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**I B\_M-2WC2 Series 1KV isolated & unregulated single output**

**2W DC/DC Converters**



**Features**

- ◆ SIP International Standard Pin
- ◆ Low-Quiescent Current and High Conversion Efficiency
- ◆ Low Ripple Coefficient and Low Noise
- ◆ Built-in Soft-Start Technology
- ◆ 1000Vdc Isolation Voltage
- ◆ Operation Temperature:-40°C to +85°C
- ◆ 100% burn-in and screening
- ◆ Special specifications of products can be designed according to customers' requirements

**Applications**

The B\_M-2WC2 series products are specially designed for applications where a power source is isolated from the input power supply in a distributed power system.

The products are applicable to:

- 1)The fluctuation range of input power supply voltage is within  $\pm 10\%$ ;
- 2)Isolation is required between input and output(1000Vdc isolation voltage );
- 3)Occasions with low requirements for the output voltage stability and output ripple –noise.

**Product Naming Convention**

BXXXXM-2WC2

① ② ③ ④ ⑤ ⑥

- ①Product Series  
(1000Vdc Isolation Voltage,Single Output)
- ②Input Voltage (Nominal Value)
- ③Output Voltage (Nominal Value)
- ④Package(Single Inline Package)
- ⑤Rated Output Power
- ⑥Identification Code

**Specifications**

Unless otherwise specified, all values are given at room temperature and standard atmosphere pressure, standard input voltage.

Selection Table					
Product Model	Input Voltage (Vdc) range (nominal)	Output Voltage① (Vdc)	Output Current(mA) Max(Full Load )/ Min(Light Load)	Maximum Capacitive Load (μF)②	Efficiency (%.Min/Typ) @ Full Load
B0505M-2WC2	4.5~5.5 (5V)	5	400/40	200	76/80
B0512M-2WC2		12	167/17	200	79/83
B0515M-2WC2		15	133/13	200	80/84
B1203M-2WC2	10.8~13.2 (12V)	3.3	400/40	200	70/74
B1205M-2WC2		5	400/40	200	76/80
B1209M-2WC2		9	222/23	200	80/84
B1212M-2WC2		12	167/17	200	79/83
B1215M-2WC2		15	133/14	200	80/84
B4803M-2WC2	43.2~52.8 (48V)	3.3	400/40	200	66/70
BXXXXM-2WC2	Special specifications of products can be designed according to customers' requirements,and 1 ~ 2W products can be provided.				

The no-load power consumption of the power modules is about 10% of the rated output power.

①Nominal output voltage refers to the input voltage in the nominal value and output current under full load conditions.

②The maximum capacitive load is the maximum capacity of the module power supply to output the capacitive load. Generally, the external output capacitance can not exceed the maximum capacitive load of the module power supply, otherwise, it will result in bad module startup and affect the reliability of the module's long-term work.

Input Specifications					
Input	Conditions	Min <sup>③</sup>	Typ	Max	Unit
Input Voltage	5V Input	-0.7	5	9	Vdc
	12V Input	-0.7	12	18	
	48V Input	-0.7	48	54	
③The series of modules have no anti-reverse input protection, the input is strictly prohibited positive and negative reverse, otherwise it will cause irreversible damage to the module.					

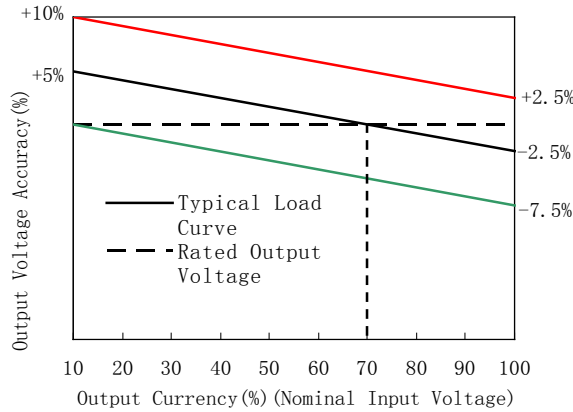
Output Specifications						
Output	Conditions	Min	Typ	Max	Unit	
Maximum Output Power	—	—	—	2	W	
Output Voltage Accuracy	—	See the error envelope diagram				
Linear Voltage Regulation	±1% changes of input voltage	—	—	±1.2	%	
Load Regulation	10% ~ 100% load	3.3V Output	—	15		20
		5V Output	—	10		15
		9V Output	—	9		15
		12V Output	—	8		15
		15V Output	—	7	15	
Ripple and Noise <sup>④</sup>	20MHz bandwidth	—	75	150	mV	
Output Short-circuit Protection	—	—	—	1	s	
④Ripple and Noise is measured by connecting the oscilloscope probe without ground wire.						

General Specifications					
General	Conditions	Min	Typ	Max	Unit
Isolation Voltage	t=60s, leak current≤1mA	1000	—	—	Vdc
Isolation Resistance	Input to Output,500Vdc	1000	—	—	MΩ
Isolation Capacitance	Input to Output 100kHz/0.1V	—	90	—	pF
Operating Temperature	Output :3.3/5/9V Temperature≥71℃ Limit use	-40	—	+71	℃
	Output :12/15V Temperature≥85℃ Limit use	-40	—	+85	
Storage Temperature	—	-55	—	+105	
Storage Humidity	non condensing	—	—	95	%RH
Temperature Coefficient	100% load	—	—	±0.03	%/℃
Soldering Temperature	1.5 mm distance between solder joint and case, 10s	—	—	300	℃
Switching Frequency	100% load, nominal input voltage	—	100	300	kHz
MTBF	—	3.5×10 <sup>6</sup> h Refer to MIL-HDFK-217F@25℃			

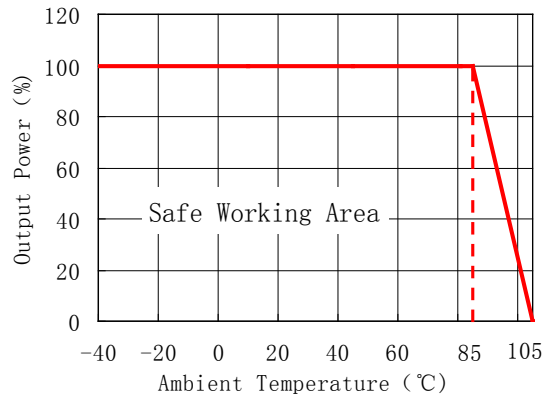
Physical Specifications	
Case material	Black flame retardant and heat-resistant epoxy (UL94-V0)
Package Size	11.6mm×10.2mm×7.5mm
Weight	1.8g typ.
Cooling mode	natural air cooling

**Characteristic Curves**

**The Error Envelope Diagram**



**Temperature vs Power**

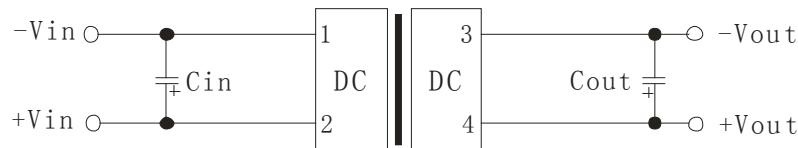


**Design Considerations**

◆ **Peripheral Recommended Circuit**

**Recommended Circuit 1:**

A filter capacitor can be connected in parallel at the input and output terminals respectively on the occasions of low requirements for ripple and noise. An external circuit is shown in the figure 1 below. The recommended values of the filter capacitors are shown in the table 1.



