

3W, fixed input voltage, isolated & unregulated single output



Patent Protection RoHS

## FEATURES

- Operating temperature range: -40°C to +85°C
- Ultra Compact SIP package
- Isolation voltage: 1.5K VDC
- High power density
- No external component required
- International standard pin-out

*B\_S-3WR2 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 ( $\mu F$ )
	Nominal (Range)	Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
B0505S-3WR2	5 (4.5-5.5)	5	600/60	80/84	220
B0509S-3WR2		9	333/33	80/84	
B1212S-3WR2	12 (10.8-13.2)	12	250/25	84/88	

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5V input	--	714/25	--	mA
	12V input	--	284/20	--	
Reflected Ripple Current		--	15	--	mA
Surge Voltage (1sec. max.)	5V input	-0.7	--	9	VDC
	12V input	-0.7	--	18	
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: $\pm 1\%$	--	--	$\pm 1.2$	--	
Load Regulation	10%-100% load	--	8	--	%	
Ripple & Noise*	20MHz bandwidth	5VDC output	--	100	--	mVp-p
		9/12VDC output	--	150	--	
Temperature Coefficient	Full load	--	--	$\pm 0.03$	%/°C	
Short Circuit Protection**		--	1	--	s	

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

\*\*Supply voltage must be discontinued at the end of short circuit duration.

## 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 $\Omega$

Isolation Capacitance	Input-output, 100KHz/0.1V	--	20	--	pF
Operating Temperature	Derating if the temperature $\geq 71^{\circ}\text{C}$ , (see Fig. 2)	-40	--	85	°C
Storage Temperature		-55	--	125	
Casing Temperature Rise	$T_a=25^{\circ}\text{C}$ , nominal input, full load output	--	25	--	
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	
Storage Humidity	Non-condensing	--	--	95	%RH
Switching Frequency	Full load, nominal input voltage	--	100	--	KHz
MTBF	MIL-HDFK-217F@25°C	3500	--	--	K hours

### Physical Specifications

Casing Material	Black flame-retardant heat-proof plastic (UL94-V0)
Dimensions	19.65*7.05*10.16mm
Weight	2.4g(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

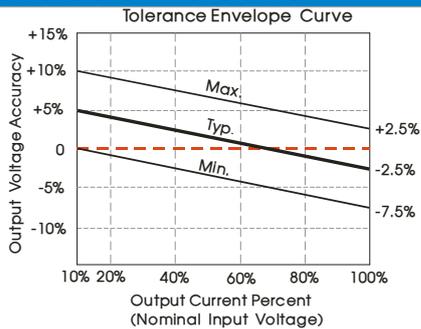


Fig. 1

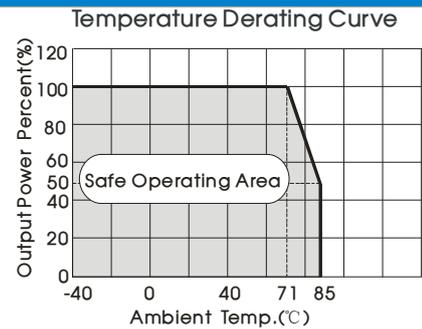
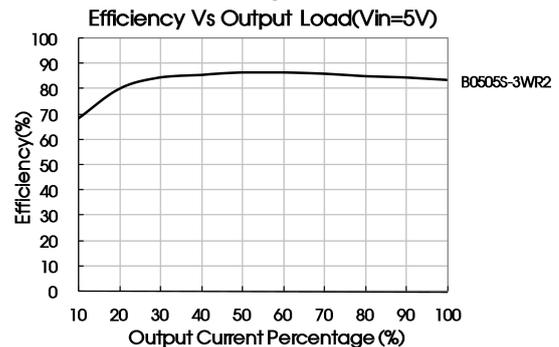
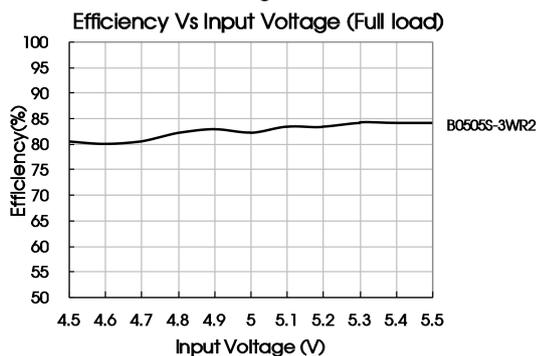


