

DC/DC Converter

SB_XT-W5R2 Series



0.5W, Fixed input voltage, isolated & unregulated single output



FEATURES

- Operating temperature range: -40°C to +105°C
- Miniature SMD package
- Isolation voltage: 1.5K VDC
- Internal SMD construction
- No external component required
- International standard pin-out

SB_XT-W5R2 series are specially designed for applications where an isolated voltage is required in a distributed power supply system. They are suitable for

1. Where the voltage of the input power supply is stable (voltage variation: $\pm 10\%V_{in}$);
2. Where isolation between input and output is necessary (isolation voltage $\leq 1500VDC$);
3. Where the output voltage regulation and the ripple & noise of the output voltage is not strictly required;
4. Typical application: digit circuit condition; normal low-frequency artificial circuit condition; relay drive circuit condition, etc.

Selection Guide

Part No.	Input Voltage (VDC)	Output		Efficiency (%Min./Typ.) @ Full Load	Max. Capacitive Load (μF)
	Nominal (Range)	Output Voltage (VDC)	Output Current (mA)(Max./Min.)		
SB0505XT-W5R2	5 (4.5-5.5)	5	100/10	74/78	220

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)		--	120/10	--/40	mA
Reflected Ripple Current		--	15	--	mA
Surge Voltage (1sec. max.)		-0.7	--	9	VDC
Input Filter		Filter capacitor			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		See tolerance envelope graph (Fig. 1)			
Line Regulation	Input voltage change: $\pm 1\%$	--	--	± 1.2	%
Load Regulation	10%-100% load	--	--	15	
Ripple & Noise*	20MHz bandwidth	--	--	120	mVp-p
Temperature Coefficient	Full load	--	--	± 0.03	%/°C
Short Circuit Protection		Continuous, automatic recovery			

Note: * Ripple and noise are measured by "parallel cable" method, please see DC-DC Converter Application Notes for specific operation;

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	1500	--	--	VDC
Isolation Resistance	Input-output, isolation voltage 500VDC	1000	--	--	M Ω
Isolation Capacitance	Input-output, 100KHz/0.1V	--	20	--	pF
Operating Temperature	Derating if the temperature $\geq 100^\circ C$ (see Fig. 2)	-40	--	105	°C
Storage Temperature		-55	--	125	
Casing Temperature Rise	Ta=25°C, nominal input, full load output	--	25	--	
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	

DC/DC Converter

SB_XT-W5R2 Series

Storage Humidity	Non-condensing	--	--	95	%RH
Reflow Soldering Temperature		Peak temp. $\leq 245^{\circ}\text{C}$, maximum duration time $\leq 60\text{s}$ at 217°C . For actual application, please refer to IPC/JEDEC J-STD-020D.1.			
Switching Frequency	Full load, nominal input voltage	--	100	300	KHz
MTBF	MIL-HDBK-217F@ 25°C	3500	--	--	K hours

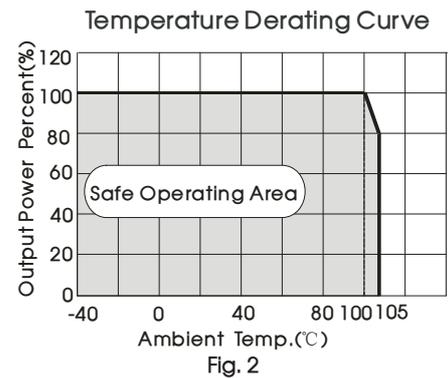
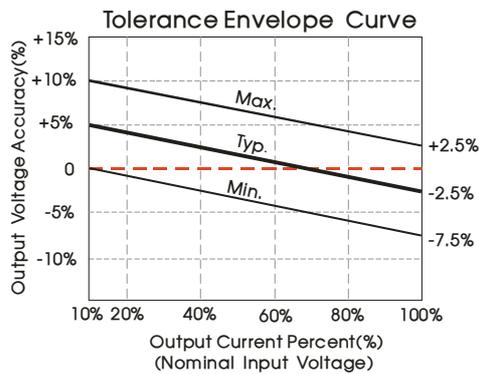
Physical Specifications

