

## LD12-20BXX SERIES 12W, AC-DC CONVERTER

**LD12 series** ----is a compact size power converter offered by Mornsun for 12W PCB mount installation applications, small volume. It features universal input voltage, taking both DC and AC input voltage, low power consumption, low ripple& noise , high efficiency, high reliability, 4000VAC safer isolation. It offers good EMC performance, meet IEC61000, UL60950 and IEC60950 standards, and meet UL60950 and EN60950 certification standards, and widely used in industrial, electricity, instruments, telecommunication and civil applications.

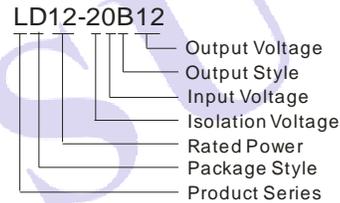


RoHS

### PRODUCT FEATURES

1. Universal Input :85 ~264VAC/120~370VDC
2. AC and DC all in one (input from the same terminal)
3. Low Ripple and Noise
4. EMC meet EN55022、EN55024/IEC/EN 61000-4 series
5. Super small volume
6. Low loss, green environmental protection
7. High efficiency,4000VAC safer isolation
8. Output short circuit protection, over-current protection and over-voltage protection
9. Meet UL60950 and EN60950 certification standards
10. Three years warranty

### MODEL SELECTION



### PRODUCT PROGRAM

Approval	Model	Package	Power	Output (Vo/Io)	Ripple and Noise (typ.)	Efficiency (%) (typ.)	Standby Power(max.)
UL/CE	LD12-20B03	53.5X28.5X23.5mm	7.9W	3.3V/2400mA	50mV	74	0.5W
	LD12-20B05			5V/2400mA		76	0.5W
	LD12-20B12		12W	12V/1000mA		80	0.5W
	LD12-20B15			15V/800mA		80	0.5W
	LD12-20B24			24V/500mA		81	0.5W

Remarks :

1. Ripple and Noise were measured by the method of anear measure;
2. Unless otherwise specified, all specifications above are measured at rated input voltage and rated output load, TA=25°C, humidity < 75%.

### INTPUT SPECIFICATIONS

Input voltage range	85~264VAC, 120~370VDC
Input frequency	47~440Hz
Input current	110VAC 230VAC 280mA, typ 190mA, typ
Inrush current	110VAC 230VAC 10A, typ 20A, typ
Leakage current	0.4mA (max)
External input fuse (recommended)	3.15A/250V Slow blow

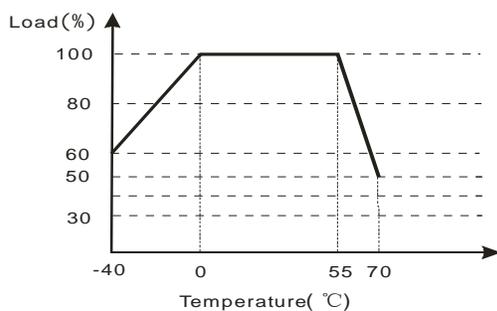
## OUTPUT SPECIFICATIONS

Voltage set accuracy		±2% (typ)
Input variation		±0.5% (typ)
Load variation (10% to 100% load)		±1% (typ)
Min load		0%
Ripple & noise (p-p)	(20MHz Bandwidth)	100mV (max)
Short circuit protection		Continuous, and auto resume
Over current protection		≥110% I <sub>O</sub> and auto resume
Maximum capacitive load (μF)	LD12-20B03	8000
	LD12-20B05	8000
	LD12-20B12	1800
	LD12-20B15	1200
	LD12-20B24	470

