3W/5W, AC-DC converter

CE Report EN62368-1 | CB IEC62368-1 | UKCA BS EN 62368-1 | RoHS | 3 years Warranty

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
- Design to meet UL62368

LDE03/05-20Bxx Series---- a compact size power converter offered by Mornsun. It features universal input voltage, taking both DC and AC input voltage, low power consumption, high reliability, safer isolation. 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 (230VAC/%, Typ.)	Max. Capacitive Load (uF)
IEC/EN	LD03-20B03-C	2.3W	3.3V/700mA	65	6000
	LD03-20B05-C	3W	5V/600mA	72	6000
	LD03-20B09-C		9V/330mA	74	1500
	LD03-20B12-C		12V/250mA	75	1500
	LD03-20B15-C		15V/200mA	75	1000
	LD03-20B24-C		24V/125mA	77	330
	LD05-20B03-C	3.3W	3.3V/1000mA	67	5000
	LD05-20B05-C	5W	5V/1000mA	74	5000
	LD05-20B09-C		9V/560mA	76	1200
	LD05-20B12-C		12V/420mA	78	1200
	LD05-20B15-C		15V/330mA	78	1000
	LD05-20B24-C		24V/210mA	80	330

Note: The product picture is for reference only. For details, please refer to the actual product.

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	LD03	115VAC	--	--	80	mA
		230VAC	--	--	50	
	LD05	115VAC	--	--	130	
		230VAC	--	--	80	
Inrush current	115VAC		--	10	--	A
	230VAC		--	20	--	
Leakage current	230VAC/50Hz		0.1mA 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	--	±3	--	%
	Others	--	±2	--	
Line Regulation	Full load	--	±0.5	--	

Load Regulation	0%-100% load		--	±1	--	
Ripple & Noise*	20MHz bandwidth (peak-peak value)		--	50	100	mV
Temperature Drift Coefficient			--	±0.02	--	%/°C
Short Circuit Protection			Continuous, self-recovery			
Over-current Protection	LD03		⩾150% Io self-recovery			
	LD05		⩾120% Io self-recovery			
Over-voltage Protection	3.3/5VDC output		⩽7.5VDC			
	9VDC output		⩽15VDC			
Over-voltage Protection	12/15VDC output		⩽20VDC			
	24VDC output		⩽30VDC			
Min. Load			0	--	--	%
Power-off Holding Time	LD03	115VAC input	--	10	--	ms
		230VAC input	--	60	--	
	LD05	115VAC input	--	5	--	
		230VAC input	--	50	--	

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
Isolation Voltage	Input-output	Test time: 1min(leakage current setting value:5 mA)		4000	--	--	VAC
Operating Temperature				-40	--	+70	°C
Storage Temperature				-40	--	+105	
Storage Humidity				--	--	95	%RH
Welding Temperature		Wave-soldering		260 ± 5℃; time: 5 - 10s			
		Manual-welding		360 ± 10℃; time: 3 - 5s			
Switching Frequency				--	100	--	kHz
Power Derating		LD03	-40℃ to -25℃	1.0	--	--	%/°C
			+55℃ to +70℃	1.0	--	--	
		LD05	-40℃ to 0℃	1.13	--	--	
			+55℃ to +70℃	3.0	--	--	
		LD05	85 - 100VAC	1.0	--	--	%/VAC
Safety Standard				IEC/EN/BS EN62368-1 safety approved; Design refer to UL62368-1			
Safety Class				CLASS Ⅱ			
MTBF				MIL-HDBK-217F@25°C > 300,000 h			

