3W, AC/DC converter

CE Report EN62368-1 UKCA BS EN 62368-1 RoHS

FEATURES

- Ultra-wide 85 - 305VAC and 70 - 430VDC input voltage range
- Operating ambient temperature range: -40℃ to +80℃
- Non-isolated & regulated single output
- Compact size, open frame
- High reliability, green power
- Industrial-grade design
- Flexible selection of EMC addtional circuits, simplify customer PCB layout
- Output short circuit, over-current protection

LS03-K3B12SS is one of Mornsun's highly efficient green power AC-DC Converters. It features wide input voltage range, accepting both DC and AC input voltage, high efficiency and low power consumption. The product is widely used in industrial control instrumentation, electric power applications and smart home type applications, the need to meet UL/CE safety certifications and lower demand for EMC compliance levels. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current(Vo/Io)	Efficiency at 230VAC (%) Typ.	Capacitive Load (uF) Max.
EN	LS03-K3B12SS	3W	12V/250mA	73	330

Warning: Non-isolated power supply, there is no insulation protection between output and input dangerous voltage, beware of electric shock! .

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	305	VAC
	DC input	70	--	430	VDC
Input Frequency		47	--	63	Hz
Input Current	115VAC	--	--	0.12	A
	277VAC	--	--	0.06	
Inrush Current	115VAC	--	25	--	
	277VAC	--	40	--	
Recommended External Input Fuse		1A/300V, slow-blow, required			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	10% - 100% load	--	±2.5	-5~+8	%
Line Regulation	Rated load	--	±1	--	
Load Regulation		--	±2	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	80	150	mV
Temperature Coefficient		--	±0.12	--	%/℃
Stand-by Power Consumption	230VAC input	--	--	0.4	W
Short Circuit Protection		Hiccup, continuous, self-recovery			
Over-current Protection		⩾110% Io, self-recovery			
Min. Load		10	--	--	%

Note: * The "parallel cable" method is used for ripple and noise test, please refer to AC-DC Converter Application Notes for specific information.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Operating Temperature		-40	--	+85	℃
Storage Temperature		-40	--	+105	
Storage Humidity		--	--	95	%RH
Soldering Temperature	Wave-soldering	260 ± 5℃; time: 5 - 10s			
	Manual-welding	360 ± 10℃; time: 3 - 5s			
Power Derating	-40℃ to -20℃	2	--	--	%/℃
	+70℃ to +85℃	2.67	--	--	
	85VAC - 110VAC	0.8	--	--	%/VAC
	277VAC - 305VAC	1.1	--	--	
Safety Standard		BS EN62368-1/EN62368-1 (Report) Safety Approval; Design refer to IEC/UL62368-1			
MTBF		MIL-HDBK-217F@25℃ >300,000 h			

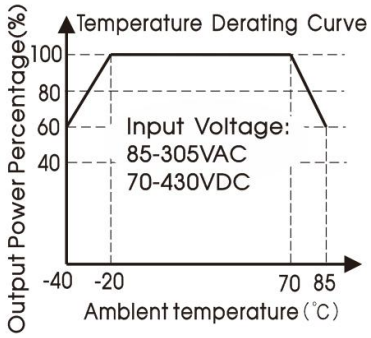
Mechanical Specifications

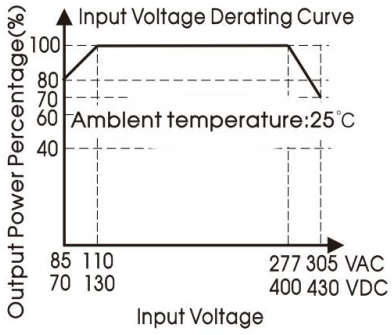
Dimension	16.13 x 15.10 x 9.50 mm
Weight	4.2g (Typ.)
Cooling method	Free air convection

Electromagnetic Compatibility (EMC)

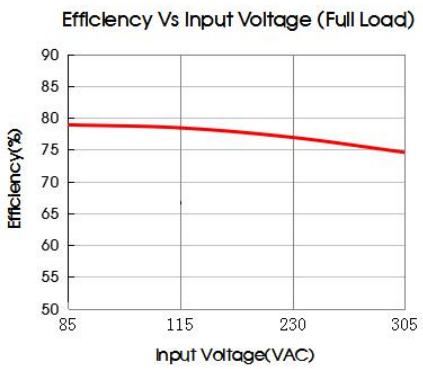
Emissions	CE	CISPR32/EN55032	CLASS A (See Fig. 1 for typical application circuit)	
		CISPR32/EN55032	CLASS B (See Fig. 2 for recommended circuit)	
	RE	CISPR32/EN55032	CLASS A (See Fig. 1 for typical application circuit)	
		CISPR32/EN55032	CLASS B (See Fig. 2 for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2	Contact ± 6KV/Air ± 8KV (See Fig. 1 for typical application circuit)	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m (See Fig. 2 for recommended circuit)	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV (See Fig. 1 for typical application circuit)	perf. Criteria B
		IEC/EN61000-4-4	±4KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±1KV (See Fig. 1 for typical application circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s (See Fig. 2 for recommended circuit)	perf. Criteria A
	Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11	0%, 70% (See Fig. 2 for recommended circuit)	perf. Criteria B

