3W, AC-DC converter

3 years Warranty

cULus CE CB RoHS

FEATURES

- Universal Input : 85 - 264VAC/100 - 370VDC
- Operating temperature range: -40℃ to +70℃
- High isolation voltage up to 4K VAC
- Regulated output, Low ripple & noise
- Output short circuit, over-current, over-voltage protection
- High efficiency, high reliability
- Plastic case, meets UL94V-0
- EMI performance meets CISPR32 / EN55032 CLASS B
- IEC62368, UL62368, EN62368 approval

LD03-10BxxR2 ---- 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, Safety specifications meet the international IEC62368、UL62368 and EN62368 standards, and widely used in medical treatment, industrial, electricity, instruments, telecommunication and civil applications. For harsh EMC environment, the application circuit in the datasheet is strongly recommended.

Selection Guide

Certification	Model	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency (230VAC/%,Typ.)	Max. Capacitive Load (uF)
UL/CE/CB	LD03-10B03R2	2.3W	3.3V/700mA	66	6000
	LD03-10B05R2	3W	5V/600mA	74	6000
	LD03-10B09R2		9V/330mA	75	1500
	LD03-10B12R2		12V/250mA	77	1500
	LD03-10B15R2		15V/200mA	77	1000
	LD03-10B24R2		24V/125mA	78	330

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	110VAC	--	65	80	mA
	230VAC	--	30	45	
Inrush current	110VAC	--	10	--	A
	230VAC	--	20	--	
Leakage current		0.1mA RMS typ. 230VAC/50Hz			
Recommended External Input Fuse		1A/250V, slow fusing			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	3.3V output	--	±3	--	%
	Others	--	±2	--	
Line Regulation	Full load	--	±0.5	--	
Load Regulation	10%-100% load	--	±1	--	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	50	100	mV
Temperature Drift Coefficient		--	±0.02	--	%/°C
Stand-by Power Consumption		--	0.45	--	W
Short Circuit Protection		Continuous, self-recovery			
Over-current Protection		≥110%Io self-recovery			
Over-voltage Protection	3.3/5VDC output	≤7.5VDC			
	9VDC output	≤12VDC			

Over-voltage Protection	12/15VDC output	≤20VDC				
	24VDC output	≤30VDC				
Min. Load		0	--	--	%	
Power-off Holding Time	230VAC input	--	50	--	ms	
Note: *Parallel line test method is adopted to test the ripple and noise, please see *AC-DC Converter Application Notes* for specific operation methods.						

General Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	Test time: 1min(leakage current setting value:5 mA)	4000	--	--	VAC
Operating Temperature			-40	--	+70	℃
Storage Temperature			-40	--	+105	
Case Temperature			--	--	+95	
Storage Humidity			--	--	95	%RH
Welding Temperature		Wave-soldering	260 ± 5℃; time: 5 - 10s			
		Manual-welding	360 ± 10℃; time: 3 - 5s			
Switching Frequency			--	115	--	kHz
Power Derating		-40℃ to -25℃	1.0	--	--	%/℃
		+55℃ to +70℃	1.0	--	--	
Safety Standard			IEC62368/EN62368/UL62368			
Safety-regulated Certification			IEC62368/EN62368/UL62368			
Safety Class			CLASS Ⅱ			
MTBF			MIL-HDBK-217F@25°C > 300,000 h			

