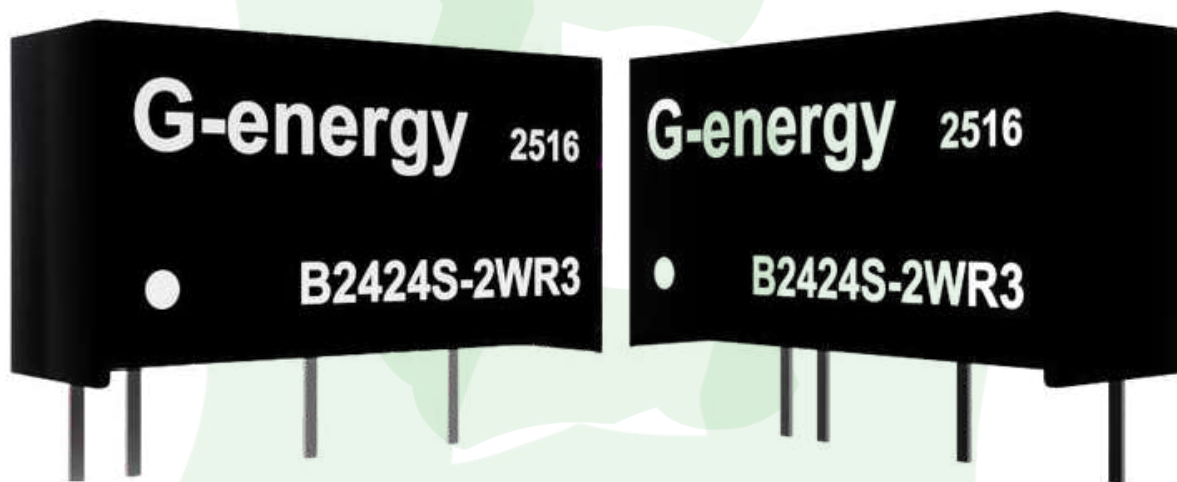


Typical performance

- 2W isolated power module with constant-voltage input and unregulated output
- 1500 VDC isolation capability
- Very low no-load power consumption: typically 0.025 W
- Efficiency up to 90% (typical)
- Operating temperature range: -40°C to $+85^{\circ}\text{C}$
- MTBF \geq 3.5 million hours (3,500,000 hrs)
- Continuous short-circuit protection with automatic recovery
- Compact SIP package with plastic enclosure
- Standard international pin configuration
- Ripple/Noise (20 MHz bandwidth): typically 30 mVp-p

2W isolated, unregulated single-output DC-DC power module with constant-voltage input.



Isolated regulated output/RoHS

The Binouts-2WR3 series is a compact, high-efficiency, low-power DC/DC module from featuring a constant-voltage input and an isolated, unregulated single-output design. This product series is designed specifically for on-board power systems that require an isolated output voltage derived from the input supply. It is suitable for applications where:

- The input power source remains relatively stable (voltage fluctuation within $\pm 10\%$ V_{in});
- Electrical isolation between input and output is needed (isolation voltage ≤ 1500 VDC);
- High output voltage regulation is not critical;
- Typical uses include pure digital circuits, general low-frequency analog circuits, relay drive circuits, and data-exchange circuitry.

Product List

Certificate	Product Module number ^①	Input Voltage range (Vdc)		Output Voltage/Current		Ripple and Noise	Efficiency @ full load	Maximum capacitiveload
		Nominal value ^② (range value)	Max value	Output voltage (Vdc)	Output current (mA) (Max.Min.)	Full load (mVp-p) Typ/Max.	% (Min./Typ.)	uF
	B0503S-2WR3	5 (4.5-5.5)	5.5	3.3	606/60	30/80	80/83	2400
	B0505S-2WR3			5	400/40	30/80	85/88	2400
	B0509S-2WR3			9	222/23	30/80	86/88	1000
	B0512S-2WR3			12	166/17	30/80	87/89	560
	B0515S-2WR3			15	133/13	30/80	87/89	560
	B0524S-2WR3			24	83/8	30/80	87/89	220
	B0903S-2WR3	9 (8.1~9.9)	9.9	3.3	606/60	30/80	80/83	2400
	B0905S-2WR3			5	400/40	30/80	85/88	2400
	B0909S-2WR3			9	222/23	30/80	86/88	1000
	B0912S-2WR3			12	166/17	30/80	87/89	560
	B0915S-2WR3			15	133/13	30/80	87/89	560
	B0924S-2WR3			24	83/8	30/80	87/89	220
	B1203S-2WR3	12 (10.8~13.2)	13.2	3.3	606/60	30/80	81/84	2400
	B1205S-2WR3			5	400/40	30/80	86/88	2400