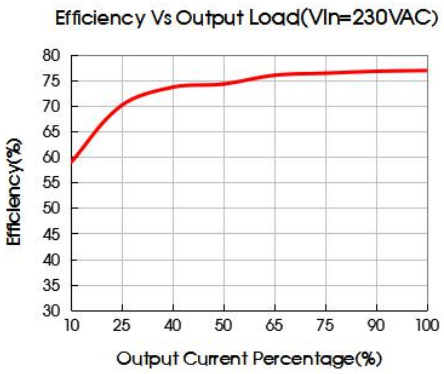
Product Characteristic Curve





Note:
① With an AC input between 85 - 110VAC/277- 305VAC and a DC input between 70 - 130VDC/400 - 430VDC, the output power must be derated as per temperature derating curves;
② This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.





Design Reference

1. Typical application

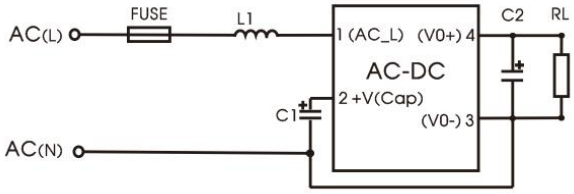


Fig. 1

Part No.	FUSE(required)	C1(required)	C2(required)	L1(required)
LS03-K3B12SS	1A/300V	10uF/400V: 165-264VAC 10uF/450V: 165-305VAC 22uF/400V: 85-264VAC 22uF/450V: 85-305VAC	220uF/16V	1.2mH

Note:
C1 is used as filter capacitor(required), if the surge immunity index is to be met, the C1 capacitor needs to be connected to 22uF;
Output filter: We recommend using an electrolytic capacitor with high frequency, high ripple current and low ESR rating for C2 refer to manufacture's datasheet). Combined with L1, they form a pi-type filter circuit. Choose a Capacitor voltage rating with at least 20% margin, in other words not exceeding 80%.

2. EMC compliance recommended circuit

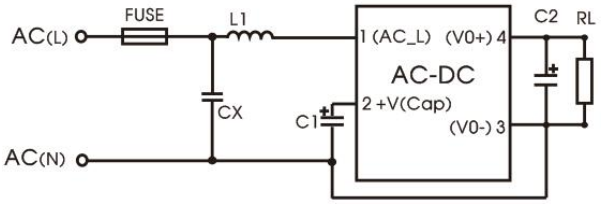


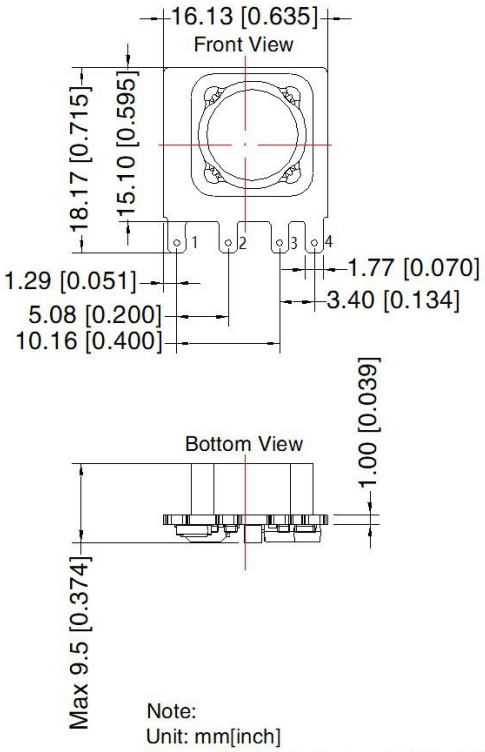
Fig. 2

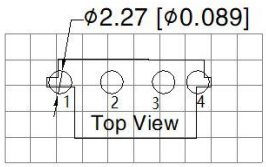
Components	Recommend Parameter
CX	0.1μF/310VAC
L1	1.2mH
FUSE (required)	1A/300V, slow-blow, required
C1 (required)	10uF/400V: 165-264VAC 10uF/450V: 165-305VAC 22uF/400V: 85-264VAC 22uF/450V: 85-305VAC
C2 (required)	220uF/16V

3. For additional information please refer to application notes on www.mornsun-power.com.

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





Note: Grid: 2.54*2.54mm

Pin-Out	
Pin	Function
1	AC(L)
2	+V(CAP)
3	AC(N)/-Vo
4	+Vo

Note:
Unit: mm[inch]
Pin section tolerances: ±0.10[±0.004]
General tolerances: ±1.0[±0.04]
The layout of the device is for reference only, please refer to the actual product

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220098;
2. External electrolytic capacitors are required to modules, more details refer to typical applications;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%, nominal input voltage (115VAC and 230VAC) and rated output load;
4. In order to improve the efficiency at light load, there will be audible noise generated, but it does not affect product performance and reliability.
5. The module needs to be glued and fixed after assembly.
6. All index testing methods in this datasheet are based on our company corporate standards;
7. We can provide product customization service, please contact our technicians directly for specific information;
8. Products are related to laws and regulations: see "Features" and "EMC";
9. If product involves multi-brand materials and there are differences in color etc, please refer to the standards of each manufacturer;
10. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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