5W, AC-DC converter

RoHS

FEATURES

- 165 - 264V Universal AC or wide 230 - 370V DC Input
- Operating ambient temperature range: -25℃ to +70℃
- High I/O isolation test voltage of up to 3000VAC
- Regulated output, low ripple & noise
- Output short circuit, over-current protection
- High efficiency, high reliability
- 2 years warranty

LO05-12Bxx series is one of Mornsun's compact size power converter. It features universal AC input and at the same time accepts DC input voltage, high efficiency, high reliability, reinforced isolation. It offers good EMC performance compliant to IEC/EN61000-4 and CISPR32/EN55032 and meets UL/EN/IEC62368 standards. The converters are widely used in industrial, office and civil applications. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

Selection Guide

Part No.	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 230VAC (%) Typ.	Capacitive Load (μF) Max.
LO05-12B03	3.3W	3.3V/1000mA	66	4000
LO05-12B05	5W	5V/1000mA	73	3400
LO05-12B09		9V/550mA	75	1200
LO05-12B12		12V/420mA	77	1000
LO05-12B15		15V/330mA	77	680
LO05-12B24		24V/210mA	79	270

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	165	--	264	VAC
	DC input	230	--	370	VDC
Input Frequency		47	--	60	Hz
Input Current	165VAC	--	--	125	mA
	230VAC	--	--	80	
Inrush Current	165VAC	--	13	--	A
	230VAC	--	15	--	
Leakage Current	240VAC/50Hz	0.25mA RMS typ.			
Recommended External Input Fuse		1A/250V slow-blow required			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	3.3V output		--	±6	--	%
	Other output		--	±5	--	
Line Regulation	3.3V output	Full load	--	±2.5	--	
	Other output		--	±1.5	--	
Load Regulation	10%-100% Load		--	±3	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)		--	50	150	mV
Stand-by Power Consumption			--	--	0.5	W
Temperature Coefficient			--	±0.02	--	%/°C
Short Circuit Protection			Hiccup, continuous, self-recovery			
Over-current Protection			≥130%Io, self-recovery			
Minimum Load			10	--	--	%

Hold-up Time	165VAC input	--	5	--	ms
	230VAC input	--	10	--	
Note: *The "Tip and barrel 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
Isolation Test	Input-output	Electric Strength Test for 1min., leakage current <5mA	3000	--	--	VAC
Operating Temperature			-25	--	+70	℃
Storage Temperature			-40	--	+85	
Storage Humidity			--	--	90	%RH
Soldering Temperature		Wave-soldering	260 ± 5℃; time: 5 - 10s			
		Manual-welding	360 ± 10℃; time: 3 - 5s			
Switching Frequency			--	65	--	kHz
Power Derating		-25℃ to -10℃	1.0	--	--	%/℃
		+50℃ to +70℃	3.0	--	--	
Safety Standard			UL62368/EN62368/IEC62368			
Safety Class			CLASS Ⅱ			
MTBF			MIL-HDBK-217F@25°C > 300,000 h			

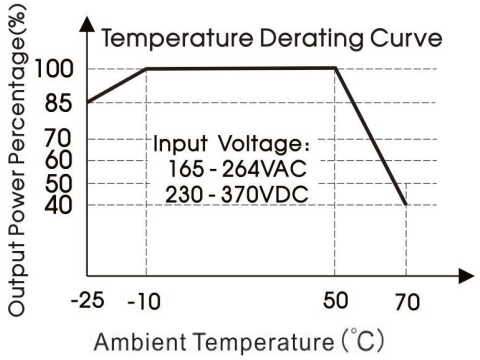
Mechanical Specifications

Dimension	42.00 x 16.00 x 17.00 mm
Weight	9g(Typ.)
Cooling method	Free air convection

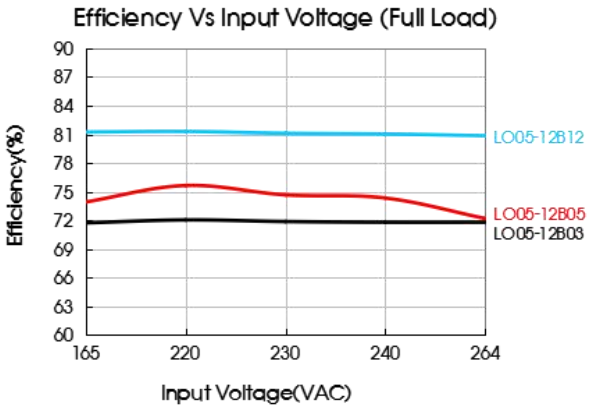
Electromagnetic Compatibility (EMC)