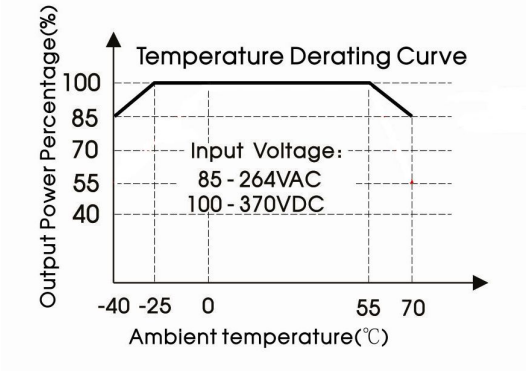
Physical Specifications

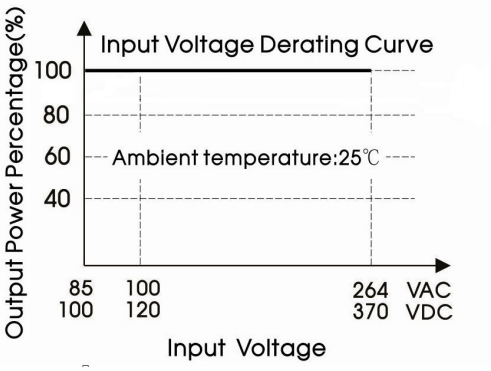
Casing Material	Black flame-retardant and heat-resistant plastic (UL94 V-0)
Package Dimensions	37.00*24.50*18.00 mm
Weight	25g(Typ.)
Cooling method	Free air convection

EMC Specifications

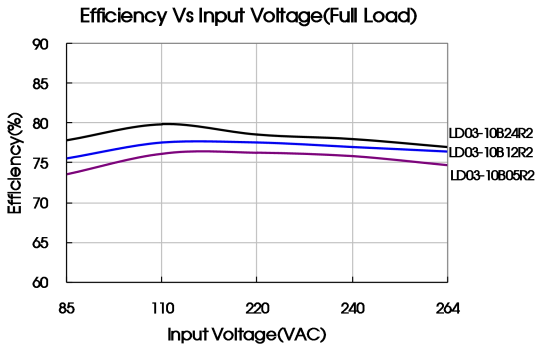
EMI	CE	CISPR32/EN55032	CLASS A	
		CISPR32/EN55032	CLASS B (See Fig. 2 for recommended circuit)	
	RE	CISPR32/EN55032	CLASS A	
		CISPR32/EN55032	CLASS B (See Fig. 2 for recommended circuit)	
EMS	ESD	IEC/EN61000-4-2	Contact ±6 KV/Air ±8 KV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	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 ±1 KV (See Fig. 1 for typical application circuit)	perf. Criteria B
		IEC/EN61000-4-5	line to line ±2 KV/line to line ±4 KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.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

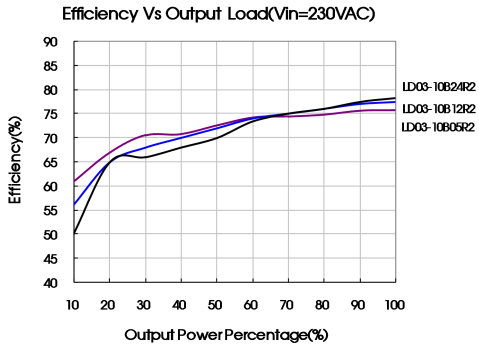
Product Characteristic Curve





Note:
①This 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

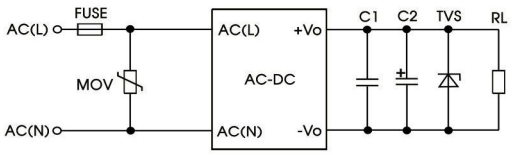


Fig. 1: Typical application circuit

Model	C1(μF)	C2(μF)	FUSE	MOV	TVS tube
LD03-10B03R2	1	150	1A/250V, slow fusing, necessary	S14K350	SMBJ7.0A
LD03-10B05R2		150			SMBJ7.0A
LD03-10B09R2		120			SMBJ12A
LD03-10B12R2		120			SMBJ20A
LD03-10B15R2		120			SMBJ20A
LD03-10B24R2		68			SMBJ30A

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. Capacitor voltage reduced to at least 80%. C1 is ceramic capacitor, which is used to filter high-frequency noise. TVS is a recommended component to protect post-circuits if converter fails.

