

10W, AC/DC converter



UL US CE CB RoHS

FEATURES

- Universal Input : 85 - 264VAC/100 - 370VDC
- Operating temperature range: -40°C to +70°C
- 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
- EMC performance meets CISPR32 / EN55032 CLASS B
- Meets IEC62368, UL62368, EN62368, EN60335 standards (Pending)

LDE10-20Bxx 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, meets IEC/EN61000-4, CISPR32/EN55032, UL62368, EN62368, EN60335, IEC62368 standards, and widely used in industrial, medical, electricity, instruments, telecommunication and civil applications.

Note: Please refer to Design Reference when module being used in a bad EMC environment.

Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency (230VAC, %/Typ.)	Max. Capacitive Load (µF)
UL/CE/CB (Pending)	LDE10-20B03	6.6W	3.3V/2000mA	71	26400
	LDE10-20B05	10W	5V/2000mA	76	9440
	LDE10-20B09		9V/1100mA	80	3600
	LDE10-20B12		12V/900mA	81	2000
	LDE10-20B15		15V/700mA	81	1170
	LDE10-20B24		24V/450mA	83	370

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	--	--	0.23	A
	230VAC	--	--	0.15	
Inrush Current	110VAC	--	15	--	
	230VAC	--	30	--	
Recommended External Input Fuse		2A/250V, slow fusing, necessary			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	3.3V output	--	±3	--	%
	Other output	--	±2	--	
Line Regulation	Full load	--	±0.5	--	
Load Regulation	0% - 100% load	--	±1	--	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	50	100	mV
Temperature Coefficient		--	±0.02	--	%/°C
Short Circuit Protection		Continuous, self-recovery			
Over-current Protection		110% - 300%Io self-recovery			

over-voltage protections	3.3VDC/5VDC	≤7.5VDC(Output voltage clamp or hiccup)			
	9VDC	≤15VDC(Output voltage clamp or hiccup)			
	12VDC/15VDC	≤20VDC(Output voltage clamp or hiccup)			
	24VDC	≤30VDC(Output voltage clamp or hiccup)			
Min. Load		0	--	--	%
Hold-up Time	115VAC input	--	15	--	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	4000	--	--	VAC
Operating Temperature		-40	--	+70	°C
Storage Temperature		-40	--	+105	
Storage Humidity		--	--	95	%RH
Welding Temperature	Wave-soldering	260 ± 5°C; time: 5 - 10s			
	Manual-welding	360 ± 10°C; time: 3 - 5s			
Switching Frequency		--	100	--	KHz
Power Derating	-40°C to -25°C	4.0	--	--	% / °C
	+55°C to +70°C	2.5	--	--	
	85VAC-100VAC	1.0	--	--	% / VAC
Safety Standard		UL62368/EN62368/EN60335/IEC62368			
Safety Certification		UL62368/EN62368/EN60335/IEC62368 (Pending)			
Safety Class		CLASS II			
MTBF		MIL-HDBK-217F@25°C > 300,000 h			

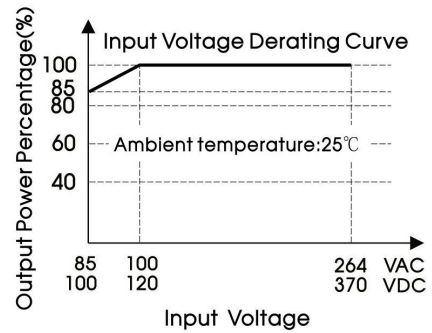
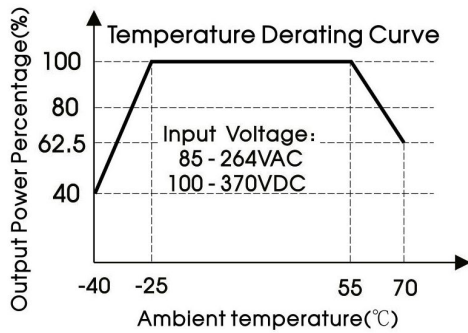
Physical Specifications

