

LD10-13BXX 10W, AC-DC CONVERTER

LD10-13BXX --- 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 widely used in LED, street lamp control, LED, street lamp control, industrial, office and civil applications. For harsh EMC environment, this series of products must use the referred application circuit.

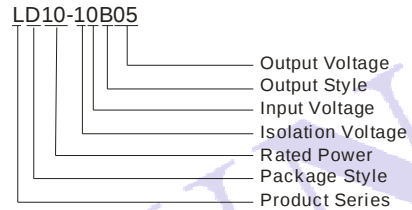


RoHS

PRODUCT FEATURES

1. Universal input :85~305VAC, 47~440Hz
2. AC and DC dual-use(input from the same terminal)
3. Regulated output, low ripple and noise
4. Protection of input under-voltage, over-current, short circuit and over-voltage protection
5. High efficiency, high power density, Low loss, green power
6. Plastic case, meets UL94V-0
7. Safety Class : Class II
8. Meet IEC61000, UL60950, EN60950 and IEC60950 standards
9. 3 years warranty

PART NUMBER SYSTEM



SELECTION GUIDE

Approval	Model	Package	Power	Output (Vo1/Io1)	Max. Capacitive Load(μF)	Ripple and Noise(Typ)	Efficiency (%) (Typ)	Standby Power(Typ)
Pending	*LD10-13B03	53.8X28.8X19.0mm	10W	3.3V/2000mA	20000uF	50mV	72	0.3W
	LD10-13B05			5V/2000mA	20000uF		76	0.3W
	*LD10-13B09			9V/1100mA	6000uF		78	0.3W
	LD10-13B12			12V/900mA	5000uF		80	0.3W
	*LD10-13B15			15V/700mA	3000uF		80	0.3W
	*LD10-13B24			24V/450mA	800uF		80	0.35W

Note: 1.*Designing.

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC Input	85	--	305	V
	DC Input	120	--	430	
Input Under Voltage Protection	Start-up Voltage AC Input	65	--	90	
	Start-up Voltage DC Input	92	--	122	
	Shut-down Voltage AC Input	55	--	75	
	Shut-down Voltage DC Input	79	--	105	
Input Frequency		47	--	440	Hz
Input Current	110VAC	--	--	230	mA
	230VAC	--	--	150	
Inrush Current	110VAC	--	13	--	A
	230VAC	--	26	--	
Leakage Current	230VAC/50Hz	--	--	0.25	mA
Recommended External Input Fuse		2A/300V slow blow			

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	3.3V output	--	±3	--	%
	Others	--	±2	--	
Line Regulation		--	±0.5	--	

Load Variation	10%~100%	--	±1	--	%
Min Load		0	--	--	
Hold-up Time	Vin=230VAC	--	80	--	ms
Short Circuit Protection		Continuous, and auto recovery			
Over Voltage Protection	3.3 / 5VDC Output	≤7.5VDC			
	9VDC Output	≤12VDC			
	12 / 15VDC Output	≤20VDC			
	24VDC Output	≤30VDC			
Over Current Protection		≥110% Io			

COMMON SPECIFICATIONS

Item	Test Conditions		Min.	Typ.	Max.	Unit
Operating Temperature			-40	--	+70	°C
Storage Temperature			-40	--	+105	
Case Temperature			--	--	+95	
Storage Humidity			--	--	95	%
Temperature coefficient			--	0.02	--	% / °C
Power derating	+55°C~+70°C		3.75	--	--	
	-40°C~-10°C		2	--	--	
Isolation Voltage	Input-Output	Tested for 1 minute(leakage current < 5mA)	3000	--	--	VAC
Switching Frequency			--	100	--	kHz
Weight			--	50	--	g
Welding Temperature	Wave-soldering		260± 5°C; time:5~10s			
	Manual-welding		360± 10°C; time:3~5s			
Safety approvals	EN60950/UL60950(pending)					
Safety Class	CLASS II					
Safety standards	IEC60950,EN60950,UL60950					
Hot swap	Forbid					
Case Material Grade	UL 94V-0					
Install	PCB					
Cooling	Free air convection					
MTBF	>300,000h @25°C					

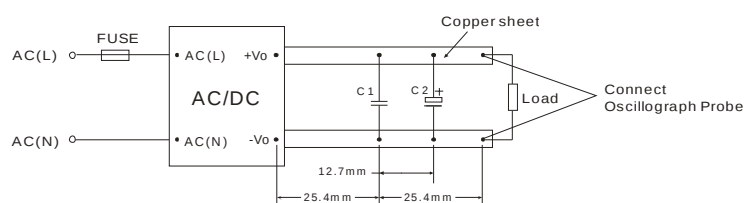
Note:1. Ripple and Noise are measured by the method of parallel lines;

