



ENGLISH

Datasheet

RS Pro AC/DC Converter

LD05-20Bxx Series



LD05-20Bxx series---- is a compact size power converter. It features universal input voltage, taking both DC and AC input voltage, low power consumption, high efficiency, high reliability, safer isolation. It offers good EMC performance, and is UL & CE certified, and widely used in industrial, electricity, instruments, telecommunication and civil applications.

Note: Please refer to Design Reference when module being used in a bad EMC environment.

Features:

- Universal input voltage range: 85~264VAC/100~370VDC
- AC and DC dual-use(input from the same terminal)
- High efficiency, high power density
- Output short circuit, over-current, over-voltage protections
- Meets UL60950, EN60950 standards (Pending)
- Mounting :PCB mounting, Chassis mounting, Din-Rail mounting available



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Selection Guide

Certification	Part No.	RS Stock No.	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency (230Vac, %/Typ.)	Max. Capacitive Load* (µF)
UL/CE (Pending)	LD05-20B03	667-5770	4.2W	3.3V/1250mA	74	4000
	LD05-20B05	667-5789	5W	5V/1000mA	78	4000
	LD05-20B09	667-5782		9V/550mA	78	1000
	LD05-20B12	667-5786		12V/420mA	80	820
	LD05-20B24	667-5795	5.5W	24V/230mA	83	330

Note: *Test without external circuit.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC Input	85	--	264	V ac
	DC Input	100	--	370	V dc
Input Frequency		47	--	63	Hz
Input Current	110V ac	--	--	150	mA
	230V ac	--	--	70	
Inrush Current	110V ac	--	10	--	A
	230V ac	--	20	--	
Recommended External Input Fuse (Special Package Series Include Fuse)		1A/250V, slow fusing, necessary			
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	10%-100% load		--	± 1	--	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	3.3V/5V output	--	60	120	mV
		Other output	--	50	100	
Temperature Coefficient			--	± 0.02	--	%/ °C
Stand-by Power Consumption			--	--	0.3	W
Short Circuit Protection			Hiccup, continuous, self-recovery			
Over-Current Protection			>110% Io self-recovery			
Over-Voltage Protection			Over-voltage shutdown			
Hold-up Time	110V ac input		--	12	--	Ms
	230V ac input		--	80	--	
Note: *Ripple and noise are measured by "Parallel Cable" method. Please see AC-DC Converter Application Notes for specific operation.						



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General Specifications

Item		Operating Conditions	Min	Typ.	Max.	Unit
Isolation Voltage	Input-Output	Test Time: 1min		--	--	V ac
Operating Temperature				--	+70	°C
Storage Temperature				--	+105	
Storage Humidity			--	--	95	%RH
Switching Frequency			--	--	140	KHz
Power Derating		+55°C~+70°C	2.0	--	--	% / °C
		+0°C~-25°C	2.0	--	--	
Safety Standard			IEC60950/EN60950/UL60950			
Safety Certification			EN60950/UL60950 (Pending)			
Safety Class			CLASS II			
MTBF			MIL-HDBK-217F@25°C > 300,000 h			

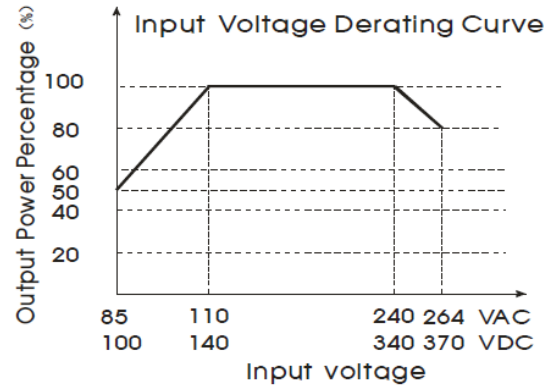
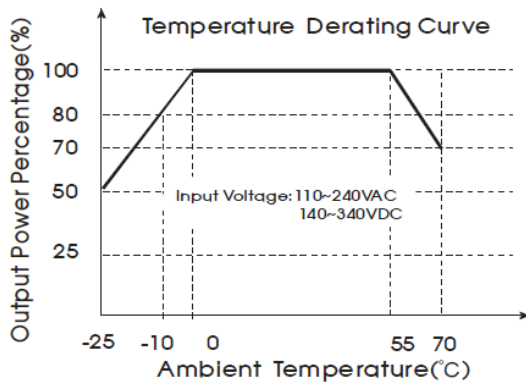
Physical Specifications