Casing Material	Black flame-retardant and heat-resistant plastic (UL94 V-0)
Dimension	53.80*28.80*19.00 mm
Weight	48g (Typ.)
Cooling Method	Free air convection

EMC Specifications

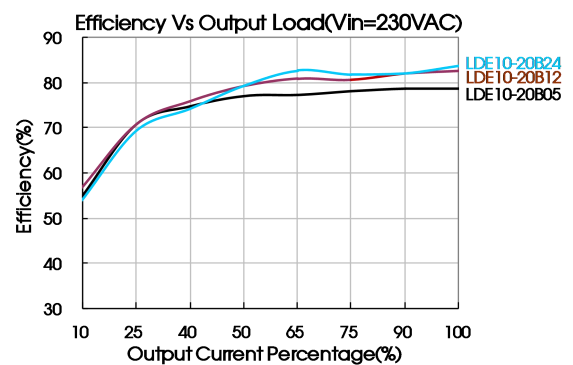
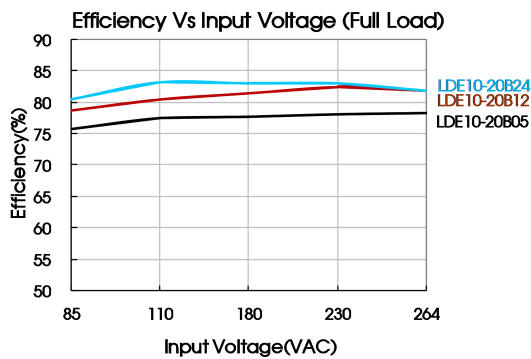
EMI	RE	CLASS		
CE	CISPR32/EN55032	CLASS B		
RE	CISPR32/EN55032	CLASS B		
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV Perf. Criteria B	
	RS	IEC/EN61000-4-3	10V/m perf. Criteria A	
	EFT	IEC/EN61000-4-4	±2kV	perf. Criteria B
		IEC/EN61000-4-4	±4kV (See Fig. 2 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±1KV±1KV (See Fig. 1 for typical application circuit)	perf. Criteria B
		IEC/EN61000-4-5	line to line ±2KV/line to ground ±4KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s	perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%,70% perf. Criteria B	

Product Characteristic Curve



Note: ①When input 85-100VAC/100-120VDC, it need to be voltage derated on basis of temperature derating;

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

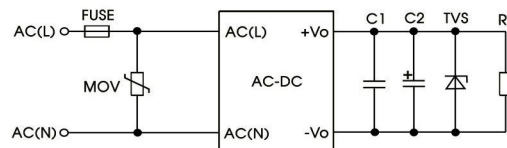


Fig. 1

Model	C1(μF)	C2(μF)	FUSE	MOV	TVS
LDE10-20B03	1μF/50V	220μF /10V	2A/250V, slow fusing, necessary	S14K300	SMBJ7.0A
LDE10-20B05		220μF /10V			SMBJ7.0A
LDE10-20B09		120μF /25V			SMBJ12A
LDE10-20B12		120μF /25V			SMBJ20A
LDE10-20B15		120μF /25V			SMBJ20A
LDE10-20B24		68μF /35V			SMBJ30A

Note: Output filtering capacitors C1 is ceramic capacitor, it is used to filter high frequency noise. C2 is electrolytic capacitors, It is recommended to use high frequency and low impedance electrolytic capacitors. For capacitance and current of capacitor please refer to manufacture's datasheet. Capacitor voltage reduced to at least 80%. TVS is a recommended component to protect post-circuits (if converter fails).

