circuit

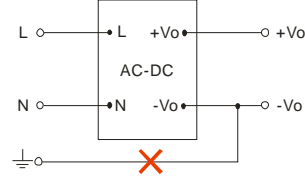


Figure 2: Note: This application is not supported for this series.

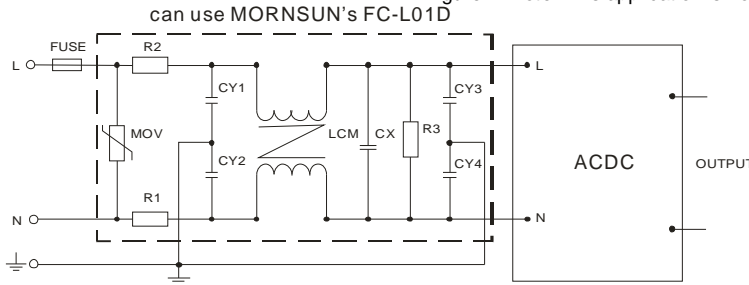


Figure 3: LD10 series Recommended circuit for application require higher EMC standard (external circuit output same as above)

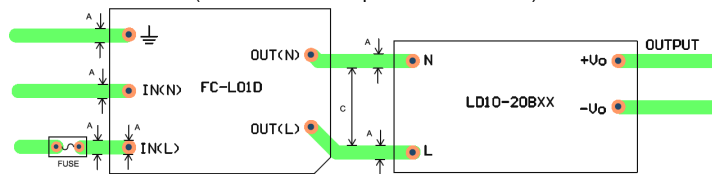


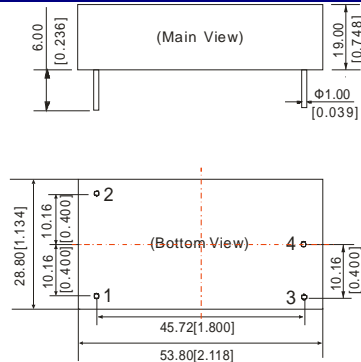
Figure 4: EMC application circuit PCB layout  
Safety and recommend wiring: linewidth  $A \geq 3\text{mm}$ ,  $C \geq 9\text{mm}$

EXTERNAL CAPACITORS TYPICAL VALUE			
Model	C1	C2	TVS
LD10-20B03	1 $\mu\text{F}$ /50V	220 $\mu\text{F}$ /10V	SMBJ7.0A
LD10-20B05	1 $\mu\text{F}$ /50V	220 $\mu\text{F}$ /10V	SMBJ7.0A
LD10-20B09	1 $\mu\text{F}$ /50V	120 $\mu\text{F}$ /25V	SMBJ12A
LD10-20B12	1 $\mu\text{F}$ /50V	120 $\mu\text{F}$ /25V	SMBJ20A
LD10-20B15	1 $\mu\text{F}$ /50V	120 $\mu\text{F}$ /25V	SMBJ20A
LD10-20B24	1 $\mu\text{F}$ /50V	68 $\mu\text{F}$ /35V	SMBJ30A

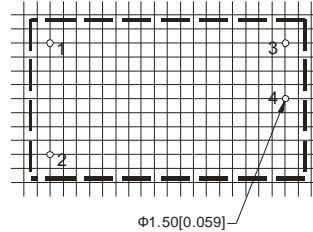
**Note:**

- 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 $\Omega$ /3W Winding resistor;  
R3: 1M $\Omega$ /2W;  
CY1、CY2、CY3、CY4: 102M/400VAC;  
CX: 0.22 $\mu\text{F}$  /275VAC;  
LCM: 10mH-30mH;  
FC-L01D: MORNSUN's 2KV/4KV Surge protector.
- FUSE: LD10 is recommended to use 2A/250V.

## PCB MOUNTING WITH SOLDER PINS



### RECOMMENDED FOOTPRINT



Note: grid 2.54\*2.54mm.

### FOOTPRINT DETAILS

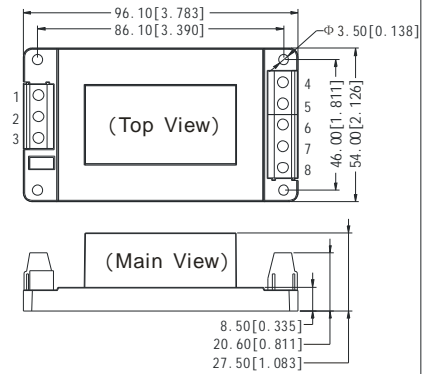
PIN	FUNCTION
1	N
2	L
3	+Vo
4	-Vo

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

## LD10XA2 CHASSIS MOUNTING WITH SCREW TERMINALS

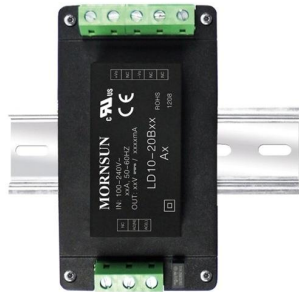


Footprint Details								
Pin	1	2	3	4	5	6	7	8
Function	NC	AC(N)	AC(L)	+Vo	NC	-Vo	NC	NC

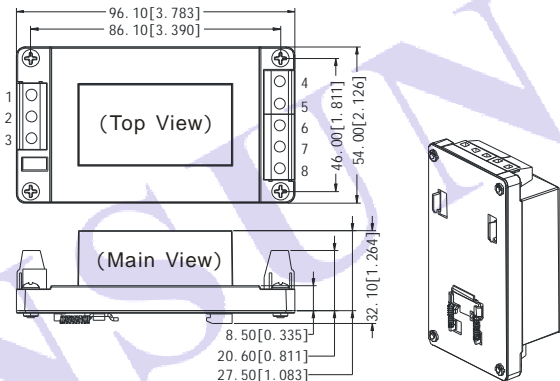


Note:  
Unit: mm[inch]  
General tolerances:  $\pm 0.50\text{mm}[\pm 0.020\text{inch}]$

## LD10XA4 DIN-RAIL MOUNTING



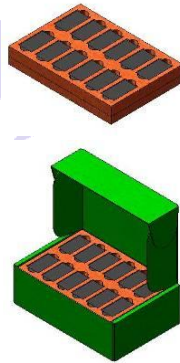
Footprint Details								
Pin	1	2	3	4	5	6	7	8
Function	NC	AC(N)	AC(L)	+Vo	NC	-Vo	NC	NC



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

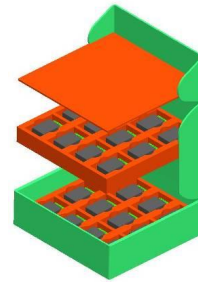
## PACKAGE DIAGRAM

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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