multicomp PRO

5W, AC-DC converter





Features

- Ultra-wide 85 305VAC and 100 430VDC input voltage range
- 1" × 1" compact size
- Operating ambient temperature range: -40°C to +85°C
- · Up to 81.5% efficiency
- No-load power consumption 0.1W
- Plastic case meets UL94V-0 flammability
- EMI performance meets CISPR32 / EN55032 CLASS B
- IEC/EN/UL62368/EN60335/EN61558 safety approval

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Description

MP-LD05-23BxxR2 series AC-DC converters is one of compact size power converter. It features ultra-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								
Part Number	Output Power	Nominal Output Voltage and Current	Efficiency at 230VAC (%) Typ.	Capacitive Load (µF) Max.				
MP-LD05-23B03R2		3.3V/1515mA	71.5	4000				
MP-LD05-23B05R2		5V/1000mA	77.5	3000				
MP-LD05-23B09R2	5W	9V/555mA	00 F	4200				
MP-LD05-23B12R2		12V/416mA	80.5	1200				
MP-LD05-23B24R2		24V/208mA	81.5	220				

Input Specifications							
Item	Operating Conditions	Min.	Тур.	Max.	Unit		
Input Voltage Bange	AC input	85		305	V AC		
Input Voltage Range	DC input	100		430	V DC		
Input Frequency	iput Frequency		-	63	Hz		
Innut Current	115V AC]	0.13			
Input Current	230V AC			0.07] ,		
Inrush Current	115V AC		15		1 A		
iniusii Current	230V AC		25				
Leakage Current	277VAC/50Hz		0.25mA RMS Max.				
Recommended External Input Fuse			1A, slow-blow, required (The actual use needs to be selected according to the application environment)				
Hot Plug			Unav	ailable			





Item	Operating Conditions	Min.	Тур.	Max.	Unit		
Outt \ /- t	3.3V output		±3	-	0/		
Output Voltage Accuracy	others		±2	-			
Linear Regulation	Full load		±0.5	-	%		
Load Regulation	0%-100% load		±1	-			
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)		50	100	mV		
Stand-by Power Consumption	230V AC		0.1	-	W		
Temperature Coefficient			±0.02	-	%/°C		
Short-circuit Protection		Hiccu	Hiccup, continuous, self-recove				
Over-current Protection		2	≥130%lo, self-recovery				
	3.3/5V DC output		≤7.5V DC				
Over veltere Dustastien	9V DC output		≤15V DC				
Over-voltage Protection	12V DC output		≤16V DC				
	24V DC output		≤30V DC				
Minimum Load		0	-	-	%		
Hold up Time	115V AC input	-	5	-	ma		
Hold-up Time	230V AC input	-	50	-	ms		

Notes: *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	Operatin	Min.	Тур.	Max.	Unit	
Isolation	Input-Output	Electric Strength Te rent <5mA	4000	-	-	V AC	
Operating T	Temperature			40	-	+85	°C
Storage Ter	mperature			-40	_	+105	
Storage Hu	midity			-	-	+95	%RH
Coldoring T	omnoratura	Wave-soldering		:	260 ± 5°C; 1	time: 5 - 10s	3
Soldering To	emperature	Manual-welding		360 ± 10°C; time: 3 - 5s			3
Switching F	requency			-	65	-	kHz
		-40°C to -25°C		3	-	-	
		+50°C to +70°C	3.3V	1.75	-	-	%/°C
		+55°C to +70°C	5V/9V/12V	2.33	-	-	
		+60°C to +70°C	24V	3.5	-	-	
Power Dera	ating	+70°C to +85°C	3.3V	1.67	-	-	
	+70 C to +83 C		Others	1	-	-	
		85V AC - 100V AC		1	-	-	%/VAC
		277V AC - 305V AC		0.54	-		
		2000m - 5000m		0.67	-		%/Km





Item	Opera	Operating Conditions			Max.	Unit	
Safety Standard					EN60335/EI	N61558	
Safety Certification		IEC/EN/UL62368/EN60335/EN			N61558		
Safety Class					CLASS II		
MTBF					25°C > 260	2,000 h	
Designed Life	230V AC	Ta:25°C 100% load		>130 :	× 10³ h		
Designed Life	230V AC	Ta: 55°C 100% load		<41 ×	10³ h		