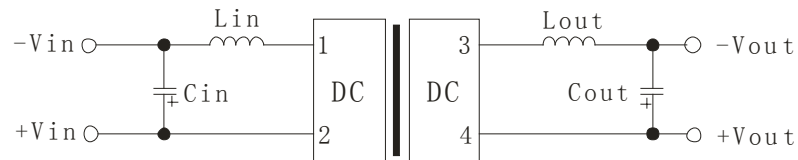
The figure 1

The table 1

$V_{in}(V_{dc})$	$C_{in}$	$V_{out}(V_{dc})$	$C_{out}$
5	4.7 $\mu$ F/16V	3.3/5	4.7 $\mu$ F/16V
12	2.2 $\mu$ F/25V	9/12	1 $\mu$ F/25V
48	1 $\mu$ F/50V	15	0.47 $\mu$ F/50V

**Recommended Circuit 2:**

The external circuit can be referred to the figure 2 on the occasions of strict requirements for ripple and noise. The recommended values of the filter capacitance and inductance are shown in the table 2.



The figure 2

The table 2

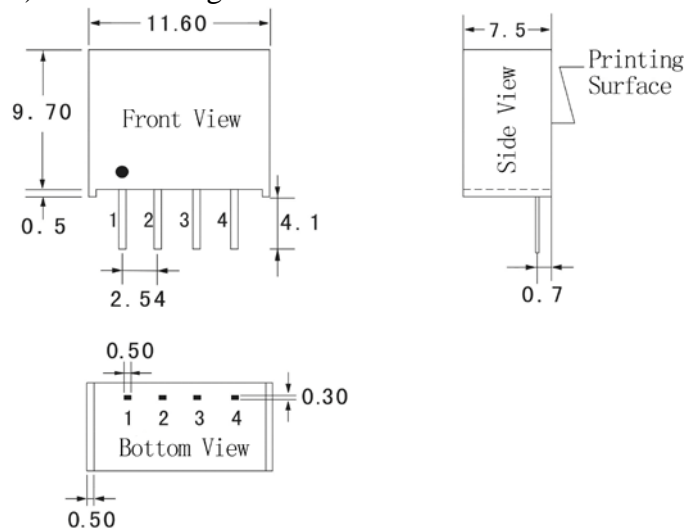
$V_{in}(V_{dc})$	$C_{in}$	$L_{in}$	$C_{out}(V_{dc})$	$L_{out}$
5/12/48	See the table 1	4.7 $\mu$ H	See the table 1	4.7 $\mu$ H

◆ **Precautions for product use**

- **Input requirement:** Ensure that the output voltage fluctuations of the power supply do not exceed the input voltage range of the DC/DC module. And the output power of the power supply must be greater than the input power of the DC/DC module.
- **Output load requirement:** Try to avoid no-load use. When the actual power consumption of the load is less than 10% of the rated power of the module or there is no load, pseudo loads are recommended to be connected at the output terminals. The pseudo load can be calculated from 5 ~ 10% of the rated power of the module, resistance =  $V_{out}^2 / (2W * 10\%)$ .
- **Overload protection:** Under the normal working conditions, the product has no output overload protection. The simplest approach is to connect a self-recovery fuse in series at the input, or to add a circuit breaker to the circuit.
- **The external capacitance of the output terminals should not be too large, otherwise it is easy to cause over-current even failure during starting up of the converter.**

**Outline Diagram and recommended layout**

1) **Outline Diagram**

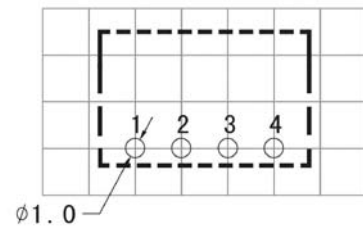


Unites:mm Tolerances:XX±0.25

2) **Pin Definition**

1	-Vin	Negative Input
2	+Vin	Positive Input
3	-Vout	Negative Output
4	+Vout	Positive Output

3) **Recommended Layout**



Note:grid distance:2.54mm\*2.54mm

**Application Data**

**Quality Statement**

The converters are manufactured in accordance with ISO 9001 system requirements, and are monitored 100% by auto-testing system, 100% burn in. The warranty for the converters is 2-year.

**Contact Information**

**Anhui Hesion Trading Co.,Ltd.**  
**Beijing Yihongtai Technology Dev.Co.,Ltd**

**TEL: +86-551-65369069,65369067**  
**Email: [alecz@ahhesion.com](mailto:alecz@ahhesion.com)**  
**Backup:[alecz@126.com](mailto:alecz@126.com)**

**II B\_S-1WC2 Series 1.5KV isolated & unregulated single output**

**1W DC/DC Converters**

**Features**



- ◆ SIP International Standard Pin
- ◆ Low-Quiescent Current and High Conversion Efficiency
- ◆ Low Ripple Coefficient and Low Noise
- ◆ Built-in Soft-Start Technology
- ◆ 1500Vdc Isolation Voltage
- ◆ Operation Temperature:-40°C to +85°C
- ◆ 100% burn-in and screening
- ◆ Special specifications of products can be designed according to customers' requirements

**Applications**

The B\_S-1WC2 series products are specially designed for applications where a power source is isolated from the input power supply in a distributed power system.

The products are applicable to:

- 1)The fluctuation range of input power supply voltage is within  $\pm 10\%$ ;
- 2)Isolation is required between input and output(1500Vdc isolation voltage );
- 3)Occasions with low requirements for the output voltage stability and output ripple-noise.

**Product Naming Convention**

**BXXXXS-1WC2**

① ② ③ ④ ⑤ ⑥

- ①Product Series  
(1500Vdc Isolation Voltage,Single Output)
- ②Input Voltage (Nominal Value)
- ③Output Voltage (Nominal Value)
- ④Package(Single Inline Package)
- ⑤Rated Output Power
- ⑥Identification Code

**Specifications**

Unless otherwise specified, all values are given at room temperature and standard atmosphere pressure, standard input voltage.

