Typical Performance

- Constant voltage input, isolated voltage regulator output, power 1W
- Isolation voltage: 1500VDC
- Low quiescent current and high conversion efficiency
- Low ripple coefficient and low noise
- Operating temperature: -40℃~+85℃
- MTBF≥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

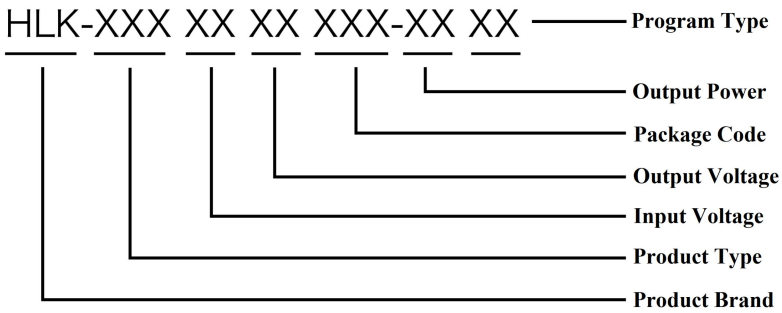
1W, constant voltage input, isolated regulated single output DC/DC module power supply

Over temperature protection and output sustainable short circuit protection RoHS

The B_LS-1WR3 series is designed for applications in distributed power systems that require the generation of a power supply isolated from the input power. The product is suitable for:

- relatively stable voltage of the input power supply (voltage variation van ±5%Vin);
- Isolation required between inputs and outputs (isolation voltage ≤ 1500VDC);
- Applications with high requirements for output voltage stability and output ripple noise;
- Typical applications: pure digital circuits, general low frequency analog circuits, relay drive circuits, data exchange circuits, etc.

Product Coding Rules



Product Selection Table

	Product model①	Input voltage range (Vdc)	Output voltage/current		Ripple and noise	Efficiency @ Full load	Max capacitive load
		Nominal value② (Range values)	Output voltage (Vdc)	Output current(mA) (Max.Min.)	Fully load(mVp-p) Typ./Max.	% Min./Typ.	uF
	IB0505LS-1WR3	5V (4.75~5.25)	5	200/20	50/80	64/68	100
	IB0509LS-1WR3		9	112/11.2	50/80	70/74	100

	IB0512LS-1WR3		12	84/8.4	50/80	70/74	100
	IB0515LS-1WR3		15	67/6.7	50/80	70/74	100
	IB1205LS-1WR3	12V (11.4~12.6)	5	200/20	50/80	64/68	100
	IB1209LS-1WR3		9	112/11.2	50/80	70/74	100
	IB1212LS-1WR3		12	84/8.4	50/80	70/74	100
	IB1215LS-1WR3		15	67/6.7	50/80	70/74	100
	IB2405LS-1WR3	24V (22.8~25.2)	5	200/20	50/80	64/68	100
	IB2409LS-1WR3		9	112/11.2	50/80	70/74	100
	IB2412LS-1WR3		12	84/8.4	50/80	70/74	100
	IB2415LS-1WR3		15	67/6.7	50/80	70/74	100
	IBxxxxLS-1WR3	We can design special specification products according to customers' requirements, and can provide 0.1~1W power products.					

Note: The no-load power consumption of each model above is about 10% of the rated output power.
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. nominal output voltage is the input voltage at nominal value and output current tested under full load conditions;
3. Maximum capacitive load is to characterize the maximum capacity of the module power supply output with capacitive load, the general external output capacitance can not exceed the maximum capacitive load value of the module power supply, otherwise it will cause poor module start-up and affect the long-term reliability of the module work.

