

1W isolated DC-DC converter  
Fixed input voltage and regulated single output



Continuous Short  
Circuit Protection

UL US CE CB Patent Protection RoHS



## FEATURES

- Continuous short-circuit protection
- No-load input current as low as 5mA
- Operating ambient temperature range: -40°C ~ +85°C
- High efficiency up to 73%
- I/O isolation test voltage 1.5k VDC
- Industry standard pin-out
- SIP package
- IEC62368, UL62368, EN62368 approved

SIB05\_LS-1WR3 series is especially designed for distributed power supply systems where an isolated voltage is required. They are suitable for occasions of : pre-interference isolation, ground interference elimination, pure digital circuit, voltage isolation conversion, general low frequency analog circuit, relay drive circuit, etc.

## Selection Guide

Certification	Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load (µF) Max.
		Nominal (Range)	Voltage (VDC)	Current (mA) Max./Min.		
CE	SIB0503LS-1WR3	5 (4.75-5.25)	3.3	250/25	63/67	2400
UL/CE/CB	SIB0505LS-1WR3		5	200/20	66/70	2400
	SIB0509LS-1WR3		9	111/12	67/71	1000
	SIB0512LS-1WR3		12	84/9	68/72	560
	SIB0515LS-1WR3		15	67/7	69/73	560
CE	SIB0524LS-1WR3		24	41/4	69/73	100

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	3.3VDC/5VDC output	--	286/5	303/10	mA
	9VDC/12VDC output	--	282/12	299/20	
	15VDC/24VDC output	--	274/18	290/30	
Reflected Ripple Current*		--	15	--	
Input Filter		Capacitance Filter			
Hot Plug		Unavailable			

Note: \* Refer to DC-DC Converter Application Notes for detailed description of reflected ripple current test method.

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Voltage Accuracy		--	--	±3	%
Linear Regulation	Input voltage change: ±1%	--	--	±0.25	%
Load Regulation	10%-100% load	3.3VDC output	--	±3	%
		Others	--	±2	
Ripple & Noise*	20MHz bandwidth	Others	--	30	mVp-p
		24V output	--	50	
Temperature Coefficient	100% load	--	±0.02	--	%/°C
Short-circuit Protection		Continuous, self-recovery			

Note: \* The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information.

# DC/DC Converter

## SIB05\_LS-1WR3 Series

### General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Isolation	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max.	1500	--	--	VDC	
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ	
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	20	--	pF	
Operating Temperature	Derating when operating temperature $\geq 71^\circ\text{C}$ (see Fig.1)	-40	--	85	°C	
Storage Temperature		-55	--	125		
Case Temperature Rise	Ta=25°C	3.3VDC output	--	30		--
		Others	--	25		--
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300		
Storage Humidity	Non-condensing	--	--	95	%RH	
Vibration		10-150Hz, 5G, 30 Min. along X, Y and Z				
Switching Frequency	100% load, nominal input voltage	--	270	--	KHz	
MTBF	MIL-HDBK-217F@25°C	3500	--	--	K hours	

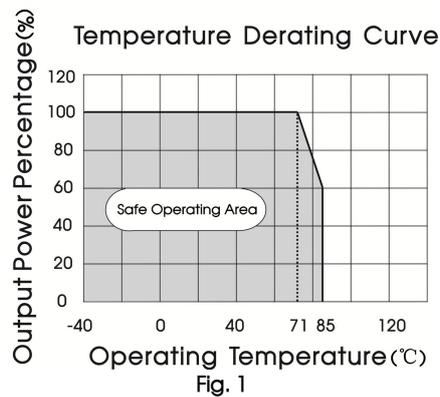
### Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)
Dimensions	19.65 x 6.0 x 10.16mm
Weight	2.1g(Typ.)
Cooling Method	Free air convection

### Electromagnetic Compatibility (EMC)

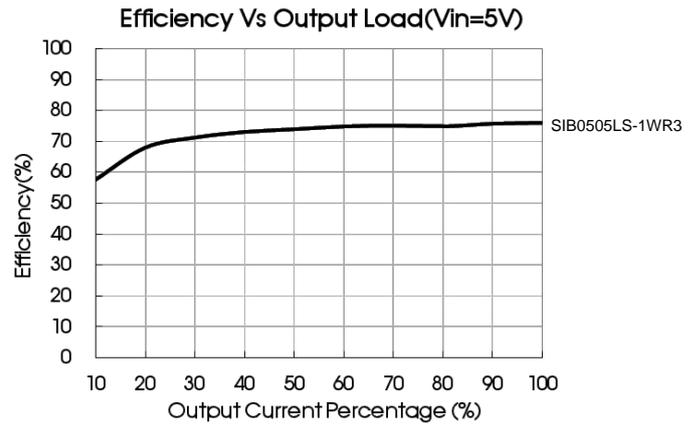
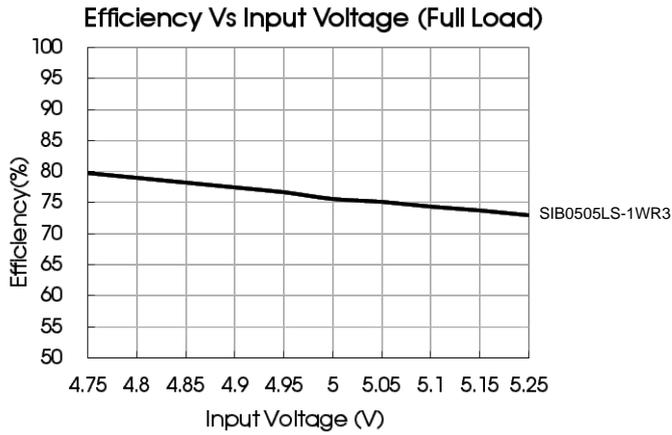
Emissions	CE	CISPR32/EN55032	CLASS B (see Fig. 3 for recommended circuit)
	RE	CISPR32/EN55032	CLASS B (see Fig. 3 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2	Air $\pm 8\text{kV}$ , Contact $\pm 4\text{kV}$ perf. Criteria B

### Typical Characteristic Curves



# DC/DC Converter

## SIB05\_LS-1WR3 Series



## Design Reference

### 1. Typical application circuit

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig.2.

Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.

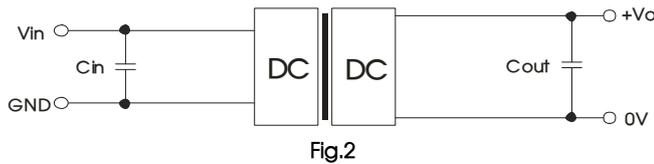


Table 1: Recommended input and output capacitor values

Vin(VDC)	Cin(μF)	Vo (VDC)	Cout(μF)
5	4.7	3.3/5	10
--	--	9/12	2.2
--	--	15	1

### 2. EMC compliance circuit

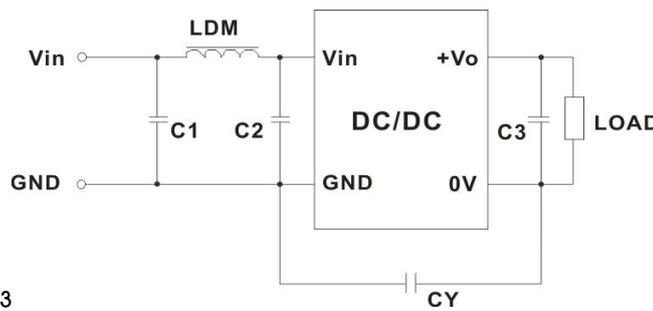


Table 2: Recommended EMC filter values

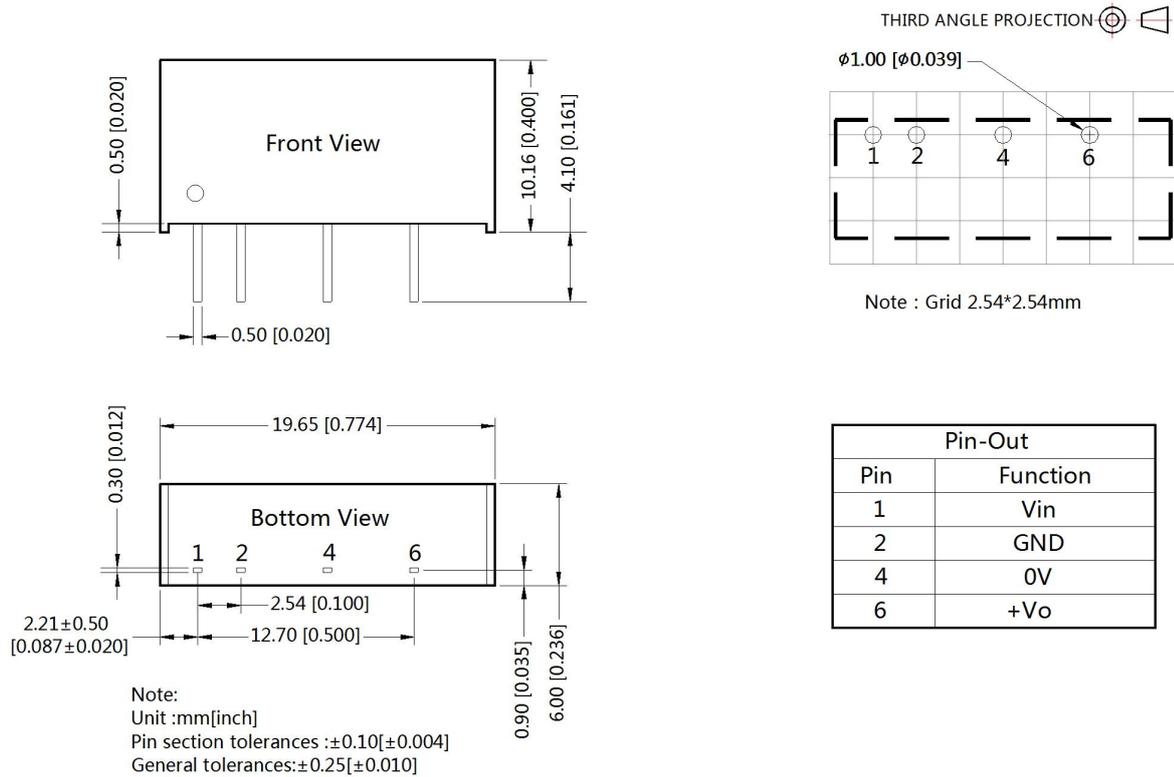
Input voltage 5VDC	Output voltage (VDC)		3.3/5/9	12/15/24
	Emissions	C1/C2	4.7μF /25V	4.7μF /25V
CY		--	VISHAY HGZ102MBP TDK CD45-E2GA102M-GKA	
C3		Refer to the Cout in table 1		
LDM		6.8μH	6.8μH	6.8μH

Note: We recommend the use of a Y-capacitor CY with a value of 1nF/4kV to help even further reduce Emissions.

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## SIB05\_LS-1WR3 Series

### Dimensions and Recommended Layout



#### Notes:

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. The maximum capacitive load offered were tested at input voltage range and full load;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of T<sub>a</sub>=25°C, humidity<75%RH with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.