Selection Table					
Product Model	Input Voltage (Vdc) range (nominal)	Output Voltage① (Vdc)	Output Current (mA) Max(Full Load )/ Min(Light Load)	Maximum Capacitive Load (μF)②	Efficiency (%Min/Typ) @ Full Load
B0303S-1WC2	2.97~3.63 (3.3V)	3.3	303/30.3	200	68/72
B0305S-1WC2		5	200/20	200	74/78
B0309S-1WC2		9	112/11.2	200	74/78
B0312S-1WC2		12	84/8.4	200	74/78
B0315S-1WC2		15	67/6.7	200	74/78
B0324S-1WC2		24	42/4.2	200	74/78
B0503S-1WC2	4.5~5.5 (5V)	3.3	303/30.3	200	70/74
B0505S-1WC2		5	200/20	200	76/80
B0509S-1WC2		9	112/11.2	200	76/80
B0512S-1WC2		12	84/8.4	200	76/80
B0515S-1WC2		15	67/6.7	200	76/80
B0524S-1WC2		24	42/4.2	200	76/80

Continue

Selection Table					
Product Model	Input Voltage (Vdc) range (nominal)	Output Voltage① (Vdc)	Output Current (mA) Max(Full Load )/ Min(Light Load)	Maximum Capacitive Load (μF)②	Efficiency (%Min/Typ) @ Full Load
B0903S-1WC2	8.1~9.9 (9V)	3.3	303/30.3	200	72/76
B0905S-1WC2		5	200/20	200	76/80
B0909S-1WC2		9	112/11.2	200	76/80
B0912S-1WC2		12	84/8.4	200	76/80
B0915S-1WC2		15	67/6.7	200	76/80
B0924S-1WC2		24	42/4.2	200	76/80
B1203S-1WC2	10.8~13.2 (12V)	3.3	303/30.3	200	72/76
B1205S-1WC2		5	200/20	200	76/80
B1209S-1WC2		9	112/11.2	200	76/80
B1212S-1WC2		12	84/8.4	200	76/80
B1215S-1WC2		15	67/6.7	200	76/80
B1224S-1WC2		24	42/4.2	200	76/80
B1503C-1WC2	13.5~16.5 (15V)	3.3	303/30.3	200	72/76
B1505S-1WC2		5	200/20	200	76/80
B1509S-1WC2		9	112/11.2	200	76/80
B1512S-1WC2		12	84/8.4	200	76/80
B1515S-1WC2		15	67/6.7	200	76/80
B1524S-1WC2		24	42/4.2	200	76/80
B2403S-1WC2	21.6~26.4 (24V)	3.3	303/30.3	200	70/74
B2405S-1WC2		5	200/20	200	76/80
B2409S-1WC2		9	112/11.2	200	76/80
B2412S-1WC2		12	84/8.4	200	76/80
B2415S-1WC2		15	67/6.7	200	76/80
B2424S-1WC2		24	42/4.2	200	76/80
BXXXXS-1WC2	Special specifications of products can be designed according to customers' requirements, and 0.1~1W products can be provided.				
The no-load power consumption of the power modules is about 10% of the rated output power.					
①Nominal output voltage refers to the input voltage in the nominal value and output current under full load conditions.					
②The maximum capacitive load is the maximum capacity of the module power supply to output the capacitive load. Generally, the external output capacitance can not exceed the maximum capacitive load of the module power supply, otherwise, it will result in bad module startup and affect the reliability of the module's long-term work.					

Input Specifications					
Input	Conditions	Min③	Typ	Max	Unit
Input Voltage	3.3V Input	-0.7	3.3	5	Vdc
	5V Input	-0.7	5	9	
	9V Input	-0.7	9	15	
	12V Input	-0.7	12	18	
	15V Input	-0.7	15	21	
	24V Input	-0.7	24	30	
③The series of modules have no anti-reverse input protection, the input is strictly prohibited positive and negative reverse, otherwise it will cause irreversible damage to the module.					

Output Specifications						
Output	Conditions		Min	Typ	Max	Unit
Maximum Output Power	—		—	—	1	W
Output Voltage Accuracy	—		See the error envelope diagram			
Linear Voltage Regulation	±1% Changes of input voltage	3.3V Output	—	—	±1.5	%
		Other Outputs	—	—	±1.2	
Load Regulation	10%~100% load	3.3V Output	—	18	—	
		5V Output	—	12	—	
		9V Output	—	8	—	
		12V Output	—	7	—	
		15V Output	—	6	—	
24V Output	—	5	—			
Ripple and Noise④	20MHz bandwidth		—	60	—	mV
Output Short-circuit Protection	—		—	—	1	s

④Ripple and Noise is measured by connecting the oscilloscope probe without ground wire.

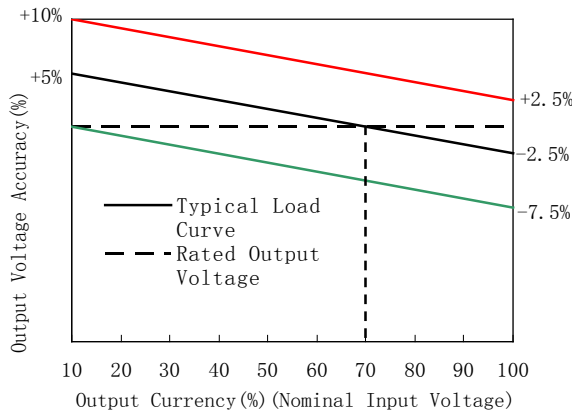
General Specifications						
General	Conditions		Min	Typ	Max	Unit
Isolation Voltage	t=60s, leak current≤1mA		1500	—	—	Vdc
Isolation Resistance	Input to Output,500Vdc		1000	—	—	MΩ
Isolation Capacitance	Input to Output 100kHz/0.1V		—	40	—	pF
Operating Temperature	Full-load states of the output voltage		-40	—	+85	°C
Storage Temperature	—		-55	—	+105	°C
Storage Humidity	Non condensing		—	—	95	%RH
Temperature Coefficient	100% load		—	—	±0.03	%/°C
Soldering Temperature	1.5 mm distance between solder joint and case, 10s		—	—	300	°C
Switching Frequency	100% load, nominal input voltage		—	100	300	kHz
MTBF	—		3.5×10 <sup>6</sup> h Refer to MIL-HDFK-217F@25°C			

Physical Specifications	
Case material	Black flame retardant and heat-resistant epoxy (UL94-V0)
Package Size	11.68mm×10.15mm×6.00mm
Weight	1.2g typ.
Cooling mode	natural air cooling

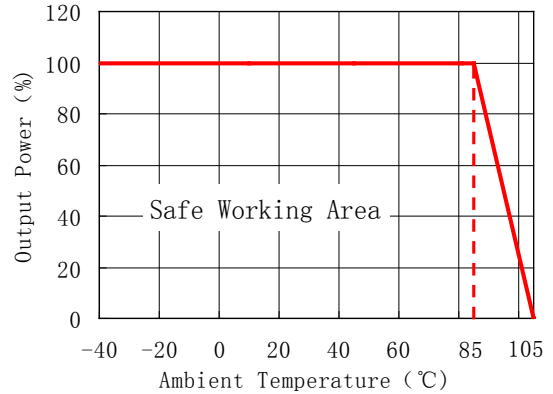


**Characteristic Curves**

**The Error Envelope Diagram**



**Temperature vs Power**

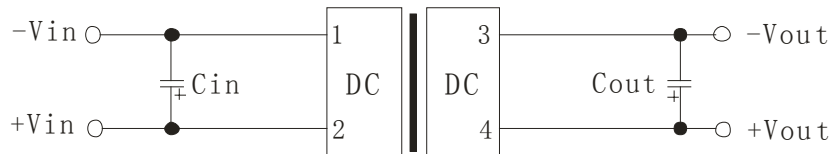


**Design Considerations**

◆ **Peripheral Recommended Circuit**

**Recommended Circuit 1:**

A filter capacitor can be connected in parallel at the input and output terminals respectively on the occasions of low requirements for ripple and noise. An external circuit is shown in the figure 1 below. The recommended values of the filter capacitors are shown in the table 1.



