

## Typical Performance

- Features: constant voltage input, isolated unregulated single output isolated unregulated single output.1W power
- Isolation Voltage: 1500VDC
- Efficiency: up to 80%
- Working temperature:-40°C~+85°C
- MTBF≥3.5 million hours(3500000Hrs)
- Output short circuit protection, self-recovery
- Small SIP package, plastic housing
- International standard pin method
- Ripple/Noise (20MH Bandwidth)<100mVp-p

1W, Constant voltage input,  
Isolated Unregulated Single Output,  
DC-DC Power module

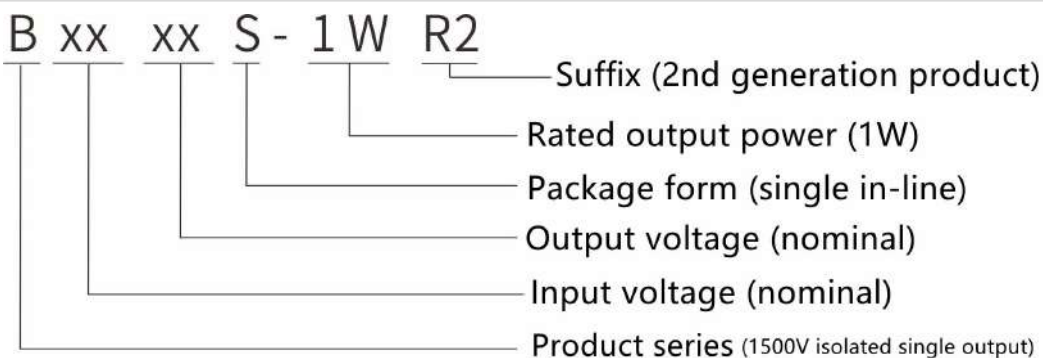


B\_S-1WR2 series----is a small size, high-efficiency micro power, constant voltage, input isolation and non-regulated, single output DC/DC module power supply launched by Hi-Link; this series of products is specially designed for on-board It is designed for applications in the power system that need to generate a set of voltages that are isolated from the input power supply.

### This product is suitable for :

- The voltage of the input power supply is relatively stable (voltage variation range  $\pm 10\%V_{in}$ );
- Isolation is required between input and output (Isolation voltage $\leq 1500VDC$ ) ;
- Low requirements for output voltage stability;
- Typical applications: pure digital circuits, general low-frequency analog circuits, relay drive circuits, data exchange circuits, etc;

## Product Coding Rules



Product Selection Table

Certification	Model <sup>①</sup>	Input voltage range (Vdc)	Output voltage/ current		Ripple and noise	Efficiency @ full load	Maximum capacitive load
		Nominal value <sup>②</sup> (range value)	Output voltage (Vdc)	Output current (mA) (Max.Min.)	Fully loaded (mVp-p) TPY/Max.	% (Min/TPY)	uF
	B0303S-1WR2	3.3 (2.97~3.63)	3.3	303/30	50/100	68/72	220
	B0305S-1WR2		5	200/20	50/100	72/76	220
	B0312S-1WR2		12	84/9	50/100	76/80	220
	B0503S-1WR2	5 (4.5~5.5)	3.3	303/30	50/100	68/72	220
	B0505S-1WR2		5	200/20	50/100	76/80	220
	B0509S-1WR2		9	111/12	50/100	76/80	220
	B0512S-1WR2		12	84/9	50/100	76/80	220
	B0515S-1WR2		15	67/7	50/100	76/80	220
	B0524S-1WR2		24	42/4	50/100	76/80	220
	B1203S-1WR2	12 (10.8~13.2)	3.3	303/30	50/100	68/72	220
	B1205S-1WR2		5	200/20	50/100	76/80	220
	B1209S-1WR2		9	111/12	50/100	76/80	220
	B1212S-1WR2		12	84/9	50/100	76/80	220
	B1215S-1WR2		15	67/7	50/100	76/80	220
	B1224S-1WR2		24	42/4	50/100	76/80	220
	B1503S-1WR2	15 (13.5~16.5)	3.3	303/30	50/100	68/72	220
	B1505S-1WR2		5	200/20	50/100	76/80	220
	B1509S-1WR2		9	111/12	50/100	76/80	220
	B1512S-1WR2		12	84/9	50/100	76/80	220
	B1515S-1WR2		15	67/7	50/100	76/80	220
	B1524S-1WR2		24	42/4	50/100	76/80	220
	B2403S-1WR2	24 (21.6~26.4)	3.3	303/30	50/100	68/72	220
	B2405S-1WR2		5	200/20	50/100	76/80	220
	B2409S-1WR2		9	111/12	50/100	76/80	220
	B2412S-1WR2		12	84/9	50/100	76/80	220
	B2415S-1WR2		15	67/7	50/100	76/80	220
	B2424S-1WR2		24	42/4	50/100	76/80	220

Note: 1. Due to limited space, the above is only a list of typical products. If you need products other than the list, please contact the sales department of our company.

