

Typical Performance

- Fixed voltage input, isolated unregulated output, 1W power
- Isolation voltage 1500VDC/1min,3000VDC/1s
- Low no-load power consumption:0.025W(Typ.)
- Working ambient temperature:-40℃~+85℃
- High efficiency up to88%
- Output short-circuit protection: Continuous short-circuit protection with auto-recover
- Industry standard pin-out
- Compact SIP package
- Low ripple/noise (20MHz bandwidth): 30mVp-p(Typ.)
- MTBF ≥ 3.5 million hours(3,500,000 Hrs)

B_S-1WR3 series----Developed by HuiZhi for customer applications:Compact, high-efficiency DC/DC converters with fixed input voltage and isolated unregulated single output; **B_S-1WR3 series** are specially designed for applications where an isolated voltage is required in a distributed power supply system

They are suitable for

- Input voltage stability: $\pm 10\%$ Vin.
- Required input-to-output isolation: 1500VDC dielectric strength
- Output voltage regulation: Unregulated topology
- Application:Digital logic circuits,Low-frequency analog circuitry,lectromechanical relay driving circuits,Data communication interface power.

1W isolated DC-DC converter Fixed
input voltage, unregulated single
output,DC-DC Converter



Thermal shutdown protection + non-latching
short-circuit endurance RoHS

Model Number Description

B	xx	xx	S	-	1W	R3	
							Suffix(3rd Generation Product)
							Rated Output Power 1W
							Package TypeSingle In-Line Package (SIP)
							Nominal Output Voltage (Nominal Value)
							Nominal Input Voltage (Nominal Value)
							Product Series1500V Isolated Single Output Series

Selection Guide

Certification	Part No.	Input Voltage (VDC)	Output		Ripple & Noise	Full Load Efficiency (%)	Capacitive Load (μ F) Max.
		Nominal (Range)	Voltage (VDC)	Current (mA) Max./Min.	Full Load (mVp-p) Typ./Max.	Full Load% (Min./Typ.)	μ F
	B0303S-1WR3	3.3 (2.97-3.63)	3.3	303/30	30/80	75/79	2400
	B0305S-1WR3		5	200/20	30/80	78/82	2400
	B0312S-1WR3		12	84/9	50/120	78/82	560
	B0503S-1WR3	5	3.3	303/30	30/80	70/74	2400

DC/DC Converter

B_S-1WR3 Series

GDHUIZHI®

	B0505S-W5R3		5	100/20	30/80	85/88	2400
	B0505S-1WR3		5	200/20	30/80	78/82	2400
	B0509S-1WR3		9	111/12	30/80	79/83	1000
	B0512S-1WR3		12	84/9	50/100	79/83	560
	B0515S-1WR3		15	67/7	50/100	79/83	560
	B0524S-1WR3		24	42/4	50/150	81/85	220
	B0903S-1WR3	9 (8.1-9.9)	3.3	303/30	30/80	71/75	2400
	B0905S-1WR3		5	200/20	30/80	76/80	2400
	B0909S-1WR3		9	111/12	30/80	76/80	1000
	B0912S-1WR3		12	84/9	30/80	76/80	560
	B0915S-1WR3		15	67/7	30/80	77/81	560
	B0924S-1WR3		24	42/4	50/100	77/81	220
	B1203S-1WR3	12 (10.8-13.2)	3.3	303/30	30/80	71/75	2400
	B1205S-1WR3		5	200/20	30/80	76/80	2400
	B1209S-1WR3		9	111/12	30/80	76/80	1000
	B1212S-1WR3		12	84/9	30/80	76/80	560
	B1215S-1WR3		15	67/7	30/80	77/81	560
	B1224S-1WR3		24	42/4	50/100	77/81	220
	B1503S-1WR3	15 (13.5-16.5)	3.3	303/30	30/80	76/80	2400
	B1505S-1WR3		5	200/20	30/80	76/80	2400
	B1509S-1WR3		9	111/12	30/80	76/80	1000
	B1512S-1WR3		12	84/9	30/80	76/80	560
	B1515S-1WR3		15	67/7	30/80	77/81	560
	B1524S-1WR3		24	42/4	50/100	77/81	220
	B2403S-1WR3	24 (21.6-26.4)	3.3	303/30	30/80	69/75	2400
	B2405S-1WR3		5	200/20	30/80	73/79	2400
	B2409S-1WR3		9	111/12	30/80	74/80	1000
	B2412S-1WR3		12	84/9	30/80	75/81	560
	B2415S-1WR3		15	67/7	30/80	75/81	560
	B2424S-1WR3		24	42/4	50/100	75/81	220

