LD60-23BxxR2 SERIES

AC-DC

60W

DIMENSIONS:

PCB: 2.756 x 1.89 x 1.063" (70 x 48 x 27mm)
A2S: 3.783 x 2.126 x 1.398" (96.1 x 54 x 35.5mm)
A4S: 3.783 x 2.126 x 1.579" (96.1 x 54 x 40.10mm)

85 - 305 VAC

-40 TO 85°C OPERATION

4200 VAC ISOLATION

Part numbers

LD60	-23B	12	R2
Series	Input voltage	Output voltage	Version
	85-305VAC	05 = 5VDC 12 = 12VDC 15 = 15VDC 24 = 24VDC 48 = 48VDC	

Key specifications

Input range	Safety certification	Efficiency	Environmental performance
85-305VAC	UL / EN 62368-1, Designed to meet IEC / EN 60335-1, CE	89-91%	-40 to 85°C

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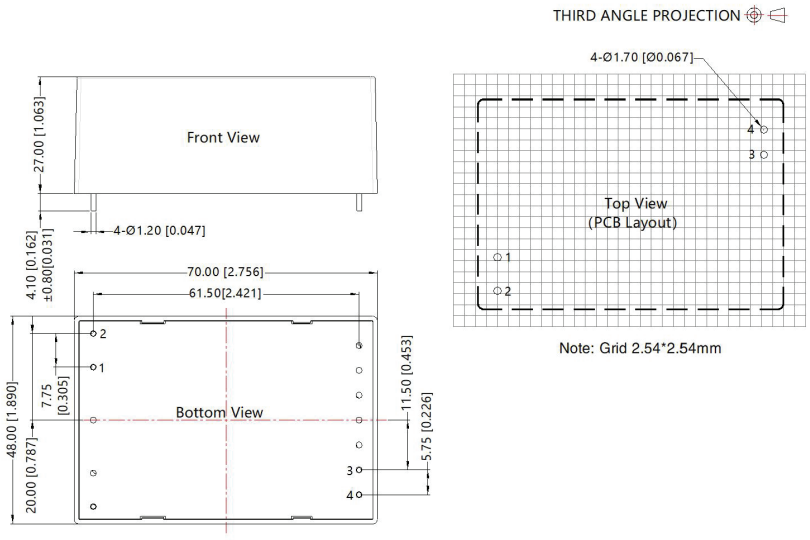
Mechanical

Through hole

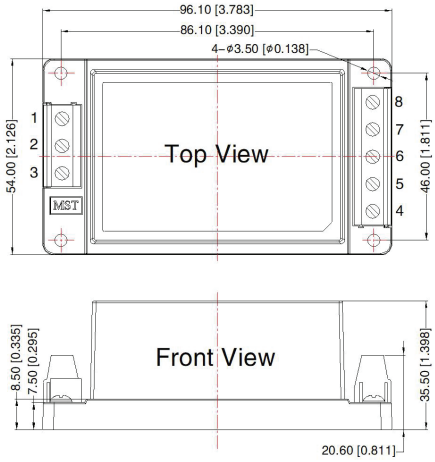


Pin	Function
1	AC IN (N)
2	AC IN (L)
3	-DC OUT
4	+DC OUT

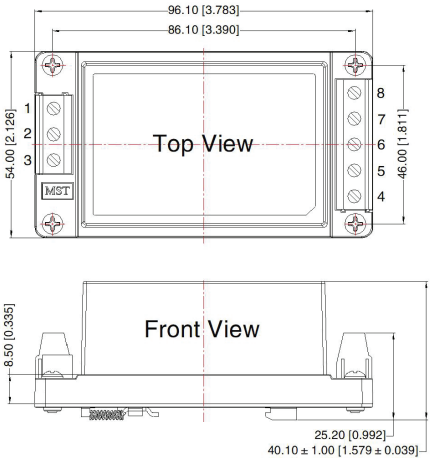
Notes

1. All dimensions shown in mm
2. Pin diameter ±0.1 [±0.004]
3. General tolerance ±0.5 [±0.02]

Chassis mount



DIN rail mount



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

Weight

Through hole	A2S	A4S
130g	177g	220g

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Models & Ratings

Model Number (1)	Output Power	Output Voltage	Output current	Efficiency (2)	Max Capacitive Load
LD60-23B05R2	50W	5V	10A	89%	20000uF
LD60-23B12R2	60W	12V	5A	91%	5000uF
LD60-23B15R2	60W	15V	4A	90%	3000uF
LD60-23B24R2	60W	24V	2.5A	91%	1800uF
LD60-23B48R2	60W	48V	1.25A	90%	470uF

