

## LBXX-10XXX SERIES

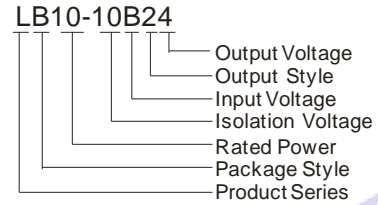
LB series ---- is a compact size power converter offered by Mornsun for PCB mount installation applications. It features universal input voltage, taking both DC and AC input voltage, low power consumption, high efficiency, high reliability, safer isolation. It offers good EMC performance, meets IEC61000, UL60950, EN60601 and IEC60950 standards, and is UL & CE certified, and widely used in industrial, office and civil applications.



### PRODUCT FEATURES

1. Universal Input :85 ~ 264VAC,50/60Hz
2. Regulated output, low ripple and noise
3. efficiency up to 81%
4. compact size, low power consumption, environmentally friendly
5. output short circuit protection, over-current protection and thermal protection
6. UL94V-0; plastic case, meets
7. Class II ,safety grade:
8. CE、UL、EN60601 approval
9. EMC and safety standard, meets
10. 3 years warranty

### MODEL SELECTION



### PRODUCT PROGRAM

Approval	Model	Package	Power	Output (Vo1/Io1)	Output (Vo2/Io2)	Ripple and Noise(Typ.)	Efficiency(%) (Typ.)
UL/CE	LB03-10B03	48.5X36X20.5mm	3W	3.3V/1000mA		50mV	68
UL/CE	LB03-10B05			5V/600mA			71
UL/CE	LB03-10B09			9V/330mA			75
UL/CE	LB03-10B12			12V/250mA			74
UL/CE	LB03-10B15			15V/200mA			75
UL/CE	LB03-10B24			24V/125mA			77
UL/CE	LB05-10B03	55X45X21.0mm	5W	3.3V/1500mA		50mV	70
UL/CE	LB05-10B05			5V/1000mA			73
UL/CE	LB05-10B09			9V/600mA			75
UL/CE	LB05-10B12			12V/450mA			76
UL/CE	LB05-10B15			15V/350mA			78
UL/CE	LB05-10B24			24V/230mA			79
UL/CE	LB05-10A05			+5V/500mA	-5V/500mA		70
UL/CE	LB05-10A12			+12V/210mA	-12V/210mA		74
UL/CE	LB05-10A15			+15V/170mA	-15V/170mA		75
UL/CE	LB05-10A24			+24V/100mA	-24V/100mA		77
UL/CE	LB05-10D0505-01			+5V/900mA	+5V/100mA		70
UL/CE	LB05-10D0512-01			+5V/750mA	+12V/100mA		74
UL/CE	LB05-10D0515-01			+5V/700mA	+15V/100mA		74
UL/CE	LB05-10D0524-01			+5V/600mA	+24V/100mA		75
	LB10-10B03	62X45X22.5mm	10W	3.3V/3000mA		50mV	70
	LB10-10B05			5V/2000mA			73
	LB10-10B09			9V/1100mA			77
	LB10-10B12			12V/900mA			78
	LB10-10B15			15V/700mA			78
	LB10-10B24			24V/450mA			80
	LB10-10A05			+5V/1000mA	-5V/1000mA		73
	LB10-10A12			+12V/450mA	-12V/450mA		78
	LB10-10A15			+15V/350mA	-15V/350mA		79
	LB10-10D0505-02I			5V/2000mA	5V/200mA		72
UL/CE	LB15-10B03		70X48X23.5mm	15W	3.3V/3500mA		
UL/CE	LB15-10B05	5V/3000mA				74	
UL/CE	LB15-10B12	12V/1250mA				79	
UL/CE	LB15-10B15	15V/1000mA				80	
UL/CE	LB15-10B24	24V/625mA				81	

Remarks:

1. Ripple and Noise were 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%;
3. Add suffix "I" for regulated slave output, and build-in line regulator. The slave output can not be continuously shorted, and neither can it be continuously over current.
4. All specifications stated in this datasheet are subject to the above listed models only. For specifications of non-standard models, please contact our technical support team.

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Specifications subject to change without notice.