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 voltage range	5V input series	-0.7	5	9	Vdc
	12V input series	-0.7	12	18	
	24V input series	-0.7	24	30	
Maximum output power		--	--	1	W
Reflected ripple current			15		mA
Input filter type		Capacitive filtering			
Hot plug and unplug		Not support			

Output Characteristics

Project	Working and testing conditions		Min.	Typ.	Max.	Unit
Output load	Load percentage		10	--	100	%
Output voltage accuracy	100% load		--	--	±3	%
Linear adjustment rate	Input voltage variation ±1%		--	--	±0.25	%
Load Adjustment Rate	10%~100% load	3.3VDC output	--	--	±3	%
		Others output	--	--	±2	
Ripple & noise	Pure resistive load, 20MHz bandwidth, peak		--	50	--	mVp-p
Temperature drift coefficient	Full load		--	--	±0.03	%/°C
Output short circuit protection	1s					

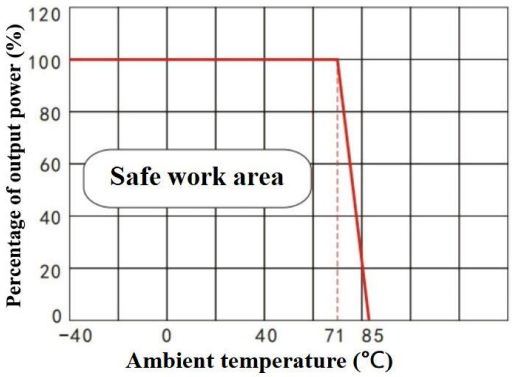
Note:
①The test method of ripple and noise twisted pair test method.
②The series module does not have the input anti-reverse function, it is strictly forbidden to reverse the input positive and negative connection, otherwise it will cause irreversible damage to the module.

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	℃
Storage temperature		-55	--	+105	
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	℃
Switching frequency	Full load, nominal voltage input	--	120	300	KHz
Vibrations		10-55Hz,10G,30Min.alongX,YandZ			
Housing material		Black flame retardant and heat resistant plastic (UL94V-0)			
Minimum trouble-free interval	MIL-HDBK-217F@25℃	$3.5X10^6$	--	--	Hrs

Product Characteristics Curve Chart

Temperature Derating Curve Chart



Typical Application Reference Circuit (Recommended Parameters)

1. Conventional applications:

To further reduce the input and output ripple, a capacitor 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 select the appropriate filtering capacitor. If the capacitor is too large, it is likely to cause start-up problems. For each output, under the condition of ensuring safe and reliable operation, the recommended capacitive load value is detailed in Table 1. recommended capacitive load value details (Table 1).

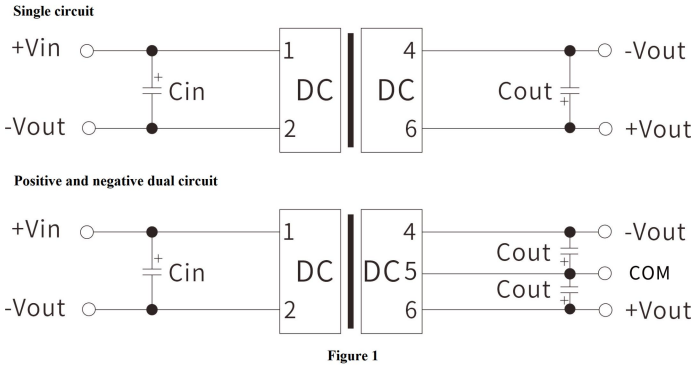


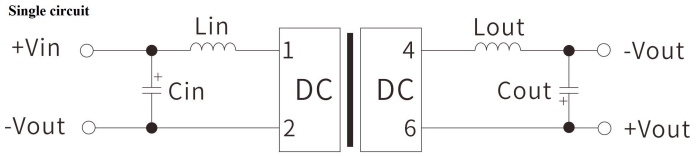
Figure 1

Vin(Vdc)	Cin(uF)	Vo(Vdc)	Cout(uF)
3.3/5	10uF/16V	3.3/5	10 uF/16V
9/12	4.7uF/25V	9/12	4.7 uF/25V
15/24	2.2 uF/50V	15/24	1uF/50V

Table(1)

2. EMI typical application circuit

Recommended EMI reference circuit value details (Table 2)



