

5W, AC/DC converter



UL US CE RoHS

FEATURES

- Universal input: 85~264VAC/100~370VDC
- AC and DC dual-use(input from the same terminal)
- High efficiency, high power density
- Output short circuit, over-current, over-voltage protection
- EN60601-1, ANSI/AAMI ES60601-1 approval (2xMOPP)

LD05-20BxxMU series is a compact size power converter offered by Mornsun. It features universal input voltage, taking both DC and AC input voltage, low power consumption, high efficiency, high reliability, safer isolation. It offers good EMC performance, and widely used in medical, industrial, instruments, telecommunication and civil applications. For harsh EMC environment, the application circuit in the datasheet is strongly recommended.

Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency (230VAC, %/Typ.)	Max. Capacitive Load*(μ F)
UL/CE	LD05-20B05MU	5 W	5V/1000mA	76	4000
	LD05-20B12MU		12V/420mA	80	820
	LD05-20B15MU		15V/333mA	81	820
	LD05-20B24MU	5.5 W	24V/230mA	81	330

Note: *Test without external circuit.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	264	VAC
	DC input	100	--	370	VDC
Input frequency		47	--	63	Hz
Input current	115VAC	--	--	0.12	A
	230VAC	--	--	0.07	
Inrush current	115VAC	--	10	--	A
	230VAC	--	20	--	
Leakage Current	264VAC	--	--	80	μ A
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	± 2	--	%
Line Regulation	Full load	--	± 0.5	--	
Load Regulation	10%-100% load	--	± 1	--	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	50	100	mV
Temperature Coefficient		--	± 0.02	--	%/ $^{\circ}$ C
Stand-by Power Consumption		--	--	0.3	W
Short Circuit Protection		Continuous, self-recovery			
Over-current Protection		110%Io~280%Io self-recovery			
Over-voltage Protection	LD05-20B05MU	--	--	7.5	V
	LD05-20B12MU	--	--	16	
	LD05-20B15MU	--	--	20	
	LD05-20B24MU	--	--	30	

Min. Load		0	--	--	%
Hold-up Time	115VAC input	--	10	--	ms
	230VAC input	--	80	--	

Note: * Ripple and noise are measured by "parallel cable" method, please see AC-DC Converter Application Notes for specific operation.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output Test time: 1min	4000	--	--	VAC
Operating Temperature		-25	--	+70	°C
Storage Temperature		-40	--	+85	
Max. Casing Temperature		--	--	+95	
Storage Humidity		--	--	95	%RH
Welding Temperature	Wave-soldering	260±5°C; time:5~10s			
	Manual-welding	360±10°C; time:3~5s			
Switching Frequency		--	--	140	kHz
Power Derating	-25°C~0°C	1	--	--	%/°C
	+55°C~+70°C	2	--	--	%/°C
Safety Standard		EN60601/UL60601			
Safety Certification		EN60601/UL60601			
Safety Class		CLASS II			
Insulation Level	First side-Second side	2xMOPP			
MTBF		MIL-HDBK-217F@25°C >300,000 h			

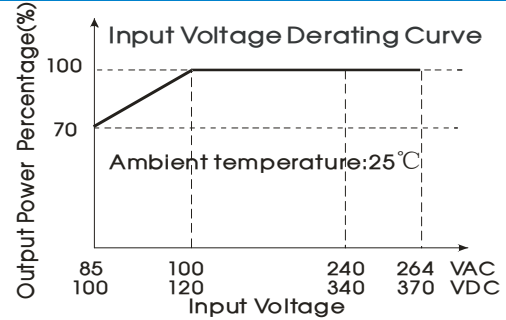
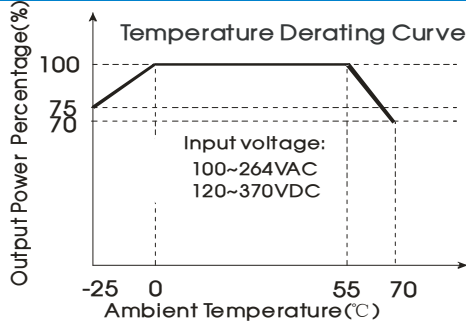
Physical Specifications

Casing Material	Black flame-retardant and heat-resistant plastic (UL94-V0)
Package Dimensions	53.80*28.80*19.00 mm
Weight	43.0 g(Typ.)
Cooling method	Free air convection

