

LD03-05 SERIES

3-5W, AC-DC CONVERTER

LDseries ----is a compact size power converter offered by Mornsun for PCB mount installation applications. 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, meets IEC61000, UL60950and IEC60950 standards, and is UL & CE certified, and widely used in industrial,medical,electricity, instruments, telecommunication and civil applications.



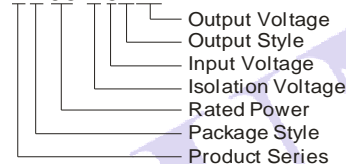
RoHS

PRODUCT FEATURES

1. Universal Input: 85 ~ 264VAC, 50/60Hz
2. AC and DC all in one (input from the same terminal)
3. Low Ripple and Noise
4. Over output voltage protection, short circuit protection and Over temperature
5. High efficiency, High power density
6. Low loss, green power
7. Multiple models available
8. industrial, medical level specifications
9. Three years warranty

MODEL SELECTION

LD05-20B24



PRODUCT PROGRAM

Approval	Model	Package	Power	Output (Vo/Io)	Output (Iomax/T)	Ripple and Noise (Typ)	Efficiency (% Typ)	Standby Power(Typ)		
UL/CE60950	LD03-10B03	37.0X23.0X15.0mm	2.3W	3.3V/700mA	900mA/60s	30mV	63	0.25W		
	LD03-10B05		3W	5V/600mA	750mA/60s		72	0.3W		
	LD03-10B09			9V/330mA	450mA/60s		74	0.35W		
	LD03-10B12			12V/250mA	330mA/60s		76	0.35W		
	LD03-10B15			15V/200mA	250mA/60s		76	0.35W		
	LD03-10B24			24V/125mA	160mA/60s		78	0.35W		
UL/CE60601	LD05-20B03	50.8X25.4X15.16mm	4.2W	3.3V/1250mA	1400mA/60s	30mV	66	0.3W		
	LD05-20B05		5W	5V/1000mA	1300mA/60s		72	0.3W		
	LD05-20B09			9V/550mA	700mA/60s		74	0.35W		
	LD05-20B12			12V/420mA	550mA/60s		76	0.35W		
	LD05-20B15			15V/333mA	450mA/60s		76	0.35W		
	LD05-20B24			24V/230mA	300mA/60s		78	0.4W		
				5.5W						

Note:

1. Ripple and Noise were measured by the method of anear measure (The details see the anear measure);
2. Unless otherwise specified, all specifications above are measured at rated input voltage and rated output load, TA=25°C, humidity < 75%;
3. All specifications stated in this datasheet are subject to the above listed models only. For specifications of non-standard models, please contact our technical support team.
4. Product can not be operated continuously over current, or it will cause permanent damage to the device.

INTPUT SPECIFICATIONS

Input Voltage Range		85~264VAC, 110~370VDC	
Input Frequency		47~440Hz	
Input Current	LD03 models LD05 models	110VAC 65mA, typ 110mA,typ	230VAC 30mA, typ 70mA, typ
Inrush Current	LD03 models LD05 models	110VAC 10A, typ 10A, typ	230VAC 20A, typ 20A, typ
Leakage current		None	
External input fuse (Recommended)	LD03 models LD05 models	0.5A/250V 1A/250V	Slow blow Slow blow

OUTPUT SPECIFICATIONS

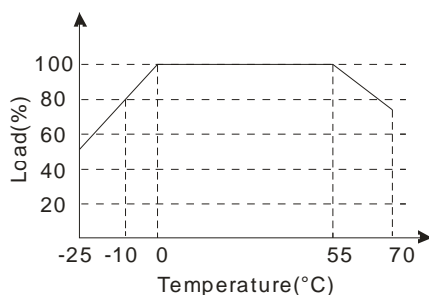
Voltage set accuracy		$\pm 2\%$ (typ) ($\pm 3\%$ @ 3.3V output)	
Input variation		$\pm 0.5\%$ (typ)	
Load variation (10% to 100%)		$\pm 1\%$ (typ)	
Ripple & noise (p-p)	20MHz Bandwidth	30mV (typ)	60mV (max)
Short circuit protection		Continuous, and auto resume	
Over temperature protection		150°C (max)	
Over output voltage protection	LD05 models	diode clamp	