Casing Material		Black flame-retardant and heat-resistant plastic (UL94-V0)
Dimension	Horizontal package/A2 chassis mounting/A4 Din-Rail mounting / A2S chassis mounting/A4S Din-Rail mounting	Refer to the Dimensions
Weight	Horizontal package/A2 chassis mounting/A4 Din-Rail mounting / A2S chassis mounting/A4S Din-Rail mounting	31g/80g /121g /52g /70g (Typ.)
Cooling Method		Free Convection

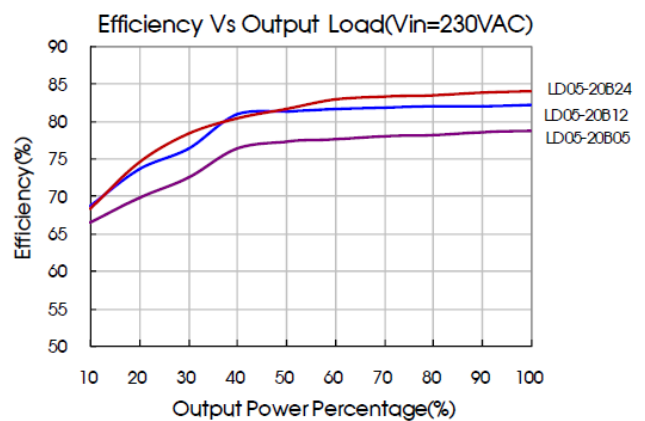
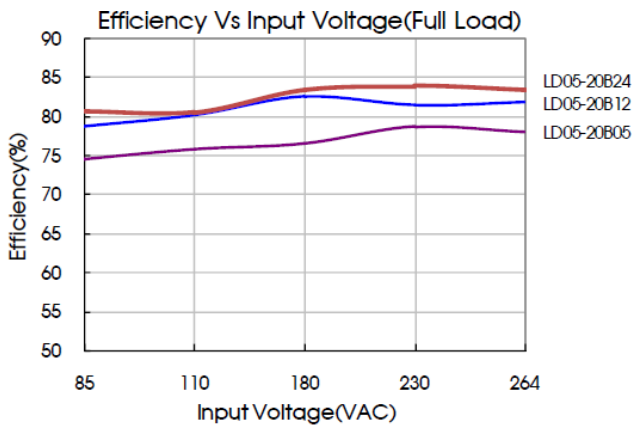
EMC Specifications

EMI	CE	CISPR22/EN55022, CLASS B
	RE	CISPR22/EN55022, CLASS B
EMS	ESD	IEC/EN61000-4-2 $\pm 6\text{KV}/8\text{KV}$ perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m perf. Criteria A
	EFT	IEC/EN 61000-4-4 $\pm 2\text{KV}$ perf. Criteria B
		IEC/EN 61000-4-4 $\pm 4\text{KV}$ (See Fig. 2 for recommended circuit) perf. Criteria B
	Surge	IEC/EN 61000-4-5 $\pm 1\text{KV}$ perf. Criteria B
		IEC/EN 61000-4-5 $\pm 2\text{KV}/\pm 4\text{KV}$ (See Fig. 2 for recommended circuit) perf. Criteria B
	CS	IEC/EN61000-4-6 10Vr.m.s perf. Criteria A
	PFM	IEC/EN61000-4-8 10A/m perf. Criteria A
Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11 0%-70% perf. Criteria B	

Product Characteristic Curve



- Note: ① When input 85~110VAC/240~264VAC/100~140VDC/340~370VDC, it need to be voltage derated on basis of temperature derating;
 ② This product is suitable for use in natural air cooling environments, if in a closed environment, please contact our company's FAE.