2. EMC solution-recommended circuit

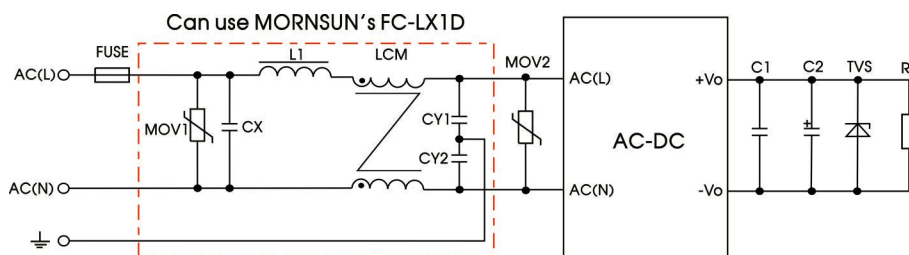
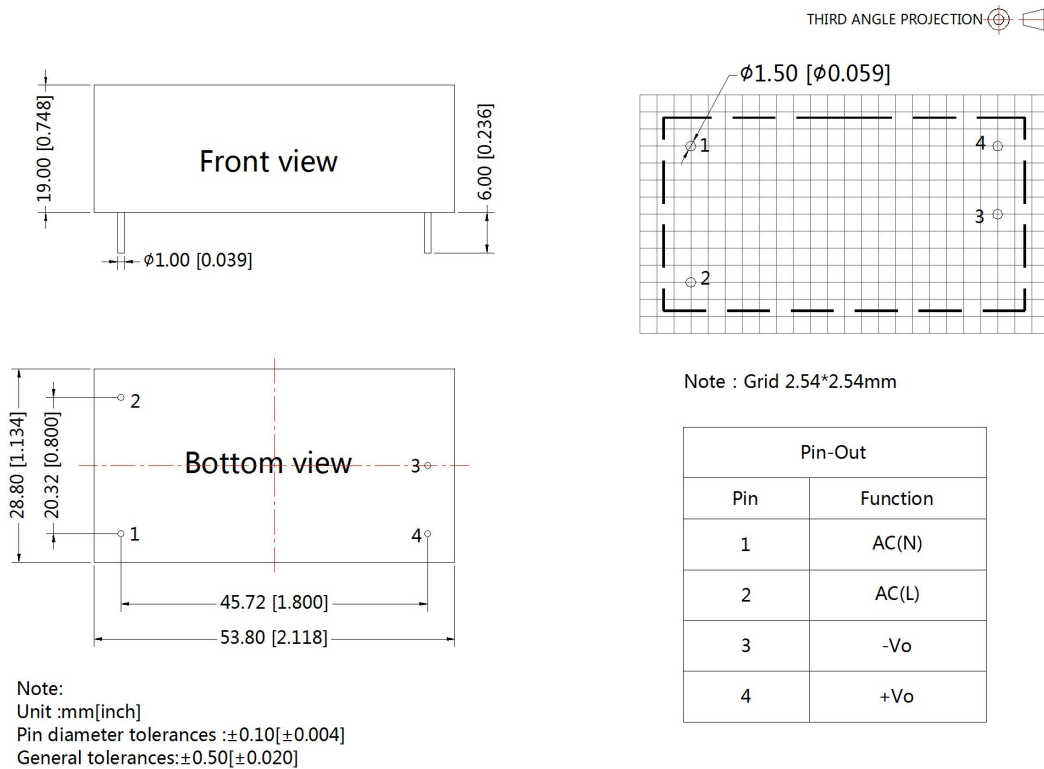


Fig 2

Element model		Recommended value
FUSE		3.15A/250V, slow fusing, necessary
MOV1	FC-LX1D (2KV/4KV EMC Filter)	S14K350
CY1, CY2		1000pF/400VAC
CX		0.1uF/275VAC
L1		4.7uH/2A
LCM		10mH, recommended to use MORNSUN's FL2D-Z5-103
MOV2		S14K300

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

Dimensions and Recommended Layout



Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58220005;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^\circ\text{C}$, 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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