Casing Material	Epoxy resin (UL94 V-0)
Dimensions	12.70*11.20*7.25 mm
Weight	1.6g(Typ.)
Cooling Method	Free air convection

EMC Specifications

EMI	CE	CISPR22/EN55022	CLASS B (see Fig. 4 for recommended circuit)
	RE	CISPR22/EN55022	CLASS B (see Fig. 4 for recommended circuit)
EMS	ESD	IEC/EN61000-4-2	Contact $\pm 6\text{kV}$ perf. Criteria B

Product Characteristic Curve



Design Reference

1. Typical application circuit

If it is required to further reduce input and output ripple, a filter capacitor may be connected to the input and output terminals, see Fig.3. Moreover, choosing a suitable filter capacitor is very important, start-up problems may be caused if the capacitance is too large. Under the condition of safe and reliable operation, the recommended capacitive load values are shown in Table 1.



Fig.3

Recommended capacitive load value table (Table 1)

Vin(VDC)	Cin(μF)	Vo (VDC)	Cout(μF)
5	4.7	5	10

2. EMC solution-recommended circuit

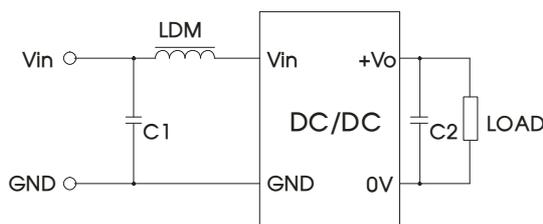


Fig. 4

Input voltage (VDC)	5
C1	4.7 μF /50V
C2	Refer to the Cout in Fig.3
LDM	6.8 μH

DC/DC Converter

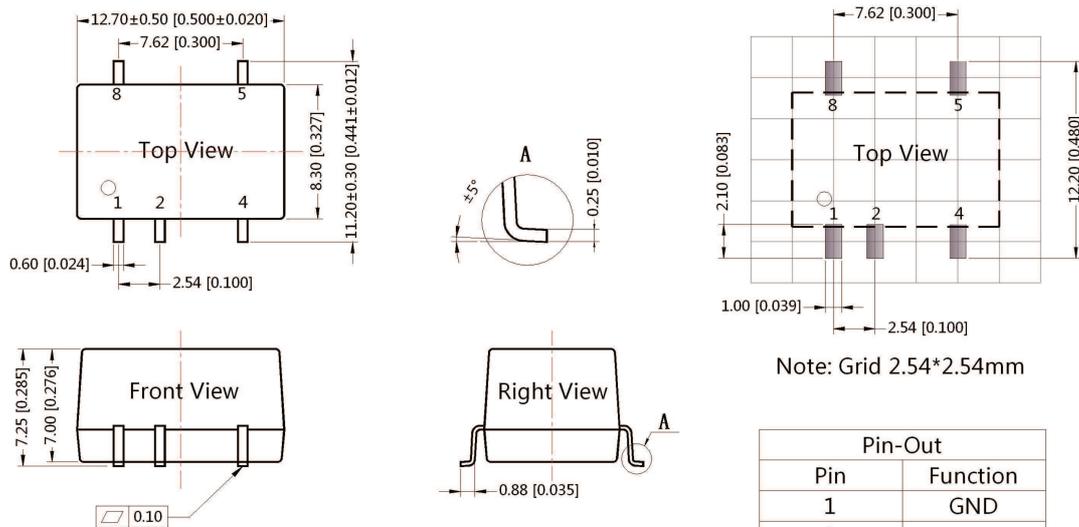
SB_XT-W5R2 Series

3. Output load requirements

In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor on the output side (The sum of the efficient power and resistor consumption power is not less than 10%)

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION 



Note:
 Unit: mm[inch]
 Pin section tolerances: $\pm 0.10[\pm 0.004]$
 General tolerances: $\pm 0.25[\pm 0.010]$

Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	GND
2	Vin
4	0V
5	+Vo
8	NC

NC: No Connection

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 $T_a=25^\circ\text{C}$, humidity<75%RH with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our Company's corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Specifications are subject to change without prior notice.