Fig. 2



### 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( $\mu\text{F}$ )	Vo (VDC)	Cout( $\mu\text{F}$ )
5	4.7	5	10
		9	4.7
12	2.2	12	2.2

2. EMC solution-recommended circuit

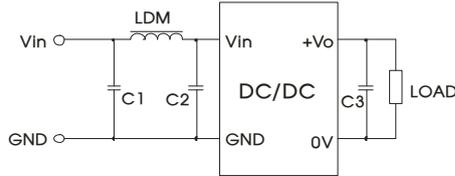


Fig. 4

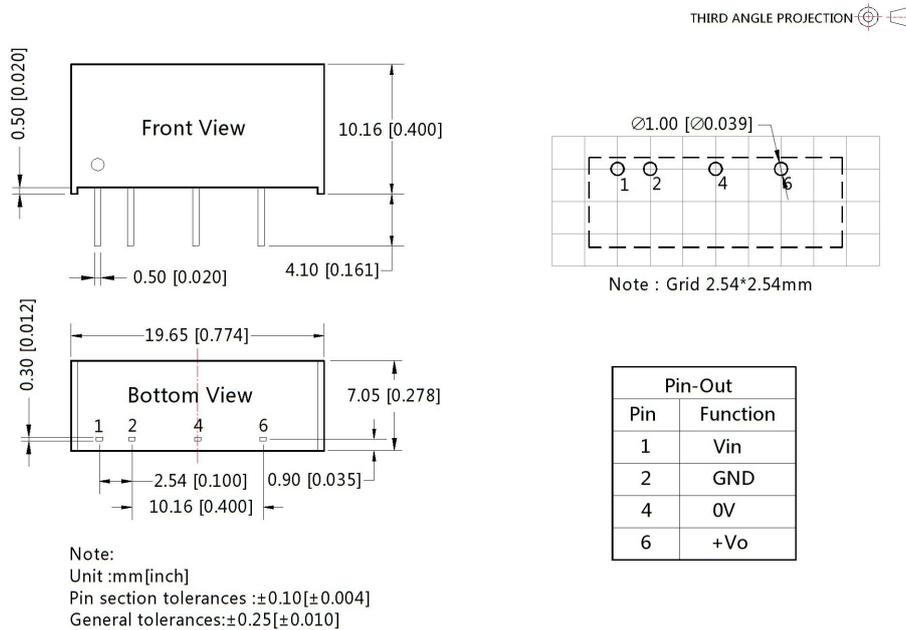
Input voltage (VDC)	5/12
C1/ C2	4.7μF /50V
C3	Refer to the Cout in Fig.3
LDM	6.8μH

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%).

4. For more information please find DC-DC converter application notes on [www.mornsun-power.com](http://www.mornsun-power.com)

Dimensions and Recommended Layout



Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from [www.mornsun-power.com](http://www.mornsun-power.com). Packing bag number: 58200001;
2. 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;
3. The maximum capacitive load offered were tested at nominal input voltage and full load;
4. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25 °C , humidity<75% with nominal input voltage and rated output load;
5. All index testing methods in this datasheet are based on our Company's corporate standards;
6. The performance parameters of the product models listed in this manual are as above, but some parameters of non-standard model products may exceed the requirements mentioned above. Please contact our technicians directly for specific information;
7. We can provide product customization service;
8. Specifications are subject to change without prior notice.

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