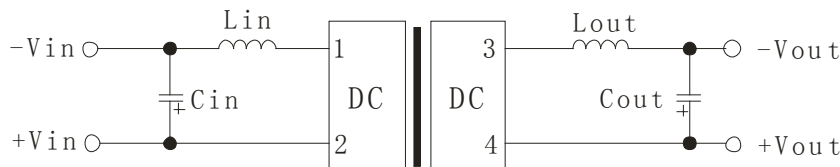
The figure 1

The table 1

Vin(Vdc)	Cin	Vout(Vdc)	Cout
3.3/5	10 $\mu$ F/16V	3.3/5	10 $\mu$ F/16V
9/12	4.7 $\mu$ F/25V	9/12	4.7 $\mu$ F/25V
15/24	2.2 $\mu$ F/50V	15/24	1 $\mu$ F/50V

**Recommended Circuit 2:**

The external circuit can be referred to the figure 2 on the occasions of high requirements for ripple and noise. The recommended values of the filter capacitance and inductance are shown in the table 2.



The figure 2

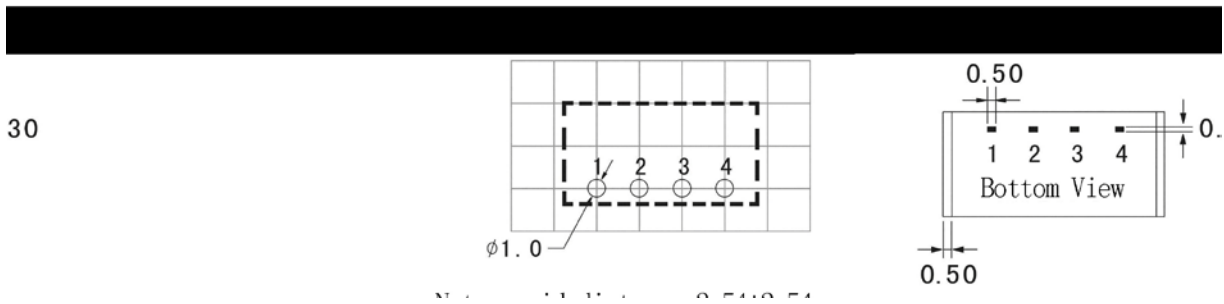
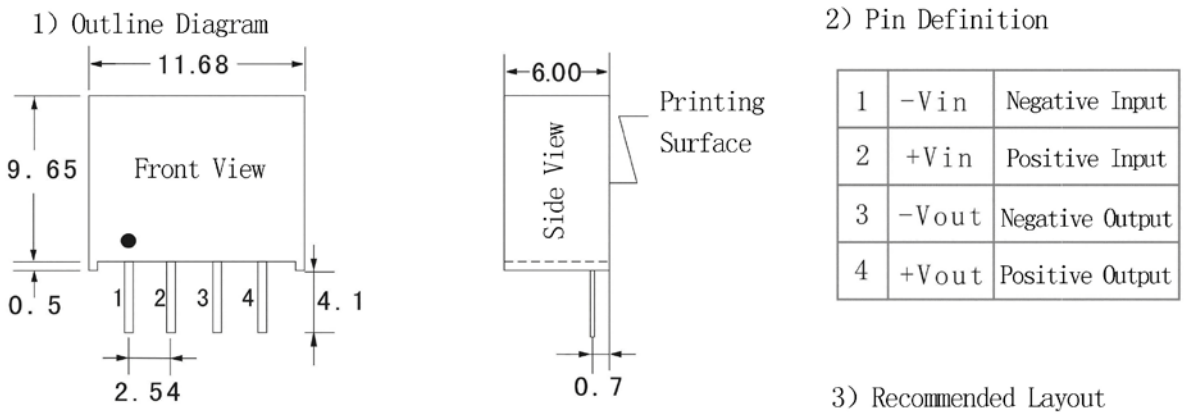
The table 2

Vin(Vdc)	Cin	Lin	Cout (Vdc)	Lout
3.3/5/9/12/15/24	see the table 1	4.7 $\mu$ H	see the table 1	4.7 $\mu$ H

◆ **Precautions for product use**

- **Input requirement:** Ensure that the output voltage fluctuations of the power supply do not exceed the input voltage range of the DC/DC module. And the output power of the power supply must be greater than the input power of the DC/DC module.
- **Output load requirement:** Try to avoid no-load use. When the actual power consumption of the load is less than 10% of the rated power of the module or there is no load, pseudo loads are recommended to be connected at the output terminals. The pseudo load can be calculated from 5 ~ 10% of the rated power of the module, resistance =  $V_{out}^2 / (1W * 10\%)$ .
- **Overload protection:** Under the normal working conditions, the product has no output overload protection. The simplest approach is to connect a self-recovery fuse in series at the input, or to add a circuit breaker to the circuit.
- The external capacitance of the output terminals should not be too large, otherwise it is easy to cause over-current even failure during the starting up of the converter.

**Outline Diagram and recommended layout**



**Application Data**

**Quality Statement**

The converters are manufactured in accordance with ISO 9001 system requirements, and are monitored 100% by auto-testing system, 100% burn in. The warranty for the converters is 2-year.

**Contact Information**

**Anhui Hesion Trading Co.,Ltd.**  
**Beijing Yihongtai Technology Dev.Co.,Ltd**

**TEL: +86-551-65369069,65369067**  
**Email: [alecz@ahhesion.com](mailto:alecz@ahhesion.com)**  
**Backup: [alecz@126.com](mailto:alecz@126.com)**

**III B\_S-2WC2 Series 1.5KV isolated & unregulated single output**

**2W DC/DC Converters**

**Features**



- ◆ SIP International Standard Pin
- ◆ Low-Quiescent Current and High Conversion Efficiency
- ◆ Low Ripple Coefficient and Low Noise
- ◆ Built-in Soft-Start Technology
- ◆ 1500Vdc Isolation Voltage
- ◆ Operation Temperature:-40℃ to +85℃
- ◆ 100% Burn-in and Screening
- ◆ Special specifications of products can be designed according to customers' requirements

**Applications**

**Product Naming Convention**

The B\_S-2WC2 series products are specially designed for applications where a power source is isolated from the input power supply in a distributed power system.