COMMON SPECIFICATIONS

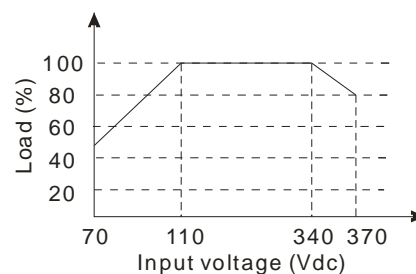
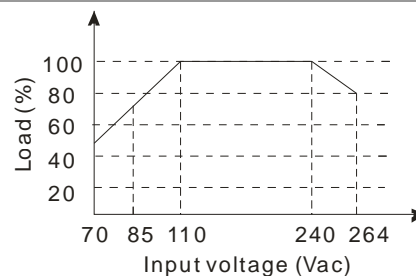
Temperature ranges	Operating Power derating Storage: Case temperature:	(above 55°C):	-25°C ~ +70°C 2% / °C -40°C ~ +105°C +95°C max
Hold-up time	(Vin=230VAC)		50ms(typ)
Humidity			95%(max)
Temperature coefficient			0.02%/°C
Switching frequency			100kHz(typ)
I/O-isolation voltage	LD03 models LD05 models		3000VAC/1Min 4000VAC/1Min
EMI/RFI conducted	LD03 models LD05 models		EN55022, level A EN55011, level A
EMC compliance	Electrostatic discharge ESD		IEC/EN 61000-4-2 level 4 8kV/15kV perf. Criteria B
	RF field susceptibility		IEC/EN 61000-4-3 level 3 10V/m perf. Criteria A
	Electrical fast transients /bursts on mainsline	LD03 models	IEC/EN 61000-4-4 level 3 2kV perf. Criteria B
		*LD05 models	IEC/EN 61000-4-4 level 4 4kV perf. Criteria B
	*Surge	LD03 models	IEC/EN 61000-4-5 level 3 1kV/2kV perf. Criteria B
		LD05 models	IEC/EN 61000-4-5 level 4 2kV/4kV perf. Criteria B
Safety standards	LD03 models LD05 models		IEC60950,EN60950,UL60950 IEC60601,EN60601
Safety approvals	LD03 models LD05 models		EN60950,UL60950 EN60601-1
Safety Class			CLASS II
Case material			UL94V-0
Install			PCB
MTBF			>300,000h @25°C
Package	LD03 models LD05 models		37X23X15mm 50.8X25.4X15.2mm
*Note: External circuit is required to models at inrush and electrical fast transients experiment, refer to typical application.			

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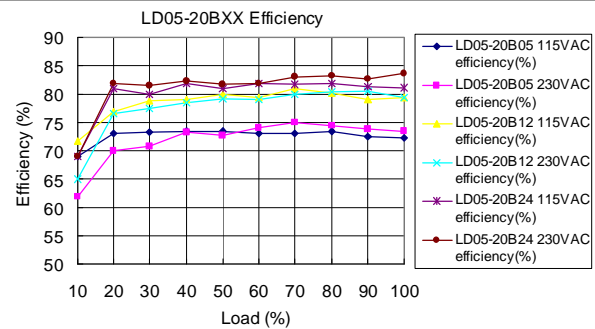
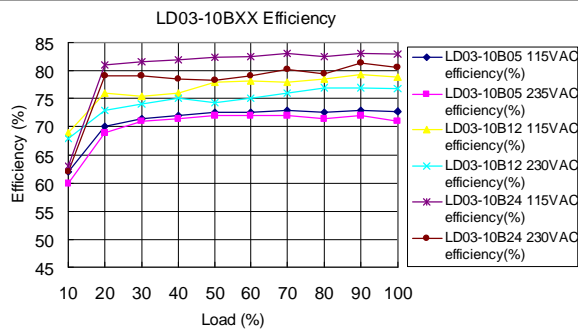
TEMPERATURE VS LOAD



