

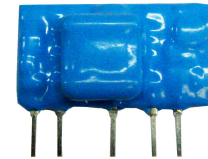
## LS03-05BXXK

### 3W,HIGH VOLTAGE DC-DC(AC-DC) CONVERTER

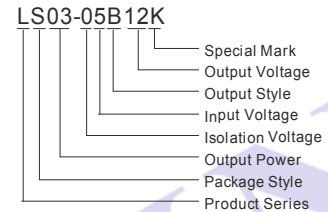
LS03 Series ----- are high efficiency green power modules with miniature packaging provided by Mornsun. The features of this series are: wide input voltage, DC and AC all in one, high efficiency, high reliability, low loss, safety isolation etc. They are widely used in industrial, office and civil equipments, as well as applications where no special requirement for EMC performance. For harsh EMC environment, this series of products must use the refered application circuit.

#### PRODUCT FEATURES

1. Wide input voltage:100 ~ 400VDC(85 ~ 264VAC)
2. Over temperature protection and short circuit protection
3. High efficiency, high density
4. Low loss, green power
5. Multiple models available
6. Industrial level specifications



#### PART NUMBER SYSTEM



#### SELECTION GUIDE

Model	Package	Power	Output (Vo/Io)	Ripple and Noise (typ.)	Efficiency (%) (typ.)
LS03-05B05K	38.5X22X11mm	2.5W	5V/500mA	50mV	70
LS03-05B12K		3W	12V/250mA	60mV	78

#### INPUT SPECIFICATIONS

Input voltage range	100~400VDC(85~264VAC)	
Input current	40mA(typ)	
Leakage current	None	
External input fuse (recommended)	1A/250V	Slow-Blow

#### OUTPUT SPECIFICATIONS

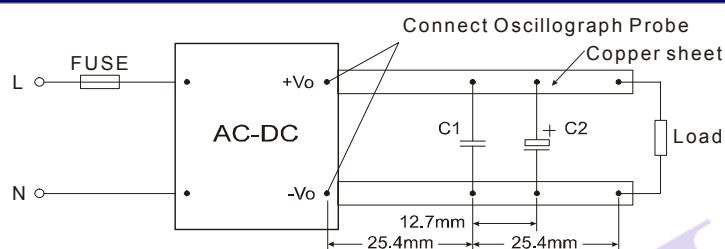
Voltage accuracy	±2%	
Input variation	±0.5% (typ)	
Load variation (10%~100%)	±1% (typ)	
Ripple & noise(p-p) (20MHz Bandwidth)	60mV(typ)	120mV( max)
Short circuit protection	Continuous, automatic resume	
Over temperature protection	150°C (max)	

#### COMMON SPECIFICATIONS

Temperature ranges		Operating	-40°C ~ +85°C			
		Power derating	(55°C~85°C)	1.33%/°C		
			(-40°C~-20°C)	2%/°C		
		Storage	-40°C ~ +105°C			
		Case temperature	+90°C (max)			
Humidity			85%(max)			
Temperature coefficient			0.02%/°C			
Switching frequency			100KHz(typ)			
I/O-isolation voltage			2000VAC/1Min			
EMC	EMI	CE	CISPR22/EN55022 CLASS B(with typical applications Figure 3)			
		RE	CISPR22/EN55022 CLASS B(with typical applications Figure 3)			
	EMS	ESD	IEC/EN61000-4-2	Contact ±2KV	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 typical applications Figure 3)		perf. Criteria B	

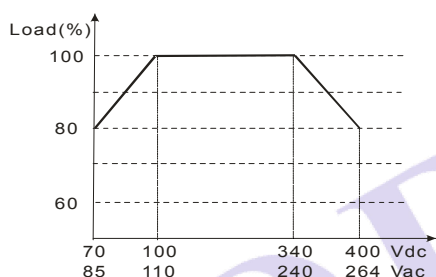
EMC	EMS	Surge	IEC/EN61000-4-5    ±2KV/±4KV (with typical applications Figure 3)	perf. Criteria B
		CS	IEC/EN61000-4-6    10 Vr.m.s	perf. Criteria A
		PFM	IEC/EN61000-4-8    10A/m	perf. Criteria A
		Voltage dips、short and interruptions immunity	IEC/EN61000-4-29    0%-70%	perf. Criteria B
Case material			UL94V-0	
Install			PCB	
MTBF			>300,000H @25°C	
Note:				
1.     External electrolytic capacitor are required to models when AC input, more details refer to typical applications.				
2.     Ripple and Noise were measured by the method of anear measure (more details refer to the anear measure).				
3.     All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.				
4.     In this datasheet, all the test methods of indications are based on corporate standards.				

