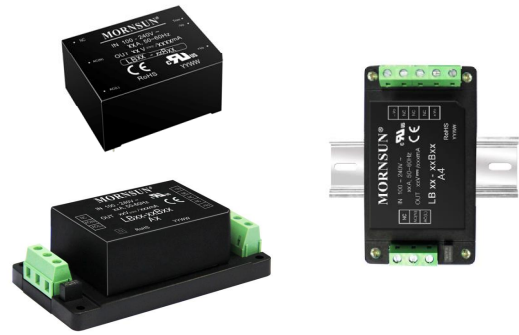


LB03-15 SERIES 3-15W, AC-DC CONVERTER

LB 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, EN60950 standards, and is widely used in industrial, office and civil applications. For harsh EMC environment, this series of products must use the refered application circuit.

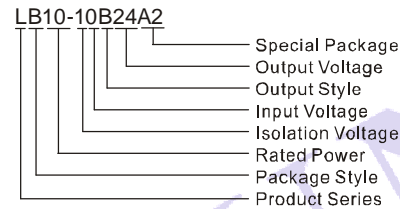
PRODUCT FEATURES

1. Universal Input :85 ~ 264VAC,50/60Hz
2. Regulated output, low ripple and noise
3. Efficiency up to 81%
4. Compact size, environmentally friendly
5. Over-current, short circuit and over-temperature protection
6. Plastic case, meets UL94V-0
7. Meets: UL60950、EN60950
8. Three years warranty
9. Mounting: PCB mounting, Chassis mounting with Screw Terminals, DIN-Rail mounting



RoHS E235235

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
UL/CE	LB15-10B03	70X48X23.5mm	15W	3.3V/3500mA		50mV	71
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

Note: LB03-10AXX sample Vo2 for feedback; LB05/10/15XX sample positive and negative output for feedback; others sample Vo1 for feedback.

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	
Recommended External Input Fuse (Special package series include fuse)	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)	Single output models Dual output models Isolation & twin output	±1% ±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	
Over current protection		≥110% I _o	
Over output voltage protection	3.3 / 5VDC output 9VDC output 12 / 15VDC output 24VDC output 48VDC output	≤6.5VDC ≤12VDC ≤20VDC ≤30VDC ≤60VDC	

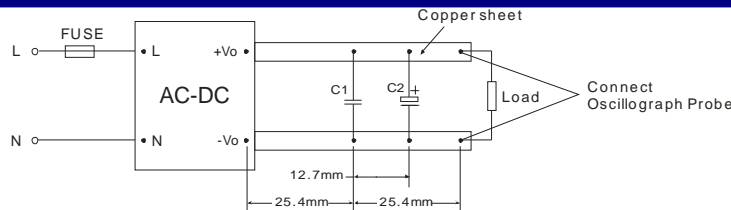
COMMON SPECIFICATIONS				
Temperature ranges	Operating	-40°C ~ +70°C		
	Power derating (above 55°C)	3.75% / °C		
	Storage	-40°C ~ +105°C		
	Case temperature	+90°C max		
Hold-up time	(Vin:230VAC)	80ms(typ.)		
Humidity		85% (max.)		
Temperature coefficient		0.02% /°C (main out) 0.15% /°C(others)		
Switching frequency		60KHz (typ)		
I/O-isolation voltage		3000VAC/1Min		
EMC	EMI	RE	CISPR22/EN55022 CLASS B	
		CE	CISPR22/EN55022 CLASS B	
	EMS	ESD	IEC/EN61000-4-2 Contact ±6KV / Air±8KV	perf. Criteria B
		RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
		EFT	IEC/EN61000-4-4 ±2KV/(without external circuit)	perf. Criteria B
			IEC/EN61000-4-4 ±4KV/(with external circuit 5/ circuit 6)	perf. Criteria B
		Surge	IEC/EN61000-4-5 ±1KV/±2KV (without external circuit)	perf. Criteria B
			IEC/EN61000-4-5 ±2KV/±4KV (with external circuit 5/ circuit 6)	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		IEC60950,EN60950,UL60950		
Safety approvals		EN60950,UL60950		
Safety Class	LB10-10BXX	CLASS II		
	Others	CLASS I		

