AC/DC Converter

LD25-25BxxR2 Series

MORNSUN®

25W, AC-DC converter



CE Report EN62368-1 UKCA Report BS EN 62368-1 RoHS

FEATURES

- Input voltage range: 176 - 418VAC and 248 - 591VDC
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -40℃ to +85℃
- Low standby power consumption: 0.3W
- conversion efficiency up to 88%
- High I/O isolation test voltage up to 4200VAC
- Output short circuit, over-current, over-voltage protection

LD25-25BxxR2 series AC-DC converters is one of Mornsun's new generation compact size power converters. It features ultra-wide AC input and at the same time accepts DC input voltage, low power consumption, high efficiency, high reliability, reinforced isolation. It offers good EMC performance compliant to IEC/EN61000-4 and CISPR32/EN55032 and meets EN62368 standards. The converters are widely used in power, instrumentation 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 (W)	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 230VAC (%) Typ.	Capacitive Load (uF) Max.
EN/BS EN	LD25-25B05R2	25	5V/5A	84	15000
	LD25-25B09R2	25.2	9V/2.8A	85	8200
	LD25-25B12R2	25.2	12V/2.1A	85	4700
	LD25-25B15R2	25.05	15V/1.67A	85	3300
	LD25-25B24R2	26.4	24V/1.1A	86	1500
	LD25-25B48R2	26.4	48V/0.55A	88	600

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	176	--	418	VAC
	DC input	248	--	591	VDC
Input Frequency		47	--	63	Hz
Input Current	230VAC	--	--	0.5	A
	380VAC	--	--	0.35	
Inrush Current	230VAC	--	35	--	
	380VAC	--	60	--	
Leakage Current	277VAC/50Hz	0.707mA RMS Max.			
Recommended External Input Fuse		3.15A/500V, slow-blow, required			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±2.0	--	%
Line Regulation	Full load	--	±0.5	--	
Load Regulation	0% - 100% load	--	±1.0	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	80	150	mV
Temperature Coefficient		--	±0.02	--	%/℃
Stand-by Power Consumption	230VAC	--	--	0.3	W
	380VAC	--	--	0.5	
Short Circuit Protection		Hiccup, continuous, self-recover			
Over-current Protection		⩾130% Io, self-recover			

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Over-voltage Protection	5V	≤7.5VDC (Output voltage hiccup)			
	9V/12V	≤16VDC (Output voltage hiccup)			
	15V	≤25VDC (Output voltage hiccup)			
	24V	≤35VDC (Output voltage hiccup)			
	48V	≤60VDC (Output voltage hiccup)			
Minimum Load		0	--	--	%
Hold-up Time	230VAC input	--	25	--	ms
	380VAC input	--	90	--	

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	4200	--	--	VAC
Insulation Resistance	Input - output	At 500VDC	100	--	--	MΩ
Operating Temperature			-40	--	+85	℃
Storage Temperature			-40	--	+85	
Storage Humidity			--	--	95	%RH
Soldering Temperature		Wave-soldering, Max. 10 seconds	255	260	265	℃
		Manual-welding, Max. 5 seconds	350	360	370	
Switching Frequency			--	65	--	kHz
Power Derating		+55℃ to +70℃	3	--	--	%/℃
		+70℃ to +85℃	1.33	--	--	
Safety Standard			BS EN/EN62368-1(report) safety approval			
Safety Class			CLASS II			
MTBF		MIL-HDBK-217F@25℃	≥500,000 h			

Mechanical Specifications

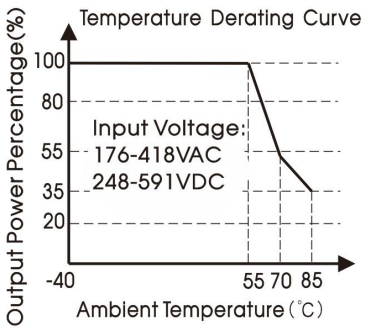
Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)
Dimension	69.50 x 39.00 x 24.00 mm
Weight	100g (Typ.)
Cooling method	Free air convection

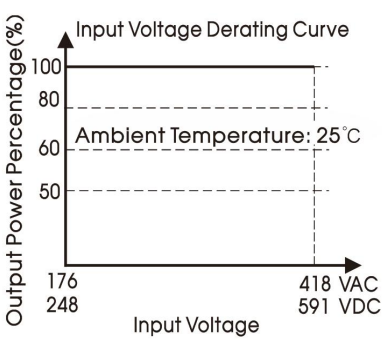
Electromagnetic Compatibility (EMC)

