

20W, AC/DC converter



FEATURES

- Ultra-wide 90 - 528VAC and 100 - 745VDC input voltage range
- Regulated output, low output ripple & noise
- Operating ambient temperature range : -40°C to +70°C
- Output short circuit, over-current, over-voltage protection
- I/O isolation test voltage up to 4000VAC
- EFT /Surge: ±4KV Perf. Criteria B
- ES1 output (EN62368)
- EN62368 safety approval
- UL62368 safety approval (12V/24V)

LD20-26Bxx Series is one of Mornsun's highly efficient green power AC-DC Converter series. They feature ultra-wide wide input range accepting either AC or DC voltage, low power consumption, high efficiency, high reliability and reinforced isolation. The converters meet EN62368 standards. The isolation voltage is 4000VAC between input and output. The converters meet IEC/EN61000-4, CISPR32/EN55032 standards and are widely used in electrical, instrumentation applications. Suitable for demanding high isolation voltage and strict electromagnetic compatibility of various terminal applications.

Selection Guide

Certification	Part No.*	Output Power	Nominal Output Voltage and Current(Vo/Io)	Efficiency at 230VAC (%) Typ.	Capacitive Load (µF)Max.
CE	LD20-26B03	11.88W	3.3V/3600mA	74	10000
	LD20-26B05	18W	5V/3600mA	78	10000
	LD20-26B09	20W	9V/2230mA	79	7000
CE/UL	LD20-26B12		12V/1660mA	82	5000
CE	LD20-26B15		15V/1330mA	83	3000
CE/UL	LD20-26B24		24V/833mA	83	1000

Note: * Use suffix "A2" for chassis and suffix "A4" for DIN-Rail mounting.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	90	--	528	VAC
	DC input	100	--	745	VDC
Input Frequency		47	--	63	Hz
Input Current	115VAC	--	--	0.8	A
	230VAC	--	--	0.4	
Inrush Current	115VAC	--	35	--	
	230VAC	--	60	--	
Leakage Current	230VAC/50Hz	0.25mA RMS typ.			
Recommended External Input Fuse		3.15A/500VAC, slow-blow, required			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	LD20-26B03	--	±3	--	%
	Others	--	±2	--	
Line Regulation	Full load	--	±0.5	--	
Load Regulation	0% - 100% load	--	±1.0	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	--	150	mV
Temperature Coefficient		--	±0.02	--	%/°C
Stand-by Power Consumption		--	--	0.75	W
Short Circuit Protection		Hiccup, continuous, self-recovery			
Over-current Protection		130 - 400%Io, self-recovery			

Over-voltage Protection	3.3/5V output	≤ 7.5 V (Output voltage clamp)			
	9V output	≤ 15 V (Output voltage clamp)			
	12/15V output	≤ 20 V (Output voltage clamp)			
	24V output	≤ 30 V (Output voltage clamp)			
Minimum Load		0	--	--	%
Hold-up Time	230VAC input	--	35	--	ms
	400VAC input	--	100	--	

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	4000	--	--	VAC
Operating Temperature	Work in the power drop curve range	-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			
Switching Frequency		--	65	--	kHz
Power Derating	+55°C to +70°C	3.0	--	--	% / °C
	-40°C to -10°C	1.0	--	--	
	90VAC - 110VAC	2.0	--	--	% / VAC
	480AVC - 528VAC	0.417	--	--	
Safety Standard		EN62368			
Safety Certification	3V/5V/9V/12V/15V/24V	EN62368			
	12V/24V	UL62368			
Safety Class		CLASS II			
MTBF		MIL-HDBK-217F@25°C > 300,000 h			