Case material		UL 94V-0
Install		PCB mounting, Chassis mounting with Screw Terminals, DIN-Rail mounting
MTBF		>300,000h @25°C

Note:

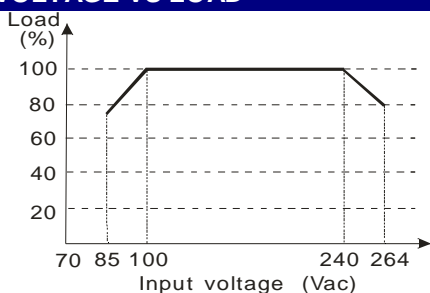
1. Ripple and Noise were measured by the method of parallel lines;
2. Unless otherwise specified, all specifications above are measured at rated input voltage and rated output load, TA=25°C, humidity < 75%;
3. All specifications stated in this datasheet are subject to the above listed models only. For specifications of non-standard models, please contact our technical support team.

PARALLEL LINES MEASURE



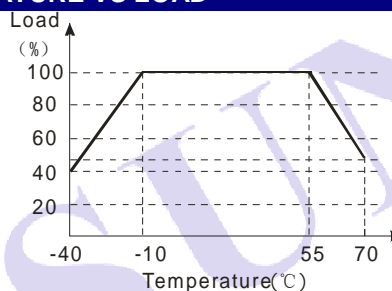
Note: C1: 1μF (ceramic capacitor) C2: 10μF (electrolytic capacitor)

INPUT VOLTAGE VS LOAD



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

TEMPERATURE VS LOAD



TYPICAL APPLICATIONS

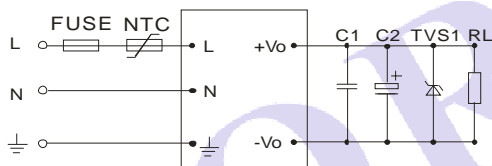


figure 1: LBXX-10B** (single Output)

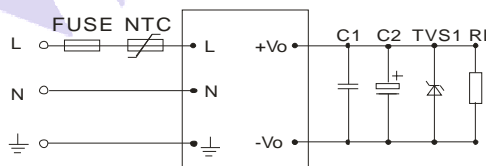


figure 2: LBXX-10A** (Dual output)

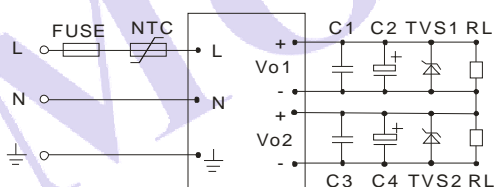


figure 3: LBXX-10D** (Isolate Twin Output)

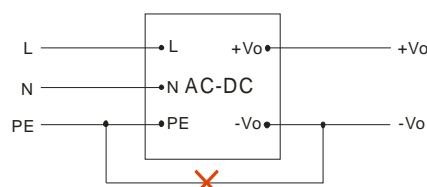


figure 4: Note: This application is not supported for this series.

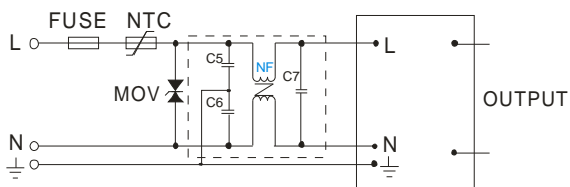


figure 5: LB03-15 series Recommended circuit for application require higher EMC standard (external circuit output same as above)

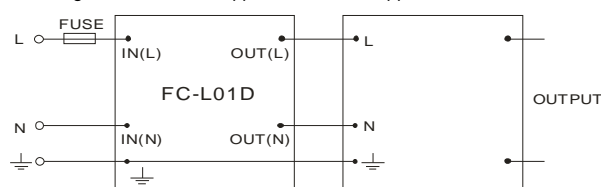


figure 6: LB03-15 series Recommended circuit for application require higher EMC standard (external circuit output same as above)

