30W AC to DC Converter PCB Mount

multicomp PRO

30W, AC-DC converter

RoHS Compliant

Features

- Input voltage range: 85V AC to 305V AC and 100V DC to 430V DC
- Operating ambient temperature range: -40°C to +85°C
- Up to 90% efficiency
- No-load power consumption <0.1W
- 5000m altitude application
- EMI performance meets CISPR32/EN55032 CLASS B, EN55014
- Meets surge ±2KV without additional circuits
- Overvoltage category OVCIII (meet EN61558)
- IEC/EN/UL62368/EN60335/EN61558 safety approval

Description

MP-LD30-23BxxR2 series AC-DC converters is one of new generation compact size power converter. It features wide AC input and at the same time accepts DC input voltage, low power consumption, high efficiency, high reliability, reinforced isolation. It offers good EMC performance compliant to IEC/EN61000-4 and CISPR32/EN55032 and meets IEC/EN/UL62368/EN60335/EN61558 standards. The converters are widely used in industrial, power, home appliances, instrumentation, communication and civil applications. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

Selection Guide

Certification	Part Number	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 230V AC (%) Typ.	Capacitive Load (uF) Max.
UL/CE/CB	MP-LD30-23B03R2	19.8	3.3V/6000mA	85	6600
	MP-LD30-23B05R2	30	5V/6000mA	86	
	MP-LD30-23B12R2		12V/2500mA	90	4400
	MP-LD30-23B15R2		15V/2000mA		3300
	MP-LD30-23B24R2	31.2	24V/1300mA	88	1000
	MP-LD30-23B48R2		48V/630mA	90	470

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	305	V AC
	DC input	100	--	430	V DC
Input Frequency		47	--	63	Hz
Input Current	115V AC	--	--	0.75	A
	230V AC	--	--	0.5	
Inrush Current	115V AC	--	25	--	
	230V AC	--	50	--	
Leakage Current	277V AC/50Hz	0.1mA RMS Max.			
Built In Fuse		2A/300V, slow-blow			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	3.3V		-	±3	-	%
	5V/9V/12V/15V/24V/48V			±2		
Line Regulation	Full load			±0.5		
Load Regulation	0%-100% load	3.3V		±2		
		5V		±1.5		
		12V/15V/24V/48V		±1		
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	3.3V/5V/9V/12V/15V		-	100	mV
		24V/48V		100	150	
Stand-by Power Consumption	230V AC	3.3V/5V/12V/15V/24V		0.075	0.1	W
		48V		0.12	0.15	
Temperature Coefficient				±0.02	--	%/°C
Short Circuit Protection			Hiccup, continuous, self-recovery			
Over-current Protection			≥110%Io, self-recovery			
Over-voltage Protection	3.3VDC Output		≤6.3VDC (Output voltage hiccup)			
	5VDC Output		≤16VDC (Output voltage hiccup)			
	12VDC Output		≤16VDC (Output voltage hiccup)			
	15VDC Output		≤25VDC (Output voltage hiccup)			
	24VDC Output		≤35VDC (Output voltage hiccup)			
	48VDC Output		≤60VDC (Output voltage hiccup)			
Minimum Load			0	-	-	%
Hold-up Time	115V AC input		-	10	-	ms
	230V AC input		-	50	-	
Note: *The “Tip and barrel method” is used for ripple and noise test, output parallel 10uF electrolytic capacitor and 1uF ceramic capacitor, please refer to AC-DC Converter Application Notes for specific information.						

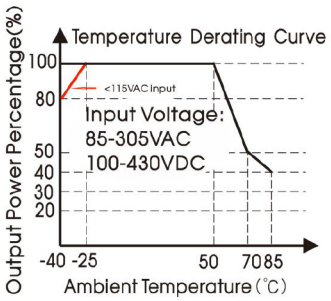
General Specifications						
Item		**Operating Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Isolation Test	Input-output	Electric Strength Test for 1min., leakage current <5mA	4200	-	--	V AC
Insulation Resistance	Input-output	At 500V DC	100		--	MΩ
Operating Temperature			-40		85	°C
Storage Temperature			-40		85	
Storage Humidity			-		95	%RH
Soldering Temperature		Wave-soldering	260 ± 5°C; time: 5 - 10s			
		Manual-welding	360 ± 10°C; time: 3 - 5s			
Switching Frequency			-	65	-	kHz
Power Derating		-40°C to -25°C (<115V AC)	1.33	-	--	%/°C
		+50°C to +70°C	2.5		--	
		+70°C to +85°C	0.67		--	
		85V AC - 100V AC	1.33		--	%/V AC
		277V AC - 305V AC	0.72			
		2000m - 5000m	6.7			%/Km
Safety Standard			IEC/EN/UL62368/EN60335/EN61558			
Safety Certification			IEC/EN/UL62368/EN60335/EN61558			
Safety Class			CLASS I I			
Vibration			10 ~ 500Hz, 5G 10min./1cycle, period for 60min. Each along X, Y, Z axes			
MTBF			MIL-HDBK-217F@25°C > 500,000 h			

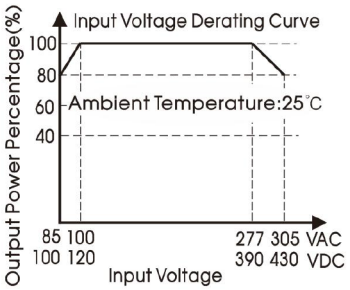
Mechanical Specifications		
Case Material		Black plastic, flame-retardant and heat-resistant (UL94V-0)/Metal
Dimension	DIP package	69.5 × 39 × 24 mm
Weight	DIP package	100g (Typ.)
Cooling method		Free air convection