Note: 1、Catalog shows core products only,Contact Sales for full portfolio.
2、Exceeding specified output capacitance (Cout_max) will cause startup failure"

Test Conditions:Unless otherwise specified,all parameters are measured at nominal input voltage,rated resistive load, and 25°C ambient temperature.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	3.3VDC Input	--	271/15	286/-	mA
	5VDC Input	--	244/15	257/-	
	9VDC Input	--	142/8	146/--	
	12VDC Input	--	105/8	110/--	
	15VDC Input	--	84/8	88/--	

DC/DC Converter

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	24VDC Input	--	53/8	58/--	
Reflected Ripple Current		--	15	--	
Surge Voltage(1sec. max.)	3.3VDC Input	-0.7	--	5	VDC
	5VDC Input	-0.7	--	9	
	9V,12VDC Input	-0.7	--	18	
	15VDC Input	-0.7	--	21	
	24VDC Input	-0.7	--	30	
Input Filter		Capacitance filter			
Hot Plug		Unavailable			

Output Specifications						
Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Load	Load percentage		10	--	100	%
Voltage Accuracy	See output regulation curves		--	--	±15.0	%
Linear Regulation	Input voltage change: ±1%	3.3Vou tput	--	--	±1.5	%
		Other output	--	--	±1.2	%
Load Regulation	10%-100% load	3.3VDC output	--	15	20	%
		5VDC output	--	10	15	%
		9VDC output	--	8	10	%
		12VDC output	--	7	10	%
		15VDC output	--	6	10	%
		24VDC output	--	5	10	%
		Other output	--	30	80	mVp-p
24VDC output	50	100				
Ripple & Noise	Purely resistive load. 20MHz bandlimited					
Temperature Coefficient	Full load		--	±0.02	--	%/°C
Output Short-Circuit Protection	Continuous, self-recovery					

Note:Ripple & Noise: Twisted-pair method.

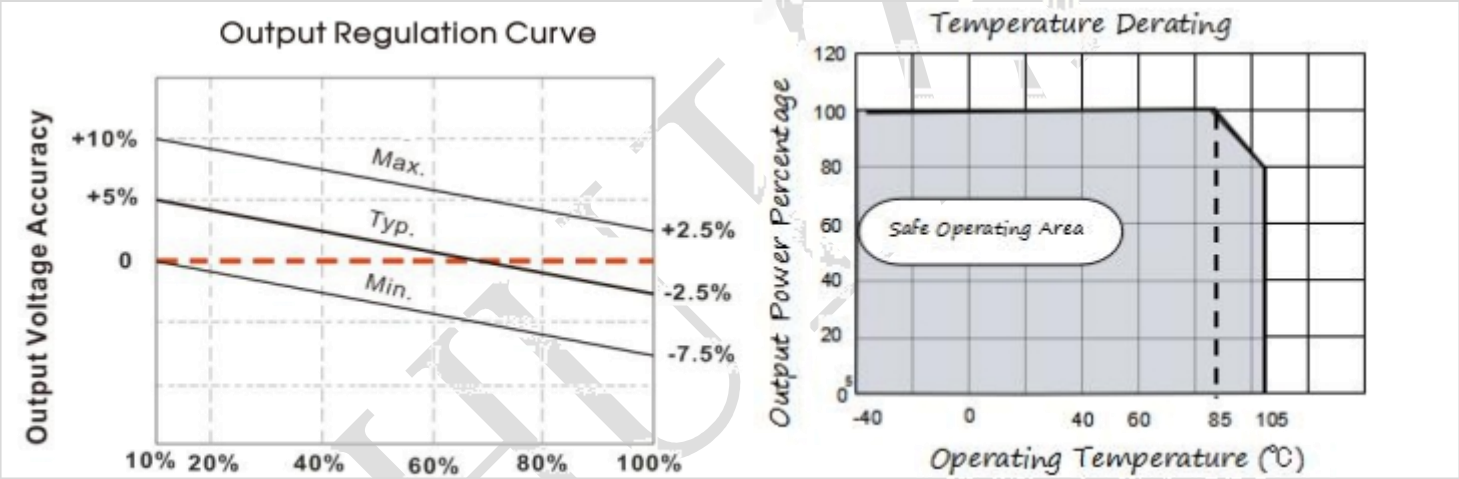
General Specifications					
Item	Operating Conditions	Min.	Typ.	Max.	Unit
Insulation Voltage	Input-output electric strength test for 1 minute with a leakage current of 1mA max.	1500	--	--	VDC
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	20	--	pF
Operating Temperature	Reference Temperature Derating Curves	-40	--	+85	°C