## ANEAR MEASURE

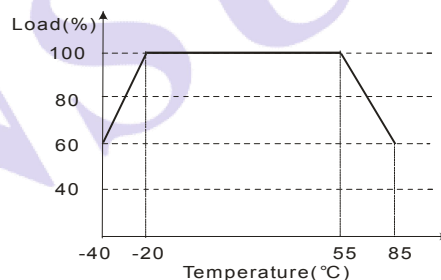


Note: C1: 1µF (Ceramic capacitor) C2: 10µF (Electrolytic capacitor)

## INPUT VOLTAGE VS LOAD

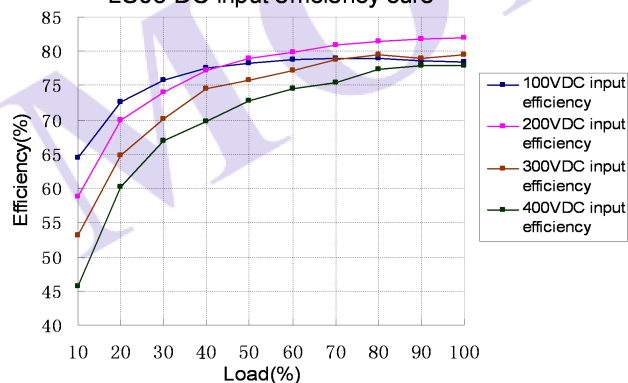


## TEMPERATURE VS LOAD

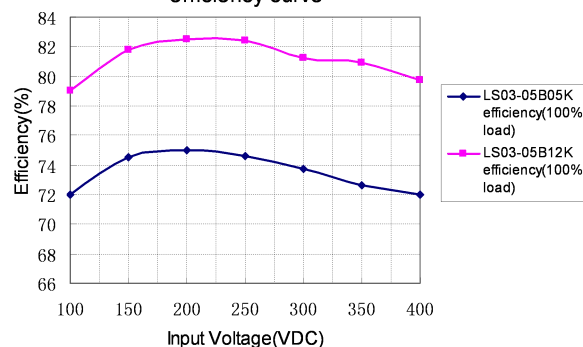


## TYPICAL EFFICIENCY CURVE

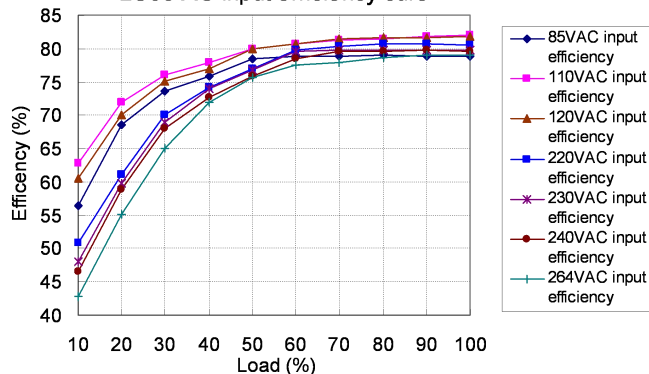
LS03 DC input efficiency cure



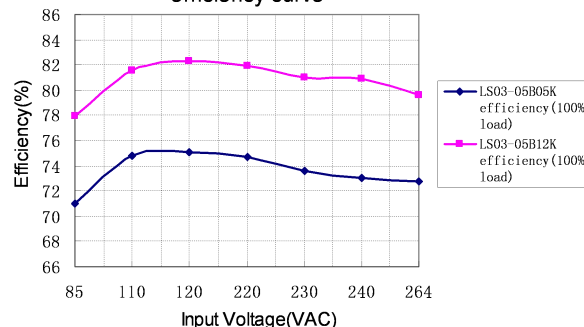
LS03-05BXXK DC input rated load efficiency curve