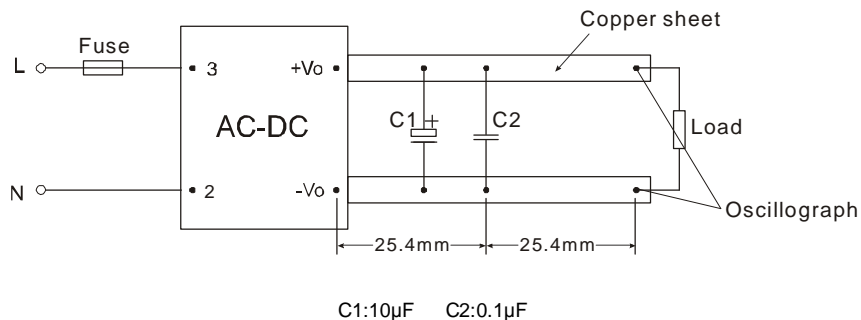
INPUT SPECIFICATIONS			
Input voltage range		85~264VAC ,120~370VDC	
Input frequency		47~63Hz	
Input current	LB03 models LB05models LB10 models LB15 models	110VAC 60mA , typ 100mA , typ 200mA , typ 280mA , typ	230VAC 30mA , typ 60mA , typ 100mA , typ 150mA , typ
Inrush current	LB03/05 models LB10/15 models	110VAC 10A, typ 10A, typ	230VAC 20A, typ 30A, typ
Leakage current		0.3mA RMS typ. 230VAC/50Hz	
External input fuse (recommended)	LB03/05 models LB10/15 models	1A/250V 2A/250V	slow blow slow blow

OUTPUT SPECIFICATIONS			
Voltage set accuracy		±2%(main out)	
Input variation		±0.5%(main out) ±1.5%(others)	
Load variation (10%-100%) (symmetric load) (symmetric load) (symmetric load)	Single output models Dual output models Isolation & twin output (with voltage regulator) Isolation & twin output (without voltage regulator)	±1% ±2% ±2% ±3%(main out) ±5%(others)	
Minimum load	Single output models Dual output models Isolation & twin output	0% 10% (main out) 10% (main out)	
Ripple& noise(p-p)	(20MHz Bandwidth)	50mV (Typ)	100mV (Max)
Short circuit protection		Continuous, and auto resume (except specialties)	
Over current protection		≥110% I <sub>o</sub>	
Over output voltage protection	3.3 / 5VDC models 9VDC models 12 / 15VDC models 24VDC models 48VDC models	≤6.5VDC ≤12VDC ≤20VDC ≤30VDC ≤60VDC	

COMMON SPECIFICATIONS			
Temperature ranges	Operating : Power derating (above 55°C) Storage: Case temperature:	-40°C ~ +70°C 3.75% / °C -40°C ~ +105°C +90°C max	
Hold-up time		80ms(typ.) at Vin:230VAC	
Humidity (non condensing)		85% (max.)	
Temperature coefficient		0.02% /°C (main out) 0.15% /°C(others)	
Switching frequency		60kHz (typ)	
I/O-isolation voltage		3000VAC/1Min	
EMC compliance	EMI	RE CE	CISPR22/EN55022 CLASS B CISPR22/EN55022 CLASS B
	EMS	ESD RS EFT *Surge CS PFM Voltage dips、short and interruptions immunity	IEC/EN61000-4-2 Air±8KV / Contact ±6KV perf. Criteria B IEC/EN61000-4-3 10V/m perf. Criteria A IEC/EN61000-4-4 ±4KV perf. Criteria B IEC/EN61000-4-5 ±2KV/4KV perf. Criteria B IEC/EN61000-4-6 10 Vr.m.s perf. Criteria A IEC/EN61000-4-8 10A/m perf. Criteria A IEC/EN61000-4-11 0%-70% perf. Criteria B
Safety standards		IEC60950,EN60950,UL60950	
Safety approvals		EN60950, IEC60950,UL60950	
Safety Class		CLASS II	
Case material		UL 94V-0	
Install		PCB	
MTBF		>300,000h @25°C	

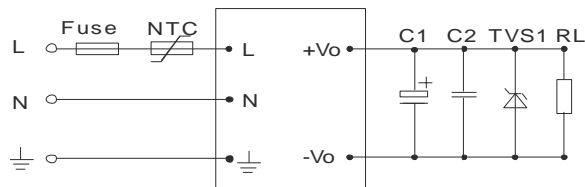
Package	LB03 models LB05models LB10 models LB15 models	48.5X36X20.5mm 55X45X21mm 62X45X22.5mm 70X48X23.5mm
Note:*Except LB10-10A05 and LB10-10D0505-02I, other models promise differential mode 2KV.		

