AC/DC Converter
LDE45-20Bxx Series

MORNSUN®

45W, AC/DC converter







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

FEATURES

- Universal 85-264VAC or 100-370VDC input voltage
- Operating ambient temperature range: -40℃ to +70℃
- High I/O isolation test voltage up to 4000VAC
- Regulated output, low ripple & noise, low power consumption
- High efficiency, high power density
- Output short circuit, over-current, over-voltage protection
- Plastic case meets UL94V-0 flammability
- EMI performance meets CISPR32/EN55032 CLASS B
- IEC/EN62368 safety approval

LDE45-20Bxx series is one of Mornsun's compact size power converters. It features universal AC input and at the same time accepts DC input voltage, low power consumption, high efficiency, high reliability, reinforced isolation. The converters are widely used in industry, electricity, instrument, communication and civil applications. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

Selection Guide

Certification	Part No.*	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 230VAC (%) Typ.	Capacitive Load (uF) Max.
EN/IEC	LDE45-20B05	40W	5V/8A	81	30000
	LDE45-20B12	45W	12V/3.8A	84	6400
	LDE45-20B15		15V/3A	85	5600
	LDE45-20B24		24V/1.9A	86	2000
	LDE45-20B48		48V/0.94A	87	600

Note: 1. * Use suffix "A2S" for chassis and suffix "A4S" for DIN-Rail mounting.
2. 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	115VAC	--	--	1.5	A
	230VAC	--	--	0.75	
Inrush Current	115VAC	--	50	--	
	230VAC	--	70	--	
Built-in Fuse		3.15A/250V, slow-blow			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load	--	±2	--	%
Line Regulation	Rated load	--	±0.5	--	
Load Regulation	0%-100% load	--	±1	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	60	120	mV
Temperature Coefficient		--	±0.02	--	%/℃
Stand-by Power Consumption	230VAC, normal temperature	--	--	0.5	W
Short Circuit Protection		Hiccup, continuous, self-recover			
Over-current Protection		≥110%Io, self-recover			
Over-voltage Protection	5VDC output	≤ 9V (Output voltage clamp or hiccup)			
	12VDC output	≤ 16V (Output voltage clamp or hiccup)			
	15 VDC output	≤ 24V (Output voltage clamp or hiccup)			
	24 VDC output	≤ 35V (Output voltage clamp or hiccup)			
	48 VDC output	≤ 56V (Output voltage clamp or hiccup)			

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Minimum Load		0	--	--	%
Hold-up Time	115VAC input	--	8	--	ms
	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	Input - Output	Electric Strength Test for 1min., leakage current <5mA		4000	--	--	VAC
Operating Temperature				-40	--	+70	℃
Storage Temperature				-40	--	+85	
Storage Humidity				--	--	95	%RH
Soldering Temperature		Wave-soldering		260 ± 5℃; time：5 - 10s			
		Manual-welding		360 ± 10℃; time：3 - 5s			
Power Derating		-40℃ to -25℃	85-220VAC input	4.00	--	--	%/℃
		-40℃ to -25℃	220-264VAC input	0	--	--	
		+50℃ to +70℃		2.50	--	--	
		85VAC - 100VAC		1.33	--	--	%/VAC
		240VAC - 264VAC		1.25	--	--	
Safety Standard				IEC/EN/BS EN62368-1 safety approved; Design refer to UL62368-1			
Safety Class				CLASS I I			
MTBF				MIL-HDBK-217F@25℃ > 300,000 h			

Mechanical Specifications

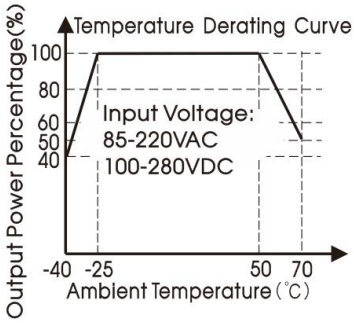
Case Material		Black plastic, flame-retardant and heat-resistant (UL94V-0)
Dimension	DIP	87.00 x 52.00 x 29.50 mm
	A2S chassis mounting	135.00 x 70.00 x 37.90 mm
	A4S Din-Rail mounting	137.00 x 70.00 x 42.40 mm
Weight	DIP	205g (Typ.)
	A2S chassis mounting	290g (Typ.)
	A4S Din-Rail mounting	360g (Typ.)
Cooling Method		Free air convection

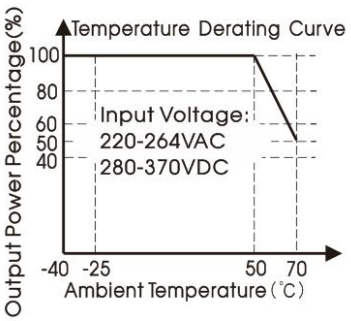
Electromagnetic Compatibility (EMC)