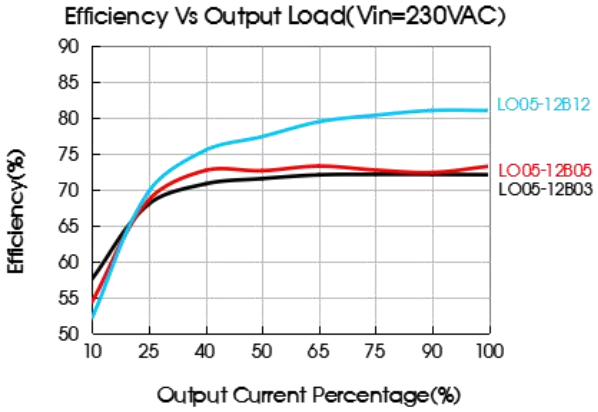
Emissions	CE	CISPR32/EN55032	CLASS A	
		CISPR32/EN55032	CLASS B (See Fig. 2 for recommended circuit)	
	RE	CISPR32/EN55032	CLASS A	
		CISPR32/EN55032	CLASS B (See Fig. 2 for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2	Contact ±6 KV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m (See Fig. 2 for recommended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

Product Characteristic Curve



Note: ①This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.





Design Reference

1. Typical application

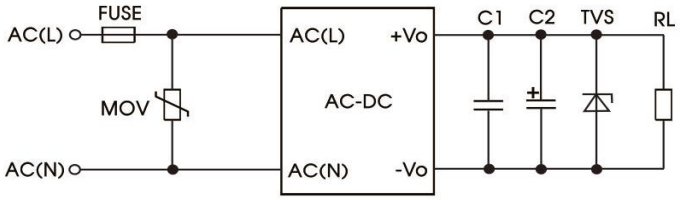


Fig. 1: Typical circuit diagram

Part no.	C1(μF)	C2(μF)	FUSE	MOV	TVS
LO05-12B03	1	150	1A/250V slow-blow required	S14K300	SMBJ7.0A
LO05-12B05		150			SMBJ7.0A
LO05-12B09		120			SMBJ12A
LO05-12B12		120			SMBJ20A
LO05-12B15		120			SMBJ20A
LO05-12B24		68			SMBJ30A

Output Filter Components:
We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2 (refer to manufacture's datasheet). Choose a capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C1 is a ceramic capacitor used for filtering high-frequency noise and TVS is a recommended suppressor diode to protect the application in case of a converter failure.

2. EMC compliance recommended circuit

Mornsun P/N: FC-LX1D

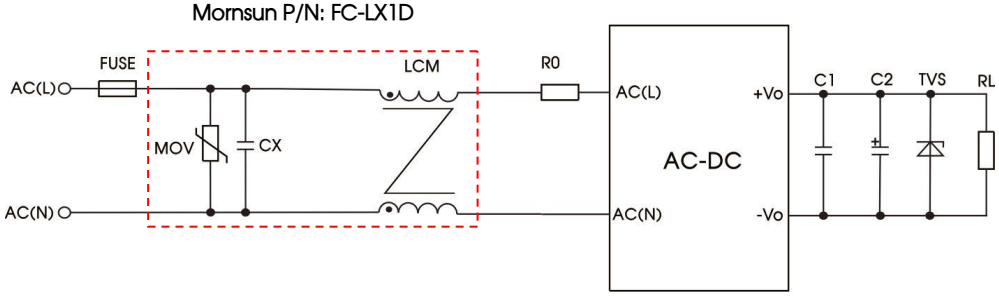


Fig. 2: EMC application circuit with higher requirements

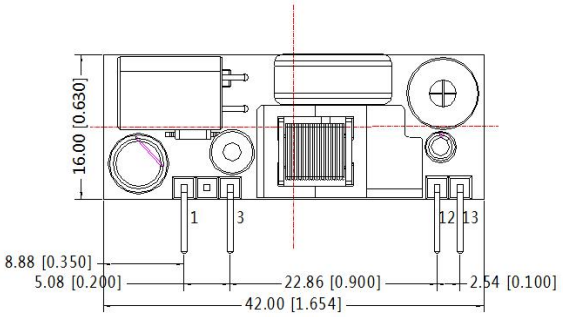
Component	Recommended value
MOV	S14K300
CX	0.1μF/275VAC
LCM	10mH, we recommend using part no. FL2D-Z5-103 (MORNSUN)
FUSE	2A/250V slow-blow required
R0	33Ω/3W

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

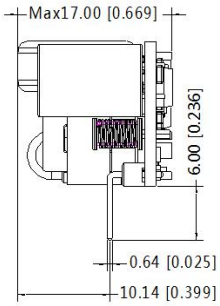
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION

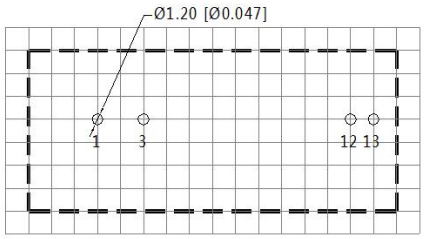
Front View



Right View



Note:
Unit: mm[inch]
Connect pin size: □0.64[0.025]
Pin section tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]



Note: Grid 2.54*2.54mm

Pin-Out			
Pin	Function	Pin	Function
1	AC(N)	12	+Vo
3	AC(L)	13	-Vo

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220058;
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;
3. All index testing methods in this datasheet are based on our company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. 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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