**BXXXXS-2WC2**

① ② ③ ④ ⑤ ⑥

The products are applicable to:

- ① Product Series (1500Vdc Isolation Voltage, Single Output)
- ② Input Voltage (Nominal Value)
- ③ Output Voltage (Nominal Value)
- ④ Package (Single Inline Package)
- ⑤ Rated Output Power
- ⑥ Identification Code

- 1) The fluctuation range of input power supply voltage is within  $\pm 10\%$ ;
- 2) Isolation is required between input and output (1500Vdc isolation voltage);
- 3) Occasions with low requirements for the output voltage stability and output ripple-noise.

**Specifications**

Unless otherwise specified, all values are given at room temperature and standard atmosphere pressure, standard input voltage.

Selection Table					
Product Model	Input Voltage (Vdc) range (nominal)	Output Voltage① (Vdc)	Output Current (mA) Max(Full Load )/ Min(Light Load)	Maximum Capacitive Load (μF)②	Efficiency (% ,Min/Typ) @ Full Load
B0303S-2WC2	2.97~3.63 (3.3V)	3.3	606/61	200	80/84
B0305S-2WC2		5	400/40	200	82/86
B0309S-2WC2		9	224/23	200	82/86
B0312S-2WC2		12	167/17	200	82/86
B0315S-2WC2		15	133/13	200	82/86
B0324S-2WC2		24	83/8	200	82/86
B0503S-2WC2	4.5~5.5 (5V)	3.3	606/61	200	82/86
B0505S-2WC2		5	400/40	200	86/90
B0509S-2WC2		9	224/23	200	82/86
B0512S-2WC2		12	167/17	200	82/86
B0515S-2WC2		15	133/13	200	82/86
B0524S-2WC2		24	83/8	200	82/86

Continue

Selection Table					
Product Model	Input Voltage (Vdc) range (nominal)	Output Voltage <sup>①</sup> (Vdc)	Output Current (mA) Max(Full Load )/ Min(Light Load)	Maximum Capacitive Load (μF) <sup>②</sup>	Efficiency (% ,Min/Typ) @ Full Load
B0903S-2WC2	8.1~9.9 (9V)	3.3	606/61	200	82/86
B0905S-2WC2		5	400/40	200	82/86
B0909S-2WC2		9	224/23	200	82/86
B0912S-2WC2		12	167/17	200	82/86
B0915S-2WC2		15	133/13	200	82/86
B0924S-2WC2		24	83/8	200	82/86
B1203S-2WC2	10.8~13.2 (12V)	3.3	606/61	200	80/84
B1205S-2WC2		5	400/40	200	82/86
B1209S-2WC2		9	224/23	200	82/86
B1212S-2WC2		12	167/17	200	82/86
B1215S-2WC2		15	133/13	200	82/86
B1224S-2WC2		24	83/8	200	82/86
B1503S-2WC2	13.5~16.5 (15V)	3.3	606/61	200	82/86
B1505S-2WC2		5	400/40	200	86/90
B1509S-2WC2		9	224/23	200	82/86
B1512S-2WC2		12	167/17	200	82/86
B1515S-2WC2		15	133/13	200	82/86
B1524S-2WC2		24	83/8	200	82/86
B2403S-2WC2	21.6~26.4 (24V)	3.3	606/61	200	82/86
B2405S-2WC2		5	400/40	200	82/86
B2409S-2WC2		9	224/23	200	82/86
B2412S-2WC2		12	167/17	200	82/86
B2415S-2WC2		15	133/13	200	82/86
B2424S-2WC2		24	83/8	200	83/87
BXXXXS-2WC2	Special specifications of products can be designed according to customers' requirements, and 1 ~ 2W products can be provided.				

The no-load power consumption of the power modules is about 10% of the rated output power.  
 ①Nominal output voltage refers to the input voltage in the nominal value and output current under full load conditions.  
 ②The maximum capacitive load is the maximum capacity of the module power supply to output the capacitive load. Generally, the external output capacitance can not exceed the maximum capacitive load of the module power supply, otherwise, it will result in bad module startup and affect the reliability of the module's long-term work.

Input Specifications					
Input	Conditions	Min <sup>③</sup>	Typ	Max	Unit
Input Voltage	3.3V Input	-0.7	3.3	5	Vdc
	5V Input	-0.7	5	9	
	9V Input	-0.7	9	15	
	12V Input	-0.7	12	18	
	15V Input	-0.7	15	21	
	24V Input	-0.7	24	30	

③The series of modules have no anti-reverse input protection, the input is strictly prohibited positive and negative reverse, otherwise it will cause irreversible damage to the module.

Output Specifications						
Output	Conditions		Min	Typ	Max	Unit
Maximum Output Power	—		—	—	2	W
Output Voltage Accuracy	—		See the error envelope diagram			
Linear Voltage Regulation	±1% Changes of input voltage	3.3V Output	—	—	±1.5	%
		Other Outputs	—	—	±1.2	
Load Regulation	10%~100% load	3.3V Output	—	18	—	
		5V Output	—	12	—	
		9V Output	—	8	—	
		12V Output	—	7	—	
		15V Output	—	6	—	
24V Output	—	5	—			
Ripple and Noise④	20MHz bandwidth		—	60	—	mV
Output Short-circuit Protection	—		—	—	1	s

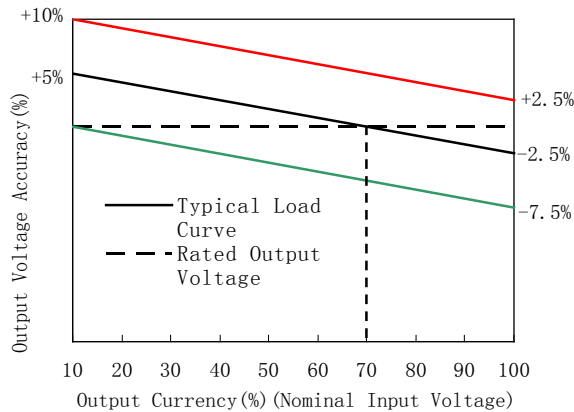
④Ripple and Noise is measured by connecting the oscilloscope probe without ground wire.