2. The maximum capacitive load indicates the maximum capacitive load that can be connected to +Vo or -Vo. If it exceeds this value, the product will not be able to start normally.

Test conditions: Unless otherwise specified, all parameter tests are measured at nominal input voltage, purely resistive rated load and 25°C room temperature.

## Input Features

Project	Working conditions	Min.	Typ.	Max.	Unit
Input current (full load/no load)	3.3VDC input series	--	404/30	--/70	mA
	5VDC input series	--	277/20	--/60	
	12VDC input series	--	115/15	--/50	
	15VDC input series	--	83/10	--/35	
	24VDC input series	--	57/17	--/30	
Reflected ripple current		--	15	--	mA
Impulse voltage (Isec.max)	3.3VDC input series	-0.7	--	5	VDC
	5VDC input series	-0.7	--	9	
	12VDC input series	-0.7	--	18	
	15VDC input series	-0.7	--	21	
	24VDC input series	-0.7	--	30	
Input filter type		Capacitive filtering			
Hot plug		Not support			

## Output Features

Project	Working and test conditions		Min.	Typ.	Max.	Unit
Output load	Load percentage		10	--	100	%
Output voltage accuracy	View error envelope curve		--	--	±15.0	%
Linear adjustment rate	Input voltage variation±1%	3.3V output	--	--	±1.5	%
		Other	--	--	±1.2	%
Load regulation	10%~100% load	3.3VDC output	--	18	--	%
		5VDC output	--	12	--	%
		9VDC output	--	8	--	%
		12VDC output	--	7	--	%
		15VDC output	--	6	--	%
		24VDC output	--	5	--	%
Ripple & Noise	Pure resistive load, 20MHz bandwidth, peak-to-peak		--	50	100	mVp-p
Temperature drift coefficient	Full load		--	--	±0.03	%/°C
Output short circuit protection			--	--	1	S

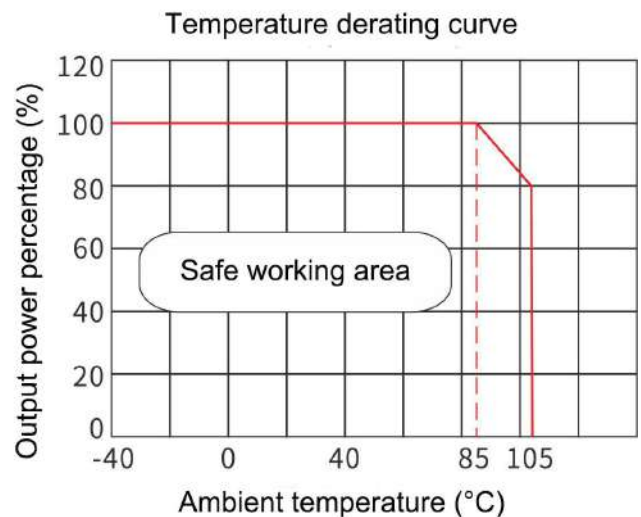
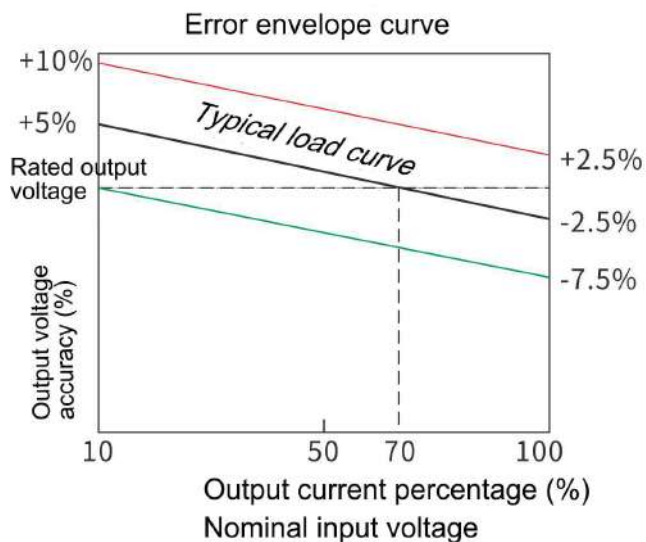
Note: ①The test method of ripple and noise is twisted pair test method.