Design Reference

1. Typical application circuit

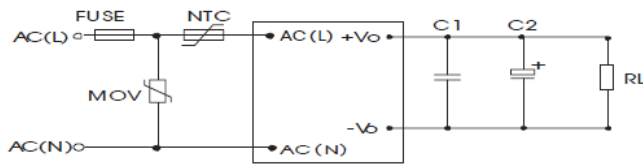


Fig. 1

Model	C1(μF)	C2(μF)
LD05-20B03	1	220
LD05-20B05		220
LD05-20B09		100
LD05-20B12		100
LD05-20B15		100
LD05-20B24		47

Note: Output filtering capacitor C2 is a electrolytic capacitor, it is recommended to use high frequency and low impedance electrolytic capacitor. For capacitance and current of capacitor please refer to manufacture’s datasheet. Output capacitor withstand voltage derating should be 80% or above. C1 is ceramic capacitor, which is used to filter high-frequency noise. External input NTC is recommended to use 12D-5; External input MOV is recommended to use S14K350.

2. EMC solution-recommended circuit

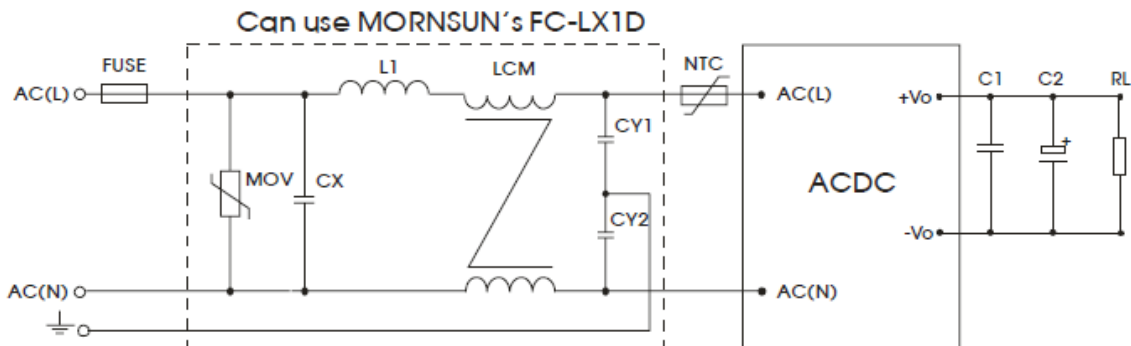
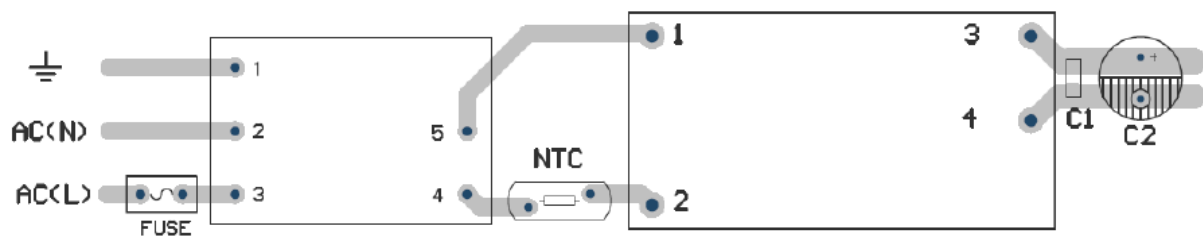


