

LS03-05BXXSC Series

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

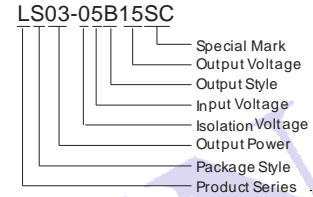
LS03 Series ---- are high efficiency green power modules with miniature packaging provided by Mornsun. The features of this series are: wide input voltage, DC and AC all in one, high efficiency, high reliability, low loss, safety isolation etc. They are widely used in industrial, office and civil equipments, as well as applications where no special requirement for EMC performance. For harsh EMC environment, this series of products must use the referred 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)	Standby Power (typ)
LS03-05B03SC	35.0X25.5X10.5mm	1.65W	3.3V/500mA	70mV	65	0.3W
LS03-05B05SC		2.5W	5V/500mA		68	0.3W
LS03-05B09SC		3W	9V/330mA		70	0.3W
LS03-05B12SC			12V/250mA		74	0.3W
LS03-05B15SC			15V/200mA		74	0.3W
LS03-05B24SC			24V/125mA		74	0.4W

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

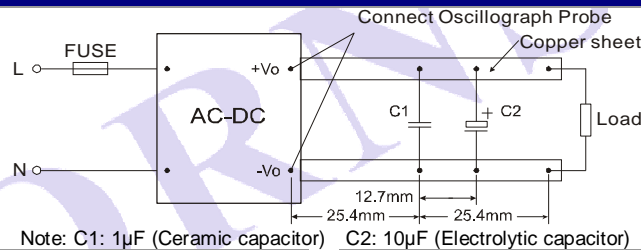
Voltage set accuracy		±2%	
Input variation		±0.5% (typ)	
Load variation (10%~100%)		±1% (typ)	
Ripple & noise(p-p) (20MHz Bandwidth)	3.3 / 5 / 9 VDC models	70mV (typ)	100mV (max)
	12VDC models	70mV (typ)	100mV (max)
	15 VDC models	70mV (typ)	100mV (max)
	24 VDC models	70mV (typ)	100mV (max)
Short circuit protection		Continuous, automatic resume	
Capacitor load max(μF)	LS03-05B03SC	950	
	LS03-05B05SC	950	
	LS03-05B09SC	450	
	LS03-05B12SC	450	
	LS03-05B15SC	350	
	LS03-05B24SC	220	

COMMON SPECIFICATIONS

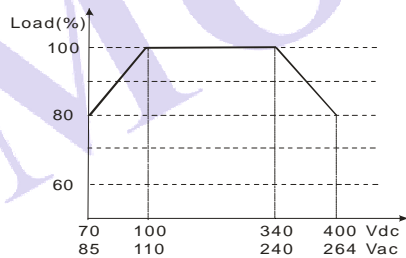
Temperature ranges	Operating		-25°C ~ +85°C
	Power derating	(55°C ~ 85°C)	1.33%/°C
		(-25°C ~ 0°C)	2%/°C
	Storage		-40°C ~ +105°C
Case temperature		+90°C (max.)	

Humidity		85%(max.)		
Temperature coefficient		0.02%/°C		
Switching frequency		100KHz(max.) frequency conversion		
I/O-isolation voltage		2000VAC/1Min		
Start delay time	1.1s and 550ms (3.3V、5V、9V、12V、15V)	115V and 230V		
	1.3s and 650ms (24V)			
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
		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%
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.				

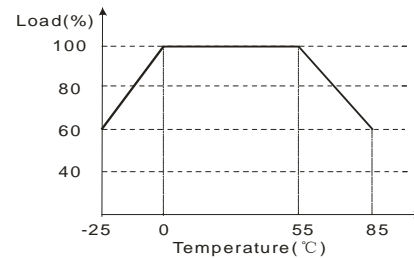
ANEAR MEASURE



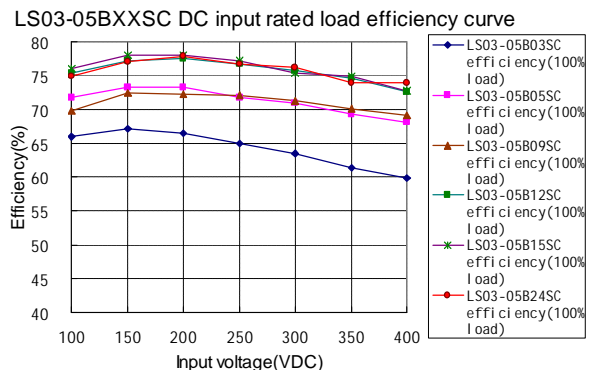
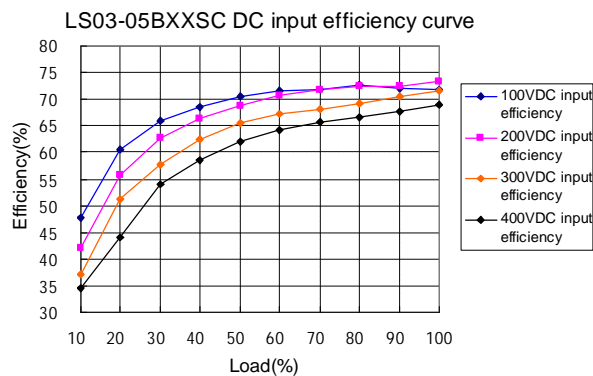
INPUT VOLTAGE VS LOAD