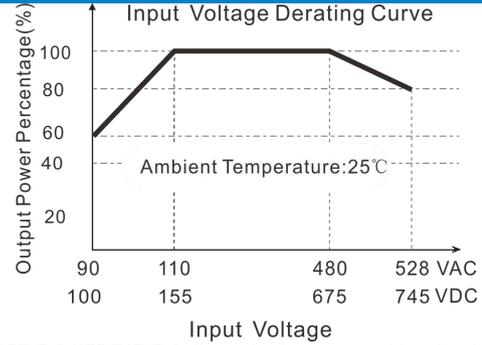
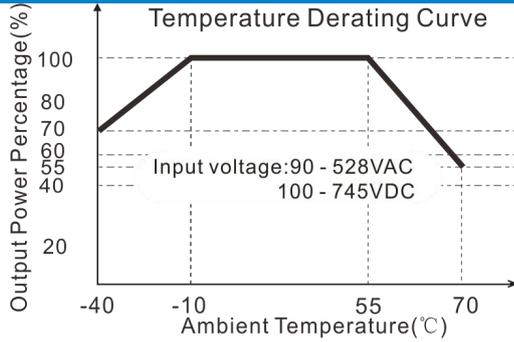
Mechanical Specifications

Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)	
Dimension	Horizontal package	70.00 x 48.00 x 30.00mm
	A2 chassis mounting	96.10 x 54.00 x 38.50 mm
	A4 Din-Rail mounting	96.10 x 54.00 x 43.10 mm
Weight	Horizontal package	160g (Typ.)
	A2 chassis mounting	210g (Typ.)
	A4 Din-Rail mounting	250g (Typ.)
Cooling Method	Free air convection	

Electromagnetic Compatibility (EMC)

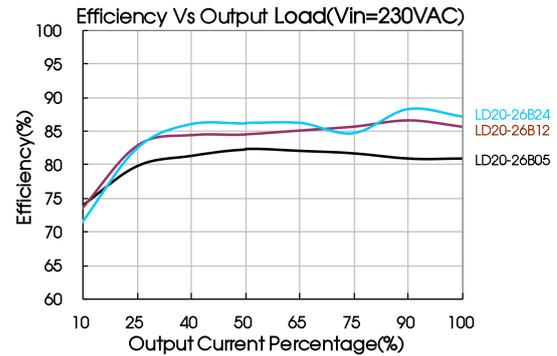
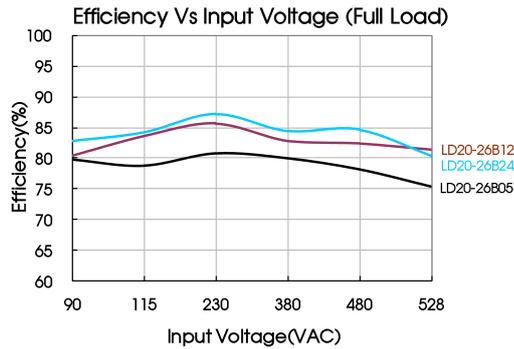
Emissions	CE	CISPR32/EN55032 CLASS B		
	RE	CISPR32/EN55032 CLASS B		
Immunity	ESD	IEC/EN 61000-4-2	Contact ±6KV/Air ±8KV	Perf. Criteria B
	RS	IEC/EN 61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4	±2KV	perf. Criteria B
		IEC/EN 61000-4-4	±4KV (See Fig. 2 or Fig. 3 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN 61000-4-5	line to line ±2KV	perf. Criteria B
		IEC/EN 61000-4-5	line to line ±4KV (See Fig. 2 or Fig. 3 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 90-110VAC/ 480-528VAC and a DC input between 100-155VDC/675-745VDC, 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

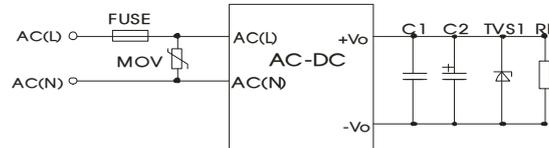


Fig. 1

Part No.	FUSE	MOV	C1 (uF)	C2 (uF)	TVS1
LD20-26B03	3.15A/500VAC, slow-blow, required	S20K625	1	330	SMBJ7.0A
LD20-26B05				330	SMBJ7.0A
LD20-26B09				220	SMBJ12A
LD20-26B12				220	SMBJ20A
LD20-26B15				220	SMBJ20A
LD20-26B24				220	SMBJ30A

