

Typical Performance

- Features: Constant voltage input, isolated unregulated output, 2W power
- Isolation voltage: 1500VDC/1min, 3000VDC/1s
- Low no-load power consumption: 0.025W (Typ.)
- Efficiency: up to 91%
- Operating temperature: -40°C ~ +85°C
- MTBF $\geq$ 3.5 million hours (3500000Hrs)
- Output short-circuit protection: sustainable short-circuit protection, automatic recovery
- Small SIP package, plastic housing
- International standard pin out method
- Ripple/noise(20MHz bandwidth):30mVp-p (Typ.)

2W, constant voltage input, isolated unregulated, single output, DC/DC Module Power Supply



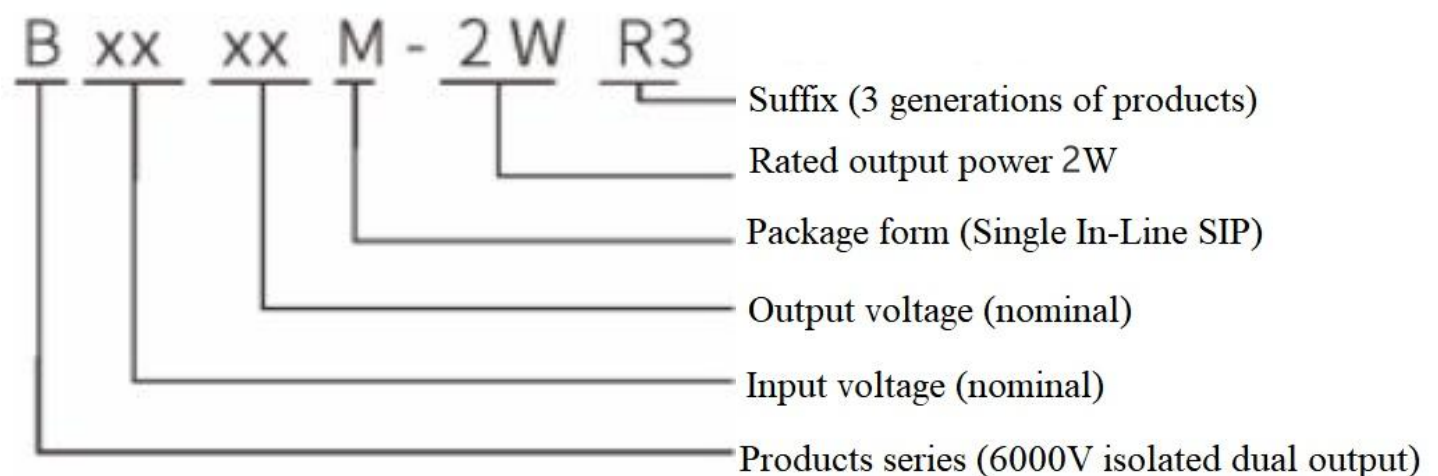
Over-temperature protection, continuous short circuit protection, RoHS

B_M-2WR3 series - This is a series of DC/DC module power supplies provided by Hi-Link for customers, featuring small size, high efficiency, micro-power, fixed voltage, input isolation and non-regulated single output. This series of products is specifically designed for applications in board-level power systems that require the generation of a set of voltages isolated from the input power supply.

This product is applicable to:

- The input power supply voltage is relatively stable (with a voltage variation range of $\pm 10\%$ of V_{in});
- Isolation is required between the input and output (the isolation voltage should be $\leq 1500\text{VDC}$);
- Suitable for scenarios where high requirements are placed on the stability of the output voltage and the output ripple noise;
- Typical applications: Pure digital circuit scenarios, generally low-frequency analog circuit scenarios, relay drive circuits, data exchange circuit scenarios, etc.