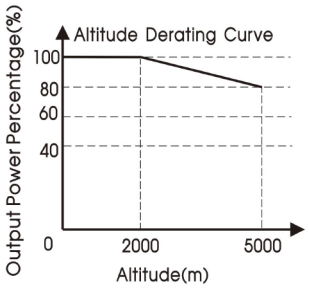
Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B	
	RE	EN55014-1	
Immunity	ESD	IEC/EN 61000-4-2 Contact ±8KV / Air ±15KV	Perf. Criteria A
		IEC/EN55014-2	Perf. Criteria A
	RS	IEC/EN61000-4-3 10V/m	Perf. Criteria A
		IEC/EN55014-2	Perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV	Perf. Criteria A
		IEC/EN61000-4-4 ±4KV (See Fig.2 for recommended circuit)	Perf. Criteria A
		IEC/EN55014-2	perf. Criteria A
	Surge	IEC/EN61000-4-5 line to line ±2KV	Perf. Criteria A
		IEC/EN61000-4-5 line to line ±2KV/line to ground ±4KV (See Fig.2 for recommended circuit)	Perf. Criteria A
		IEC/EN55014-2	Perf. Criteria A
	CS	IEC/EN61000-4-6 10Vr.m.s	Perf. Criteria A
		IEC/EN55014-2	Perf. Criteria A
	Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11 0%, 70%	perf. Criteria B
		IEC/EN55014-2	perf. Criteria B

Product Characteristic Curve

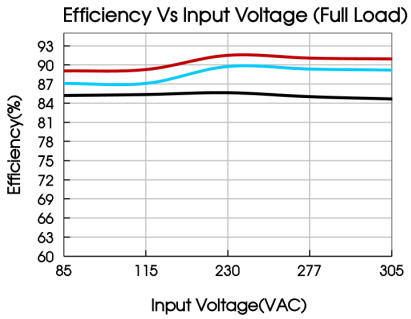


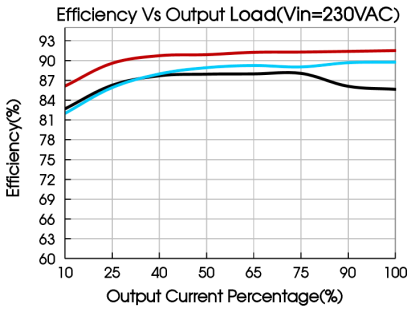




Note:

1. With an AC input between 85-100V/277-305VAC and a DC input between 100-120V/390-430VDC, the output power must be derated as per temperature derating curves;
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.





Design Reference

1. Typical application

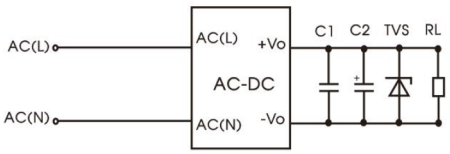


Fig. 1: Typical circuit diagram

Part No.	C1	C2	TVS
MP-LD30-23B03R2	1uF/100V	10uF/50V	SMBJ7.0A
MP-LD30-23B05R2		10uF/50V	SMBJ7.0A
MP-LD30-23B12R2		10uF/50V	SMBJ20A
MP-LD30-23B15R2		10uF/50V	SMBJ20A
MP-LD30-23B24R2		10uF/50V	SMBJ30A
MP-LD30-23B48R2		10uF/63V	SMBJ64A

Output Filter Components:

1. C1 is a ceramic capacitor used for filtering high-frequency noise and TVS is a recommended suppressor diode to protect the application in case of a converter failure;
2. This circuit is recommended for indoor use.

2. EMC compliance recommended circuit

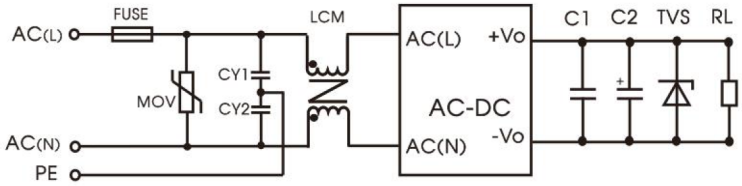
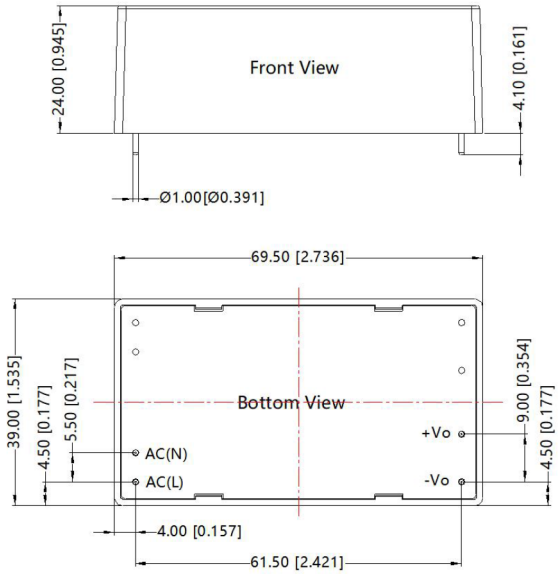
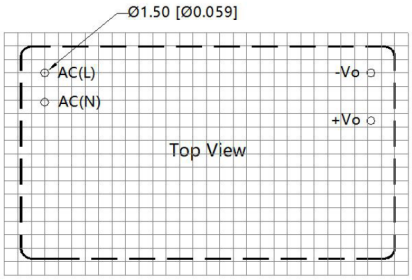


Fig 2: EMC application circuit with higher requirements

Component	Recommended value
FUSE	2A/300V, slow-blow, required
MOV	S14K350
CY1/CY2	1nF/400V AC
LCM	10mH

Dimensions and Recommended Layout





Note: Grid 2.54*2.54mm

Note:
Unit: mm[inch]
Pin diameter tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]