General Specifications					
General	Conditions	Min	Typ	Max	Unit
Isolation Voltage	t=60s, leak current≤1mA	1500	—	—	Vdc
Isolation Resistance	Input to Output,500Vdc	1000	—	—	MΩ
Isolation Capacitance	Input to Output 100kHz/0.1V	—	40	—	pF
Operating Temperature	Full-load states of the output voltage	-40	—	+85	°C
Storage Temperature	—	-55	—	+105	°C
Storage Humidity	Non condensing	—	—	95	%RH
Temperature Coefficient	100% load	—	—	±0.03	%/°C
Soldering Temperature	1.5 mm distance between solder joint and case, 10s	—	—	300	°C
Switching Frequency	100% load, nominal input voltage	—	100	300	kHz
MTBF	—	3.5×10 <sup>6</sup> h Refer to MIL-HDFK-217F@25°C			

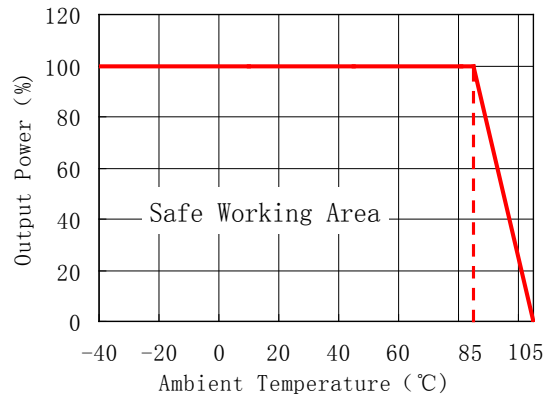
Physical Specifications	
Case material	Black flame retardant and heat-resistant epoxy (UL94-V0)
Package Size	19.50mm×10.00mm×7.00mm
Weight	2.4g typ.
Cooling mode	natural air cooling

**Characteristic Curves**

**The Error Envelope Diagram**



**Temperature vs Power**

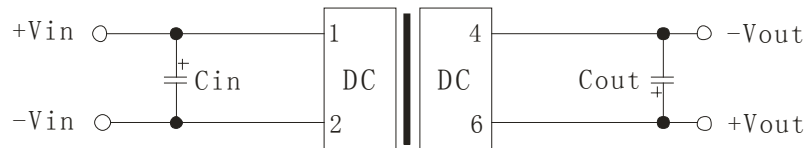


**Design Considerations**

◆ **Peripheral Recommended Circuit**

**Recommended Circuit 1:**

A filter capacitor can be connected in parallel at the input and output terminals respectively on the occasions of low requirements for ripple and noise. An external circuit is shown in the figure 1 below. The recommended values of the filter capacitors are shown in the table 1.



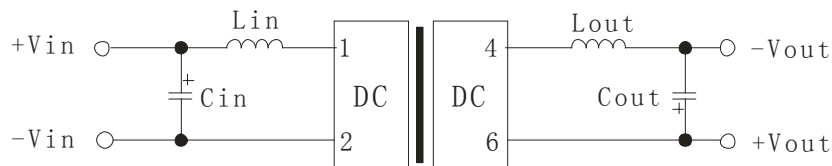
The figure 1

The table 1

Vin(Vdc)	Cin	Vout(Vdc)	Cout
3.3/5	4.7μF/16V	3.3/5	4.7μF/16V
9/12	2.2μF/25V	9/12	1μF/25V
15/24	1μF/50V	15/24	0.47μF/50V

**Recommended Circuit 2:**

The external circuit can be referred to the figure 2 on the occasions of strict requirements for ripple and noise. The recommended values of the filter capacitance and inductance are shown in the table 2.



The figure 2

The table 2

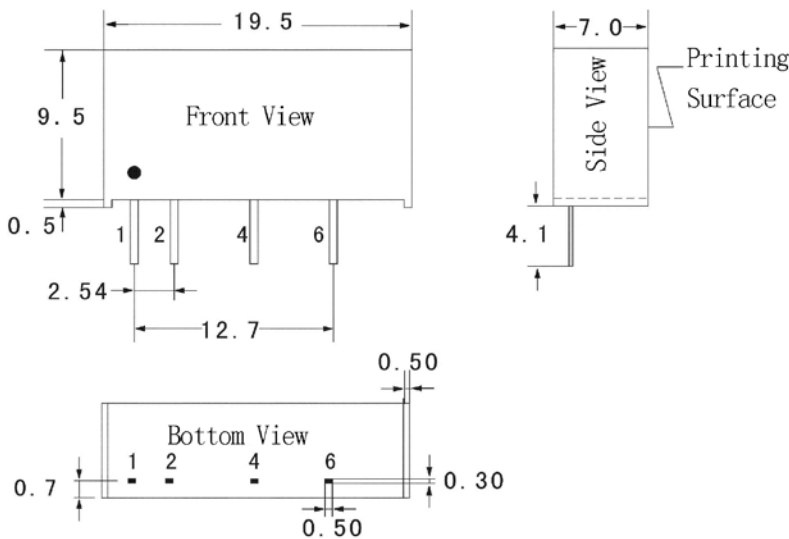
Vin(Vdc)	Cin	Lin	Cout (Vdc)	Lout
3.3/5/9/12/15/24	See the table 1	4.7μH	See the table 1	4.7μH

◆ **Precautions for product use**

- **Input requirement:** Ensure that the output voltage fluctuations of the power supply do not exceed the input voltage range of the DC/DC module. And the output power of the power supply must be greater than the input power of the DC/DC module.
- **Output load requirement:** Try to avoid no-load use. When the actual power consumption of the load is less than 10% of the rated power of the module or there is no load, pseudo loads are recommended to be connected at the output terminals. the pseudo load can be calculated from 5 ~ 10% of the rated power of the module, resistance =  $V_{out}^2 / (2W * 10\%)$ .
- **Overload protection:** Under the normal working conditions, the product has no output overload protection. The simplest approach is to connect a self-recovery fuse in series at the input, or to add a circuit breaker to the circuit.
- The external capacitance of the output terminals should not be too large, otherwise it is easy to cause over-current even failure during the starting up of the converter.

**Outline Diagram and recommended layout**

1) Outline Diagram

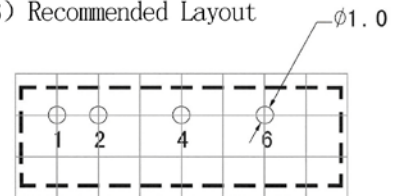


Units:mm Tolerances:XX±0.25

2) Pin Definition

1	+Vin	Positive Input
2	-Vin	Negative Input
3	No Pin	No Pin
4	-Vout	Negative Output
5	No Pin	No Pin
6	+Vout	Positive Output

3) Recommended Layout



Note: grid distance:2.54\*2.54mm

**Application Data**

**Quality Statement**

The converters are manufactured in accordance with ISO 9001 system requirements, and are monitored 100% by auto-testing system, 100% burn in. The warranty for the converters is 2-year.