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

EMC SPECIFICATIONS

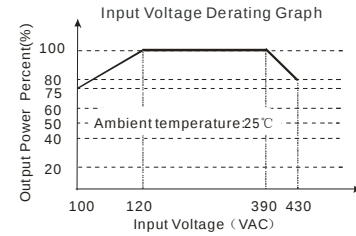
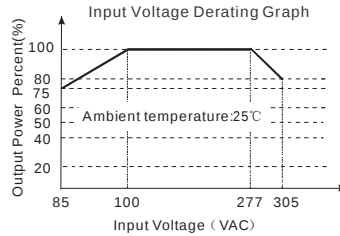
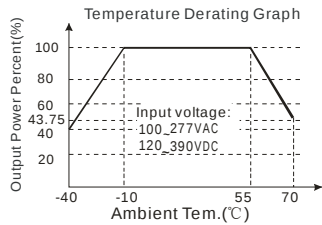
EMI	CE	CISPR22/EN55022 CLASS B(Without External Circuit)			
	RE	CISPR22/EN55022 CLASS B(Without External Circuit)			
EMS	ESD	IEC/EN 61000-4-2	Contact ±6KV /Air ±8KV		perf. Criteria B
	RS	IEC/EN 61000-4-3	10V/m		perf. Criteria A
	EFT	IEC/EN 61000-4-4	±2 KV(Without External Circuit)		perf. Criteria B
		IEC/EN 61000-4-4	±4 KV (Recommended Circuit Refer to 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 (Recommended Circuit Refer to 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

PARALLEL LINES MEASURE



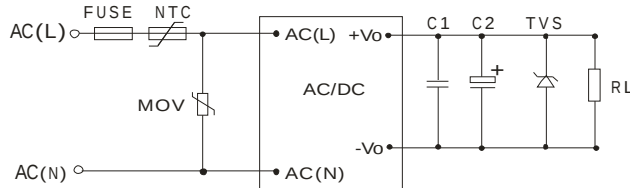
Note: C1: 1µF (Ceramic capacitor) C2: 10µF (Electrolytic capacitor)

PRODUCT TYPICAL CURVE

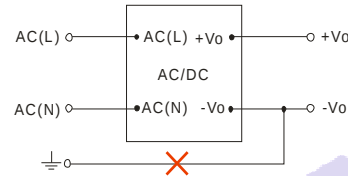


Note: When input 85~100VAC/277~305VAC/100~120VDC/390~430VDC, it need to be voltage derated on basis of temperature derating.

TYPICAL APPLICATIONS

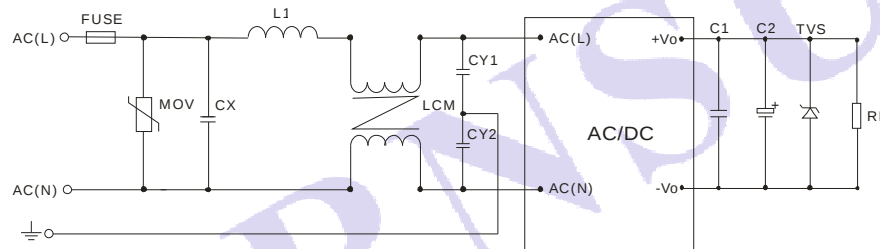


(Figure 1): Typical application circuit



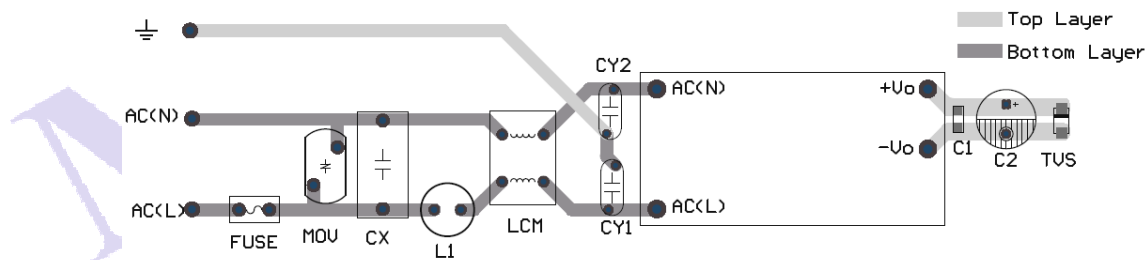
(Figure 2): This application is not available for this series.
Note: If you have such application, please consult to our FAE department

EMC RECOMMENDED CIRCUIT



(Figure 3): This recommended circuit above is available for higher EMC requirements.