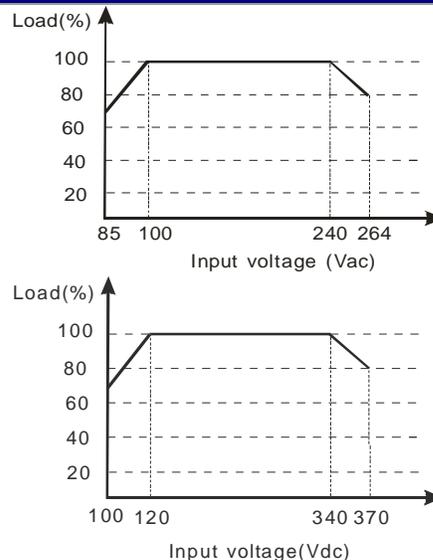
## COMMON SPECIFICATIONS

Temperature ranges	Operating		-40°C ~ +70°C
	Power derating	(above 55°C)	3.3% /°C
		(below 0°C)	1% /°C
	Storage:		-40°C ~ +105°C
Case temperature:		+90°C max	
Hold-up time	(V <sub>in</sub> =230VAC)		50ms(typ)
	(V <sub>in</sub> =115VAC)		10ms(typ)
Humidity			95%(max)
Temperature coefficient			±0.02%/°C
Switching frequency			100kHz(typ)
I/O-isolation voltage			4000VAC/1Min
EMI/RFI conducted			EN55022, CLASS B
EMC compliance	Electrostatic discharge	EN55024/IEC/EN 61000-4-2 level 4	8kV/15kV perf. Criteria B
	RF field susceptibility	EN55024/IEC/EN 61000-4-3 level 3	10V/m perf. Criteria A
	Electrical fast transients	EN55024/IEC/EN 61000-4-4 level 4	4kV perf. Criteria B
	Surge	EN55024/IEC/EN 61000-4-5 level 4	2kV perf. Criteria B
Safety standards			IEC60950/EN60950/UL60950
Safety approvals			EN60950/UL60950 (pending)
Safety class			CLASS B
Case material			UL94V-0
Install			PCB
Cooling			Free air convection
MTBF			>300,000h @25°C
Package			53.5X28.5X23.5mm

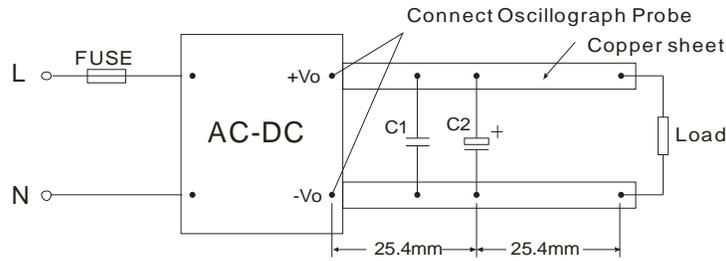
## TEMPERATURE VS LOAD



## INPUT VOLTAGE VS LOAD

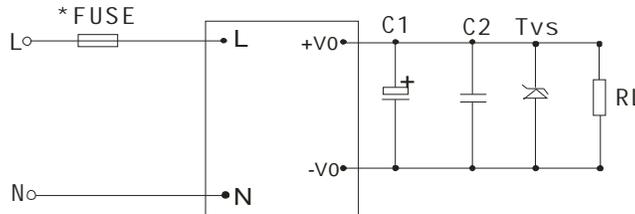


## ANEAR MEASURE



Remark: C1: ceramic capacitor, 0.1 $\mu$ F; C2: electrolytic capacitors, 10 $\mu$ F

## TYPICAL APPLICATIONS



EXTERNAL CAPACITORS TYPICAL VALUE(Unit:  $\mu$ F)

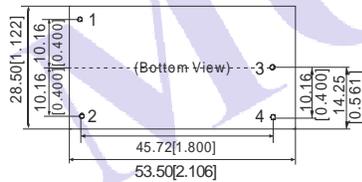
Model	C1	C2	TVS
LD12-20B03	220 $\mu$ F/10V	0.1 $\mu$ F/50V	P6KE6.8A
LD12-20B05	220 $\mu$ F/10V	0.1 $\mu$ F/50V	P6KE6.8A
LD12-20B12	120 $\mu$ F/25V	0.1 $\mu$ F/50V	P6KE20A
LD12-20B15	120 $\mu$ F/25V	0.1 $\mu$ F/50V	P6KE20A
LD12-20B24	68 $\mu$ F/35V	0.1 $\mu$ F/50V	P6KE30A

Note:

- Output filtering capacitors C1 is 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).
- External connect FUSE, recommended the parameter is 3.15A/250V slow blow.

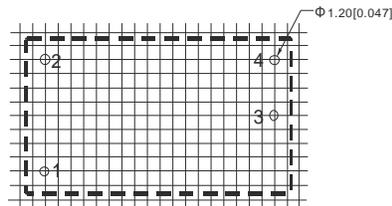
## OUTLINE DIMENSIONS & PIN CONNECTIONS

## PACKAGE DIAGRAM



Note:  
 First Angle Projection  
 Unit: mm[inch]  
 Pin diameter: 1.00  $\pm$  0.10mm [0.039  $\pm$  0.004inch]  
 General tolerances:  $\pm$  0.50mm [ $\pm$  0.020inch]  
 Weight: 60g(max.)

RECOMMENDED FOOTPRINT  
 Top view, grid: 2.54mm [0.100inch]



FOOTPRINT DETAILS	
PIN	FUNCTION
1	L
2	N
3	-Vo
4	+Vo



Inner packaging dimensions:  
 L\*W\*H=355\*192\*93mm  
 Packaging quantity: 40pcs  
 Outer packaging dimensions:  
 L\*W\*H=405\*380\*305mm  
 Packaging quantity: 240pcs

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