

Datasheet

RS Pro LDE20-20Bxx AC/DC Converter

20W, 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 and EN62368 approval

UL US CE CB RoHS

LDE20-20Bxx 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, IEC62368 standards and are widely used in industrial, medical, instrumentation, telecommunications applications

Selection Guide

RS Stock no. (Standard Pack)	Certification	Part No.*	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency (230VAC, %/Typ.)	Max. Capacitive Load (µF)
1812123	UL/CE/CB	LDE20-20B03	11.8W	3.3V/3600mA	74	10000
1812124		LDE20-20B05	18W	5V/3600mA	78	6600
1812125		LDE20-20B12	20W	12V/1660mA	82	3000
1812126		LDE20-20B24		24V/833mA	83	800

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	--	0.37	0.44	A
	230VAC	--	0.24	0.26	
Inrush current	115VAC	--	12	--	
	230VAC	--	36	--	
Recommended External Input Fuse		3.15A/250V, slow fusing, necessary			
Hot Plug		Unavailable			

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Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	0%-100%	3.3V output	--	±3	--	%
		Other models	--	±2	--	
Line Regulation	Full load		--	±0.5	--	%
Load Regulation	0%-100% load		--	±1	--	
Ripple & Noise*	20MHz bandwidth (peak-peak value)		--	50	120	mV
Temperature Coefficient			--	±0.02	--	%/°C
Short Circuit Protection			Hiccups, Continuous, self-recovery			
Over-current Protection			≥110% Io, self-recovery			
Over-voltage Protection	3.3/5V output		≤7.5V			
	9V output		≤15V			
	12/15V output		≤20V			
	24V output		≤30V			
Min. Load			0	--	--	%
Hold-up Time	115VAC input		5	10	--	ms
	230VAC input		44	55	--	

Note: * Ripple and noise tested with "parallel cable" method, Testing at rated load. please see *AC-DC Converter Application Notes* for specific operation methods.

General Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit	
Isolation Voltage	Input-output	Test time: 1min (leakage current < 5mA)	4000	--	--	VAC	
Operating Temperature			-40	--	+70	°C	
Storage Temperature			-40	--	+85		
Storage Humidity			--	--	95	%RH	
Welding Temperature	Wave-soldering		260 ± 5°C; time: 5 - 10s				
	Manual-welding		360 ± 10°C; time: 3 - 5s				
Switching Frequency			--	100	--	kHz	
Power Derating	-40°C to 0°C		1.67	--	--	%/°C	
	+40°C to +70°C	3.3/5V	2.66	--	--		
		Others	2.33	--	--		
	85 - 130VAC	5V	-25°C to +70°C	0.66	--	--	%/VAC
			-40°C to -25°C	1.33	--	--	
	85 - 100VAC	Others	-25°C to +70°C	2.0	--	--	
-40°C to -25°C			4.0	--	--		
240 - 264VAC		0.83	--	--			
Safety Standard			IEC62368/EN62368/UL62368				
Safety-regulated Certification			IEC62368/EN62368/UL62368				
Safety Class			CLASS II				
MTBF			MIL-HDBK-217F@25°C > 300,000 h				

Physical Specifications

Casing Material	Black flame-retardant and heat-resistant plastic (UL94 V-0)	
Package Dimensions	DIP	53.80*28.80*23.50 mm
Weight	DIP	60g (Typ.)
Cooling method	Free air convection	