Fig 2

EMC solution-recommended circuit PCB layout



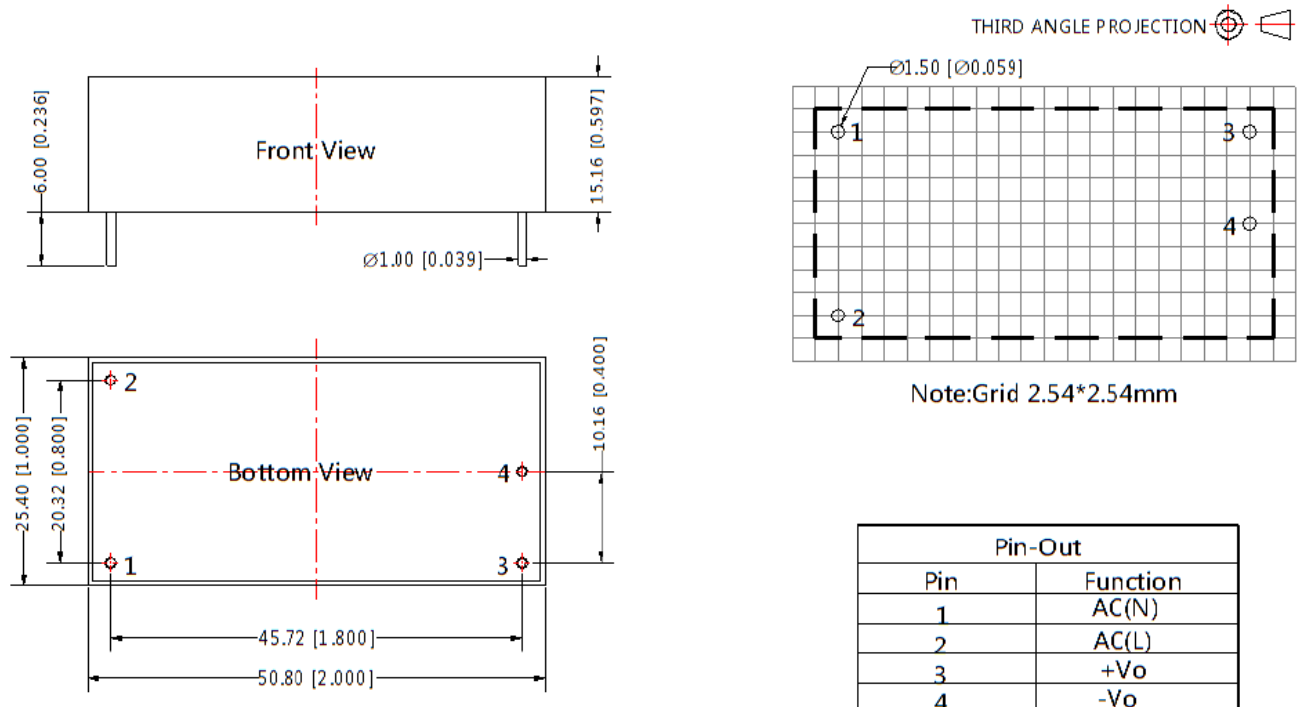
FC-LX1D

Fig 3

Note: Suggestions for safety regulation and wiring width: wire width ≥3mm, distance between wires ≥6mm, and distance between wire and ground ≥6mm

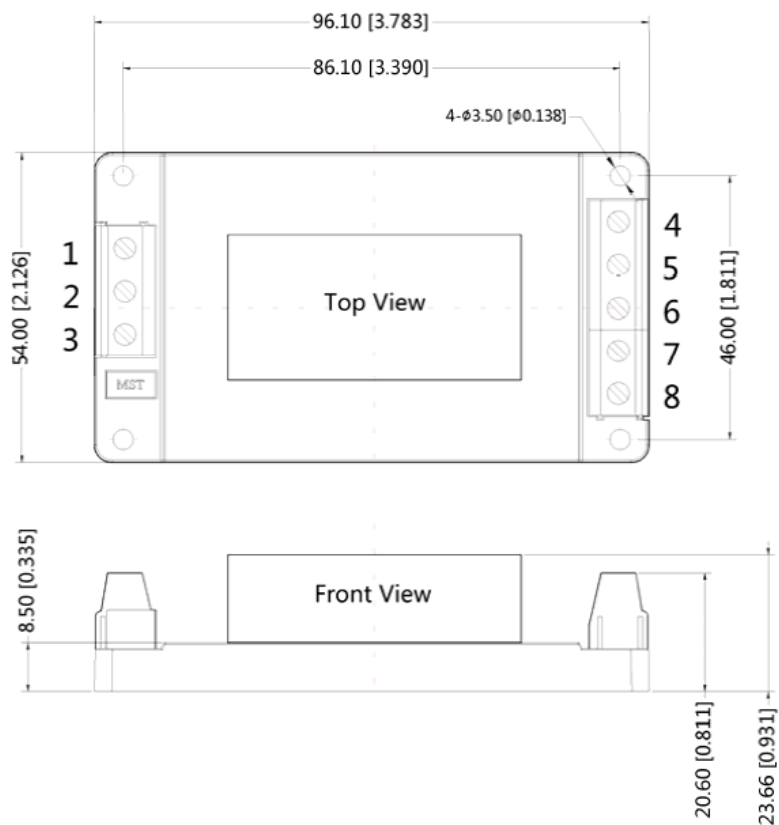
Element model	Recommended value
MOV	S14K350
CX	0.1 μ F/275VAC
L1	4.7 μ H/2.0A
CY1	1nF/400VAC
CY2	1nF /400VAC
LCM	2.2mH, recommended to use MORN SUN's FL2D-10-222
FUSE	1A/250V, slow fusing, necessary