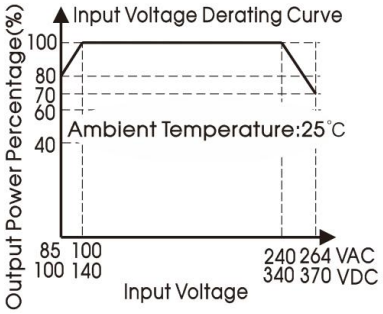
Emissions	CE	CISPR32/EN55032	CLASS B	
	RE	CISPR32/EN55032	CLASS B	
Immunity	ESD	IEC/EN61000-4-2	Contact ±6KV/ Air ±8KV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4	±4KV	perf. Criteria B
	Surge	IEC/EN 61000-4-5	line to line ±1KV	perf. Criteria B
		IEC/EN 61000-4-5	line to line ±2KV/ line to PE ±4KV (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

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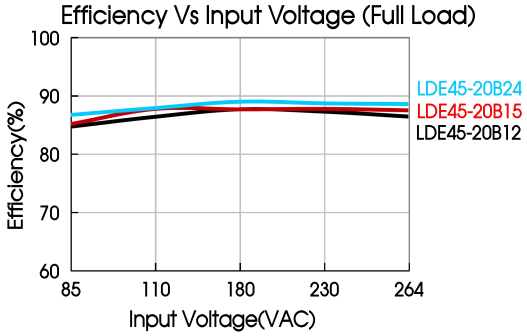
Product Characteristic Curve

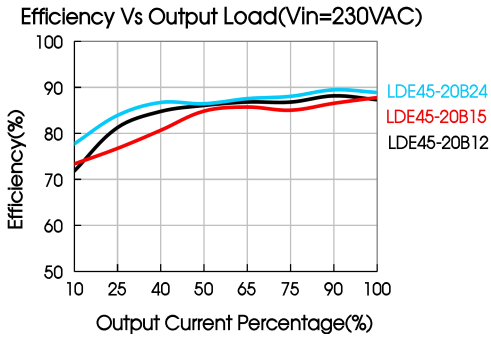






Note: ① With an AC input between 85-100VAC/240-264VAC and a DC input between 100-140VDC/340-370VDC, the output power must be derated as per temperature derating curves;
② This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.





Design Reference

1. Typical application

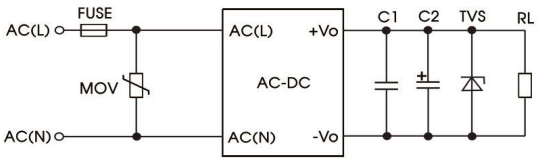


Fig. 1: Typical circuit diagram

Part No.	C1(uF)	C2(uF)	FUSE	MOV	TVS
LDE45-20B05	1	680	3.15A/250V, slow-blow	S14K350	SMBJ7.0A
LDE45-20B12		220			SMBJ20A
LDE45-20B15		220			SMBJ20A
LDE45-20B24		120			SMBJ30A
LDE45-20B48		100			SMBJ64A

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

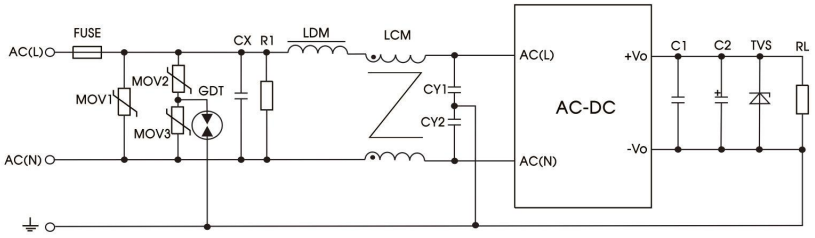


Fig. 2: EMC application circuit with higher requirements
(Output external circuit refer to the typical application circuit)

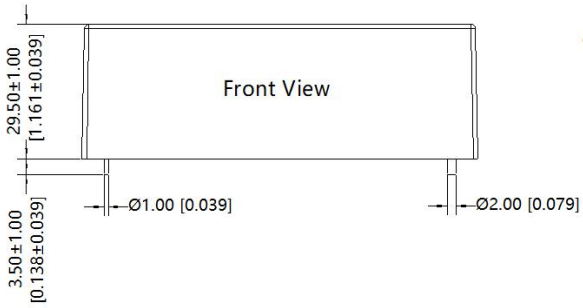
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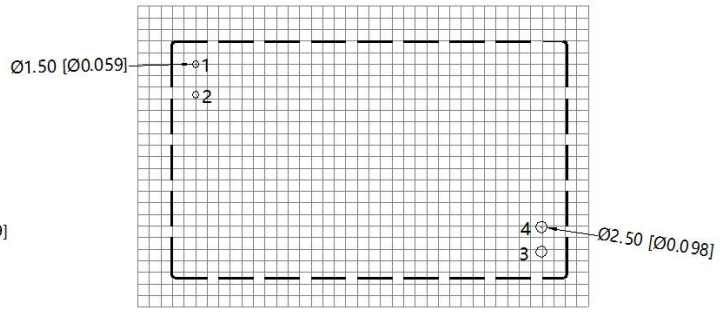
Component	Recommended value
FUSE	3.15A/250V, slow-blow, required
MOV1	S20K300
MOV2/MOV3	S10K300
GDT	EM3600XS
CX	0.22uF/275VAC
CY1/CY2	1nF/400VAC
R1	1MΩ/1W
LDM	4.7uH
LCM	2mH