INPUT VOLTAGE VS LOAD

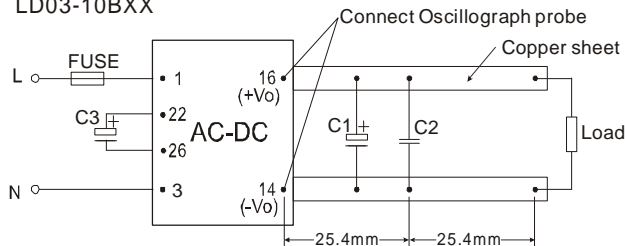


TYPICAL EFFICIENCY CURVE

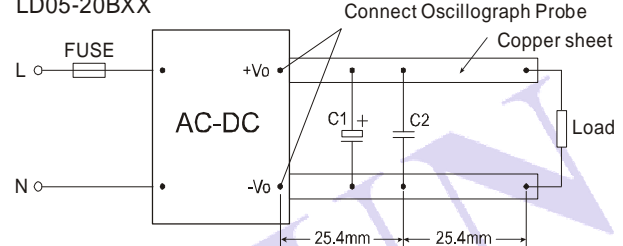


ANEAR MEASURE

LD03-10BXX



LD05-20BXX



TYPICAL APPLICATIONS

LD03-10BXX

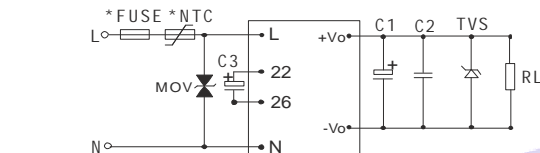


Figure 1

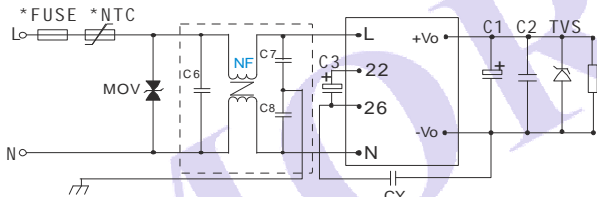


Figure 3 LD03 EMC Application

LD05-20BXX

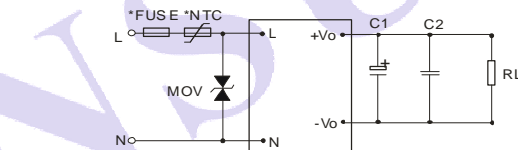


Figure 2

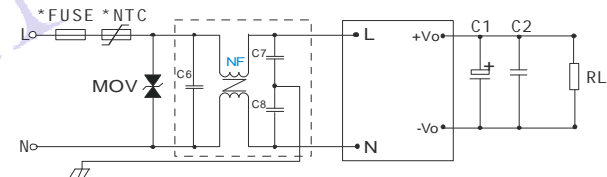


Figure 4 LD05 EMC Application

EXTERNAL CAPACITORS TYPICAL VALUE(Unit: mF)

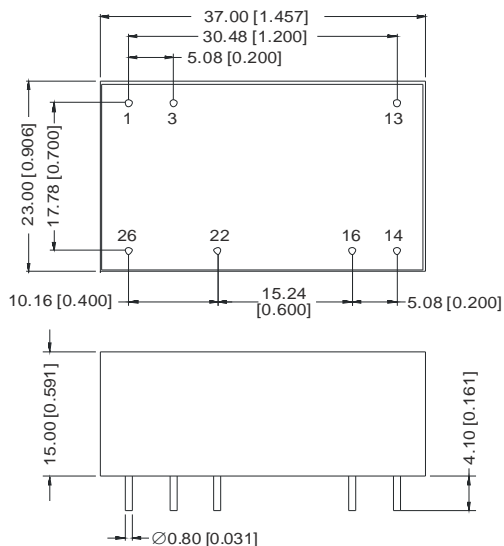
Model	C1	C2	C3	TVS	Model	C1	C2
LD03-10B03	150	0.1	4.7/400V	P4KE6.8A	LD05-20B03	47	0.1
LD03-10B05	150	0.1	4.7/400V	P4KE6.8A	LD05-20B05	47	0.1
LD03-10B09	120	0.1	4.7/400V	P4KE12A	LD05-20B09	33	0.1
LD03-10B12	120	0.1	4.7/400V	P4KE20A	LD05-20B12	33	0.1
LD03-10B15	120	0.1	4.7/400V	P4KE20A	LD05-20B15	33	0.1
LD03-10B24	68	0.1	4.7/400V	P4KE30A	LD05-20B24	10	0.1