Dimensions and Recommended Layout



LD05-20BxxA4 Chassis Mounting Dimensions

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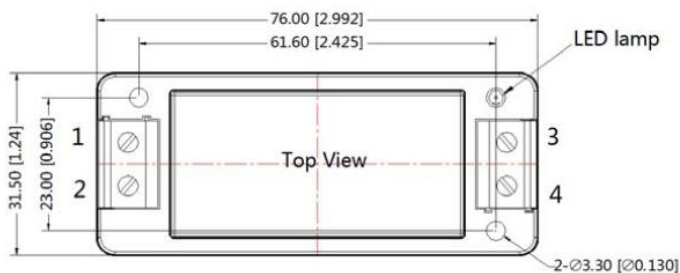


Pin	Function
1	NC
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	-Vo
7	NC
8	NC

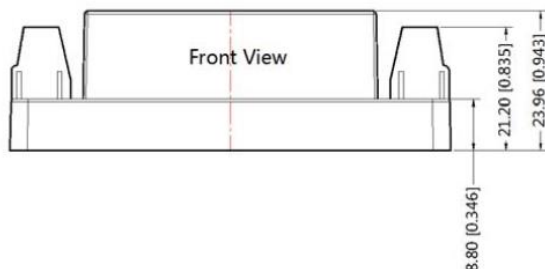
Note:
 Unit:mm[inch]
 Wire range : 24~12 AWG
 General tolerances: \pm 0.50[\pm 0.020]

LD05-20BxxA2S Chassis Mounting Dimensions

THIRD ANGLE PROJECTION



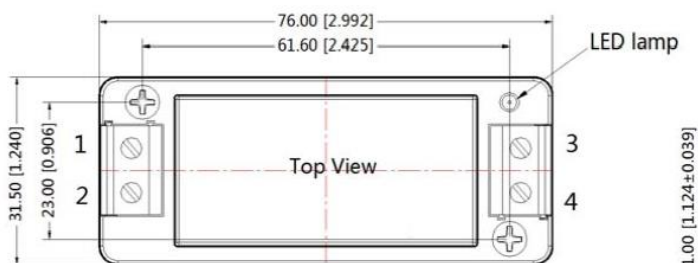
Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	+Vo
4	-Vo



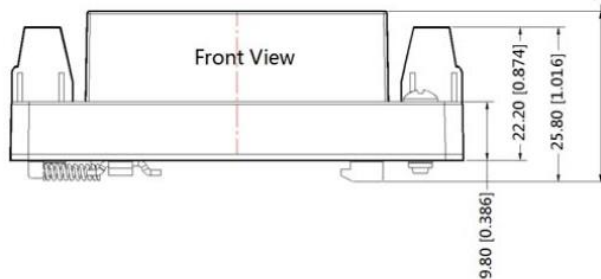
Note:
 Unit:mm[inch]
 Wire range : 24~12 AWG
 General tolerances: \pm 0.50[\pm 0.020]

LD05-20BxxA4S Chassis Mounting Dimensions

THIRD ANGLE PROJECTION



Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	+Vo
4	-Vo



Note:
 Unit:mm[inch]
 Wire range : 24~12 AWG
 Installed on DIN RAIL TS35
 General tolerances: \pm 0.50[\pm 0.020]