

45W, AC/DC converter



FEATURES

- 85 - 264V Universal AC or wide 100 - 370VDC Input
- Operating ambient temperature range: -40°C ~ +70°C
- High I/O Isolation test voltage of up to 4000VAC
- Regulated output, low output ripple & noise, low power consumption
- High efficiency, high power density
- Output short circuit, over-current, over-voltage protection
- Plastic case meets flammability per UL94V-0
- EMI performance meets CISPR32 / EN55032 CLASS B
- Designed to meet UL/IEC/EN62368 safety standards (CE Approval Pending)

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 (μF) Max.
CE (Pending)	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

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	--	
Recommended External Input Fuse		3.15A/250V, slow-blow, required			
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	--	%/°C
Stand-by Power Consumption	230VAC, normal temperature	--	--	0.5	W
Short Circuit Protection		Hiccup, continuous, self-recovery			
Over-current Protection		≥110%Io, self-recovery			
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)			

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 Test	Input - Output	4000	--	--	VAC	
Operating Temperature		-40	--	+70	°C	
Storage Temperature		-40	--	+85		
Storage Humidity		--	--	95	%RH	
Soldering Temperature	Wave-soldering	260 ± 5°C; time: 5 - 10s				
	Manual-welding	360 ± 10°C; time: 3 - 5s				
Power Derating	-40°C ~ -25°C	85-220VAC input	4.00	--	--	% / °C
	-40°C ~ -25°C	220-264VAC input	0	--	--	
	+50°C ~ +70°C		2.50	--	--	
	85 - 100VAC		1.33	--	--	% / VAC
	240 - 264VAC		1.25	--	--	
Safety Standard		IEC62368/EN62368/UL62368				
Safety Certification		EN62368 (Pending)				
Safety Class		CLASS II				
MTBF		MIL-HDBK-217F@25°C > 300,000 h				

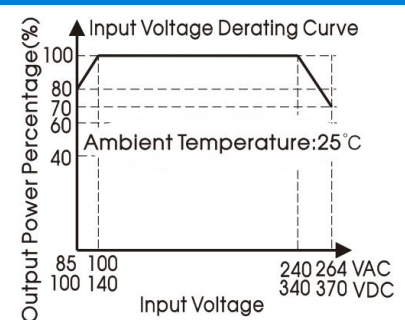
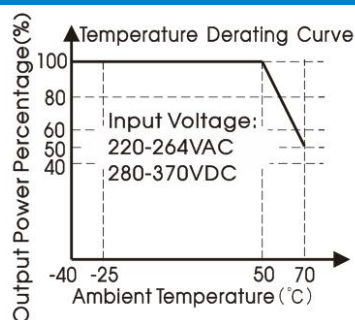
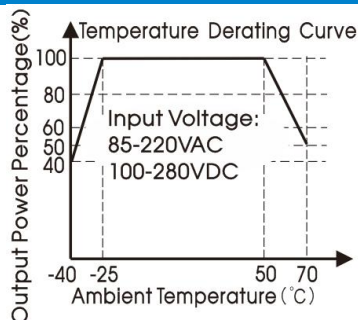
Mechanical Specifications

Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)
Dimension	87.00 x 52.00 x 29.50 mm
Weight	205g (Typ.)
Cooling Method	Free air convection

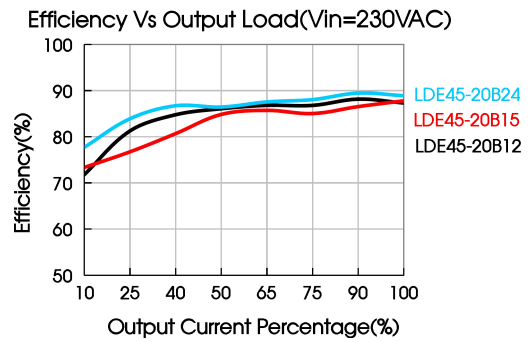
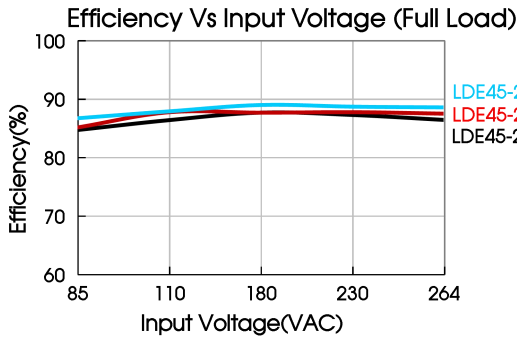
Electromagnetic Compatibility (EMC)

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

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 factory or one of our FAE.