②When the output short-circuit time exceeds 1 second, be sure to cut off the input power supply, otherwise the power supply will be permanently damaged.

## General Features

Project	Working conditions	Min.	Typ.	Max.	Unit
Insulation voltage	Input-output, test time: 1m, leakage current < 1mA	1500	--	--	VDC
Insulation resistance	Input-output, isolation voltage: 500VDC	1000	--	--	MΩ
Isolation capacitor	Input-output, 100KHz/0.1V	--	20	--	pF
Operating temperature	Please refer to the temperature derating curve for use	-40	--	+85	°C
Storage temperature		-40	--	+125	
Shell temperature rise during operation		--	25	--	
Storage humidity	No condensation	5	--	95	%RH
Pin Soldering Temperature	The solder joint is 1.5mm away from the shell, 10s	--	--	+300	°C
Switching frequency	Full load, nominal voltage input	--	100	--	KHz
Vibration		10-55Hz, 10G, 30Min.alongX, YandZ			
Shell material		Black flame retardant heat resistant plastic (UL94V-0)			
Minimum time between failures	MIL-HDBK-217F@25°C	3.5X10 <sup>6</sup>	--	--	Hrs

## Product Characteristic Curve



## Typical Application Reference Circuit (Recommended Parameters)

### 1. General application: Details of recommended capacitive load values (Table 1)

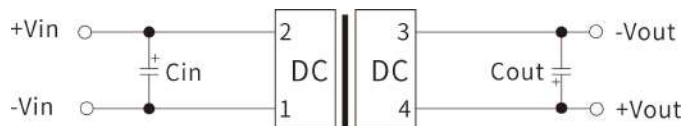


Figure 1

If it is required to further reduce the input and output ripple, a capacitor filter network can be connected to the input and output ends, and the application circuit is shown in Figure 1.

However, attention should be paid to the selection of appropriate filter capacitors. If the capacitor is too large, it is likely to cause startup problems. For each output, under the condition of ensuring safe and reliable operation, the recommended capacitive load value is shown in Table 1.

Vin (Vdc)	Cin(uF)	Vo (Vdc)	Cout(uF)
3.3/5	4.7	3.3/5	10
12	2.2	9	4.7
15	2.2	12	2.2
24	1	15	1
-	-	24	0.47

### 2. EMI typical application circuit

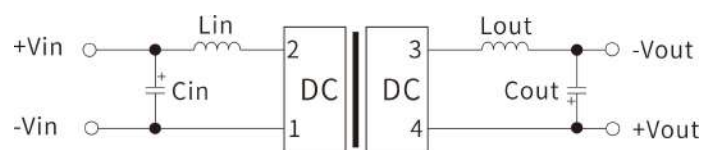


Figure 2

Recommended EMI Reference Circuit Values (Table 2)

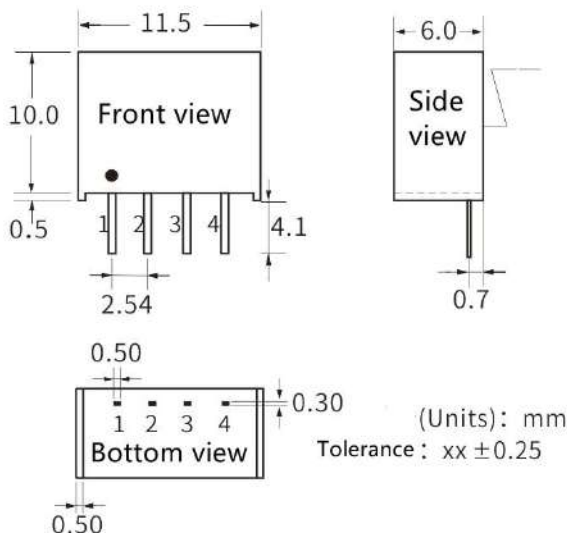
Vin (Vdc)	3.3/5/12/15/24
Cin	4.7uF/50V
Cout	Refer to Table1
Lin	4.7uH
Lout	4.7uH

### 3. Output load requirements

To ensure that the module works efficiently and reliably, the minimum output load must not be less than 10% of the rated load when in use. If the required power is really low, please connect a resistor in parallel between the positive and negative poles of the output (the sum of the actual power used by the resistor is greater than or equal to 10% of the rated power and the rated power of the selected resistor must be greater than 5 times the actual power used. , otherwise the temperature of the resistor will be higher)