EMC RECOMMENDED CIRCUIT PCB LAYOUT



(figure 4): EMC application circuit PCB layout
Safety and recommend wiring: linewidth $\geq 3\text{mm}$, line-line distance $\geq 6\text{mm}$, line- ground distance $\geq 6\text{mm}$

EXTERNAL CAPACITORS TYPICAL VALUE

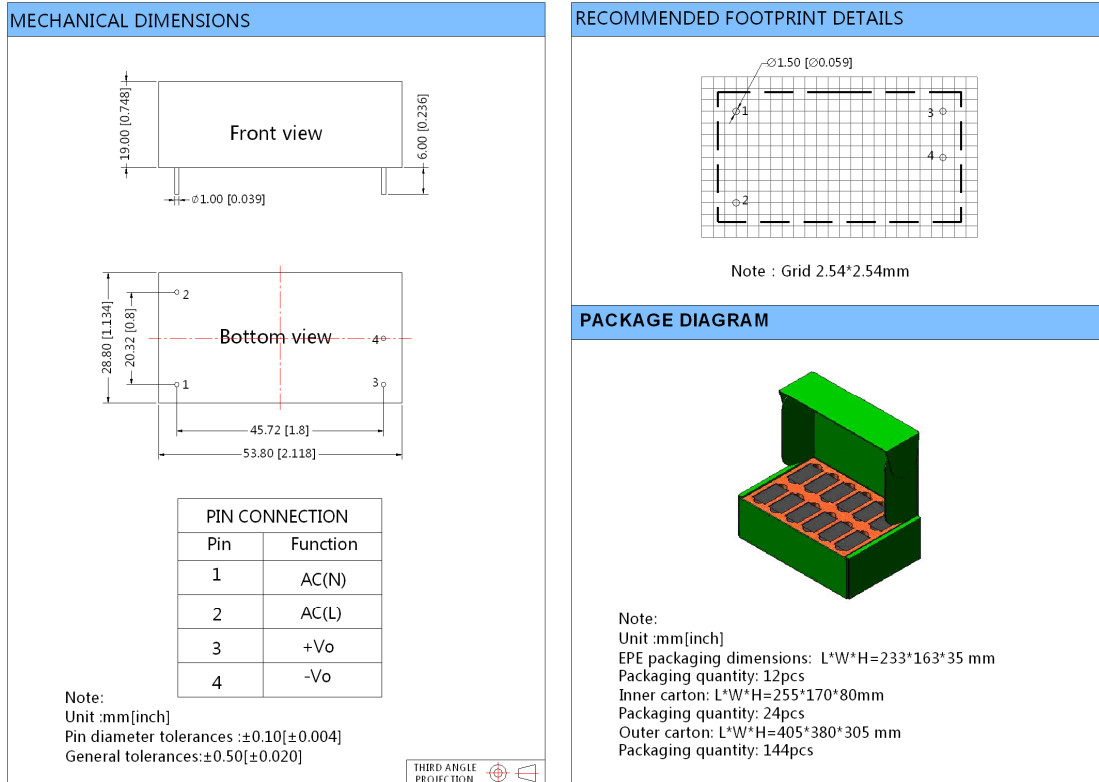
Model	C1(μF)	C2(μF)	TVS
*LD10-13B03	1 μF /50V	470 μF /10V	SMBJ7.0A
LD10-13B05	1 μF /50V	470 μF /10V	SMBJ7.0A
*LD10-13B09	1 μF /50V	220 μF /25V	SMBJ12A
LD10-13B12	1 μF /50V	220 μF /25V	SMBJ20A
*LD10-13B15	1 μF /50V	220 μF /25V	SMBJ20A
*LD10-13B24	1 μF /50V	100 μF /35V	SMBJ30A

Note:

- Output filtering capacitor 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. C1 is ceramic capacitor, it is used to filter high frequency noise. TVS is a recommended component to protect post-circuits (if converter fails). External input NTC is recommended to use 5D-9.
- For standard EMC requirement, please refer to figure 1 or figure 2. If higher EMC requirement, please refer to figure 3, recommended parameters are shown in the table below.

Recommend Parameter For Higher EMC Standard Circuit	
Components	Recommend Parameter
MOV	S14K350
CX	0.1 μ F/310VAC
L1	4.7uH/2.0A
CY1	1nF/400VAC
CY2	1nF /400VAC
LCM	2.2mH, recommended to use MORN SUN's FL2D-10-222
FUSE	2A/300V, slow blow, it must be connected to FUSE

DIMENSIONS, RECOMMENDED FOOTPRINT&PACKAGING



MORN SUN 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

Fax:86-20-38601272

E-mail: info@mornsun.cn

<http://www.mornsun-power.com>