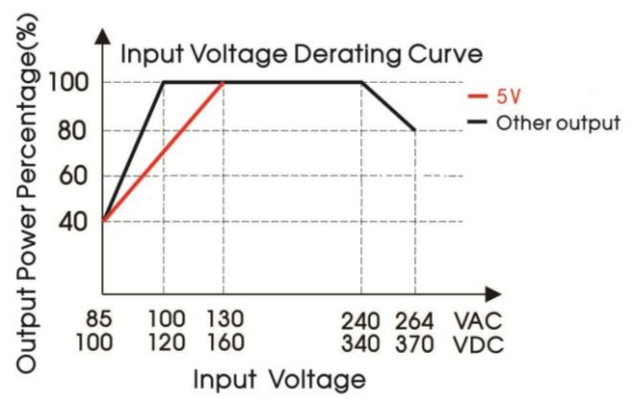
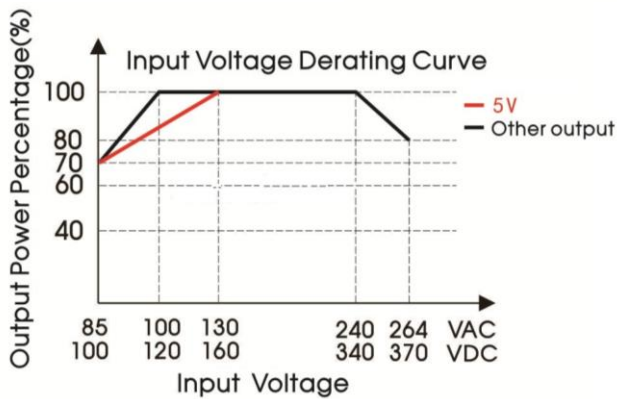
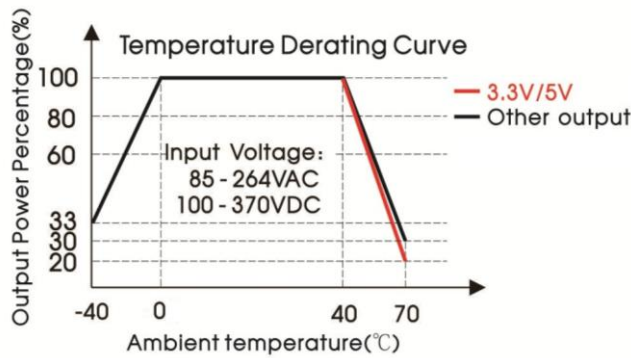
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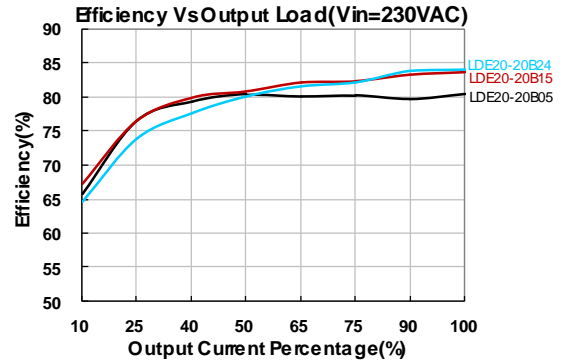
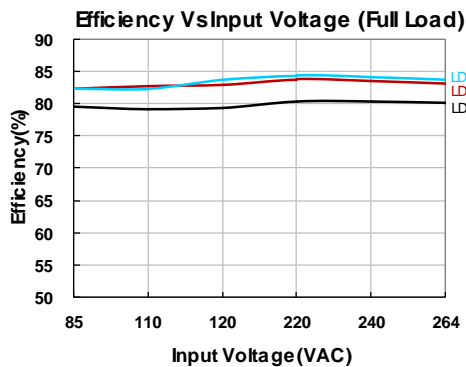
EMC Specifications

EMI	CE	CISPR32/EN55032 CLASS B		
	RE	CISPR32/EN55032 CLASS B		
EMS	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	$\pm 4\text{KV}$	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line $\pm 2\text{KV}$	perf. Criteria B
		IEC/EN61000-4-5	line to line $\pm 4\text{KV}$ /line to ground $\pm 6\text{KV}$ (See Fig. 2 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s	perf. Criteria A
Voltage dips, short interruptions and voltage variations immunity		IEC/EN61000-4-11	0%,70%	perf. Criteria B

Product Characteristic Curve



Note: Derating when input is 85-100VAC/240-264VAC/100-140VDC/340-370VDC (LDE20-20B05:85-130VAC/240-264VAC/100-160VDC/340-370VDC). This product is suitable for use in natural air-cooling environments.