## PARALLEL LINES MEASURE

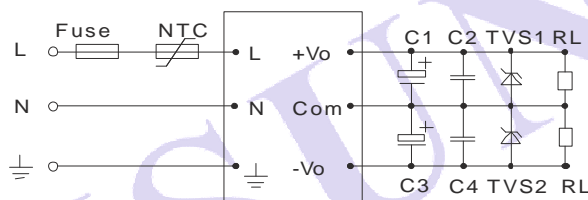


## TYPICAL APPLICATIONS

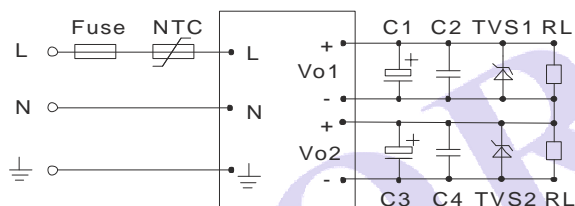
LB\*\*-10B\*\*( single Output)



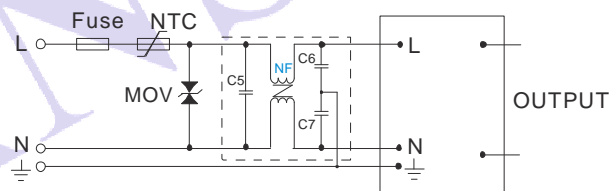
LB\*\*-10A\*\*(Dual output)



LB\*\*-10D\*\*(Isolate Twin Output)



LB03-15 series if higher requirement to EMC application circuit  
(external circuit output as above typical applications):



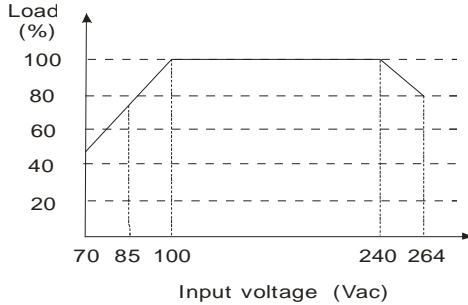
EXTERNAL TYPICAL VALUE(UNIT:  $\mu$ F )

MODEL	C1	C3	MODEL	C1	C3
LB03-10B03	220		LB05-10D0524-01	220	47
LB03-10B05	220		LB10-10B03	470	
LB03-10B09	120		LB10-10B05	330	
LB03-10B12	120		LB10-10B09	120	
LB03-10B15	68		LB10-10B12	120	
LB03-10B24	10		LB10-10B15	120	
LB05-10B03	330		LB10-10B24	68	
LB05-10B05	330		LB10-10A05	220	220
LB05-10B09	120		LB10-10A12	120	120
LB05-10B12	120		LB10-10A15	47	47
LB05-10B15	68		LB10-10D0505-02I	220	120
LB05-10B24	68		LB15-10B03	330	
LB05-10A05	120	120	LB15-10B05	680	
LB05-10A12	68	68	LB15-10B12	220	
LB05-10A15	47	47	LB15-10B15	220	
LB05-10A24	10	10	LB15-10B24	68	
LB05-10D0505-01	220	68			
LB05-10D0512-01	220	68			
LB05-10D0515-01	220	47			

**Remark:**

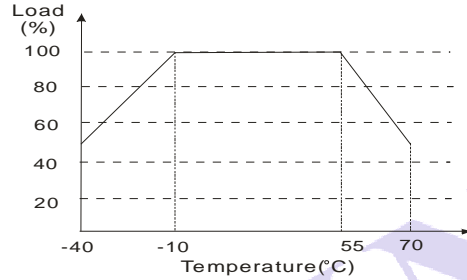
- Output filtering capacitor C3 and C1 are electrolytic capacitor. It is recommended to use high frequency and low resistance electrolytic capacitor. For capacitance and current of the capacitor please refer to suppliers' specifications. Voltage derating of capacitor should be 80% or above. C2andC4 eliminate high frequency noise, advice use 0.1μF/50V.TV5 is a recommended component to protect post-circuits (when converter fails).
- External input NTC is recommended to use 5D-9 ( Only LB10 models)
- if higher requirement to EMC performance, recommended to add"EMC filter" at the input end, recommended parameter as follows:  
 MOV: Varistor, model: 471KD10, it is used to protect the device under surge.  
 C5:X capacitor, recommended parameter 0.1μF/275V;  
 C6,C7:Y capacitor, recommended parameter 2200pF/400V;  
 NF: common model choke, recommended inductance is about 10mH-30mH.