Product Appearance Size and Pin Definition(Recommended printing layout)

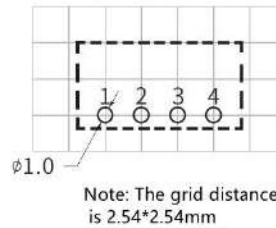
1) Physical dimension



2) Pin definition

1	2	3	4
-Vin	+Vin	-Vout	+Vout
Input negative	Input positive	Output negative	Output positive

3) Recommended print layout



\*Note: If the definition of each pin of the power module is inconsistent with the selection manual, the label on the physical label shall prevail.

Package Description

Package code	LxWxH	
S	11.50x6.0x10.0mm	0.453×0.236×0.394inch

Test Application Reference

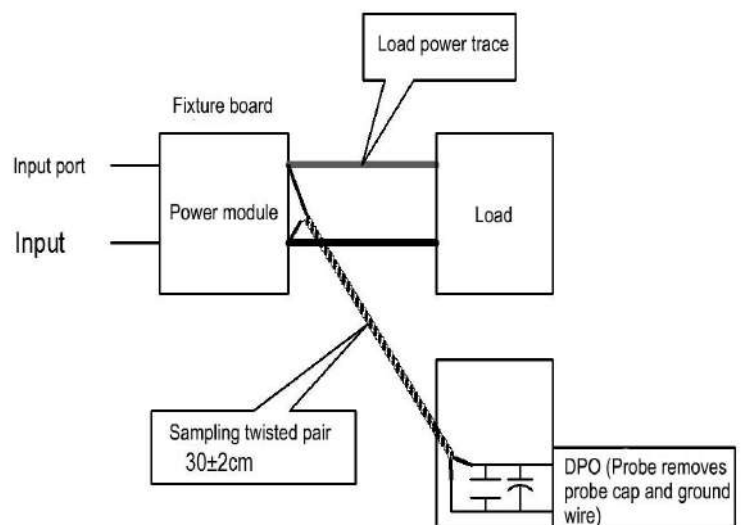
Ripple & noise test: (twisted pair method 20MHZ bandwidth)

Test method:

1. Ripple noise is connected by 12# twisted pair cable, the bandwidth of the oscilloscope is set to 20MHz, the bandwidth of the probe is 100M, and the 0.1uF polypropylene capacitor and the 4.7uF high-frequency low-resistance electrolytic capacitor are connected in parallel to the probe end, and the oscilloscope sampling uses Sample sampling model.

2. Schematic diagram of output ripple noise test:

Connect the power input end to the input power supply, and connect the power output to the electronic load through the fixture board, and use a 30cm±2cm sampling line to sample directly from the power output port for testing. The power line selects the wire with the insulation sheath of the corresponding wire diameter according to the magnitude of the output current.



## Product Application Notes

1. Input requirements: ensure that the output voltage fluctuation range of the power supply does not exceed the input requirements of the DC/DC module itself, and the output power of the input power supply must be greater than the output power of the DC/DC module;
2. Recommended circuit 1 for ripple noise requirements in general, the input and output terminals can be connected in parallel with a filter capacitor, external circuit as shown in Figure (1), the recommended value of the filter capacitor is detailed in Table (1). Output load requirements: try to avoid no-load use. When the actual power consumption of the load is less than 10% of the output rated power of the module or there is no-load phenomenon, it is recommended to connect a dummy load at the output end. The dummy load (resistance) can be based on the rated power of the module. 5~10% calculation, resistance value= $U_{out}/(I_{WR2} * 10\%)$ ;
3. Overload protection: Under normal operating conditions, the output circuit of the product has no protection against overload. The simplest way is to connect a self-recovery fuse in series with the input, or to add a circuit breaker in the circuit;
4. The capacitance of the external capacitor at the output should not be too large, otherwise it will easily cause over-current or bad start when the module is started;
5. If the product works below the minimum required load, it cannot be guaranteed that the product performance meets all the performance indicators in this manual;
6. The maximum capacitive load is tested under the input voltage range and full load conditions;
7. Unless otherwise specified, all indicators in this manual are measured at  $T_a=25^{\circ}\text{C}$ , humidity  $<75\%RH$ , nominal input voltage and output rated load;
8. All index test methods in this manual are based on the company's standards;
9. Our company provides product customization, and you can directly contact our technical staff for specific conditions;
10. Product specifications are subject to change without notice.

## Contact

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