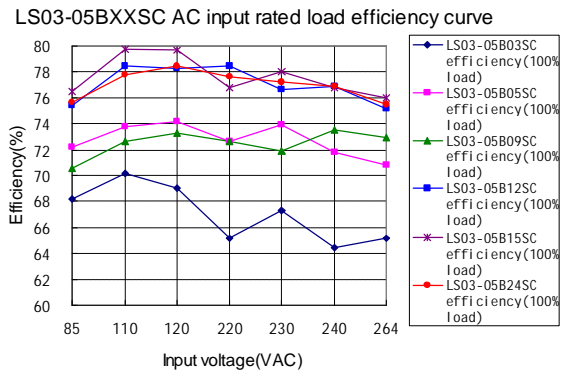
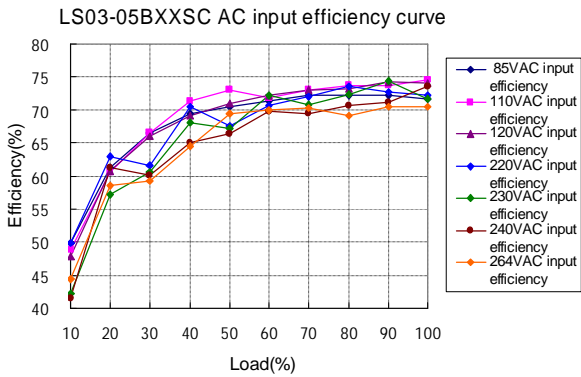


TEMPERATURE VS LOAD

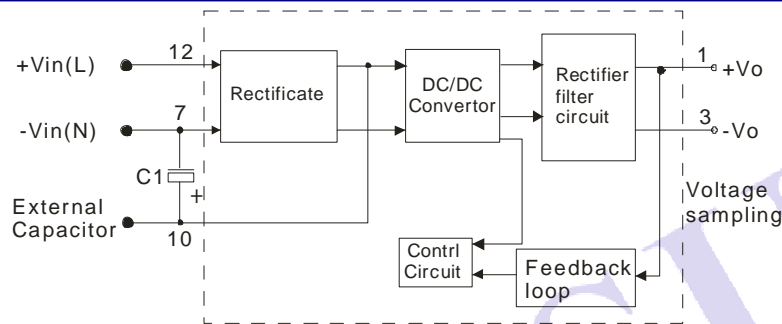


TYPICAL EFFICIENCY CURVE





STRUCTURE FIGURE



TYPICAL APPLICATIONS

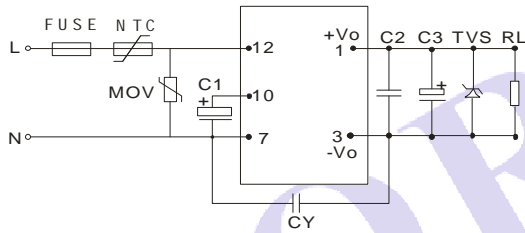


Figure 1: LS03-05BXXSC

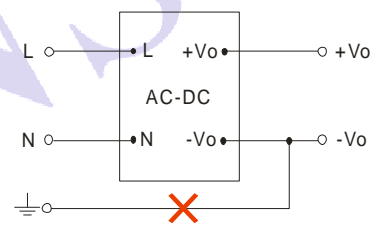


Figure 2: Note: This application is not supported for this series.

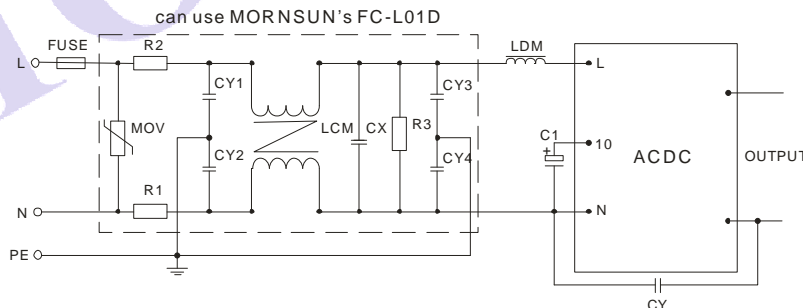


Figure 3: LS03 series Recommended circuit for application require higher EMC standard (external circuit output same as above)