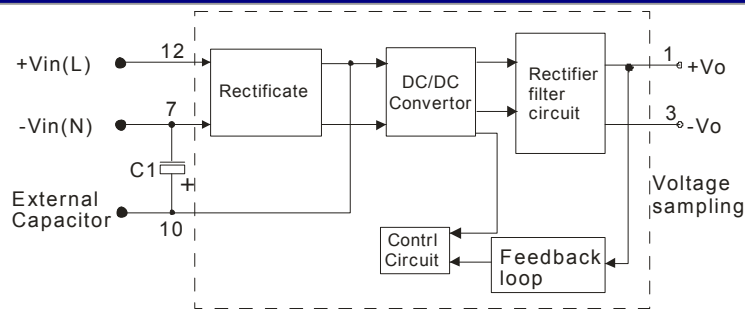
LS03 AC input efficiency cure



LS03-05BXXK AC input rated load efficiency curve



## STRUCTURE FIGURE



## TYPICAL APPLICATIONS

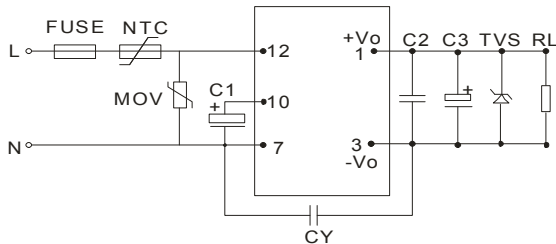


Figure 1: LS03-05BXXK

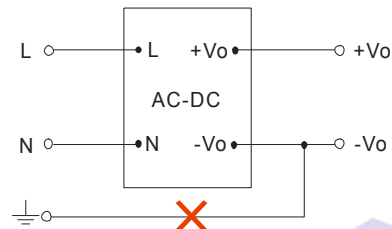


Figure 2: Note: This application is not supported for this series.

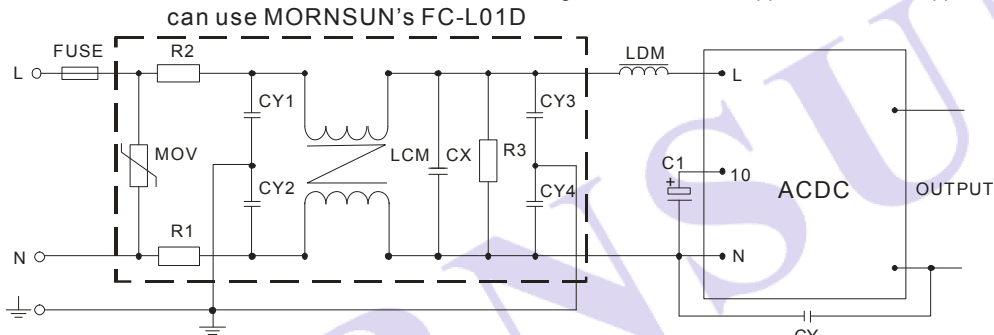


Figure 3: LS03 series Recommended circuit for application require higher EMC standard (external circuit output same as above)

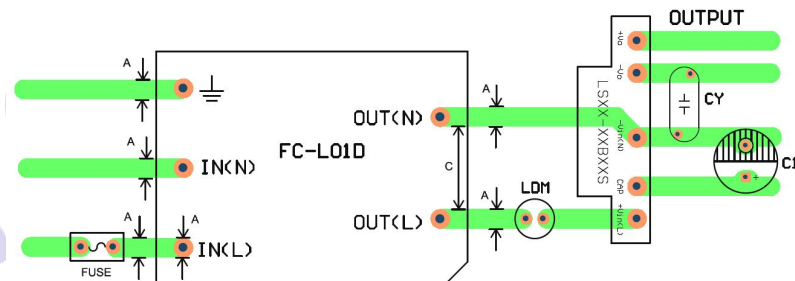


Figure 4: EMC application circuit PCB layout  
Safety and recommend wiring: linewidth  $A \geq 3\text{mm}$ ,  $C \geq 9\text{mm}$