Note:

- Output filtering capacitor C1 and input filtering capacitors C3 are electrolytic capacitors. It is recommended to use high frequency and low impedance electrolytic capacitors. For capacitance and current of capacitor please refer to manufacture's datasheet. Voltage derating of capacitor should be 80% or above. C2 is ceramic capacitor, it is used to filter high frequency noise. TVS is a recommended component to protect post-circuits (if converter fails).
- To protect the device from damage, external circuit is required to models at inrush and electrical fast transients experiment. MOV is required to LD03 models and LD05 models, model: 471KD10; It is recommended to connect FUSE, the parameter for LD03 models is 0.5A/250V slow blow, for LD05 models is 1A/250V slow blow. External input NTC is recommended to use 5D-14 or 10Q/2W wire-round resistor. (see figure 1,2)
- If EMC performance is required, recommended to add "EMC filter" at the input end(see figure 3,4)
C6: X capacitor, recommended parameter 0.1μF/275V;
C7,C8: Y capacitor, recommended parameter 2200pF/400V;
CY: Y capacitor, recommended parameter 102K/400V, LD03 models recommended external, to meet EMC higher require.
NF: common model choke, recommended inductance is about 10mH-30mH.
- LD03 models: Terminals 22 and 26 are internal rectification and filtering terminals. To protect the models further, it is recommended to connect an electrolytic capacitor C3 (it is recommended to be 4.7μF/400V). If operation voltage of the module is between 160~264VAC, C3 can be removed.

LD03-10BXX

MECHANICAL DIMENSIONS

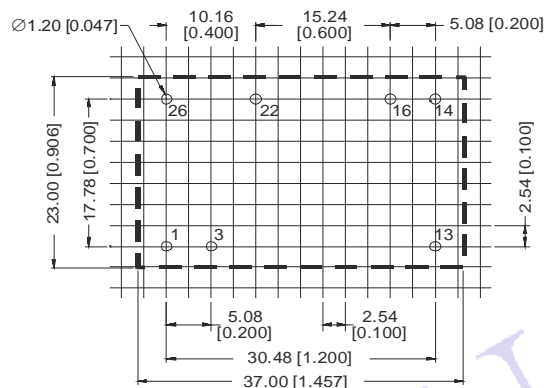


FOOTPRINT DETAILS	
Pin	Function
1	L
3	N
13	NC
14	-Vo
16	+Vo
22	+V(cap)
26	-V(cap)

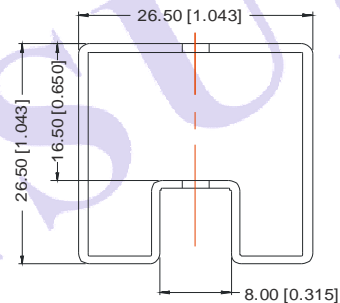
Note:
 1) NC: No connection.
 2) Terminals 1 and 3 are DC&AC input,
 Terminals 22 and 26 are internal
 rectification and filtering terminals

Note:
 First Angle Projection
 Unit:mm[inch]
 Pin section tolerances: $\pm 0.10\text{mm}[\pm 0.004\text{inch}]$
 General tolerances: $\pm 0.50\text{mm}[\pm 0.020\text{inch}]$