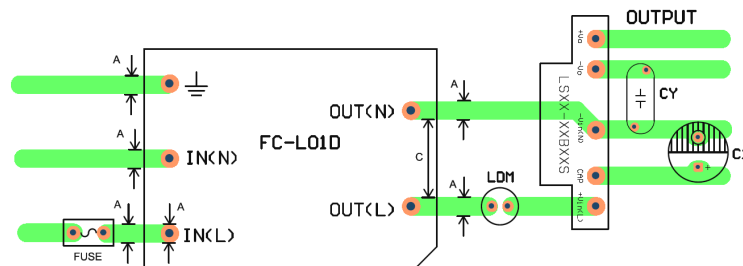


Figure 4: EMC application circuit PCB layout
Safety and recommend wiring: linewidth $A \geq 3\text{mm}$, $C \geq 9\text{mm}$

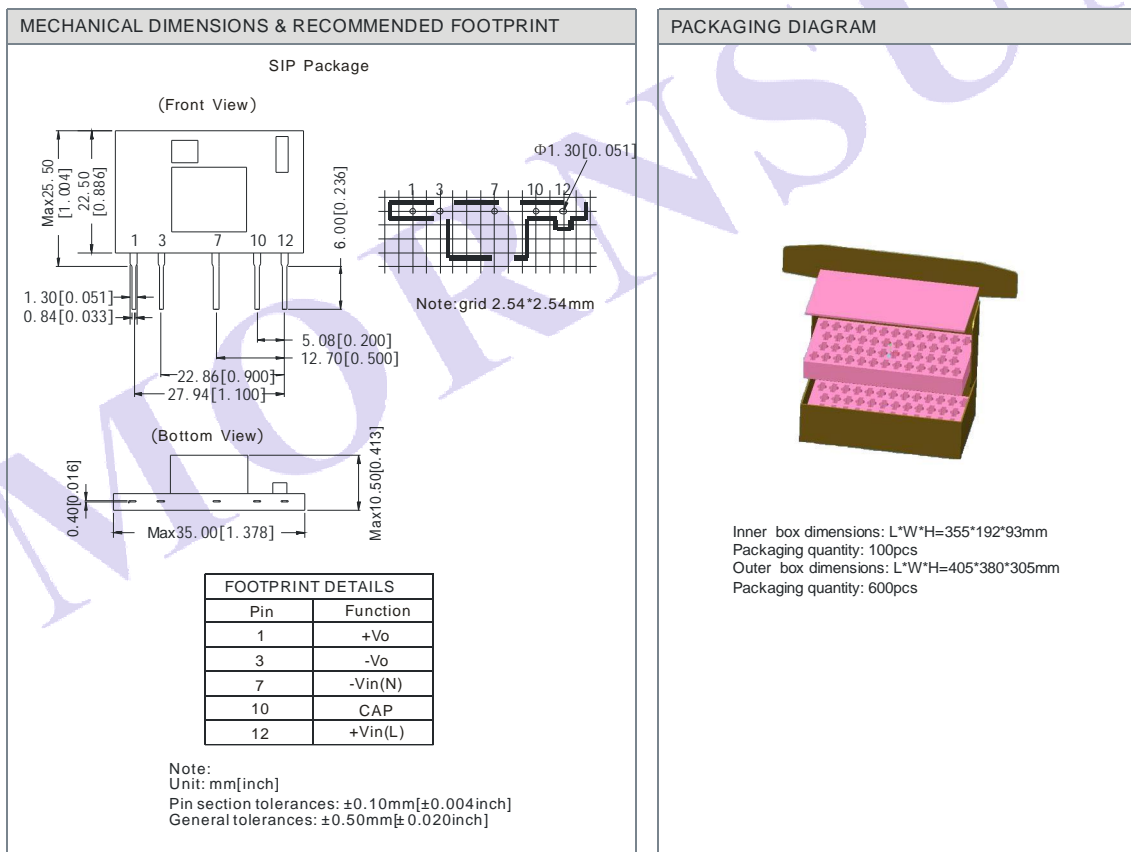
EXTERNAL CAPACITORS TYPICAL VALUE					
Output Voltage	C1	C2	C3	FUSE	TVS
3.3V	10μF/400V	1μF/50V (Ceramic Capacitor)	150μF/25V	1A/250V	SMBJ7.0A
5V					SMBJ12A
9V			SMBJ20A		
12V					
15V					
24V	SMBJ30A				

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 22μF/400V. DC input, is a filtering capacitor in EMC Filter, the value of C1 is 10μF/400V (when input voltage is above 370VDC, and the value of C1 is 10μF/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: 2Ω/3W;
R3: 1MΩ/2W;
CY, CY1, CY2, CY3, CY4: 102M/400VAC;
CX: 0.22μF/275VAC;
LCM: 10mH-30mH;
LDM: 300μH;
FC-L01D: MORNSUN's 2KV/4KV Surge protector.
4. FUSE: 1A/250V Slow-Blow

OUTLINE DIMENSIONS & FOOTPRINT DETAILS



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