	B1209S-2WR3	12 (10.8~13.2)	13.2	9	222/23	30/80	87/89	1000
	B1212S-2WR3			12	166/17	30/80	88/90	560
	B1215S-2WR3			15	133/13	30/80	88/90	560
	B1224S-2WR3			24	83/8	30/80	88/90	220
	B1503S-2WR3	15 (13.5~16.5)	16.5	3.3	606/60	30/80	81/84	2400
	B1505S-2WR3			5	400/40	30/80	86/88	2400
	B1509S-2WR3			9	222/23	30/80	87/89	1000
	B1512S-2WR3			12	166/17	30/80	88/90	560
	B1515S-2WR3			15	133/13	30/80	88/90	560
	B1524S-2WR3			24	83/8	30/80	88/90	220
	B2403S-2WR3	24 (21.6~26.4)	26.4	3.3	606/60	30/80	81/84	2400
	B2405S-2WR3			5	400/40	30/80	86/88	2400
	B2409S-2WR3			9	222/23	30/80	87/89	1000
	B2412S-2WR3			12	166/17	30/80	88/91	560
	B2415S-2WR3			15	133/13	30/80	88/91	560
	B2424S-2WR3			24	83/8	30/80	88/91	220

Note:

- 1.The products listed above represent only typical models. If you require options not shown, please contact our sales team for additional selections.
- 2.The maximum capacitive load refers to the highest capacitance that can be connected to +Vo or -Vo. If this limit is exceeded, the module may fail to start properly.

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

Input Features

Testing	Working conditions	Min.	Value	Max.	Unit
Input current (Fully loaded/no load)	5VDC input series	--	454/5	--/10	mA
	9VDC input series	--	250/5	--/10	
	12VDC input series	--	186/2	--/5	
	15VDC input series	--	148/2	--/4	
	24VDC input series	--	92/1	--/2	
Reflected Ripple Current		--	15	--	VDC
Impulse voltage (Isec.max)	3.3VDC input series	-0.7	--	5	
	5VDC input series	-0.7	--	9	
	9VDC input series	-0.7	--	15	
	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	No support				

Output Features

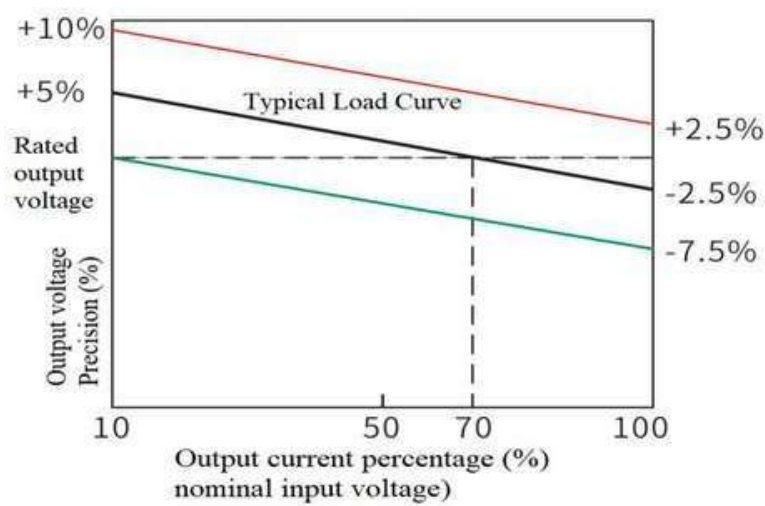
Project	Working and testing conditions		Min.	Typ.	Max.	Unit
Output load	Load percentage		10	--	100	%
Output voltage	See error envelope curve		--	--	±15.0	%
Linear adjustment rate	Input voltage variation ±1%	3.3V output	--	--	±1.5	%
		Others	--	--	±1.2	%
Load Regulation	10%~100% load	3.3VDC output	--	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		--	30	80	mVp-p
Temperature Drift	Fully loaded		--	--	±0.03	%/°C
Output short circuit protection	Continuous short circuit protection, automatic recovery					
Note: Ripple and noise test method twisted pair test method						