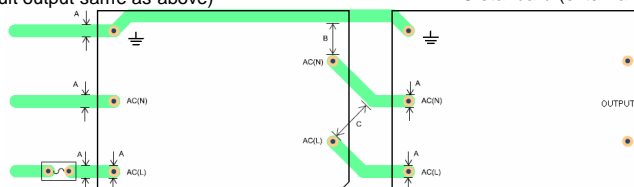


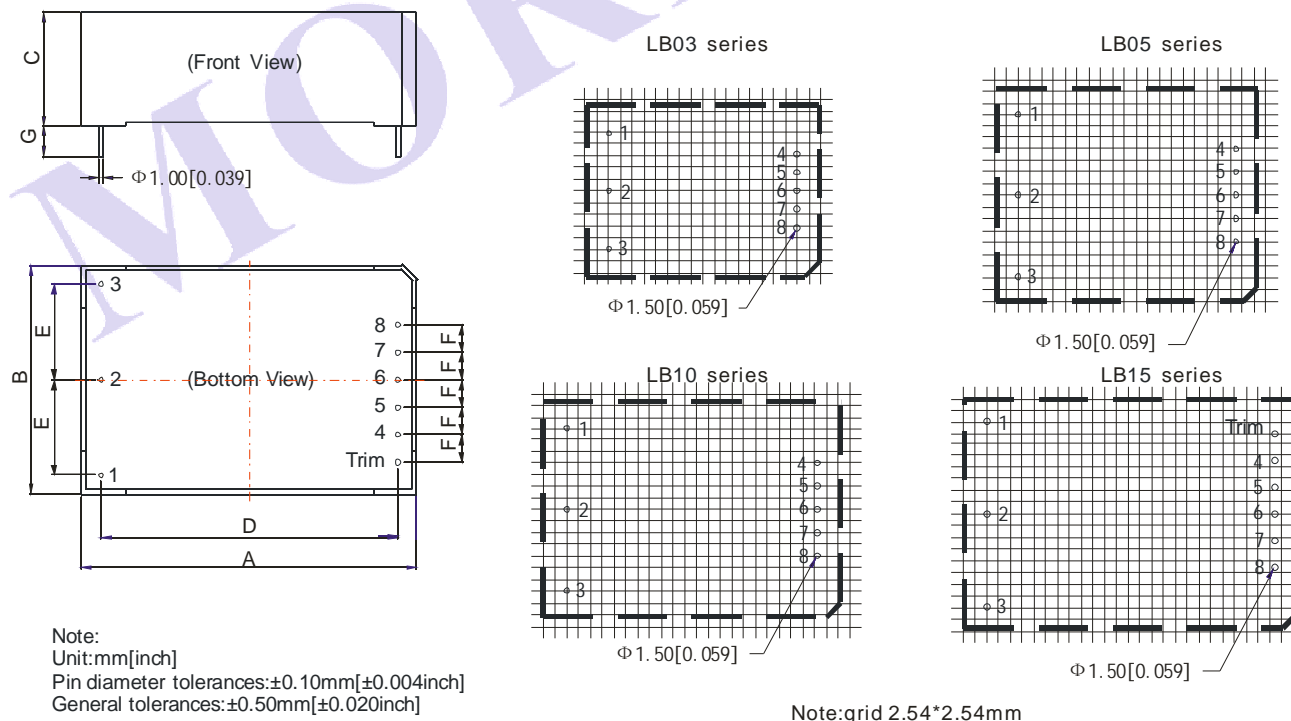
figure 7: EMC application circuit PCB layout
 Safety and recommend wiring: linewidth $A \geq 3\text{mm}$, $B \geq 6\text{mm}$, $C \geq 9\text{mm}$

