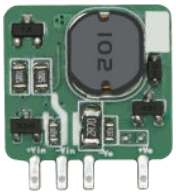
DC/DC Converter

LSF01-K5BxxSS Series

MORNSUN®

1W, Single-wire converter



Report EN62368-1 BS EN 62368-1 RoHS

FEATURES

- Ultra-wide input voltage range: 85-264VAC/8(15/35)-380VDC
- Operating ambient temperature range: -25℃ to +85℃
- Ultra-low static current
- Compact size
- Safety according to UL62368

LSF01-K5BxxSS series is regulated single-wire converters with an ultra-low DC input of 85-264VAC/8(15/35)-380VDC. The products feature high reliability. It can be widely used in areas of single-wire smart home with extremely demanding on power consumption requirements, non-isolated power supply products, and replace low-efficiency resistance-capacitance step-down power supply circuits (such as white goods, smart meters, automation instrument power), and standby power for appliances with low power consumption requirements (such as ultra-low power standby power for green and energy-saving appliances), etc. The converters provide stable operating voltage for the load. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

Selection Guide

Certification	Model	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 230VAC (%) Typ.
EN/UKCA	LSF01-K5B05SS	0.625W	5.5V/114mA	50
	LSF01-K5B12SS	1W	12.5V/83mA	58
EN	LSF01-K5B24SS	1W	24.5V/42mA	60
Caution: this series is non-isolated power supply and there is no insulation protection at the input and output, please beware of electric shock!				

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	LSF01-K5BxxSS	85	--	264	VAC
	DC input	LSF01-K5B05SS	8	--	380	VDC
		LSF01-K5B12SS	15	--	380	
		LSF01-K5B24SS	35	--	380	
Input Current	115VAC		--	--	0.10	A
	230VAC		--	--	0.05	
Input Frequency			50	--	60	Hz
External Input Fuse			1A/250V, slow-blow, required			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Vo	LSF01-K5B05SS	4.9	--	6.5	V
	Vo	LSF01-K5B12SS	11.5	--	13.5	
	Vo	LSF01-K5B24SS	22.0	--	28.0	
Stand-by Power Consumption	230VAC		--	--	5.2	mW
Minimum Load			0	--	--	%

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Operating Temperature		-25	--	+85	℃
Storage Temperature		-40	--	+85	
Soldering Temperature	Wave-soldering	260 ± 5℃; time: 5 - 10s			
	Manual-welding	360 ± 10℃; time: 3 - 5s			

Power Derating	-25℃ to -10℃	LSF01-K5B05SS	3.33	--	--	%/℃
	+70℃ to +85℃		3.33	--	--	
	-25℃ to -10℃	LSF01-K5B12SS	1.00	--	--	
	+70℃ to +85℃		3.33	--	--	
	-25℃ to -10℃	LSF01-K5B24SS	0	--	--	
	+70℃ to +85℃		3.33	--	--	
	85-264VAC	LSF01-K5B05SS	0	--	--	%/VAC
	30-80VDC		1.36	--	--	%/VDC
	10-30VDC		0	--	--	
	8-10VDC		25	--	--	
	85-264VAC	LSF01-K5B12SS	0	--	--	%/VAC
	15-30VDC		4	--	--	%/VDC
	85-264VAC	LSF01-K5B24SS	0	--	--	%/VAC
	35-380VDC		0	--	--	%/VDC
Safety Standard	LSF01-K5B05/12SS		EN62368-1, BS EN 62368-1 (Report); Design refer to UL62368-1			
	LSF01-K5B24SS		EN62368-1 (Report); Design refer to UL62368-1, BS EN 62368-1			
MTBF			MIL-HDBK-217F@25℃ ≥300,000 h			

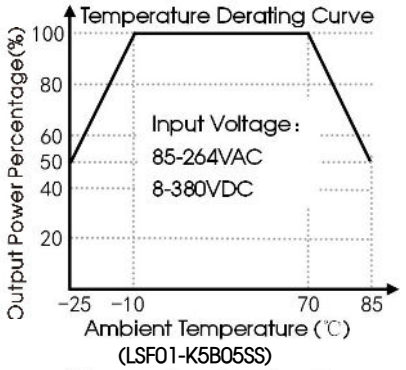
Mechanical Specifications

Package Dimensions	15.70 x 9.00 x 14.50mm
Weight	1.90g (Typ.)
Cooling method	Free air convection