**Contact Information**

**Anhui Hesion Trading Co.,Ltd.**  
**Beijing Yihongtai Technology Dev.Co.,Ltd**

**TEL: +86-551-65369069,65369067**  
**Email: [alecz@ahhesion.com](mailto:alecz@ahhesion.com)**  
**Backup:[alecz@126.com](mailto:alecz@126.com)**

**IVB\_LS-1WC2 Series 1.5KV isolated&unregulated single output**

**1W DC/DC Converters**

**Features**



- ◆ SIP International Standard Pin
- ◆ Low-Quiescent Current and High Conversion Efficiency
- ◆ Low Ripple Coefficient and Low Noise
- ◆ Built-in Soft-Start Technology
- ◆ 1500Vdc Isolation Voltage
- ◆ Operation Temperature :-40°C to +85°C
- ◆ 100% burn-in and screening
- ◆ Special specifications of products can be designed according to customers' requirements

**Applications**

The B\_LS-1WC2 series products are specially designed for applications where a power source is isolated from the input power supply in a distributed power system.

The products are applicable to:

- 1)The fluctuation range of input power supply voltage is within  $\pm 10\%$ ;
- 2)Isolation is required between input and output(1500Vdc isolation voltage );
- 3)Occasions with low requirements for the output voltage stability and output ripple-noise.

**Product Naming Convention**

**BXXXXLS-1WC2**

① ② ③ ④ ⑤ ⑥

- ①Product Series  
(1500Vdc Isolation Voltage,Single Output)
- ②Input Voltage (Nominal Value)
- ③Output Voltage (Nominal Value)
- ④Package(Single Inline Package)
- ⑤Rated Output Power
- ⑥Identification Code

**Specifications**

Unless otherwise specified, all values are given at room temperature and standard atmosphere pressure, standard input voltage.

Selection Table					
Product Model	Input Voltage (Vdc) range (nominal)	Output Voltage① (Vdc)	Output Current (mA) Max(Full Load )/ Min(Light Load)	Maximum Capacitive Load (μF)②	Efficiency (% ,Min/Typ) @ Full Load
B0303LS-1WC2	2.97~3.63 (3.3V)	3.3	303/30.3	200	68/72
B0305LS-1WC2		5	200/20	200	74/78
B0309LS-1WC2		9	112/11.2	200	74/78
B0312LS-1WC2		12	84/8.4	200	74/78
B0315LS-1WC2		15	67/6.7	200	74/78
B0324LS-1WC2		24	42/4.2	200	74/78
B0503LS-1WC2	4.5~5.5 (5V)	3.3	303/30.3	200	70/74
B0505LS-1WC2		5	200/20	200	76/80
B0509LS-1WC2		9	112/11.2	200	76/80
B0512LS-1WC2		12	84/8.4	200	76/80
B0515LS-1WC2		15	67/6.7	200	76/80
B0524LS-1WC2		24	42/4.2	200	76/80

Continue



Selection Table					
Product Model	Input Voltage (Vdc) range (nominal)	Output Voltage① (Vdc)	Output Current (mA) Max(Full Load )/ Min(Light Load)	Maximum Capacitive Load (μF)②	Efficiency (% ,Min/Typ) @ Full Load
B0903LS-1WC2	8.1~9.9 (9V)	3.3	303/30.3	200	72/76
B0905LS-1WC2		5	200/20	200	76/80
B0909LS-1WC2		9	112/11.2	200	76/80
B0912LS-1WC2		12	84/8.4	200	76/80
B0915LS-1WC2		15	67/6.7	200	76/80
B0924LS-1WC2		24	42/4.2	200	76/80
B1203LS-1WC2	10.8~13.2 (12V)	3.3	303/30.3	200	72/76
B1205LS-1WC2		5	200/20	200	76/80
B1209LS-1WC2		9	112/11.2	200	76/80
B1212LS-1WC2		12	84/8.4	200	76/80
B1215LS-1WC2		15	67/6.7	200	76/80
B1224LS-1WC2		24	42/4.2	200	76/80
B1503LS-1WC2	13.5~16.5 (15V)	3.3	303/30.3	200	72/76
B1505LS-1WC2		5	200/20	200	76/80
B1509LS-1WC2		9	112/11.2	200	76/80
B1512LS-1WC2		12	84/8.4	200	76/80
B1515LS-1WC2		15	67/6.7	200	76/80
B1524LS-1WC2		24	42/4.2	200	76/80
B2403LS-1WC2	21.6~26.4 (24V)	3.3	303/30.3	200	70/74
B2405LS-1WC2		5	200/20	200	76/80
B2409LS-1WC2		9	112/11.2	200	76/80
B2412LS-1WC2		12	84/8.4	200	76/80
B2415LS-1WC2		15	67/6.7	200	76/80
B2424LS-1WC2		24	42/4.2	200	76/80
BXXXXS-1WC2	Special specifications of products can be designed according to customers' requirements, and 0.1 ~ 1W products can be provided.				
The no-load power consumption of the power modules is about 10% of the rated output power.					
① Nominal output voltage refers to the input voltage in the nominal value and output current under full load conditions.					
② The maximum capacitive load is the maximum capacity of the module power supply to output the capacitive load. Generally, the external output capacitance can not exceed the maximum capacitive load of the module power supply, otherwise, it will result in bad module startup and affect the reliability of the module's long-term work.					

Input Specifications					
Input	Conditions	Min③	Typ	Max	Unit
Input Voltage	3.3V Input	-0.7	3.3	5	Vdc
	5V Input	-0.7	5	9	
	9V Input	-0.7	9	15	
	12V Input	-0.7	12	18	
	15V Input	-0.7	15	21	
	24V Input	-0.7	24	30	
③ The series of modules have no anti-reverse input protection, the input is strictly prohibited positive and negative reverse, otherwise it will cause irreversible damage to the module.					

Output Specifications						
Output	Conditions		Min	Typ	Max	Unit
Maximum Output Power	—		—	—	1	W
Output Voltage Accuracy	—		See the error envelope diagram			
Linear Voltage Regulation	±1% Changes of input voltage	3.3V Output	—	—	±1.5	%
		Other Outputs	—	—	±1.2	
Load Regulation	10%~100% load	3.3V Output	—	18	—	
		5V Output	—	12	—	
		9V Output	—	8	—	
		12V Output	—	7	—	
		15V Output	—	6	—	
24V Output	—	5	—			
Ripple and Noise④	20MHz bandwidth		—	60	—	mV
Output Short-circuit Protection	—		—	—	1	s

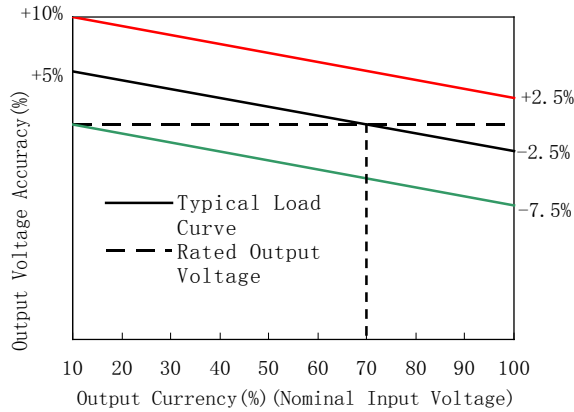
④Ripple and Noise is measured by connecting the oscilloscope probe without ground wire.

