

# Datasheet

## RS Pro LDE10-20Bxx AC/DC Converter

10W, AC-DC converter



### Features

- Universal 85 - 264V AC and wide 100 - 370V DC Input
- Operating ambient temperature range -40°C to +70°C
- High I/O isolation test voltage up to 4000VAC
- Regulated output, Low output ripple & noise
- Output short circuit, over-current, over-voltage protection
- High efficiency, high reliability
- Plastic case meets UL94V-0 flammability
- EMI performance meets CISPR32 / EN55032 CLASS B
- IEC62368, UL62368, EN62368 and EN60335 approval



LDE10-20Bxx series features a universal AC input and DC input voltage, low power consumption, high efficiency, high reliability and double or reinforced insulation. The converters meet IEC/EN61000-4, CISPR32/EN55032, UL62368, EN62368, EN60335, IEC62368 standards and are widely used in industrial, medical, instrumentation, telecommunications applications.

### Selection Guide

Certification	RS Stock no. (Standard Pack)	Part No.	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 230VAC (%) Typ.	Capacitive Load (μF)Max.
UL/CE/CB	1812114	LDE10-20B03	6.6W	3.3V/2000mA	71	26400
	1812115	LDE10-20B05	10W	5V/2000mA	76	9440
	1812116	LDE10-20B09		9V/1100mA	80	3600
	1812117	LDE10-20B12		12V/900mA	81	2000
	1812118	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	115VAC	--	--	0.23	A
	230VAC	--	--	0.15	
Inrush Current	115VAC	--	15	--	
	230VAC	--	30	--	
Recommended External Input Fuse		2A/250V slow-blow required			
Hot Plug		Unavailable			

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### 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-to-peak value)	--	50	100	mV
Temperature Coefficient		--	±0.02	--	%/°C
Short Circuit Protection		Hiccup, continuous, self-recovery			
Overcurrent Protection		110% - 300%Io self-recovery			
Overvoltage 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)			
Minimum Load		0	--	--	%
Hold-up Time	115VAC input	--	15	--	ms
	230VAC input	--	80	--	

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		-40	--	+70	°C
Storage Temperature		-40	--	+105	
Storage Humidity		--	--	95	%RH
Soldering Temperature	Wave-soldering	260 ± 5°C; time: 5 - 10s			
	Manual-soldering	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			
Safety Class		CLASS II			
MTBF		MIL-HDBK-217F@25°C > 300,000 h			

### Mechanical Specifications

Casing Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)				
Dimension	DIP	53.80 x 28.80 x 19.00mm			
Weight	DIP	48g (Typ.)			
Cooling Method	Free air convection				

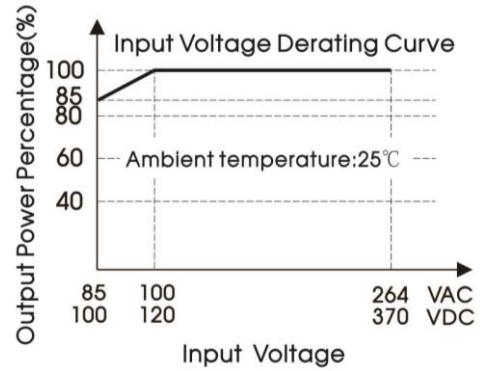
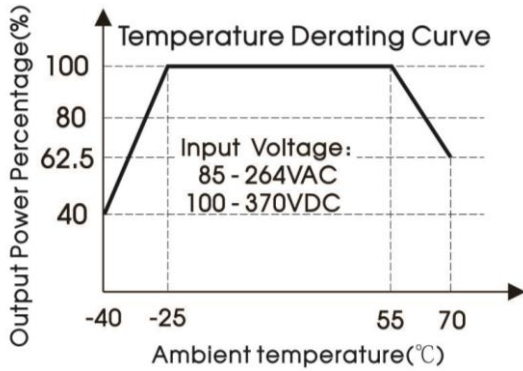
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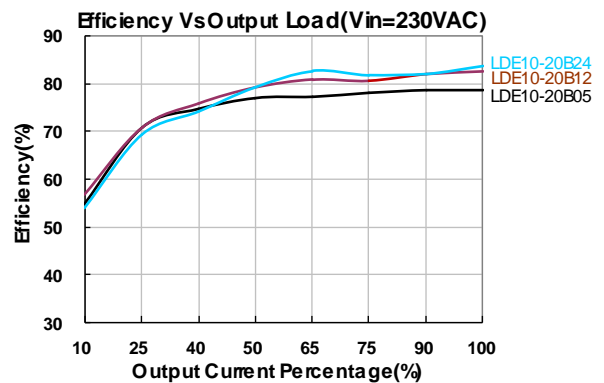
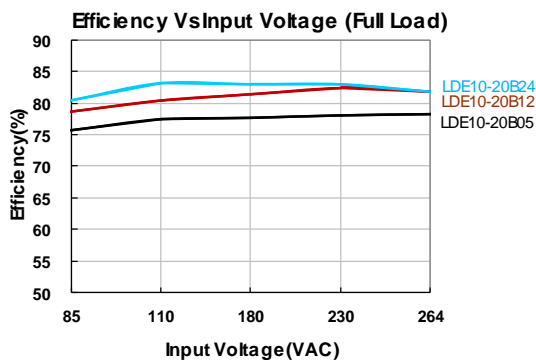
### Electromagnetic Compatibility (EMC)

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

### Product Characteristic Curve



Note: With an AC input between 85-100VAC and a DC input between 100-120VDC, the output power must be derated as per temperature derating curves. This product is suitable for applications using natural air cooling.



