AC/DC Converter

SLD03-23BxxR2 Series

3W, AC-DC converter

FEATURES

- Ultra-wide 85 - 305VAC and 100 - 430VDC input voltage range
- 1 x 1 inch compact size
- Operating ambient temperature range: -40℃ to +85℃
- Up to 79% efficiency
- No-load power consumption 0.1W
- Plastic case meets UL94V-0 flammability
- EMI performance meets CISPR32 / EN55032 CLASS B, EN55014
- IEC/EN/UL62368/EN60335/EN61558 safety approval

SLD03-23BxxR2 series AC-DC converters is one of SCHMID-M 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

Certification	Part No.*	Output Power	Nominal Output Voltage and Current	Efficiency at 230VAC (%) Typ.	Capacitive Load (μF) Max.
UL/CE/CB	SLD03-23B03R2	3W	3.3V/900mA	72	4000
	SLD03-23B05R2		5V/600mA	76	3000
	SLD03-23B09R2		9V/333mA	78	1200
	SLD03-23B12R2		12V/250mA	78	1200
	SLD03-23B15R2		15V/200mA	79	680
	SLD03-23B24R2		24V/125mA	79	220

Note: * Use suffix "A2S" for chassis and suffix "A4S" for DIN-Rail mounting.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	305	VAC
	DC input	100	--	430	VDC
Input Frequency		47	--	63	Hz
Input Current	115VAC	--	--	0.08	A
	230VAC	--	--	0.06	
Inrush Current	115VAC	--	15	--	
	230VAC	--	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 enviroment)			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	3.3V output	--	±3	--	%
	others	--	±2	--	
Line 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	230VAC	--	0.10	--	W
Temperature Coefficient		--	±0.02	--	%/°C

Short Circuit Protection		Hiccup, continuous, self-recovery				
Over-current Protection		≥200%Io, self-recovery				
Over-voltage Protection	3.3/5VDC output	≤7.5VDC				
	9VDC output	≤15VDC				
	12VDC output	≤16VDC				
	15VDC output	≤20VDC				
	24VDC output	≤30VDC				
Minimum Load		0	--	--	%	
Hold-up Time	115VAC input	--	5	--	ms	
	230VAC 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	Input-Output	Electric Strength Test for 1min, leakage current <5mA		4000	--	--	VAC
Operating Temperature				-40	--	+85	℃
Storage Temperature				-40	--	+105	
Storage Humidity				--	--	+95	%RH
Soldering Temperature		Wave-soldering		260 ± 5℃; time：5 - 10s			
		Manual-welding		360 ± 10℃; time：3 - 5s			
Switching Frequency				--	65	--	kHz
Power Derating		+70℃ to +85℃	3.3V	2.33	--	--	%/℃
			Others	1.33	--	--	
		85VAC - 100VAC		1.33	--	--	%/VAC
Altitude				--	--	5000	m
Safety Standard				IEC/EN/UL62368/EN60335/EN61558			
Safety Certification				IEC/EN/UL62368/EN60335/EN61558			
Safety Class				CLASS Ⅱ			
MTBF				MIL-HDBK-217F@25°C > 2799,000 h			
Designed Life		230VAC	Ta：25℃ 100% load	>150x10^3 h			
			Ta：70℃ 100% load	>27x10^3 h			