Product Coding Rules



Product Selection Table

	Product model ^①	Input voltage range (Vdc)	Output voltage/current		Ripple and noise	Efficiency @ Full load	Max capacitive load
		Nominal value ^② (Range values)	Output voltage (Vdc)	Output current(mA) (Max.Min.)	Fully load(mVp-p) Typ./Max.	% (Min./ Typ.)	uF
	B0303M-2WR3	3.3 (2.97~3.63)	3.3	606/60	30/80	78/81	2400
	B0305M-2WR3		5	400/40	30/80	79/82	2400
	B0312M-2WR3		12	167/17	30/80	80/83	560
	B0503M-2WR3	5 (4.5~5.5)	3.3	606/60	30/80	80/83	2400
	B0505M-2WR3		5	400/40	30/80	85/88	2400
	B0509M-2WR3		9	222/22	30/80	86/88	1000
	B0512M-2WR3		12	167/17	30/80	87/89	560
	B0515M-2WR3		15	134/13	30/80	87/89	560
	B0524M-2WR3		24	84/8	30/80	87/89	220
	B1203M-2WR3	12 (10.8~13.2)	3.3	606/60	30/80	81/84	2400
	B1205M-2WR3		5	400/40	30/80	86/88	2400
	B1209M-2WR3		9	222/22	30/80	87/88	1000
	B1212M-2WR3		12	167/17	30/80	88/90	560
	B1215M-2WR3		15	134/13	30/80	88/90	560
	B1224M-2WR3		24	84/8	30/80	88/90	220
	B1503M-2WR3	15 (13.5~16.5)	3.3	606/60	30/80	81/84	2400
	B1505M-2WR3		5	400/40	30/80	86/88	2400
	B1509M-2WR3		9	222/22	30/80	87/88	1000
	B1512M-2WR3		12	167/17	30/80	88/90	560
	B1515M-2WR3		15	134/13	30/80	88/90	560
	B1524M-2WR3		24	84/8	30/80	88/90	220
	B2403M-2WR3	24 (21.6~26.4)	3.3	606/60	30/80	81/84	2400
	B2405M-2WR3		5	400/40	30/80	86/88	2400
	B2409M-2WR3		9	222/22	30/80	87/89	1000
	B2412M-2WR3		12	167/17	30/80	88/91	560
	B2415M-2WR3		15	134/13	30/80	88/91	560
	B2424M-2WR3		24	84/8	30/80	88/91	220

Note:

1. Due to limited space, the above is only a typical product list, if you need products outside the list, please contact our sales department.
2. Maximum capacitive load means the maximum capacitive load that can be connected to +Vo or -Vo, if it exceeds this value, the product will not start normally.

Test conditions: If not specified, all parameters are measured at nominal input voltage, pure resistive rated load and 25°C room temperature.

Input Characteristics

Project	Working conditions	Min.	Typ.	Max.	Unit.
Input current (Full load/no load)	3.3VDC input series	--	756/8	--/15	mA
	5VDC input series	--	454/5	--/10	
	9VDC input series	--	186/2	--/5	
	12VDC input series	--	148/2	--/4	
	15VDC input series	--	92/1	--/2	
	24VDC input series	--	756/8	--/15	
Reflected ripple current		--	15	--	
Impulse voltage (Isec.max)	3.3VDC input series	-0.7	--	5	VDC
	5VDC input series	-0.7	--	9	
	9VDC input series	-0.7	--	16	
	12VDC input series	-0.7	--	20	
	15VDC input series	-0.7	--	30	
	24VDC input series	-0.7	--	5	
Input filter type		Capacitive filtering			
Hot swapping		Not support			

Output Characteristics

Project	Working and testing conditions		Min.	Typ.	Max.	Unit.
Output load	Load percentage		10	--	100	%
Output voltage accuracy	See error envelope graph		--	±15.0	--	%
Linear adjustment rate	Input voltage variation ±1%	3.3V output	--	±1.5	--	%
		Other	--	±1.2	--	%
Load regulation rate	10%~100% load	3.3VDC output	15	20	15	%
		5VDC output	10	15	10	%
		9VDC output	8	10	8	%
		12VDC output	7	10	7	%
		15VDC output	6	10	6	%
		24VDC output	5	10	5	%
Ripple & noise	Pure resistive load, 20MHz bandwidth, peak-to-peak		30	80	30	mVp-p
Temperature drift coefficient	Full load		--	--	±0.03	%/°C