Physical Specifications

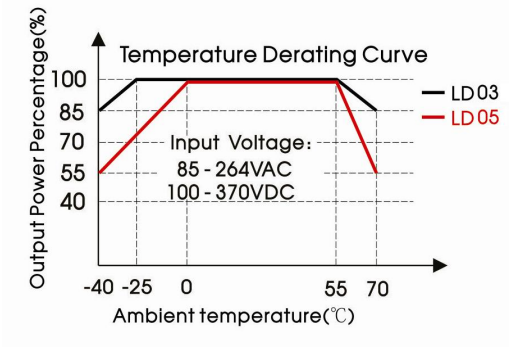
Casing Material	Black flame-retardant and heat-resistant plastic (UL94V-0)
Package Dimensions	37.00x 24.50x18.00 mm
Weight	25g (Typ.)
Cooling method	Free air convection

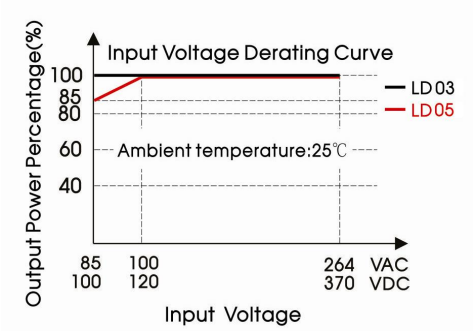
EMC Specifications

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

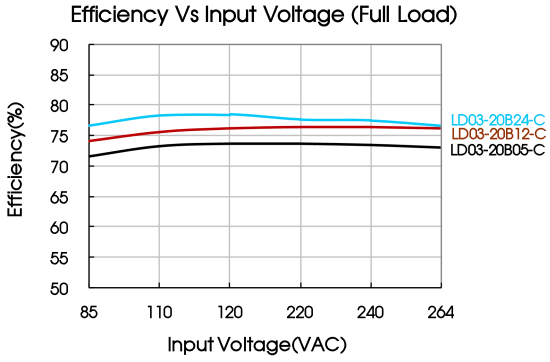
		IEC/EN61000-4-4	± 4KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±1 KV (See Fig. 1 for typical application circuit)	perf. Criteria B
		IEC/EN61000-4-5	line to line ±2 KV/line to ground ±4 KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s	perf. Criteria A
	Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11	0%, 70%	perf. Criteria B

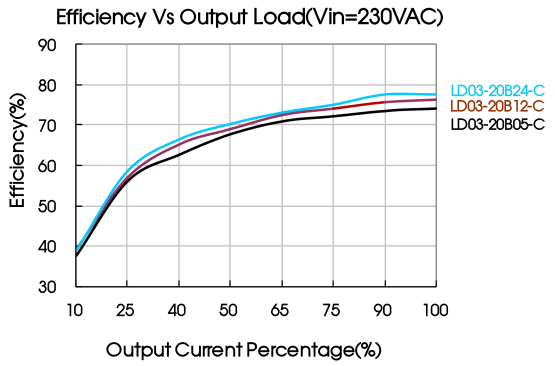
Product Characteristic Curve

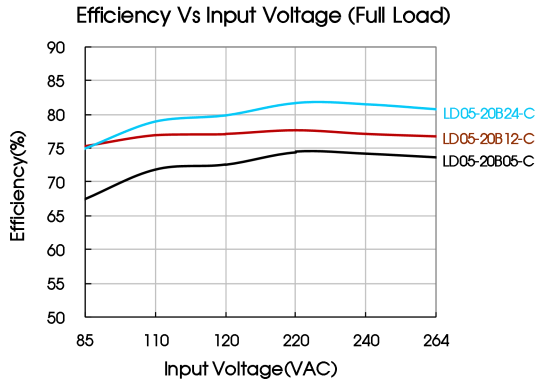


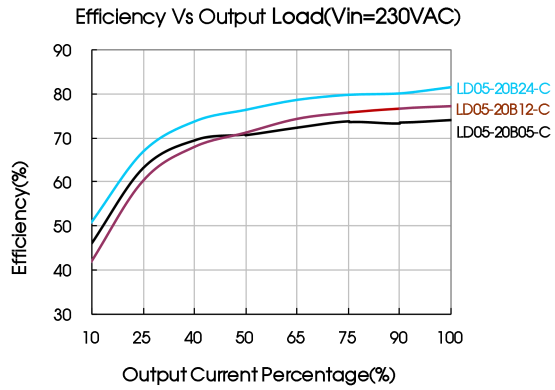


Note: ① With an AC input between 85-100VAC and a DC input between 100-120VDC, the output power must be derated as per temperature derating curves;
② This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.