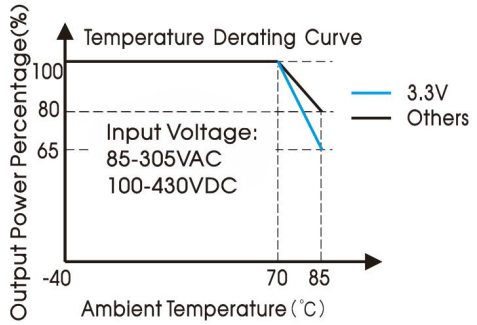
Mechanical Specifications

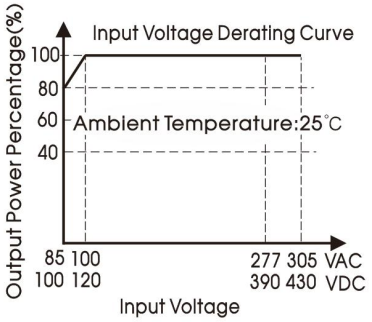
Case Material			Black plastic, flame-retardant and heat-resistant (UL94V-0)
Dimension	Horizontal package		25.40 x 25.40 x 17.60 mm
	A2S mounting		76.00 x 31.50 x 26.40 mm
	A4S mounting		76.00 x 31.50 x 31.00 mm
Weight	Horizontal package	3.3V/5V/9V/12V	18.0g (Typ.)
		15V/24V	18.5g (Typ.)
	A2S mounting		38.0g (Typ.)
	A4S mounting		58.0g (Typ.)
Cooling method			Free air convection

Electromagnetic Compatibility (EMC)

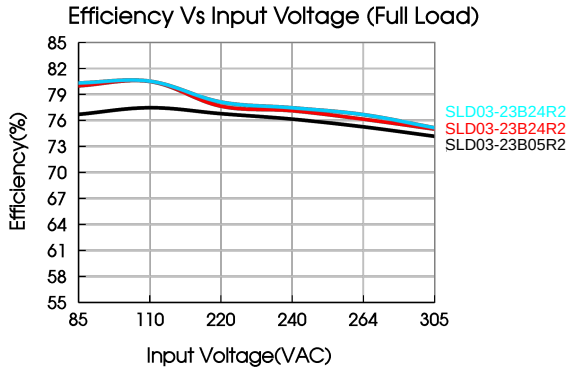
Emissions	CE	CISPR32/EN55032 CLASS B	
		EN55014-1	
	RE	CISPR32/EN55032 CLASS B	
		EN55014-1	
Immunity	ESD	IEC/EN 61000-4-2 Contact ±6KV/Air ±8KV	Perf. Criteria B
		EN55014-2	Perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
		EN55014-2	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV (See Fig.1 for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

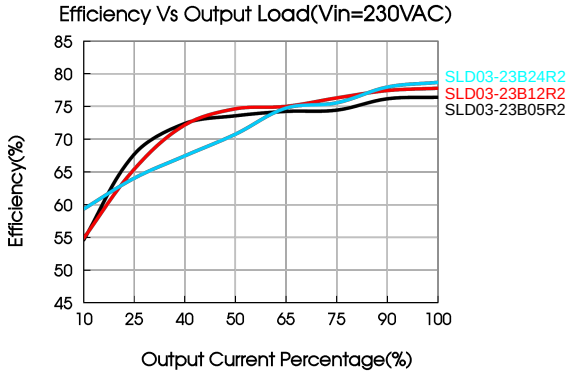
Product Characteristic Curve





Note: ① With an AC input between 85-100V/ a DC input between 100-120VDC, 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

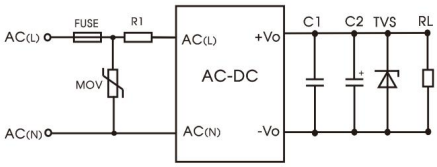


Fig. 1: Typical circuit diagram

Part No.	C1(μF)	C2(μF)	FUSE	R1	TVS	MOV
SLD03-23B03R2	1	150	1A/300V, slow-blow, required	12Ω/3W	SMBJ7.0A	S10K350
SLD03-23B05R2		150			SMBJ7.0A	
SLD03-23B09R2		120			SMBJ12A	
SLD03-23B12R2		120			SMBJ20A	
SLD03-23B15R2		120			SMBJ20A	
SLD03-23B24R2		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