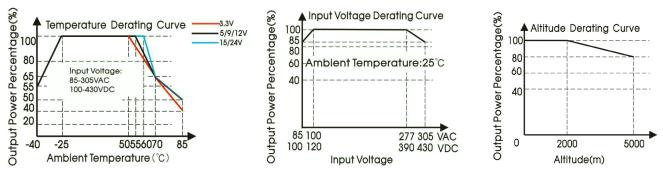
Mechanical Specifications						
Case Material Black plastic; flame-retardant and heat-resistant (UL94 V-0)						
Dimensions	Horizontal package		25.4mm × 25.4mm × 17.6mm			
\A/a i alat	Harimantal maakana	3.3V/5V/9V/12V	18g (Typ.)			
Weight	eight Horizontal package 24V		18.5g (Typ.)			
Cooling Method			Free air convection			

Electron	Electromagnetic Compatibility (EMC)					
	CE	CISPR32/EN55032	CLASS B			
Emissions	CE	EN55014-1				
EIIIISSIOIIS	RE	CISPR32/EN55032	CLASS B (see Fig. 5-2 for recommended circuit)			
	NE .	EN55014-1				
	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	perf. Criteria B		
	ESD	EN55014-2		perf. Criteria B		
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A		
	No	EN55014-2		perf. Criteria A		
	EFT	IEC/EN61000-4-4	±2KV (See Fig.1 for typical application circuit)	perf. Criteria B		
		IEC/EN61000-4-4	±4KV (See Fig.2 for recommended circuit)	perf. Criteria B		
		EN55014-2		perf. Criteria B		
		IEC/EN61000-4-5	line to line ±1KV	perf. Criteria B		
Immunity	Surge		(See Fig.1 for typical application circuit)	pen. Chlena B		
	Surge	IEC/EN61000-4-5	line to line ±2KV	perf. Criteria B		
			(See Fig.2 for recommended circuit)	pen. Chtena b		
		EN55014-2		perf. Criteria B		
	CS	IEC/EN61000-4-6	10Vr.m.s	perf. Criteria A		
		EN55014-2		perf. Criteria A		
	Voltage dip, short	IEC/EN61000-4-11	0%, 70%	perf. Criteria B		
	interruption and voltage variation	EN55014-2	·	perf. Criteria B		



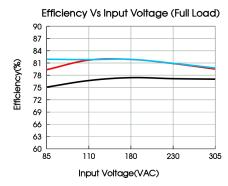
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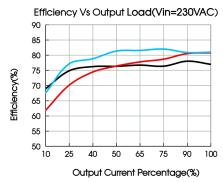
Typical Characteristic Curves



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

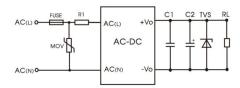


Fig. 1: Typical circuit diagram

Part Number	C1(µF)	C2(µF)	FUSE	R1	TVS	MOV
MP-LD05-23B03R2		150			SMBJ7A	
MP-LD05-23B05R2		150	1A/300V.		SIVIDOTA	
MP-LD05-23B09R2	1	120	slow-blow,	12Ω/3W	SMBJ12A	S10K350
MP-LD05-23B12R2			120	required		SMBJ20A
MP-LD05-23B24R2		68			SMBJ30A	

Output Filter Components:

We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2 (refer to manufacture's datasheet). Choose a Capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. 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. EMC compliance recommended circuit

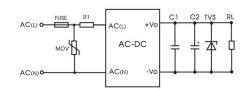
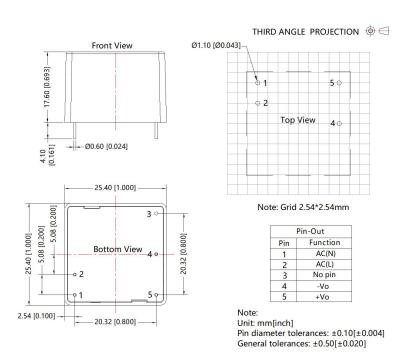


Fig 2: EMC application circuit with higher requirements

Component	Recommended value	
MOV	S14K350	
R1	33Ω/3W	
FUSE	2A/300V, slow-blow, required	

Dimensions and Recommended Layout



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