1. Typical efficiency at 230VAC
2. Unless stated, figures are at 25°C <75RH and nominal line/ load.

Input

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Input voltage	85		305	VAC	100-430 VDC slow blow fuse required. See page 6 for derating curve
Input frequency	47		63	Hz	
Power factor					EN61000-3-2 class A
Input current	1		1.8	Arms	1.8A 115VAC / 1A at 230VAC
Inrush current	45		90	A	45A at 115VAC and 90A at 230VAC. Cold start at 25°C
No load input power		0.3	0.45	W	
Leakage current			0.5	mA	277VAC 50Hz
Built in fuse	3.15A / 300V slowblow				

Output

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Output voltage	5		48	VDC	See Models & Ratings table
Set point accuracy		±2		%	
Line regulation		±0.5	±1	%	
Load regulation		±1	±1.5	%	0 to 100% load
Minimum load	0			%	
Ripple and noise		80	150	mV pk-pk	All models measured with 10uF and 0.1uf capacitor. 20 MHz bandwidth
Hold up time	8		65	mS	8ms for 115VAC and 65ms for 230VAC

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Protections

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Overload	140			%	Trip and restart. Automatic recovery
Short circuit					Trip and restart. Automatic recovery
Over voltage			9 18 25 35 60	VDC	5V units 12V units 15V units 24V units 48V units

Safety

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Safety standards	IEC/EN/UL62368-1/EN60335-1				
Isolation: Input to output	4200			VAC	Input to output

EMC: Immunity

	Standard	Test level	Criteria	Notes/Conditions
ESD	EN61000-4-2	3	A	±6kV contact / ±8kV Air
Radiated	EN61000-4-3	3	A	10V/m
EFT	EN61000-4-4	3	A	±2kV Circuit 1
	EN61000-4-4	3	A	±4kV Circuit 2
Surges	EN61000-4-5	Installation class 3	A	±2kV
	EN61000-4-5	Installation class 3	A	±2kV Line-Line, 4kV Line-Ground Circuit 2
Conducted	EN61000-4-6	2	A	10Vrms
Voltage dips and interruptions	EN61000-4-11	0% interruptions 70% dips performance criteria B		

EMC: Emissions

	Standard	Test level	Criteria	Notes/Conditions
Conducted	EN55032	B		
Radiated	EN55032	B		
Harmonic current	EN61000-3-2	Class A		
Voltage flicker	EN61000-3-3			

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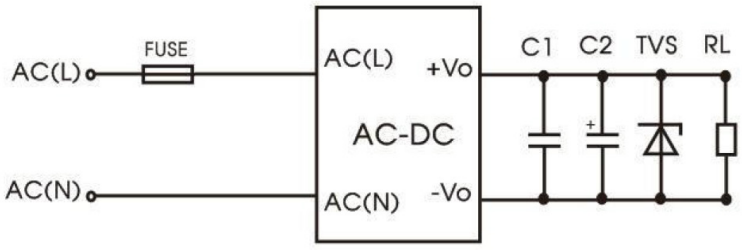
Application Notes



Typical Application: Circuit 1

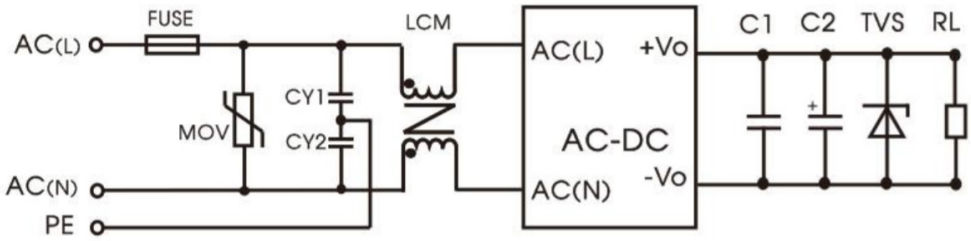
1. For a typical application we recommend placing these additional components close to the converter
2. In circuit 1, C1 should be a ceramic cap for HF noise and C2 an electrolytic with low ESR
3. Both caps should have a minimum 20% voltage margin on the output voltage
4.The TVR is placed to protect the load should the converter fail