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

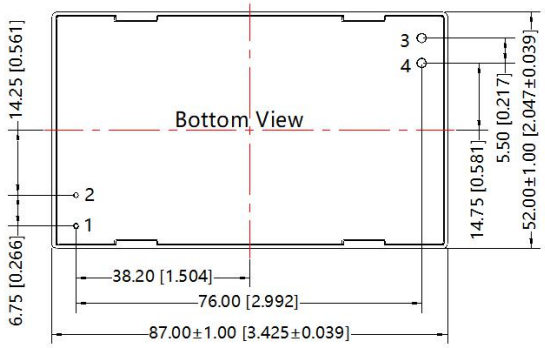
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





Note : Grid 2.54*2.54mm



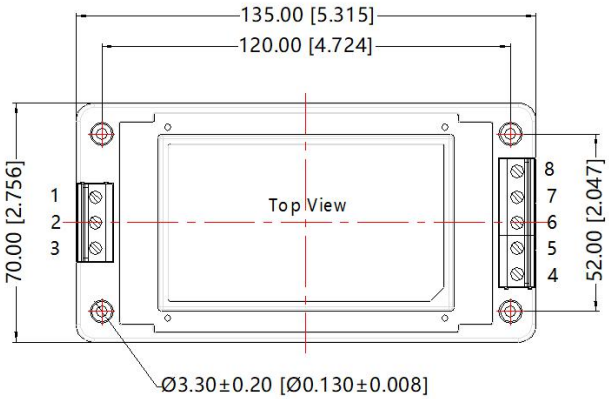
Pin-Out	
Pin	Function
1	AC(L)
2	AC(N)
3	+Vo
4	-Vo

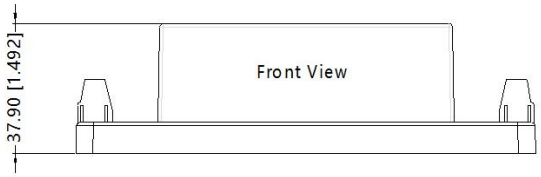
Note:
Unit: mm[inch]
Pin diameter tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]

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A2S Dimensions

THIRD ANGLE PROJECTION



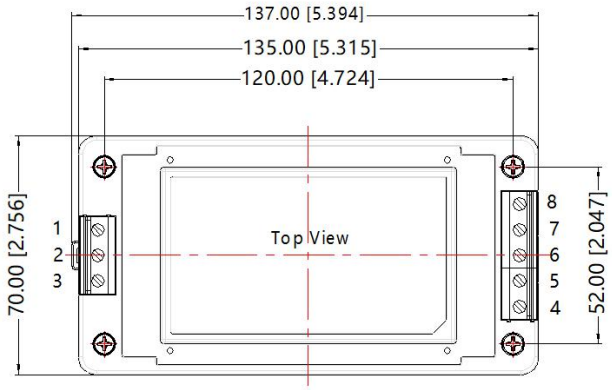


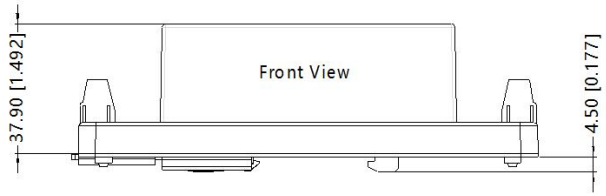
Pin-Out	
Pin	Function
1	AC(L)
2	NC
3	AC(N)
4	+Vo
5	-Vo
6	NC
7	NC
8	NC

Note:
Unit:mm[inch]
Wire range:24~12 AWG
Tightening torque: Max 0.4 N·m
General tolerances:±1.00[±0.040]

A4S Dimensions

THIRD ANGLE PROJECTION





Pin-Out	
Pin	Function
1	AC(L)
2	NC
3	AC(N)
4	+Vo
5	-Vo
6	NC
7	NC
8	NC

Note:
Unit: mm[inch]
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
Installed on DIN RAIL TS35
General tolerances: ±1.00[±0.040]

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Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220019(DIP package); 58220031 (A2S/A4S package);
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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