Design Reference

1. Typical application circuit

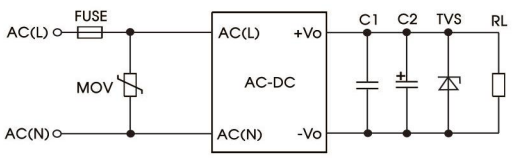


Fig. 1: Typical application circuit

Model	C1(μF)	C2(μF)	FUSE	MOV	TVS tube
LD03/05-20B03-C	1	150	1A/250V, slow fusing, necessary	S14K350	SMBJ7.0A
LD03/05-20B05-C		150			SMBJ7.0A
LD03/05-20B09-C		120			SMBJ12A
LD03/05-20B12-C		120			SMBJ20A
LD03/05-20B15-C		120			SMBJ20A
LD03/05-20B24-C		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

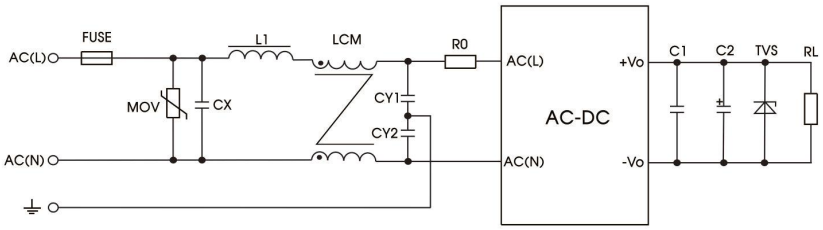


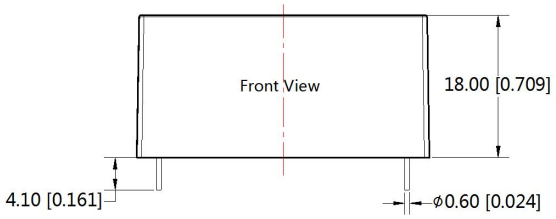
Fig 2: EMC application circuit with higher requirements

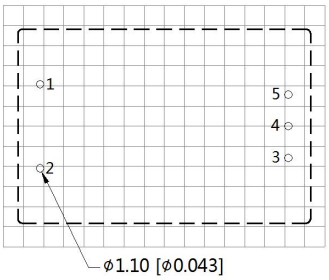
Element model	Recommended value
MOV	S14K350
CX	0.1μF/275VAC
L1	330uH/2.0A
LCM	10mH - 30mH, P/N:FL2D-Z5-103(MORNSUN) is recommended
CY1	1nF/400VAC
CY2	1nF/400VAC
FUSE	2A/250V, slow-blow, required
R0	33Ω/3W

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

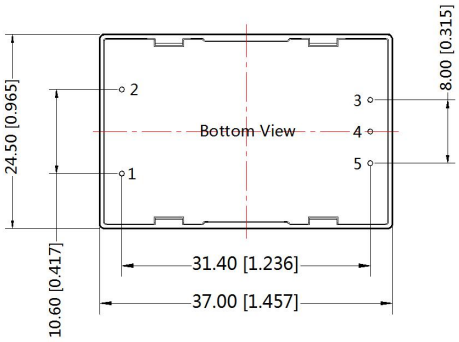
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





Note:Grid 2.54*2.54mm



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

Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	+Vo
4	No pin
5	-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.

Mornsun Guangzhou Science & Technology Co., Ltd.
Address: No. 8 Nanyun 4th Road, Huangpu District, Guangzhou, China
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com