EMC Specifications

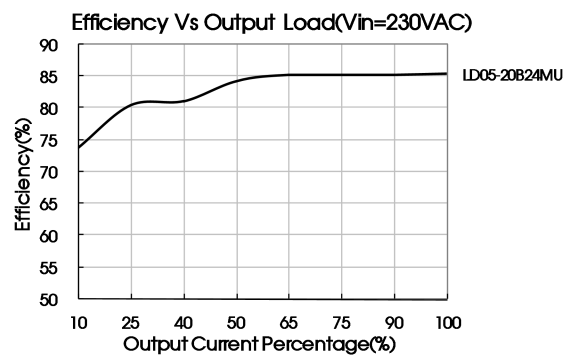
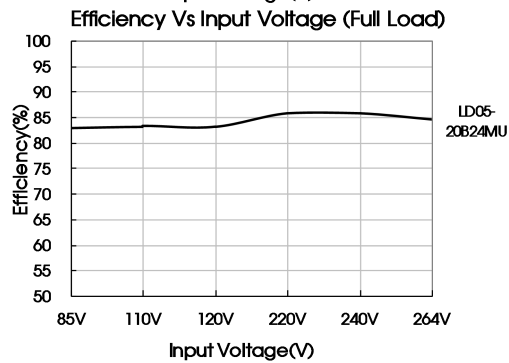
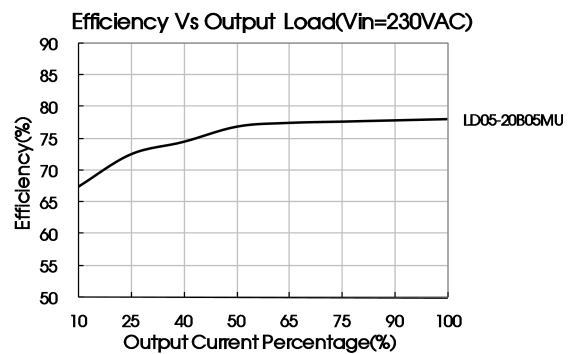
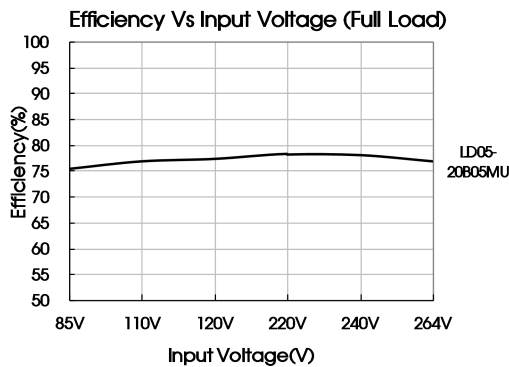
EMI				
EMI	CE	CISPR11/EN55011 CLASS B		
	RE	CISPR11/EN55011 CLASS B		
EMS	ESD	IEC/EN61000-4-2	Contact±6KV/Air±8KV Perf. Criteria B	
	RS	IEC/EN61000-4-3	10V/m perf. Criteria A	
	EFT	IEC/EN61000-4-4	±2KV	perf. Criteria B
		IEC/EN61000-4-4	±4KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	±1KV	perf. Criteria B
		IEC/EN61000-4-5	±2KV/±4KV (See Fig. 2 for recommended circuit)	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 interruptions and voltage variations immunity	IEC/EN61000-4-11	0%-70% perf. Criteria B	

Product Characteristic Curve



Note: ①Input voltage should be derated based on temperature derating when it is 85~100VAC/100~120VDC;

②This product is suitable for use in natural air cooling environments, if in a closed environment, please contact our company's FAE.



Design Reference

1. Typical application circuit

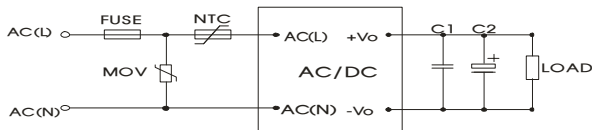


Fig. 1: Typical application circuit

Model	C1(μF)	C2(μF)
LD05-20B05MU	1	220
LD05-20B12MU		100
LD05-20B15MU		100
LD05-20B24MU		47

Note:
Output filtering capacitor C2 is electrolytic capacitor, it is recommended to apply electrolytic capacitor with high frequency and low resistance. For capacitance and current of capacitor please refer to manufacture's datasheet. Capacitance withstand voltage derating should be 80% or above. C1 is ceramic capacitor, which is used to filter high-frequency noise. External input NTC is recommended to use 5D-9. External input MOV is recommended to use S14K300. External input FUSE is recommended to use 2A/250V,slow fusing.