EXTERNAL TYPICAL VALUE(UNIT: μF)										
MODEL	C2	C4	TVS1	TVS2	MODEL	C2	C4	TVS1	TVS2	
LB03-10B03	220		SMBJ7.0A		LB05-10D0524-01	220	47	SMBJ7.0A	SMBJ33A	
LB03-10B05	220		SMBJ7.0A		LB10-10B03	470		SMBJ7.0A		
LB03-10B09	120		SMBJ12A		LB10-10B05	330		SMBJ7.0A		
LB03-10B12	120		SMBJ20A		LB10-10B09	120		SMBJ12A		
LB03-10B15	68		SMBJ20A		LB10-10B12	120		SMBJ20A		
LB03-10B24	10		SMBJ33A		LB10-10B15	120		SMBJ20A		
LB05-10B03	330		SMBJ7.0A		LB10-10B24	68		SMBJ33A		
LB05-10B05	330		SMBJ7.0A		LB10-10A05	220	220	SMBJ7.0A	SMBJ7.0A	
LB05-10B09	120		SMBJ12A		LB10-10A12	120	120	SMBJ20A	SMBJ20A	
LB05-10B12	120		SMBJ20A		LB10-10A15	47	47	SMBJ20A	SMBJ20A	
LB05-10B15	68		SMBJ20A		LB15-10B03	330		SMBJ7.0A		
LB05-10B24	68		SMBJ33A		LB15-10B05	680		SMBJ7.0A		
LB05-10A05	120	120	SMBJ7.0A	SMBJ7.0A	LB15-10B12	220		SMBJ20A		
LB05-10A12	68	68	SMBJ20A	SMBJ20A	LB15-10B15	220		SMBJ20A		
LB05-10A15	47	47	SMBJ20A	SMBJ20A	LB15-10B24	68		SMBJ33A		
LB05-10A24	10	10	SMBJ33A	SMBJ33A						
LB05-10D0505-01	220	68	SMBJ7.0A	SMBJ7.0A						
LB05-10D0512-01	220	68	SMBJ7.0A	SMBJ20A						
LB05-10D0515-01	220	47	SMBJ7.0A	SMBJ20A						

Note:

- Output filtering capacitor C2 and C4 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. C1 and C3 eliminate high frequency noise, advice use $1\mu\text{F}/50\text{V}$.TVS is a recommended component to protect post-circuits (when converter fails).External input NTC is recommended to use 5D-9.
- For standard EMC requirement, please refer to figure 1 , figure 2 or figure 3, if higher EMC requirement ,please refer to figure 5 or figure 6.
MOV: Varistor, model: 561KD14, it is used to protect the device under surge;
C5,C6:Y capacitor, recommended parameter 222K/400V;
C7:X capacitor, recommended parameter $0.1\mu\text{F}/275\text{V}$;
NF: common model choke, recommended inductance is about 10mH-30mH;
FC-L01D: Mornsun's 2KV/4KV Surge protector.
FUSE: LB03/05 is recommended to use 1A/250V, LB10/15 is recommended to use 2A/250V;

PCB MOUNTING WITH SOLDER PINS



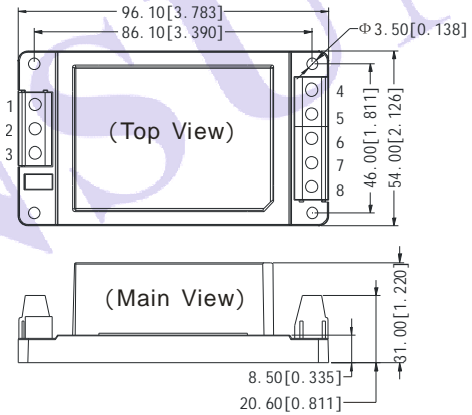
OUTLINE AND DIMENSIONS (Unit: mm)				
NO.	LB03	LB05	LB10	LB15
A	48.50	55.00	62.00	70.00
B	36.00	45.00	45.00	48.00
C	20.50	21.00	22.50	23.50
D	40.50	47.00	54.00	62.00
E	12.50	17.50	17.50	20.00
F	4.00	5.00	5.00	5.75
G	10.00	12.50	12.50	12.50

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

FOOTPRINT DETAILS				
Pin	LBXX-10B	LBXX-10A	LBXX-10C	LBXX-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.

LBXXA2 CHASSIS MOUNTING WITH SCREW TERMINALS



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

*The figure above is related to LB10 series, the height of other series is different.