Output short circuit protection

Continuous short circuit protection with automatic recovery

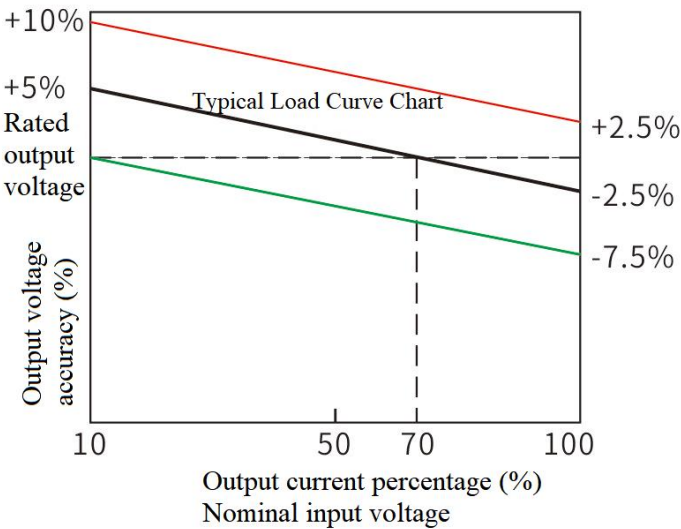
Note: ① Ripple and noise test method twisted pair test method.

General Characteristics

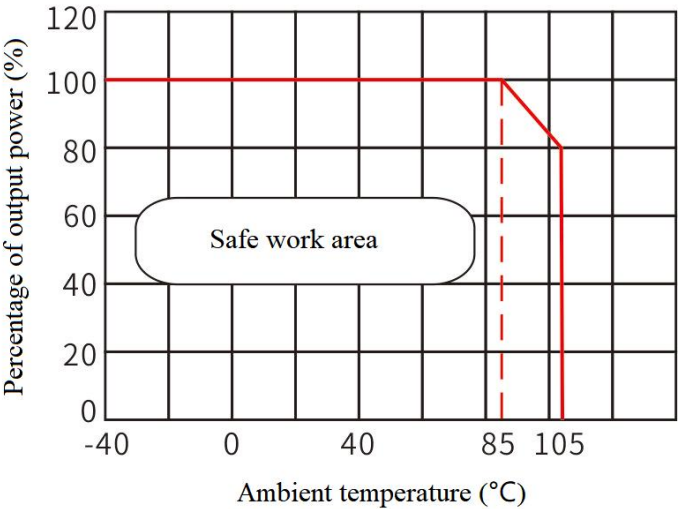
Project	Working conditions	Min.	Typ.	Max.	Unit.
Insulation voltage	Input-output, test time 1 minute, leakage current less than 1mA	1500	--	--	VDC
Insulation resistance	Input-output, insulation voltage 500VDC	1000	--	--	MΩ
Isolation capacitor	Input-output, 100KHz/0.1V	--	20	--	pF
Operating temperature	Use the reference temperature derating graph	-40	--	+85	°C
Storage temperature		-40	--	+125	
Case temperature rise during operation		--	25	--	
Storage humidity	No condensation	5	--	95	%RH
Pin soldering temperature resistance	Solder joint distance from housing 1.5mm, 10s	--	--	+300	°C
Switching frequency	Full load, nominal voltage input	--	100	--	KHz
Vibrations		10-55Hz, 10G, 30 Min. along X, Y and Z			
Housing material		Black flame retardant and heat resistant plastic (UL94 V-0)			
Minimum trouble-free interval	MIL-HDBK-217F@25°C	3.5X10 ⁶	--	--	Hrs

Product Characteristics Curve Chart

Error Envelope Curve Chart



Temperature Derating Curve Chart



Typical application reference circuit (recommended parameters)

1. Conventional applications:

To further reduce the input and output ripple, a capacitive filter network can be connected to the input and output terminals, and the application circuit is shown in Figure 1.

However, care should be taken to choose the right filter capacitor. If the capacitor is too large, it is likely to cause start-up problems. For each output, the recommended capacitive load value is detailed in Table 1 under the condition of ensuring safe and reliable operation.

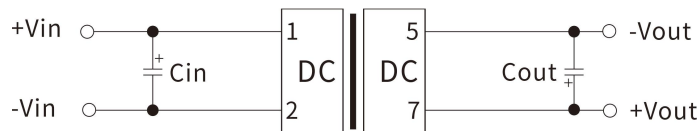


Figure (1)

Recommended capacitive load value details (Table 1)

Vin (Vdc)	Cin (u F)	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

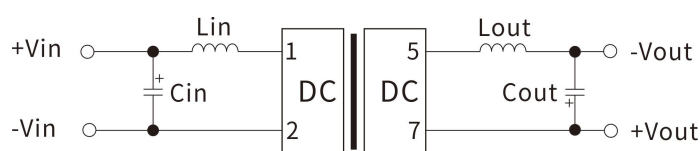


Figure (2)