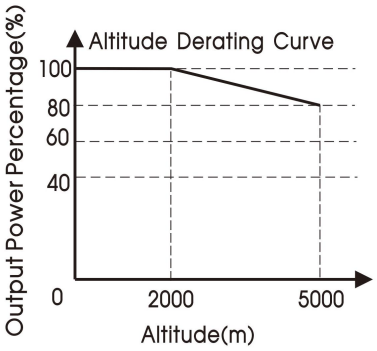
Emissions	CE	CISPR32/EN55032	CLASS B	
	RE	CISPR32/EN55032	CLASS B	
Immunity	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV (See Fig. 1 for recommended circuit)	Perf. Criteria A
		IEC/EN61000-4-4	±4KV (See Fig. 2, Fig. 3 for recommended circuit)	perf. Criteria A
	Surge	IEC/EN61000-4-5	line to line ±2KV (See Fig. 1 for recommended circuit)	perf. Criteria A
		IEC/EN61000-4-5	line to line ±4KV (See Fig. 2 for recommended circuit)	perf. Criteria A
		IEC/EN61000-4-5	line to line ±2KV/line to PE ±4KV (See Fig. 3 for recommended circuit)	perf. Criteria A
	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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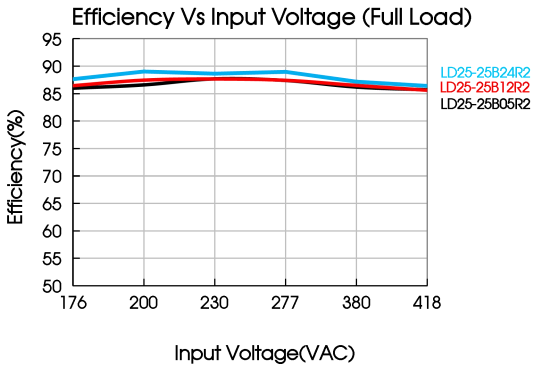
Product Characteristic Curve

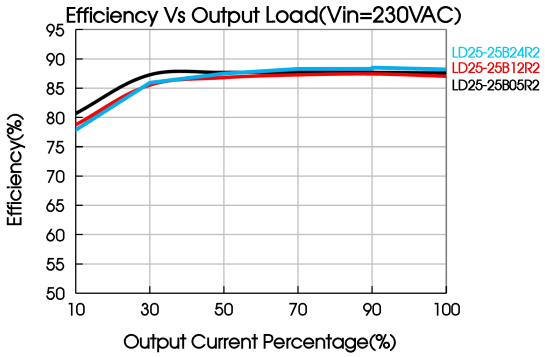






Note: This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.





Design Reference

1. Typical application

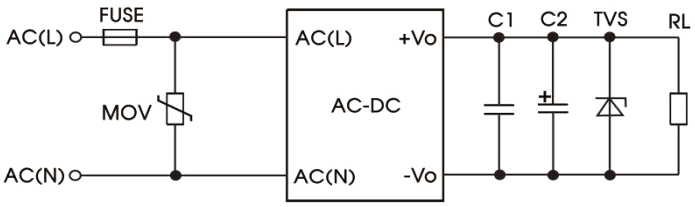


Fig. 1: Typical circuit diagram

Part No.	FUSE	MOV	C1	TVS
LD25-25B05R2	3.15A/500V, slow-blow, required	14D751K	1uF/100V	SMBJ7.0A
LD25-25B09R2				SMBJ12A
LD25-25B12R2				SMBJ20A
LD25-25B15R2				SMBJ30A
LD25-25B24R2				SMBJ30A
LD25-25B48R2				SMBJ64A

Output Filter Components: 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.

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2. EMC compliance recommended circuit

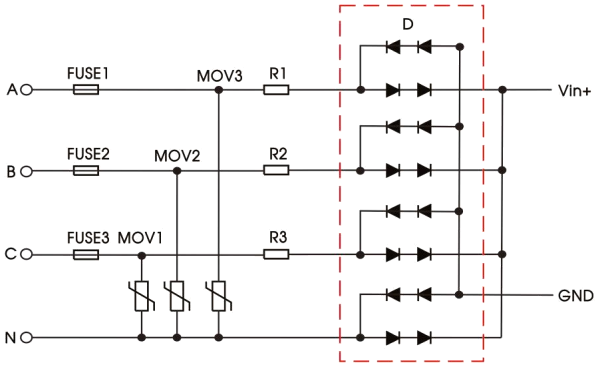


Fig. 2: Line to line ±4kV EMC application circuit with higher requirements

Component	Recommended value
MOV1/MOV2/MOV3	14D751K
D	2A/1000V
R1/R2/R3	12Ω/5W (wire-wound resistor)
FUSE1/FUSE2/FUSE3	3.15A/500V, slow-blow, required