2. EMC solution-recommended circuit

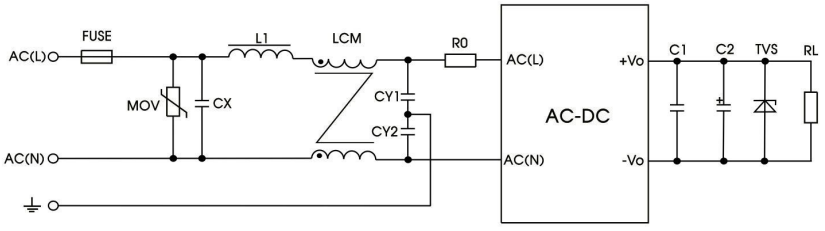
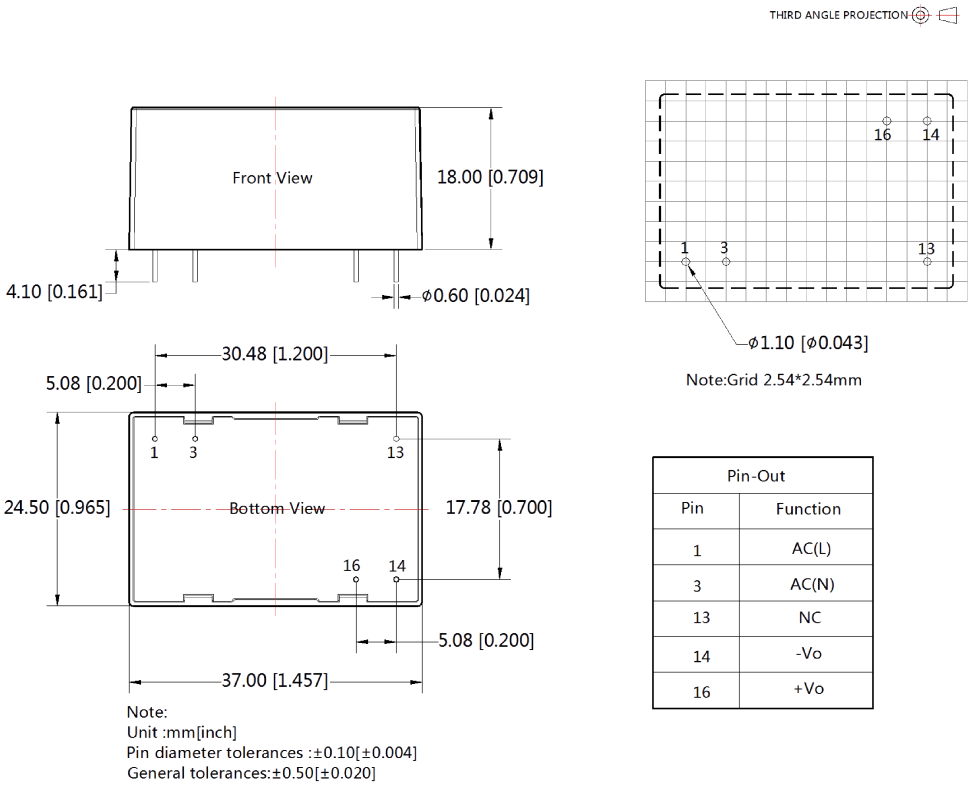


Fig 2: EMC application circuit with higher requirements

Element model	Recommended value
MOV	S14K350
CX	0.1μF/275VAC
L1	330uH/2.0A
LCM	10mH - 30mH,recommended to use MORNSUN's FL2D-Z5-103
CY1	1nF/400VAC
CY2	1nF/400VAC
FUSE	2A/250V, slow fusing, necessary
R0	33Ω/3W

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

Dimensions and Recommended Layout



Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]

Pin-Out	
Pin	Function
1	AC(L)
3	AC(N)
13	NC
14	-Vo
16	+Vo

Note:
1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58200055;
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's 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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