DC/DC Converter

B_S-1WR3 Series

Storage Temperature		-40	--	+125	
Housing temperature rise		--	25	--	
Storage Humidity	Non-condensing	5	--	95	%RH
Pin Soldering Resistance	Soldering spot is 1.5mm away from case for 10 seconds	--	--	+300	°C
Switching Frequency	full load, nominal input voltage	--	100	--	KHz
Vibration		10-55Hz, 10G, 30 Min. along X, Y and Z			
Case Material		Black plastic; flame-retardant and heat-resistant (UL94 V-0)			
Minimum Failure-Free Interval	MIL-HDBK-217F@25°C	3.5X10 ⁶	--	--	Hrs

Typical Characteristic Curves



Typical Application Reference Circuit (Recommended Parameters)

1. Typical application

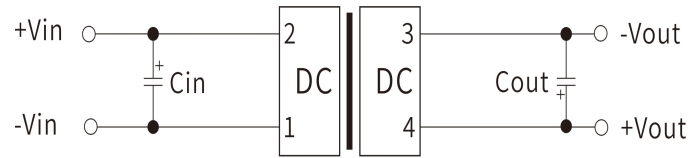


Fig 1

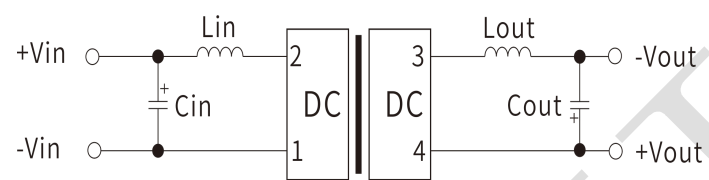
Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig.1.

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(u	Vo (Vdc)	Cout (u F)
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	1

2.EMI Typical application circuit



图(2)

Table 2: Recommended EMI filter values

Vin (Vdc)	3. 3/5/12/15/24
Cin	4. 7u F/50V
Cout	Refer to the Cout in table 1
Lin	4. 7uH
Lout	4. 7uH

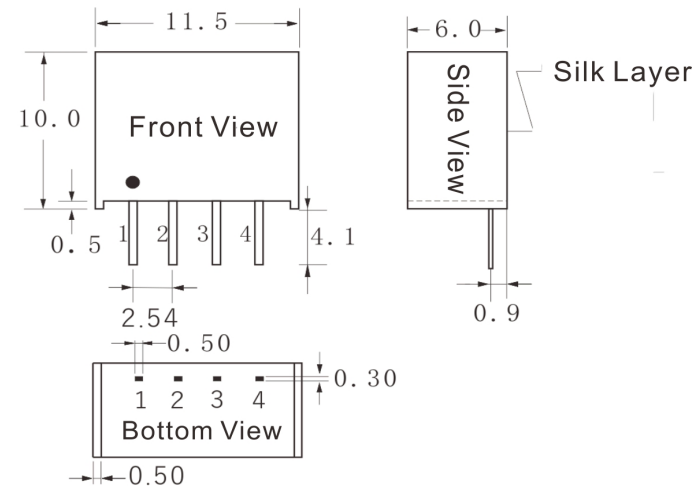
3.Output Load Requirements

To ensure reliable and efficient operation, the minimum load must not be less than 10% of the rated power. If the actual required power is lower, connect a parallel resistor at the output terminals meeting:

- (1)Resistor power dissipation $\geq 10\%$ of rated power
- (2)Resistor power rating $\geq 5 \times$ actual dissipation(to prevent overheating)

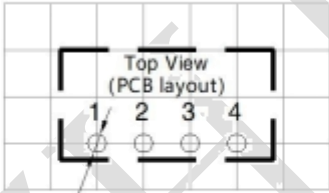
Dimensions and Recommended Layout

1.Dimensions (Unit: mm, Tolerance: ±0.25)



2.Pin Definitions

Pin	Mark
1	- Vin
2	+ Vin
3	- Vout
4	+ Vout



3.Recommended PCB Layout Guidelines
Note: Grid 2.54*2.54mm

***Note:** If the pin definitions of the power module are inconsistent with the selection manual, the labels on the physical product shall prevail.

Package Description

Package Code	L x W x H	
S	11.50 x 6.0 x 10.0mm	0.453 ×0.236 ×0.394inch

Test Application Reference

Ripple & Noise Test(Twisted Pair Method, 20MHz Bandwidth)

Test Method:

1.Measurement Setup:

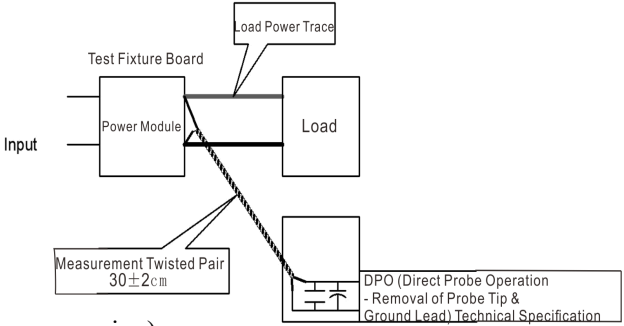
- Use 12#AWG twisted pair for connections.
- Set oscilloscope bandwidth to 20MHz with a 100MHz probe.
- Parallel connect at the probe tip:

- (1)0.1μF polypropylene capacitor (for high-frequency noise suppression)
- (2)4.7μF low-ESR electrolytic capacitor (for mid-frequency stabilization)

Oscilloscope sampling mode: Sample mode (to avoid aliasing).

Test Schematic:

- 2.Connect the power input to the DC source.
- 3.Link the power output to an electronic load via a test fixture board.
- 4.Use a 30cm ±2cm dedicated sampling wire to directly measure output ripple at the power port.
- 5.Select insulated power wires with appropriate gauge based on output current:



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 applications with general requirements for ripple and noise, a filter capacitor can be connected in parallel at both the input and output ends. The external circuit is shown in Figure (1) below, and the recommended values of the filter capacitors are detailed in Table (1). Output Load Requirements: Avoid no-load operation as much as possible. When the actual power consumption of the load is less than 10% of the module's rated output power or no-load occurs, it is recommended to connect an external dummy load at the output end. The dummy load (resistor) can be calculated according to 5~10% of the module's rated power, with the resistance value calculated as: $\text{Resistance} = U_{\text{out}} / (\text{Rated Power} \times 10\%)$.
3. Overload Protection: Under normal operating conditions, the output circuit of this product has no protection function against overload. Long-term overload will trigger over-temperature protection and shut down the output.
4. Continuous short-circuit protection with auto-recover
5. The capacitance value of the external capacitor at the output end should not be too large; otherwise, it may easily cause overcurrent or startup failure during module startup
6. If the product operates below the minimum required load, it cannot be guaranteed that all product performance indicators meet those specified in this manual.
7. The maximum capacitive load is tested under the conditions of input voltage range and full load.
8. Unless otherwise specified, all specifications in this manual are measured at $T_a=25^{\circ}\text{C}$, humidity $<75\%\text{RH}$, nominal input voltage, and rated output load.
9. All specification test methods in this manual are based on the company's internal standards.
10. We provide product customization services. For specific details, please contact our technical staff directly.
11. Product specifications are subject to change without prior notice.

Contact Information

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