Part no	C1	C2	Fuse	TVS
LD60-23B05R2	1uF/50V	470uF/16V	3.15A/300V slow blow required	SMBJ10A
LD60-23B12R2		330uF/16V		SMBJ20A
LD60-23B15R2		330uF/25V		SMBJ30A
LD60-23B24R2		220uF/35V		SMBJ40A
LD60-23B48R2	1uF/100V	100uF/63V		SMBJ60A

Suggested EMC: Circuit 2

1. The neighbouring circuit 2 is recommended to pass EMC emission and immunity.
2. Place components as close to the converter as possible
3. For better EMC performance fit MOV S14K350, 3.15A/300V fuse, 1nF/4000V Y caps and 20mH LCM.

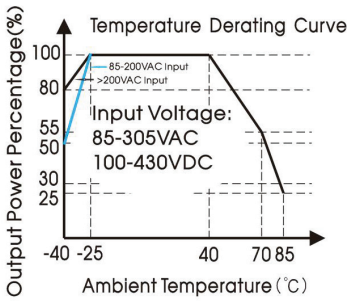
Component	Recommended value
Fuse	3.15A/300V slow blow
MOV	S14K350
CY 1/2	1nF/400VAC
LCM	20mH



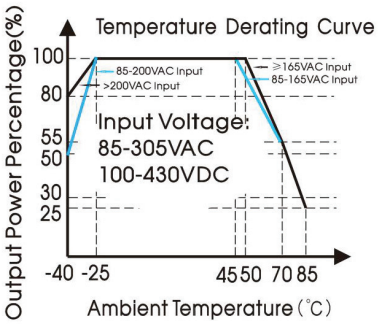
Environmental

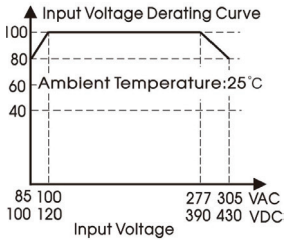
Parameter	Min	Typical	Max	Unit	Notes/Conditions
Operating temperature	-40		85	°C	See derating curve
Storage temperature	-40		85	°C	
Altitude	2000		5000	m	Derate 6.6% every km above 2km
Temperature coeffiwcient			±0.02	%/°C	
Storage Humidity			95	% RH	

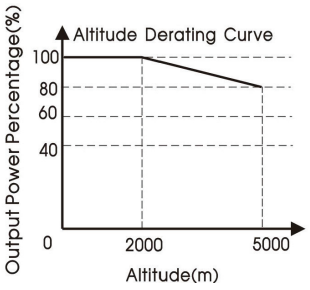
5VDC output

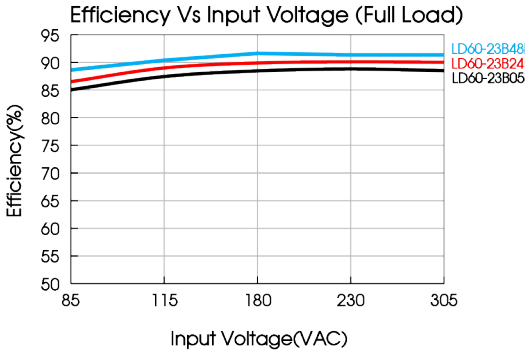


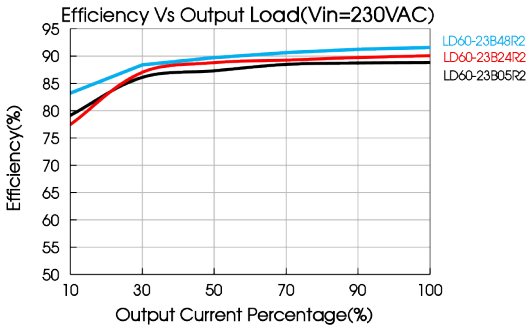
12-48VDC output











20th October 2023