### Design Reference

#### 1. Typical application

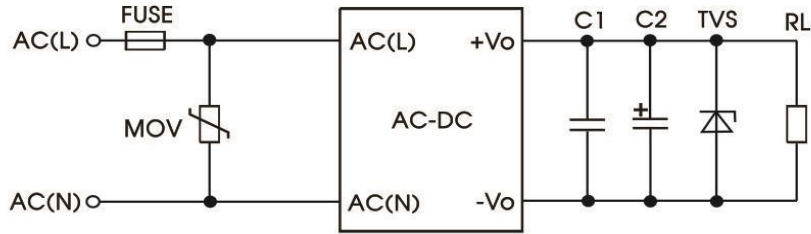


Fig. 1: Typical circuit diagram

Model	C1( $\mu$ F)	C2( $\mu$ F)	FUSE	MOV	TVS
LDE10-20B03	1 $\mu$ F/50V	220 $\mu$ F /10V	2A/250V slow-blow required	S14K300	SMBJ7.0A
LDE10-20B05		220 $\mu$ F /10V			SMBJ7.0A
LDE10-20B09		120 $\mu$ F /25V			SMBJ12A
LDE10-20B12		120 $\mu$ F /25V			SMBJ20A
LDE10-20B24		68 $\mu$ F /35V			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 the TVS provides optional supplementary overvoltage protection.

#### 2. EMC compliance recommended circuit

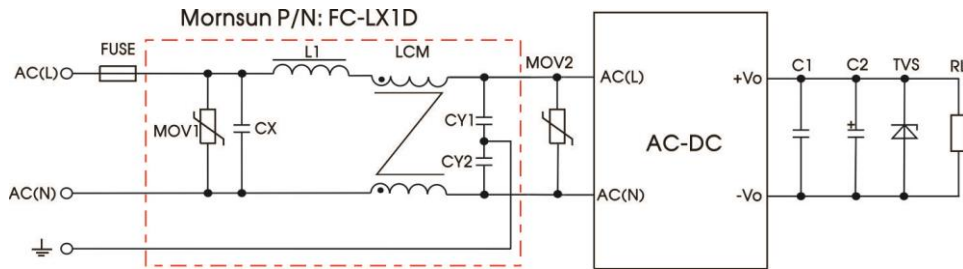


Fig 2

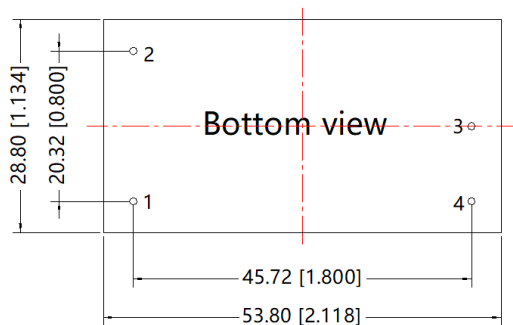
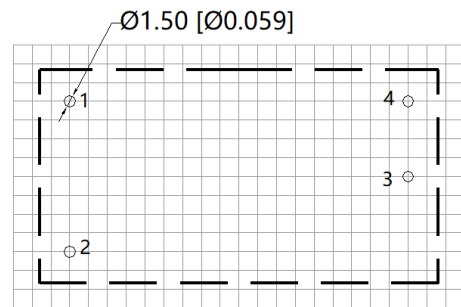
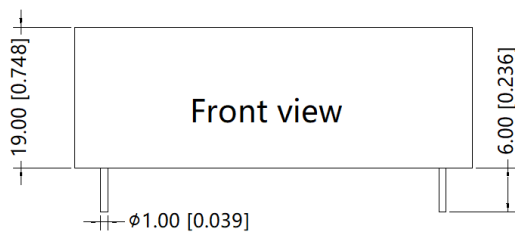
Component	Recommended value
FUSE	3.15A/250V slow-blow required
MOV1	S14K350
CY1, CY2	1000pF/400VAC
CX	0.1 $\mu$ F/275VAC
L1	4.7 $\mu$ H/2A
LCM	10mH, recommended to use MORNSUN's FL2D-Z5-103
MOV2	S14K300

# AC/DC Converter

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### Dimensions and Recommended Layout

THIRD ANGLE PROJECTION 



Note : Grid 2.54\*2.54mm

Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
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. 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;
2. All index testing methods in this datasheet are based on our Company's corporate standards.
3. Products are related to laws and regulations: see "Features" and "EMC".
4. Products are classified according to ISO14001 and related environmental laws and regulation.