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

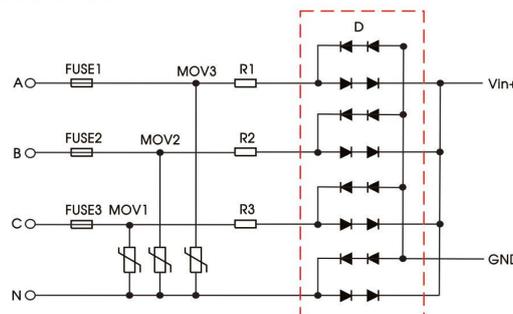


Fig. 2 Recommended circuit for applications which require 4KV differential-mode inrush standard (full-wave rectification)

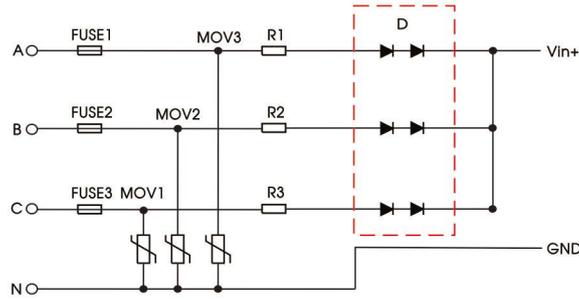
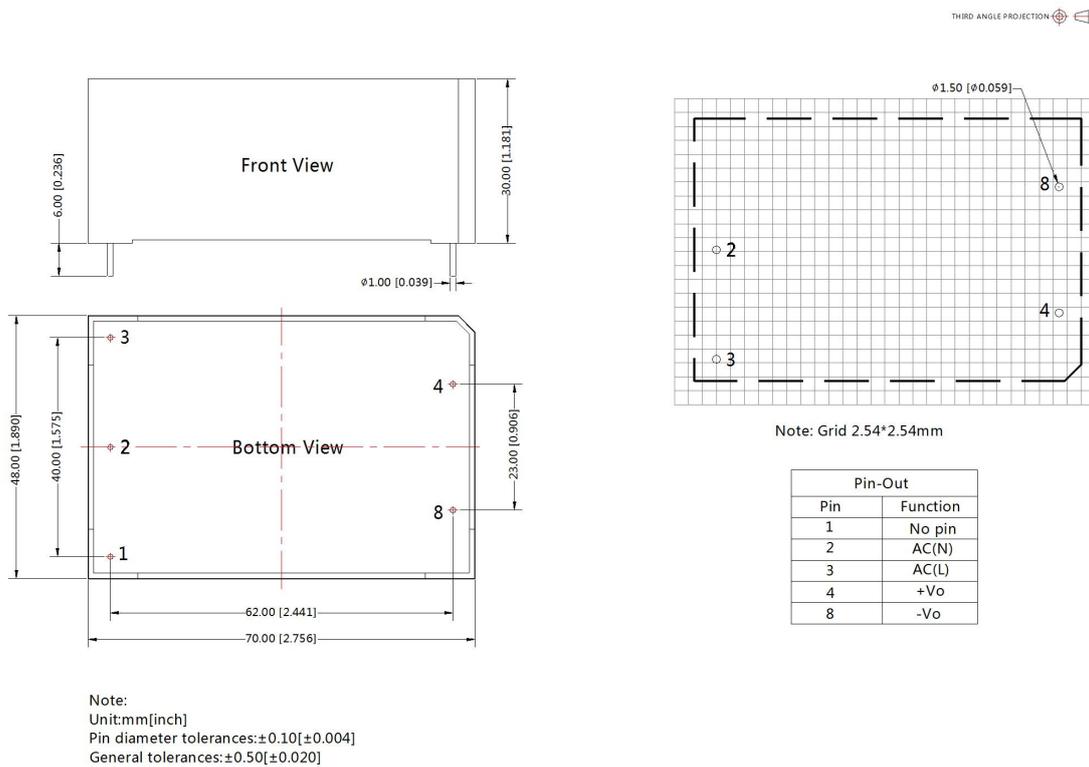