General characteristics

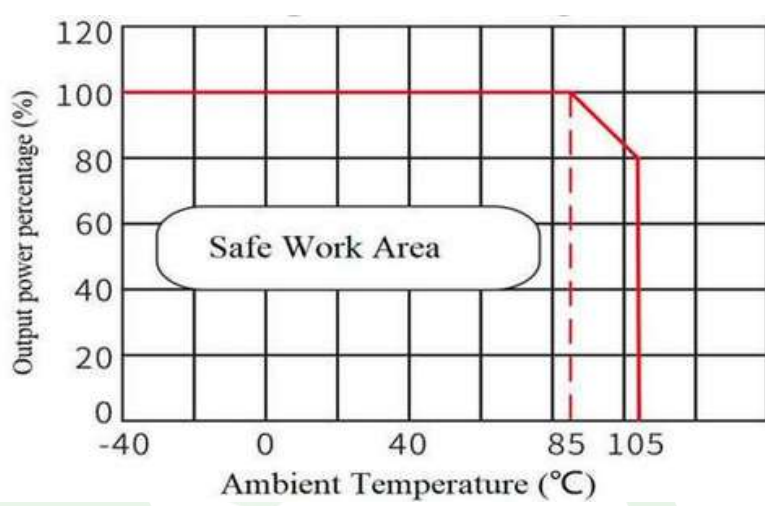
Project	Working conditions	Min.	Typ.	Max.	Unit
Insulation voltage	Input-Output, test time is 1 minute, the leakage current is less than 1mA	1500	--	--	VDC
Insulation resistance	Input-Output, insulation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitor	Input-Output, 100KHz/0.1V	--	40	--	pF
Working temperature	Using the reference temperature derating curve	-40	--	+85	°C
Storage temperature		-40	--	+125	
Shell temperature rise during operation		--	25	--	
Storage humidity	no condensation	5	--	95	%RH
Pin Soldering	The solder joint is 1.5mm away from the shell,	--	--	+300	°C
On-off level	Full load, nominal voltage input	--	100	--	KHz
Shock		10-55Hz, 10G, 30Min.alongX, YandZ			
Shell material		Black flame retardant heat resistant plastic(UL94V-0)			
Minimum time between failures	MIL-HDFK-217F@25°C	3.5X10 ⁶	--	--	Hrs

Product characteristic curve

Errorenvelopplot



Temperature Derating Curve



Typical Application Reference Circuit (Recommended Parameters)

Normal application circuit

To further reduce input and output ripple, a capacitor filter network may be added to both sides of the module, as illustrated in Figure 1. When doing so, it is important to choose suitable filter capacitors—using excessively large capacitance may lead to startup issues. For each output, and while maintaining safe and reliable operation, the recommended capacitive load values are provided in Table 1.

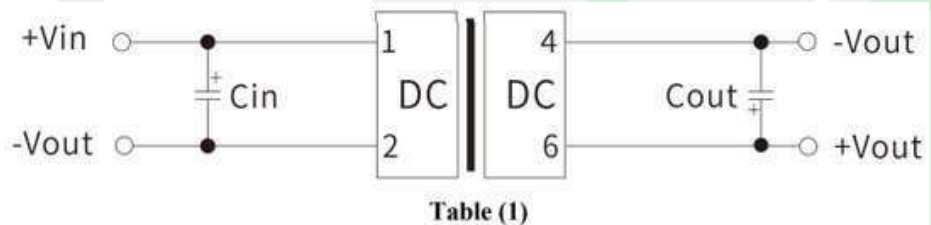


Table (1)