2. EMC solution-recommended circuit

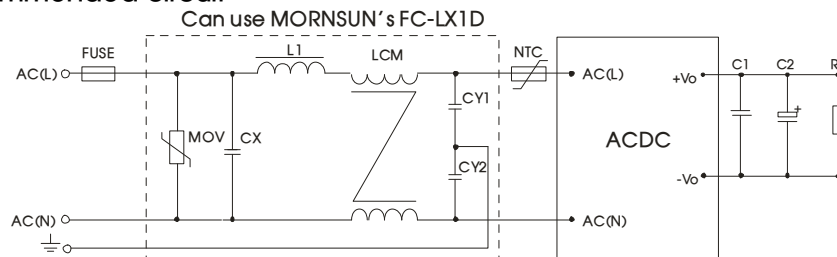
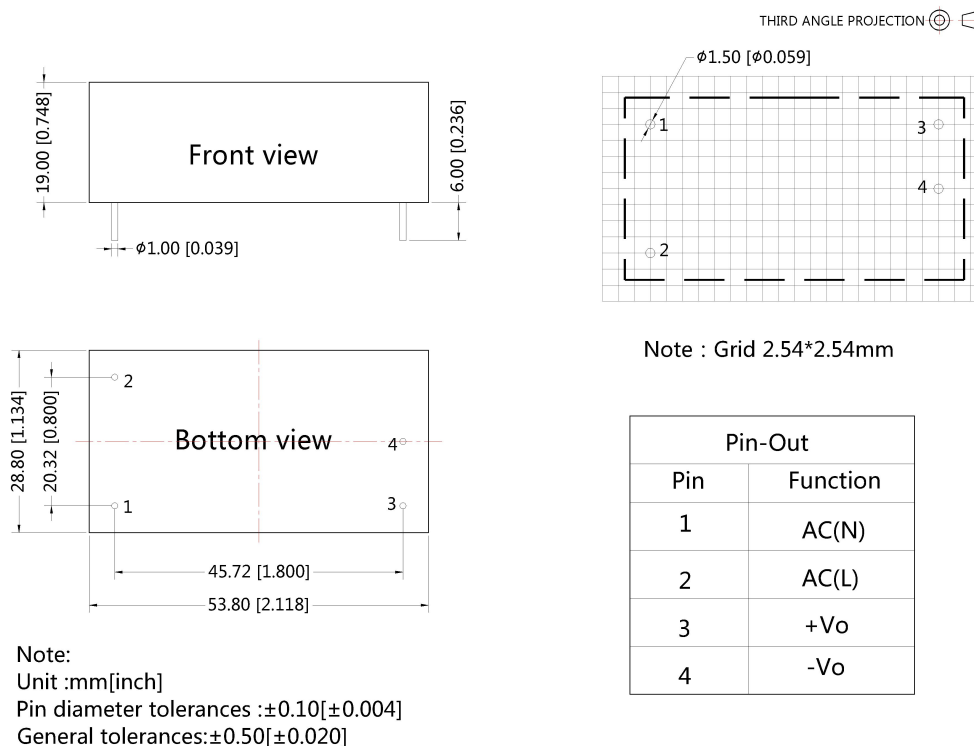


Fig 2: EMC Recommended circuit with high requirements

Element model	Recommended value
MOV	S14K300
CX	0.1 μ F/275VAC
L1	4.7 μ H/2.0A
CY1	1nF/400VAC
CY2	1nF /400VAC
NTC	5D-9
LCM	2.2mH, recommended to use MORNSUN's FL2D-10-222
FUSE	2A/250V, slow fusing, necessary
FC-LX1D	EMC Filter

3. For more information please find application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Note:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58220005;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25 °C, humidity<75% with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our Company's corporate standards;
5. The performance parameters of the product models listed in this manual are as above, but some parameters of non-standard model products may exceed the requirements mentioned above. Please contact our technicians directly for specific information;
6. We can provide product customization service;
7. Specifications are subject to change without prior notice.

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