RECOMMENDED FOOTPRINT(TOP VIEW)



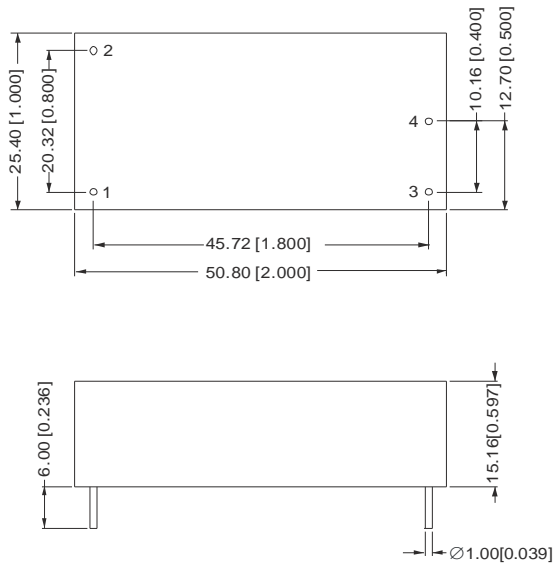
TUBE OUTLINE DIMENSIONS



Note:
 Unit :mm[inch]
 General tolerances: $\pm 0.50\text{mm}[\pm 0.020\text{inch}]$
 L=530mm[20.866inch] Devices per tube quantity: 13pcs
 L=220mm[8.661inch] Devices per tube quantity: 5pcs
 Short tube inner packaging box dimensions: 255*170*80mm
 Short tube outer packaging carton dimensions: 375*280*270mm
 Long tube inner packaging box dimensions: 580*200*100mm
 Long tube outer packaging carton dimensions(with two inner packaging boxes):
 600*215*220mm
 Long tube outer packaging carton dimensions(with three inner packaging boxes):
 600*215*325mm

LD05-20BXX

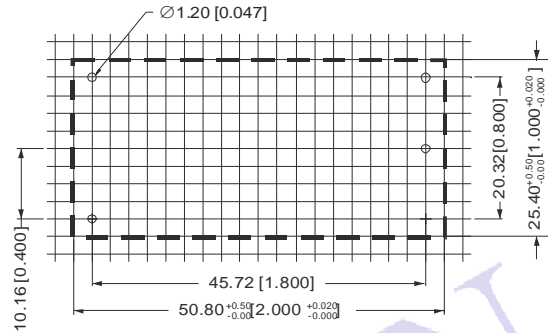
MECHANICAL DIMENSIONS



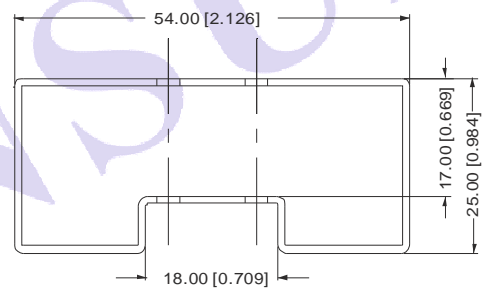
FOOTPRINT DETAILS	
Pin	Function
1	N
2	L
3	+Vo
4	-Vo

Note:
First Angle Projection
Unit:mm[inch]
Pin section tolerances:±0.10mm[±0.004inch]
General tolerances:±0.50mm[±0.020inch]

RECOMMENDED FOOTPRINT(TOP VIEW)



TUBE OUTLINE DIMENSIONS



Note:
Unit :mm[inch]
General tolerances: ±0.50mm[±0.020inch]
L=530mm[20.866inch] Devices per tube quantity: 19pcs
L=220mm[8.661inch] Devices per tube quantity: 7pcs
Short tube inner packaging box dimensions: 255*170*80mm
Short tube outer packaging carton dimensions: 375*280*270mm
Long tube inner packaging box dimensions: 580*200*100mm
Long tube outer packaging carton dimensions(with two inner packaging boxes): 600*215*220mm
Long tube outer packaging carton dimensions(with three inner packaging boxes): 600*215*325mm

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