Details of recommended capacitive load values (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

EMI typical application circuit

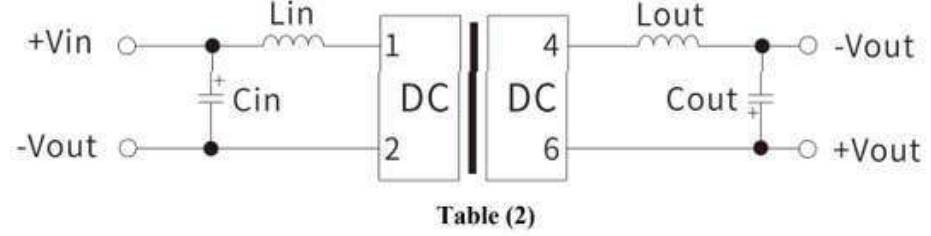


Table (2)

Recommended EMI reference circuit values are detailed (Table 2)

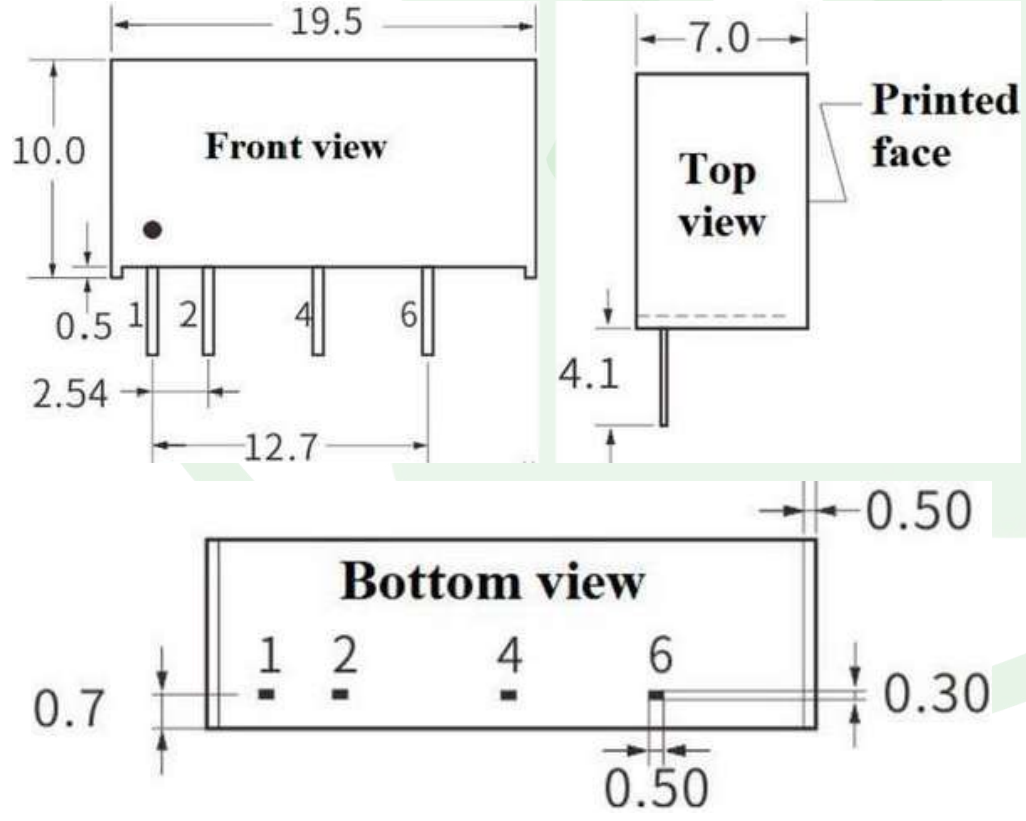
Vin(Vdc)	3.3/5/12/15/24
Cin	4.7uF/50V
Cout	Refer to Table 1
Lin	4.7uH
Lout	4.7uH

Output load requirements

To ensure efficient and reliable operation, the module's output load must not fall below 10% of the rated load. If your application requires very low power, connect a resistor in parallel across the output terminals so that the combined power consumption is at least 10% of the module's rated output. Additionally, the resistor's power ratings should be at least five times the actual power it dissipates; otherwise, it may overheat.