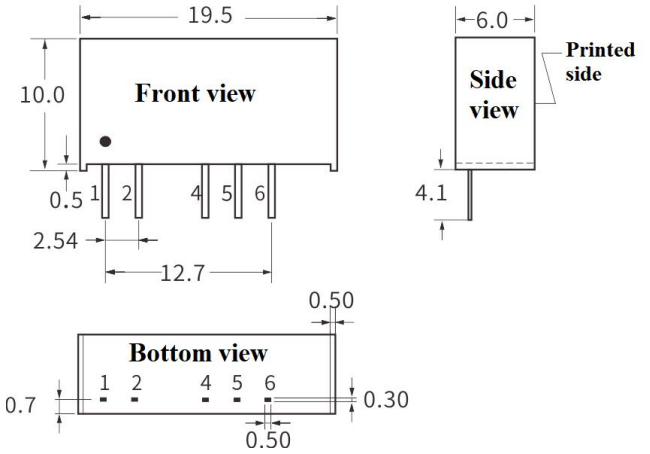
Vin（Vdc）	3.3/5/9/12/15/24
Cin	Refer to Table 1
Cout	Refer to Table 1
Lin	4.7uH
Lout	4.7uH

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 terminals 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 more than 5 times the actual power used, otherwise the temperature of the resistor will be higher).

Product Dimensions And Pin Definition, Suggested Printing Layout

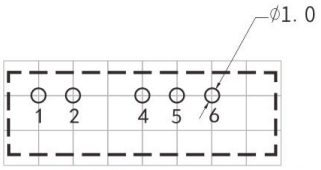
1) Appearance dimensions (unit: mm, tolerance: xx±0.25)



2) Pin definition

Pin	1	2	3	4	5	6
Single circuit	+Vin	-Vin	No Pin	-Vout	No Pin	+Vout

3) Suggested print version



Note: Grid distance: 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	LxWxH	
LS	19.50x6.0x10.0mm	0.768×0.236×0.394inch

Test Application Reference

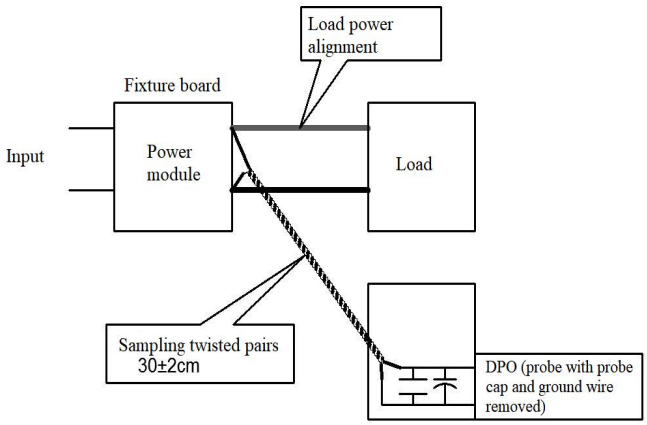
Ripple & Noise Test: (twisted pair method 20MHZ bandwidth)

Test method:

1. Ripple noise is connected using 12# twisted pair, oscilloscope bandwidth set to 20MHz, 100M bandwidth probe, and 0.1uF polypropylene capacitor and 4.7uF high frequency low resistance electrolytic capacitor connected in parallel on the probe end, oscilloscope sampling using Sample sampling mode.

2. Output ripple noise test schematic:

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



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, 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 output rated power 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 rated power 5 ~ 10%, resistance value = Uout / (1WR3 * 10%).
3. Overload protection: Under normal operating conditions, the output circuit of the product has no protection against overload, long time overload will overtemperature 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 at the input voltage range, under full load conditions;
8. unless otherwise specified, all indicators in this manual are measured at Ta=25℃, humidity <75%RH, nominal input voltage and output rated load;
9. All indicators in this manual are tested according to our company's standards;
10. our company can provide product customization, the specific situation can be directly contacted with our technical staff;
11. Product specifications are subject to change without notice.

Contact information

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