Design Reference

1. Typical application circuit

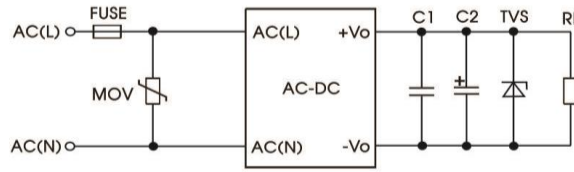


Fig. 1

Model	FUSE	MOV	C1	C2	TVS
LDE20-20B03	3.15A/250V, slow fusing, necessary	S20K300	1μF/50V	220μF/16V	SMBJ7.0A
LDE20-20B05				220μF/16V	SMBJ7.0A
LDE20-20B12				120μF/25V	SMBJ20A
LDE20-20B24				68μF/35V	SMBJ30A

C2 should be fitted in all applications to achieve low ripple and good dynamic load performance. We recommend using a high frequency, low ESR electrolytic capacitors. Choose a capacitor voltage rating with at least 20% margin. C1 is a ceramic capacitor used for filtering high-frequency noise and the TVS provides optional supplementary overvoltage protection.

C2 values should be increased as below for applications with fast switching loads.

Model	C2
LDE20-20B03	470μF/16V (Solid capacitor)
LDE20-20B05	470μF/16V (Solid capacitor)
LDE20-20B12	390μF/25V
LDE20-20B15	390μF/25V

2. EMC solution-recommended circuit

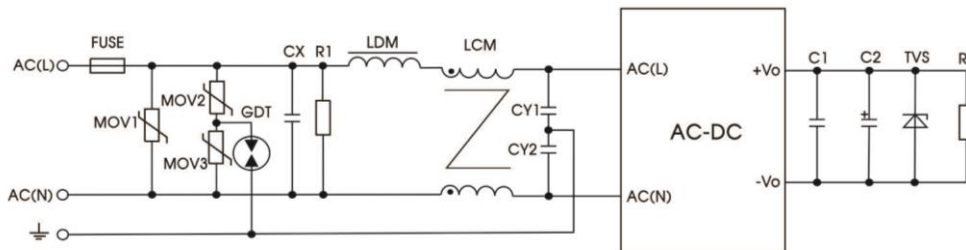


Fig 2

Note: Output external circuit refer to the typical application circuit.

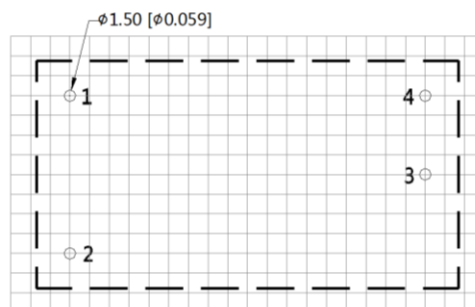
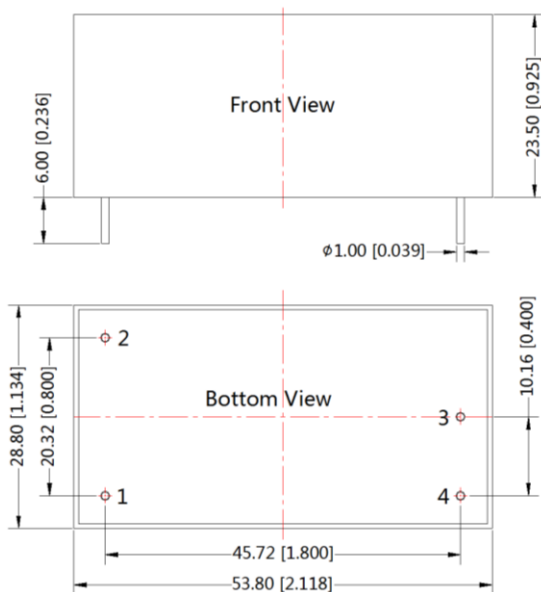
Element model	Recommended value
MOV1	S20K300
MOV2	S10K300
MOV3	S10K300
CX	0.22μF/275VAC
CY1, CY2	1nF/400VAC
R1	1MΩ/2W
LDM	4.7uH
LCM	2mH
GDT	EM3600XS
FUSE	6.3A/250V, slow fusing, necessary

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.