Recommended EMI reference circuit value details (Table 2)

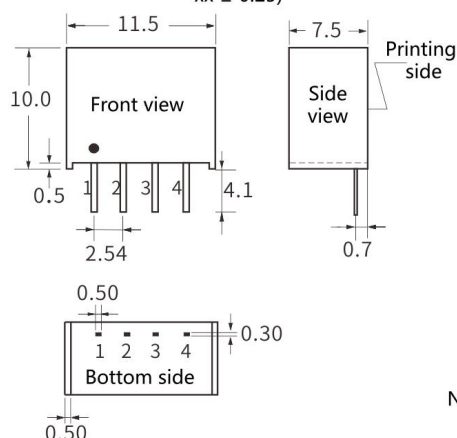
Vin (Vdc)	3.3/5/12/15/24
Cin	4.7u F/50V
Cout	Refer to Table 1
Lin	4.7uH
Lout	4.7uH

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 power you need is really small, 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)

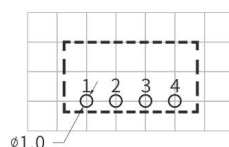
Product Dimensions And Pin Definition, Suggested Printing Layout

1) Dimension of appearance (unit: mm, tolerance: 2) Pin definition
xx ± 0.25)



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

3) Suggested printing layout



Note: the spacing of the grid: 2.54*2.54mm

***Note:** If the definition of each pin of the power supply module does not match with the selection manual, the label on the physical label shall prevail.

Package Description

Package code	L x W x H	
S	11.50 x 7.5 x 10.0mm	0.453 × 0.295 × 0.394inch

Test Application Reference

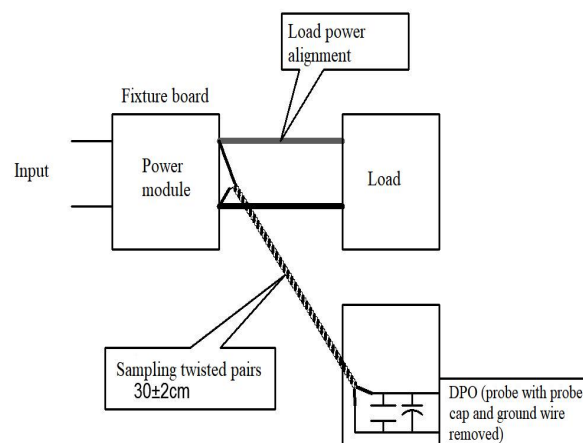
Ripple & Noise Test: (Twisted Pair Method 20MHZ Bandwidth)

Test method:

1. ripple noise is the use of 12 # twisted pair cable connection, oscilloscope bandwidth set to 20MHz, 100M bandwidth probe, and in parallel with the probe end 0.1uF polypropylene capacitor and 4.7uF high-frequency low-resistance electrolytic capacitors, oscilloscope sampling using Sample sampling mode.

2. Output ripple noise test schematic:

The power input is connected to the input power supply, and the power output is connected to the electronic load through the fixture board. The test is performed directly from the power output port with a 30 cm ± 2 cm sampling wire. The power wire is selected according to the size of the output current with the corresponding wire diameter with insulating skin.



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 for ripple noise requirements in general, the input and output terminals can be connected in parallel with a filter capacitor, the external circuit shown in Figure (1) below, 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 module's output power rating or no-load phenomenon, it is recommended that the external dummy load at the output, dummy load (resistance) can be calculated in accordance with the module's rated power of 5 to 10%, resistance value = $U_{out}/(1WR3 * 10\%)$.
3. Overload protection: Under normal operating conditions, the output circuit of the product has no protection against overload, long time overload will over temperature protection, shutting down the output;
4. Output can be continuously short-circuit protection, automatic recovery.
5. 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.
6. If the product works below the minimum required load, the product performance is not guaranteed to meet all the performance indicators in this manual;
7. the maximum capacitive load are tested in the input voltage range, under full load conditions;
8. unless otherwise specified, all indicators in this manual are measured at $T_a=25^{\circ}\text{C}$, humidity $<75\%\text{RH}$, nominal input voltage and output rated load;
9. All indicators in this manual are tested according to our standard;
10. We can provide customized products, please contact with our technical staff or marketing personnel directly for details;
11. Product specifications are subject to change without notice.

Contact information

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