Package size and pin function diagram

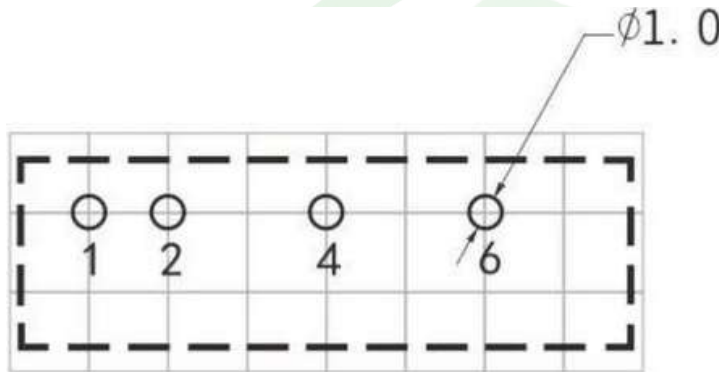
1 Dimension (Unit:mm, Error: ±0.25mm)



Pin defination

1	2	3	4	5	6
+Vin	-Vin	No pin	-Vout	No Pin	+V out

Recomended 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 No	LXWXH	
S	19.5x7.0x10.0mm	0.768x0.276x0.394inch

Test Application Reference

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

Testing method:

- For ripple and noise testing, use 12# twisted-pair wiring. Set the oscilloscope bandwidth to 20 MHz, and the probe bandwidth to 100 MHz. Connect a 0.1 μ F polypropylene capacitor and a 4.7 μ F high-frequency, low-ESR electrolytic capacitor in parallel at the probe end. The oscilloscope should operate in Sample acquisition mode.
- Output ripple and noise test setup schematic:(Corresponds to the referenced diagram.)
- Connect the power module's input to the DC supply, and connect the output to the electronic load through the fixture board. Use a 30 cm \pm 2 cm sampling lead to measure directly from the output terminals. Select power wires with insulation and conductor size suitable for the expected output current.

Application Notes

- 1.Input Requirements:** Ensure that the power supply's output voltage fluctuation stays within the DC-DC module's allowable input range. The input supply must also provide output power greater than the module's rated output power.
- 2.Recommended Circuit 1:** For applications with general ripple and noise requirements, a filter capacitor may be added in parallel to both the input and output. The recommended external circuit is shown in Figure (1), and suitable capacitor values are listed in Table (1).
- 3.Output Load Requirements:** Avoid operating the module with no load. If the actual load consumes less than 10% of the module's rated power, or if no-load operation is expected, a dummy load should be added at the output. The dummy load resistor can be calculated as 5–10% of the module's rated power:
$$R = U_{out} / (I_{WR3} \times 10\%)$$
- 4.**
- 5.Overload Protection:** Under normal conditions, the module does not include overload protection on its output. For long-term overload, over-temperature protection activates and shuts down the output.
- 6.Short-Circuit Protection:** The output features continuous short-circuit protection with automatic recovery.
- 7.External Output Capacitor:** Avoid using excessively large output capacitors, as they may cause high inrush current or startup failures.
- 8.Minimum Load:** If the module operates below the minimum required load, its performance may not meet the specifications listed in this manual.
- 9.Maximum Capacitive Load:** Testing is performed under full-load conditions across the entire input voltage range.
- 10.Test Conditions:** Unless otherwise stated, all specifications are measured at $T_a = 25^\circ\text{C}$, humidity $< 75\% \text{ RH}$, nominal input voltage, and rated output load.
- 11.Testing Standards:** All test methods in this manual follow the company's internal standards.
- 12.Custom Products:** Customization services are available; please contact our technical staff for specific requirements.
- 13.Specification Updates:** Product specifications may be revised without prior notice.