### EXTERNAL CAPACITORS TYPICAL VALUE

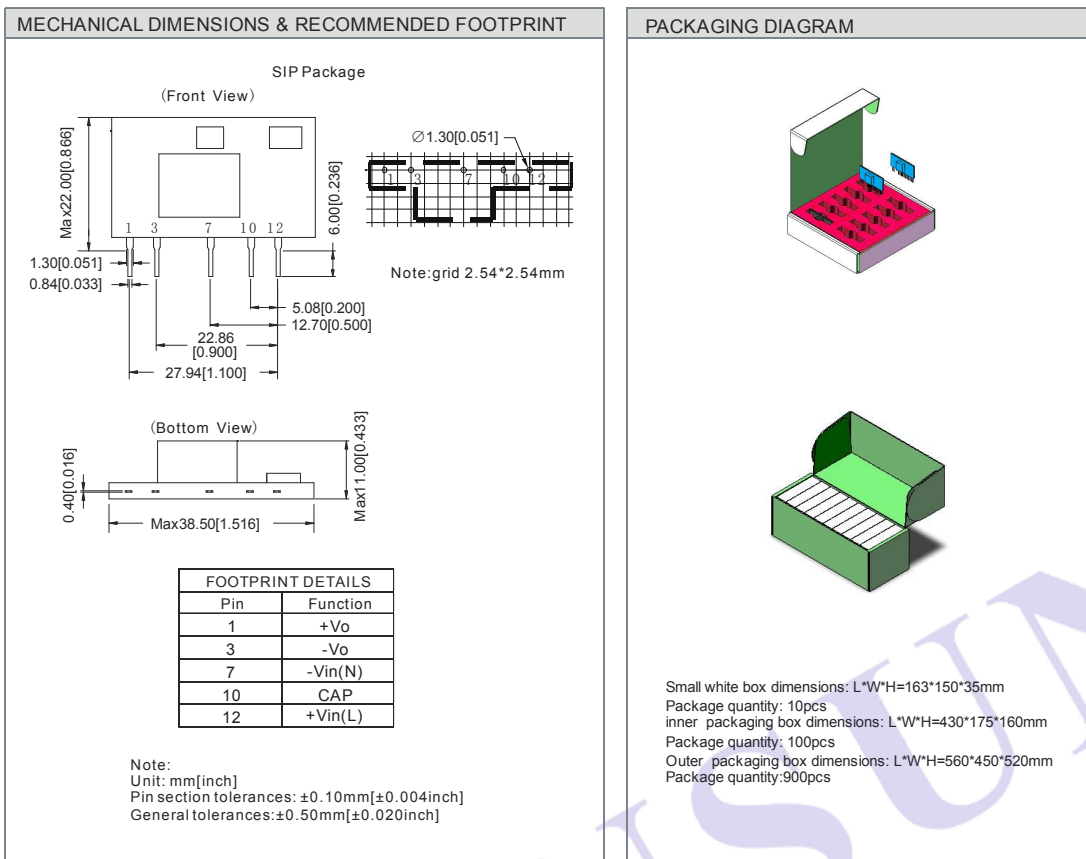
Output Voltage	C1	C2	C3	FUSE	TVS
5V	10 $\mu$ F/400V	1 $\mu$ F/50V (Ceramic Capacitor)	150 $\mu$ F/25V	1A/250V	SMBJ7.0A
12V					SMBJ20A

Note:

For standard EMC requirement, please refer to figure 1, if higher EMC requirement, please refer to figure 3.

1. C1: AC input, is filtering electrolytic capacitor (which is required), when input voltage is below 100VAC, and the value of C1 is 22 $\mu$ F/400V. DC input, is a filtering capacitor in EMC Filter, the value of C1 is 10 $\mu$ F/400V (when input voltage is above 370VDC, and the value of C1 is 10 $\mu$ F/450V), if EMC performance is not required, C1 could not need.
2. C2 is ceramic capacitor, it is used to filter high frequency noise. Output filtering capacitor C3 (which is required when AC input or DC input) 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).
3. Recommended external circuit parameters in Figure 3:  
MOV: Varistor, model: 561KD14, it is used to protect the device under surge;  
R1, R2: 2 $\Omega$ /3W Winding resistor;  
R3: 1M $\Omega$ /2W;  
CY, CY1, CY2, CY3, CY4: 102M/400VAC;  
CX: 0.22 $\mu$ F/275VAC;  
LCM: 10mH-30mH;  
LDM: 300 $\mu$ H;  
FC-L01D: MORNSUN's 2KV/4KV Surge protector.
4. FUSE: 1A/250V Slow-Blow

## OUTLINE DIMENSIONS & FOOTPRINT DETAILS



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