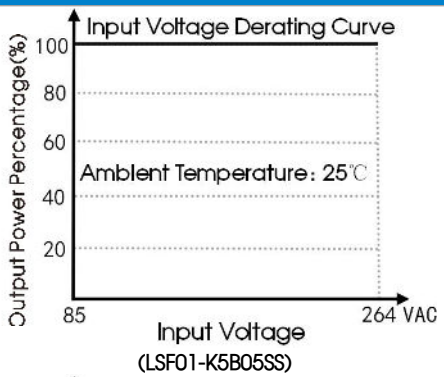
Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B (See Fig. 1 for typical application circuit)	
	RE	CISPR32/EN55032	CLASS B (See Fig. 1 for typical application circuit)	
Immunity	Surge	IEC/EN61000-4-5	line to line ±1KV (See Fig. 1 for typical application circuit)	Perf. Criteria B

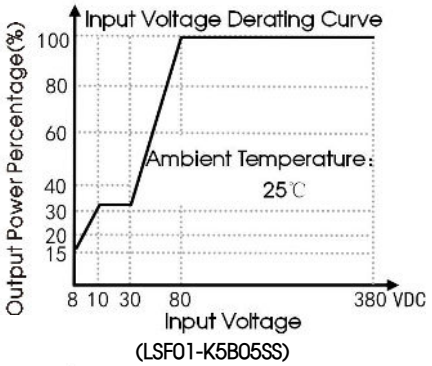
Product Characteristic Curve



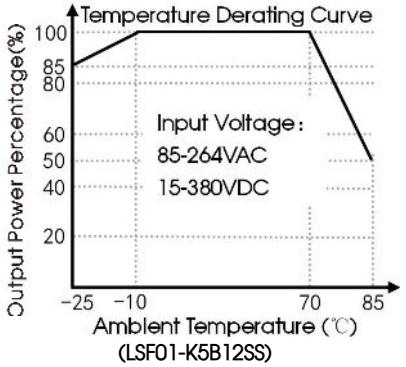
(LSF01-K5B05SS)



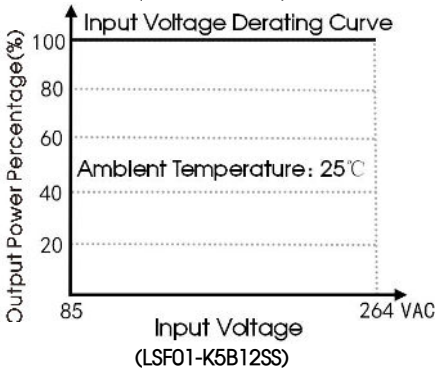
(LSF01-K5B05SS)



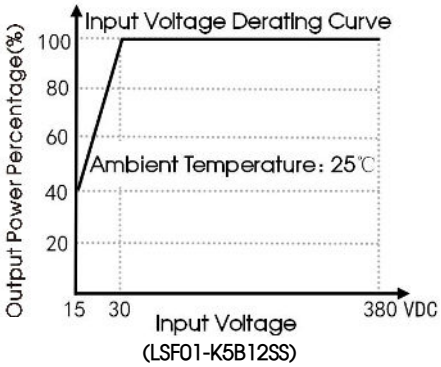
(LSF01-K5B05SS)



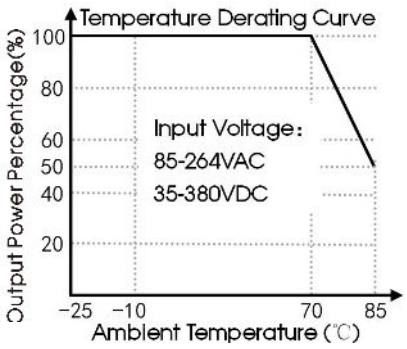
(LSF01-K5B12SS)



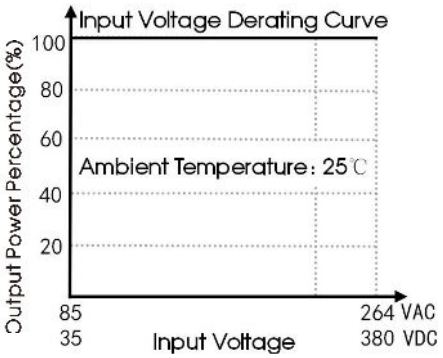
(LSF01-K5B12SS)



(LSF01-K5B12SS)