Fig. 3 Recommended circuit for applications which require 4kV differential-mode inrush standard (half-wave rectification)

Recommend Parameter For Higher EMC Standard Circuit	
Component	Recommended value
MOV1, MOV2, MOV3	S20K510
D	2A/1000V
R1, R2, R3	10Ω/5W
FUSE1, FUSE2, FUSE3	3.15A/500VAC, slow-blow, required

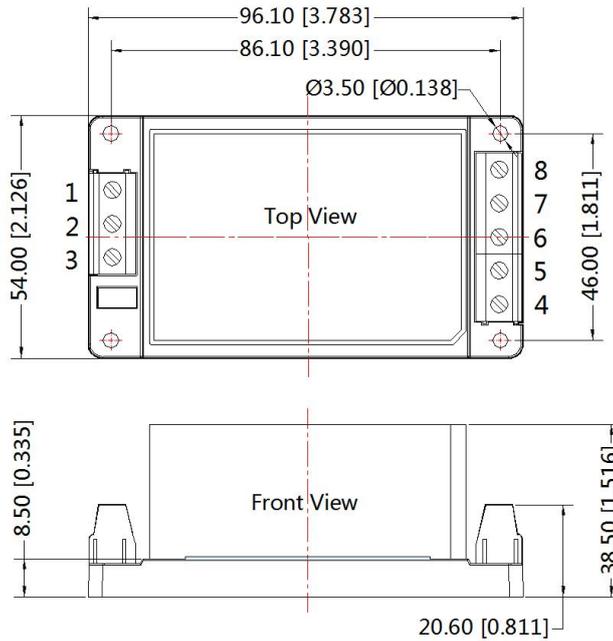
3. For additional information please refer to application notes on www.mornsun-power.com

Dimensions and Recommended Layout



A2 Dimensions

THIRD ANGLE PROJECTION

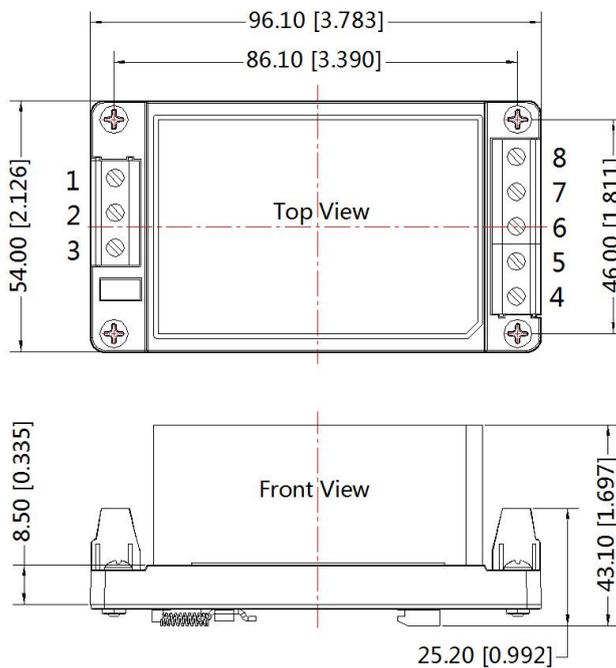


Pin-Out	
Pin	Function
1	NC
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	NC
7	NC
8	-Vo

Note:
Unit: mm[inch]
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±1.00[±0.039]

A4 Dimensions

THIRD ANGLE PROJECTION



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

Note:
Unit: mm[inch]
Mounting rail: TS35, rail needs to connect safety ground
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±1.00[±0.039]

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220017 (Horizontal package); 58220019(A2/A4 package);
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 $T_a=25^{\circ}\text{C}$, 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. 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, Guangzhou, P. R. China
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com