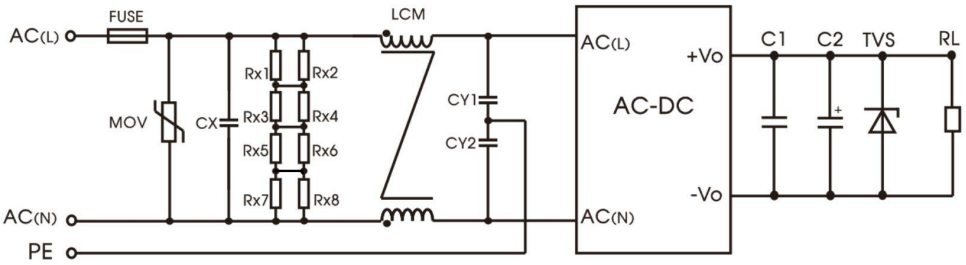


Fig. 3: Recommended circuit for class Ⅰ equipment

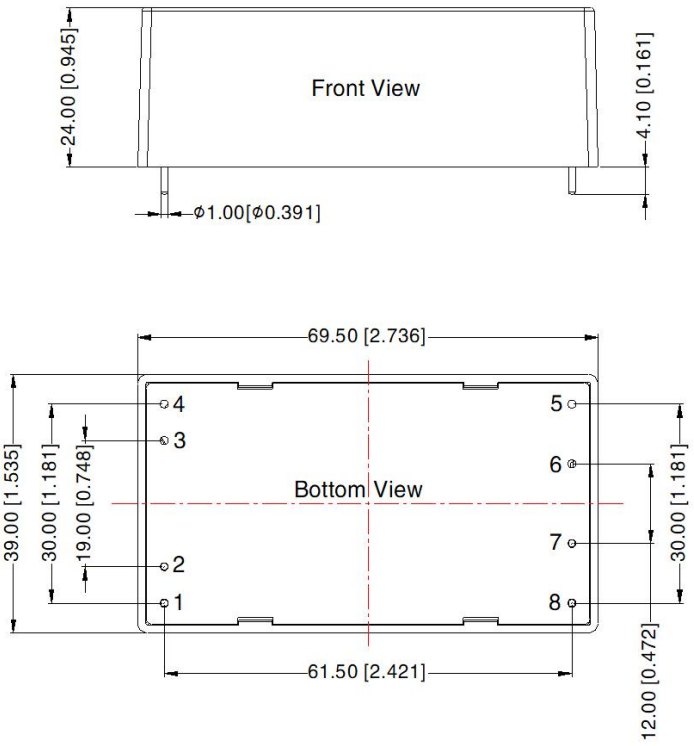
Component	Recommended value
FUSE	3.15A/500V, slow-blow, required
MOV	14D751K
CX	0.1uF/480VAC
CY1/CY2	1nF/400VAC
LCM	10 mH, P/N: FL2D-Z5-103 (MORNSUN) is recommended
Note: Rx1/Rx2/Rx3/Rx4/Rx5/Rx6/Rx7/Rx8 is the bleeder resistance of CX, and the recommended resistance value is 2.5MΩ.	

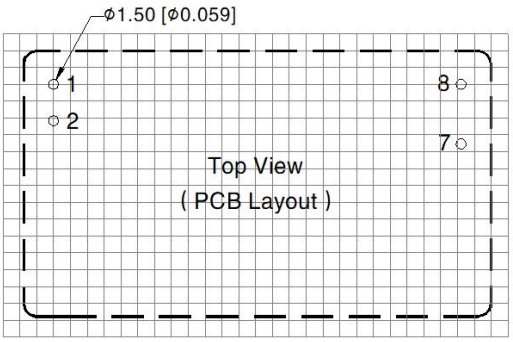
3. For additional information please refer to application notes on www.mornsun-power.com.

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Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





Note: Grid 2.54*2.54mm

Pin–Out	
Pin	Mark
1	AC(L)
2	AC(N)
3	No Pin
4	No Pin
5	No Pin
6	No Pin
7	+Vo
8	–Vo

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

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220193;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. 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;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. If product involves multi-brand materials and there are differences in color etc, please refer to the standards of each manufacturer;
8. 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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