**INPUT VOLTAGE VS LOAD**

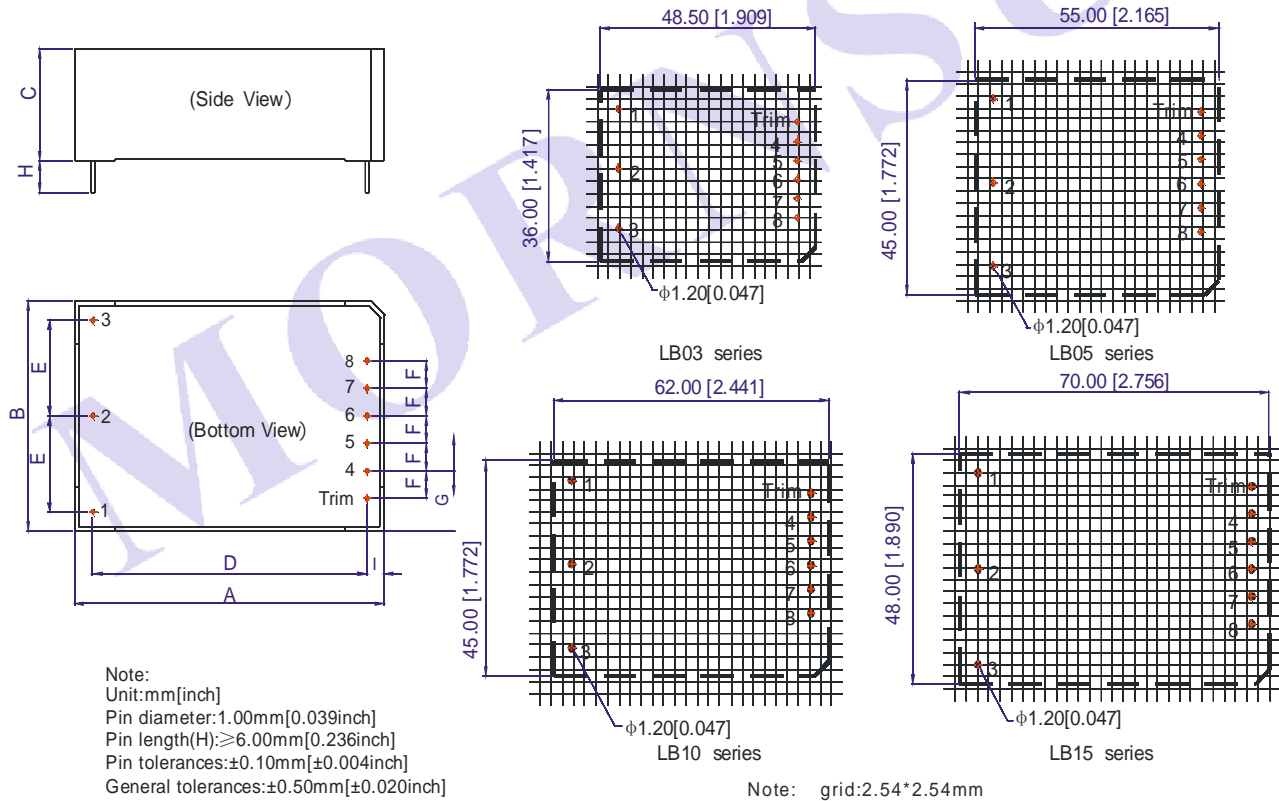


The relationship of dc and ac is as follows while input voltage is dc:  
 $V_{dc} = 1.414V_{ac} - 20V_{dc}$

**TEMPERATURE VS LOAD**



**OUTLINE AND DIMENSIONS**



Note:  
 Unit:mm[inch]  
 Pin diameter:1.00mm[0.039inch]  
 Pin length(H):≥6.00mm[0.236inch]  
 Pin tolerances:±0.10mm[±0.004inch]  
 General tolerances:±0.50mm[±0.020inch]

OUTLINE AND DIMENSIONS (Unit: mm)				
NO.	LB03	LB05	LB10	LB15
A	48.50	55.00	62.00	70.00
B	36.00	45.00	45.00	48.00
C	20.50	21.00	22.50	23.50
D	40.50	47.00	54.00	62.00
E	12.50	17.50	17.50	20.00
F	4.00	5.00	5.00	5.75
G	10.00	12.50	12.50	12.50
I	4.00	4.00	4.00	4.00

FOOTPRINT DETAILS				
Pin	LB**-10B	LB**-10A	LB**-10C	LB**-10D
1				
2	AC(N)	AC(N)	AC(N)	AC(N)
3	AC(L)	AC(L)	AC(L)	AC(L)
4	-Vo	-Vo	-Vo1	-Vo1
5	No Pin	No Pin	+Vo1	+Vo1
6	No Pin	COM	-Vo2	No Pin
7	No Pin	No Pin	COM	-Vo2
8	+Vo	+Vo	+Vo2	+Vo2
Trim	Trim**	No Pin	No Pin	No Pin

There is no pin "1" on LB10-10BXX  
 Trim\*\*: only for LB15-10BXX Series.

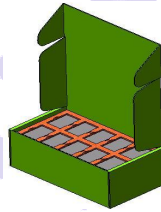
MODLES WEIGHT				
WEIGHT	LB03	LB05	LB10	LB15
(Typ.)	50g	70g	80g	120g

## PACKAGE DIAGRAM

(LB03 Series)



(other series)



Inner packaging box dimensions: L\*W\*H=355\*192\*93mm  
 Outer packaging box dimensions: L\*W\*H=405\*380\*305mm

Packaging quantity: 20pcs (LB03 Series:40pcs)  
 Packaging quantity:120pcs (LB03 Series:240pcs)

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