Design Reference

1. Typical application

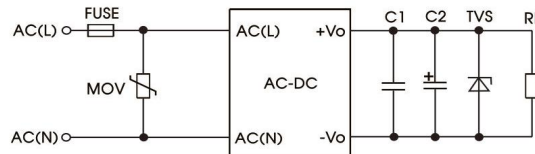


Fig. 1: Typical circuit diagram

Part No.	C1(μF)	C2(μF)	FUSE	MOV	TVS
LDE45-20B05	1	680	3.15A/250V, slow-blow, required	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

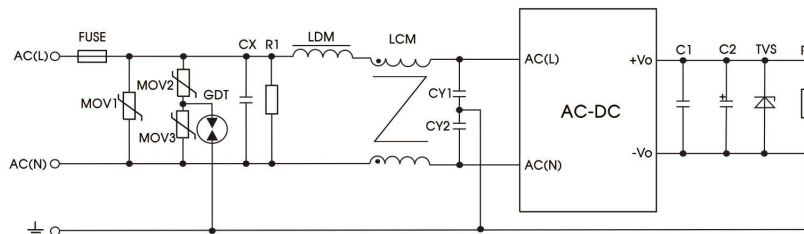


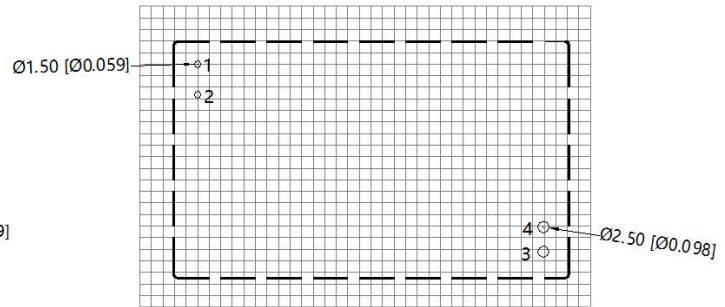
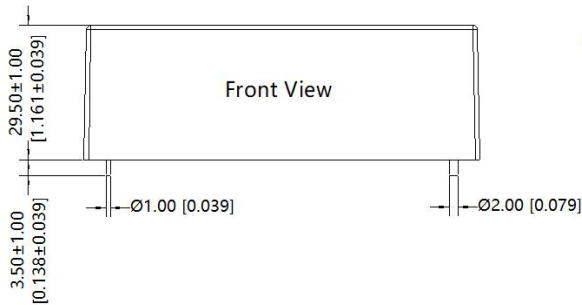
Fig 2: EMC circuit for harsh requirements

Component	Recommended value
FUSE	3.15A/250V, slow-blow, required
MOV1	20D471K
MOV2	10D471K
MOV3	10D471K
GDT	EM3600XS
CX	0.22μF/275VAC
CY1, CY2	1nF/400VAC
R1	1MΩ/2W
LDM	4.7uH
LCM	2mH

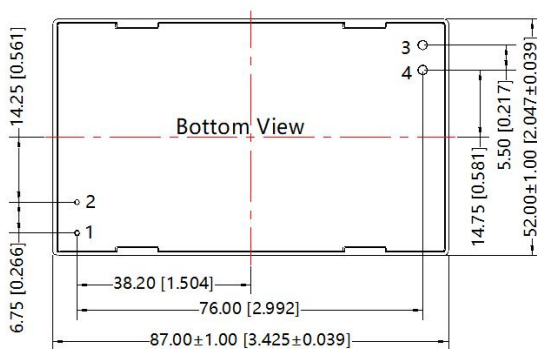
3. For additional information please refer to application notes on www.mornsun-power.com

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: $\pm 0.10[\pm 0.004]$
General tolerances: $\pm 0.50[\pm 0.020]$

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220019;
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 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. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Huangpu District, Huangpu, P. R. China
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com