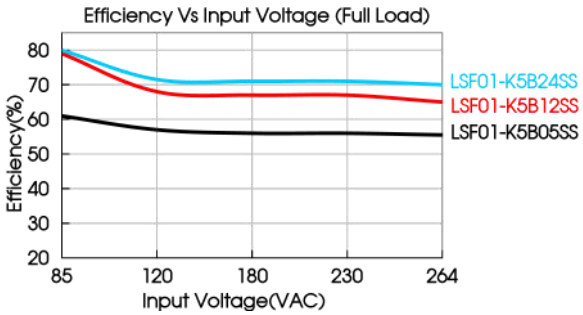


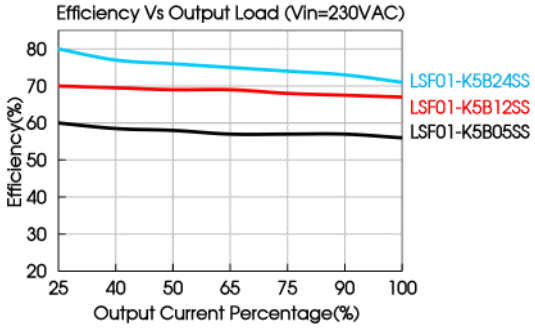
(LSF01-K5B24SS)



(LSF01-K5B24SS)

Note:
① With a DC input between 8-80VDC (LSF01-K5B05SS)/15 - 30VDC (LSF01-K5B12SS), 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 circuit

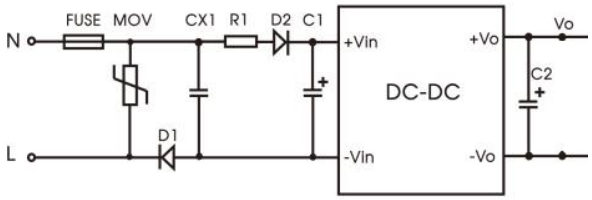


Fig. 1

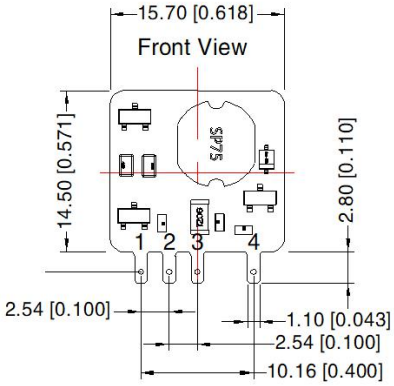
Components	Recommend
FUSE	1A/250VAC, required
D1、D2	1A/1000V
MOV	S10K300
CX1	474K/275VAC
R1	8-120VDC: 24Ω (LSF01-K5B05SS) 15-120VDC:12Ω (LSF01-K5B12SS) 35-120VDC:12Ω (LSF01-K5B24SS) 85-264VAC/120-380VDC: 240Ω
C1	450V/10uF
C2	35V/220uF

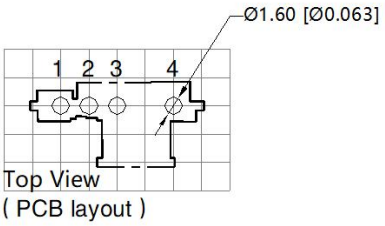
Output Filter Components:
1. CX1 is not necessary if no requirement for emissions, and MOV is not necessary if no requirement for immunity;
2. R1: current-limiting resistor (required), rated power ≥ 3W, which depends on the input voltage range;
3. C1: Input capacitor for rectificating and filtering,the smaller capacitor value can be selected according to actual load requirements;
4. C2: output filter capacitor, 16V/220uF can be selected for LSF01-K5B05SS, LSF01-K5B12SS ;
5. Above for typical application reference. For more applications and materials(relay solutions), please contact MORNSUN FAE;

2. For more information Please find the application notes on www.mornsun-power.com, or contact our technicians to obtain.

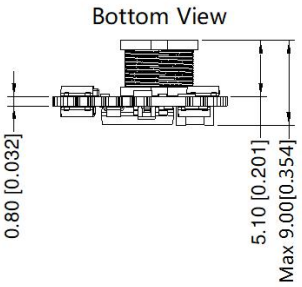
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





Note: Grid 2.54*2.54mm



Pin-Out	
Pin	Mark
1	+Vin
2	–Vin
3	–Vo
4	+Vo

Note:
Unit: mm[inch]
Pin section tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]
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. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75% with nominal input voltage and rated output load; (See Fig. 1/Fig. 2 for typical application circuit)
3. All index testing methods in this data sheet are based on our company corporate standards;
4. The above are the performance indicators of the product models listed in this datasheet. Some indicators of non-standard models will exceed the above requirements. For details, please contact our technical staff.
5. We can provide product customization service;
6. Specifications of this product are subject to changes without prior notice;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. 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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