OUTLINE AND DIMENSIONS (Unit: mm)	
MODEL	DIMENSIONS
LB03XXA2	96.1x54x29mm
LB05XXA2	96.1x54x29.5mm
LB10XXA2	96.1x54x31mm
LB15XXA2	96.1x54x32mm

MODELS WEIGHT				
WEIGHT	LB03	LB05	LB10	LB15
Typ.	100g	120g	130g	170g

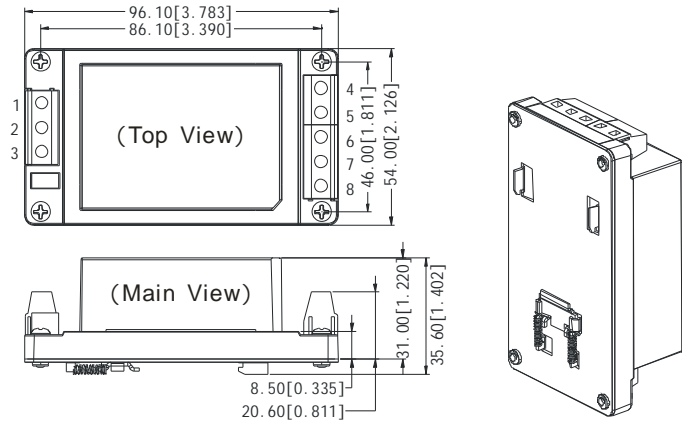
FOOTPRINT DETAILS			
Pin	LBXX-10B	LBXX-10A	LBXX-10D
1			
2	AC(N)	AC(N)	AC(N)
3	AC(L)	AC(L)	AC(L)
4	-Vo	-Vo	-Vo1
5	NC	NC	+Vo1
6	NC/Trim**	COM	NC
7	NC	NC	-Vo2
8	+Vo	+Vo	+Vo2

There is no pin "1" on LB10-10BXXA2.
NC/Trim** : The pin is Trim on LB15-10BXXA2 ,
The pin is not connected on other single output products.

LBXXA4 DIN-RAIL MOUNTING



DIN35mm standard rail installation



Note:

Unit: mm[inch]

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

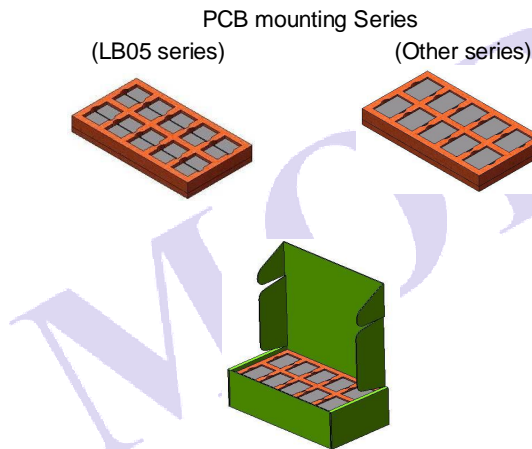
* The figure above is related to LB10 series, the height of other series is different.

**Footprint Details are the same as Chassis mounting with Screw Terminals'.

MODELS WEIGHT				
WEIGHT	LB03	LB05	LB10	LB15
Typ.	140g	160g	170g	210g

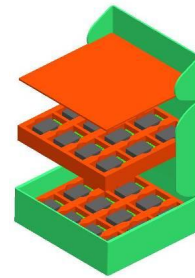
OUTLINE AND DIMENSIONS (Unit: mm)	
MODEL	DIMENSIONS
LB03XXA4	96.1x54x33.6
LB05XXA4	96.1x54x34.1
LB10XXA4	96.1x54x35.6
LB15XXA4	96.1x54x36.6

PACKAGE DIAGRAM



Inner packaging box dimensions: L*W*H=355*192*93mm
 Packaging quantity: 20pcs (LB03 series: 40pcs)
 Outer packaging box dimensions: L*W*H=405*380*305mm
 Packaging quantity: 120pcs (LB03 series: 240pcs)

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