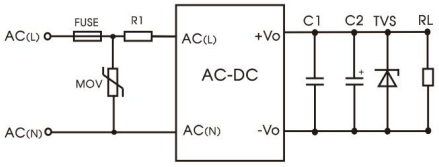
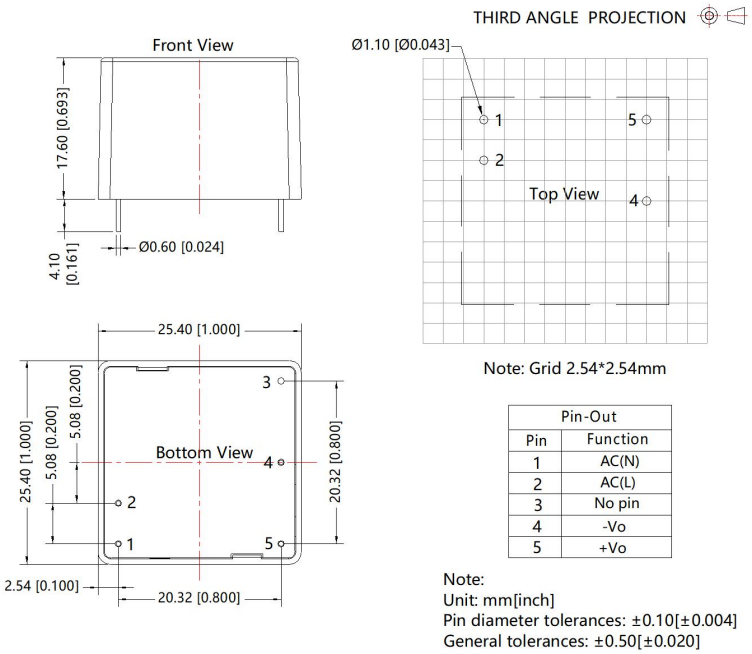


Fig 2: EMC application circuit with higher requirements

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

Dimensions and Recommended Layout



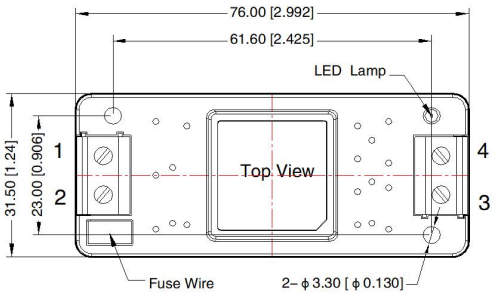
Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	No pin
4	-Vo
5	+Vo

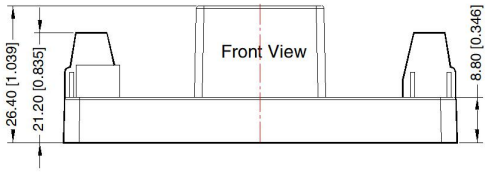
Note:
Unit: mm[inch]
Pin diameter tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]

A2S Dimensions

THIRD ANGLE PROJECTION



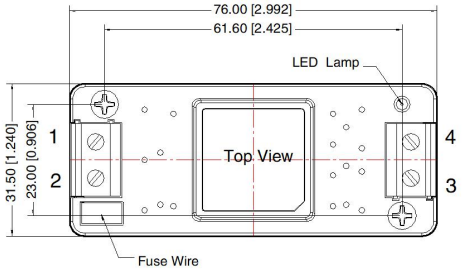
Pin–Out	
Pin	Function
1	AC(N)
2	AC(L)
3	–Vo
4	+Vo



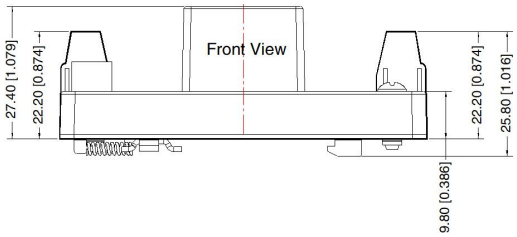
Note:
Unit: mm[inch]
Wire range: 24–12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ± 1.00[± 0.039]

A4S Dimensions

THIRD ANGLE PROJECTION



Pin–Out	
Pin	Function
1	AC(N)
2	AC(L)
3	–Vo
4	+Vo



Note:
Unit: mm[inch]
Wire range: 24–12 AWG
Tightening torque: Max 0.4 N·m
Mounting rail: TS35, rail needs to connect safety ground
General tolerances: ± 1.00[± 0.039]

Note:

1. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75% with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on our company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.