General Specifications					
General	Conditions	Min	Typ	Max	Unit
Isolation Voltage	t=60s, leak current≤1mA	1500	—	—	Vdc
Isolation Resistance	Input to Output,500Vdc	1000	—	—	MΩ
Isolation Capacitance	Input to Output 100kHz/0.1V	—	40	—	pF
Operating Temperature	Full-load states of the output voltage	-40	—	+85	°C
Storage Temperature	—	-55	—	+105	°C
Storage Humidity	Non condensing	—	—	95	%RH
Temperature Coefficient	100% load	—	—	±0.03	%/°C
Soldering Temperature	1.5 mm distance between solder joint and case, 10s	—	—	300	°C
Switching Frequency	100% load, nominal input voltage	—	100	300	kHz
MTBF	—	3.5×10 <sup>6</sup> h Refer to MIL-HDFK-217F@25°C			

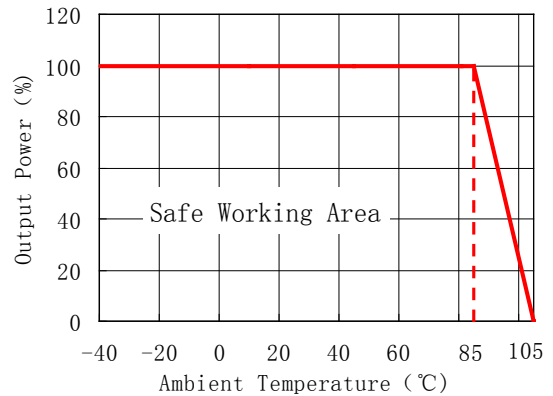
Physical Specifications	
Case material	Black flame retardant and heat-resistant epoxy (UL94-V0)
Package Size	19.50mm×10.00mm×6.00mm
Weight	2.4g typ.
Cooling mode	natural air cooling

**Characteristic Curves**

**The Error Envelope Diagram**



**Temperature vs Power**

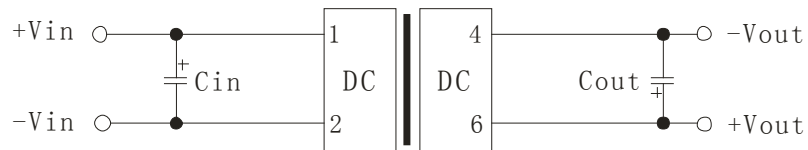


**Design Considerations**

◆ **Peripheral Recommended Circuit**

**Recommended Circuit 1:**

A filter capacitor can be connected in parallel at the input and output terminals respectively on the occasions of low requirements for ripple and noise. An external circuit is shown in the figure 1 below. The recommended values of the filter capacitors are shown in the table 1.



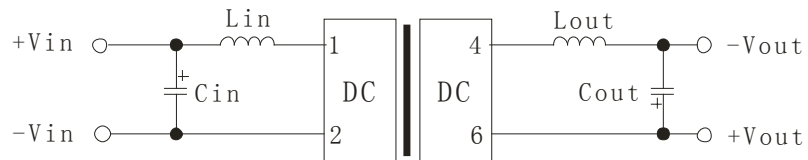
The figure 1

The table 1

Vin(Vdc)	Cin	Vout(Vdc)	Cout
3.3/5	10 $\mu$ F/16V	3.3/5	10 $\mu$ F/16V
9/12	4.7 $\mu$ F/25V	9/12	4.7 $\mu$ F/25V
15/24	2.2 $\mu$ F/50V	15/24	1 $\mu$ F/50V

**Recommended Circuit 2:**

The external circuit can be referred to the figure 2 on the occasions of strict requirements for ripple and noise. The recommended values of the filter capacitance and inductance are shown in the table 2.



The figure 2

The table 2

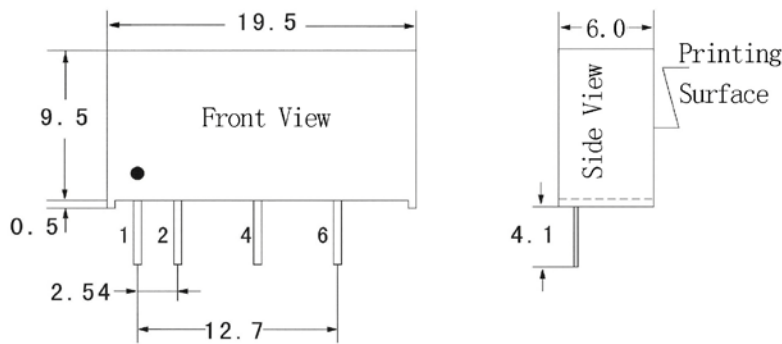
Vin(Vdc)	Cin	Lin	Cout (Vdc)	Lout
3.3/5/9/12/15/24	See the table 1	4.7 $\mu$ H	See the table 1	4.7 $\mu$ H

◆ **Precautions for product use**

- **Input requirement:** Ensure that the output voltage fluctuations of the power supply do not exceed the input voltage range of the DC/DC module. And the output power of the power supply must be greater than the input power of the DC/DC module.
- **Output load requirement:** Try to avoid no-load use. When the actual power consumption of the load is less than 10% of the rated power of the module or there is no load, pseudo loads are recommended to be connected at the output terminals. The pseudo load can be calculated from 5 ~ 10% of the rated power of the module, resistance =  $V_{out}^2 / (1W * 10\%)$ .
- **Overload protection:** Under the normal working conditions, the product has no output overload protection. The simplest approach is to connect a self-recovery fuse in series at the input, or to add a circuit breaker to the circuit.
- The external capacitance of the output terminals should not be too large, otherwise it is easy to cause over-current even failure during the starting up of the converter.

**Outline Diagram and recommended layout**

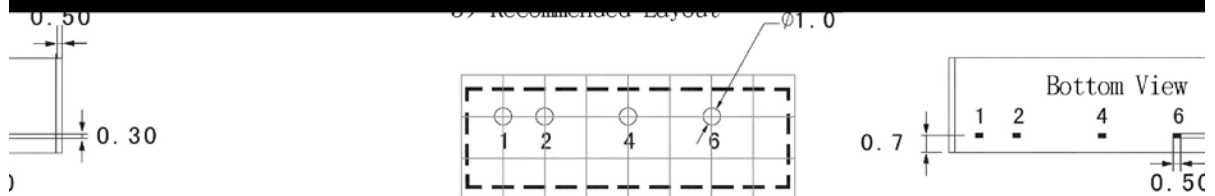
1) Outline Diagram



2) Pin Definition

1	+Vin	Positive Input
2	-Vin	Negative Input
3	No Pin	No Pin
4	-Vout	Negative Output
5	No Pin	No Pin
6	+Vout	Positive Output

3) Recommended Layout



**Application Data**

**Quality Statement**

The converters are manufactured in accordance with ISO 9001 system requirements, and are monitored 100% by auto-testing system, 100% burn in. The warranty for the converters is 2-year.

**Contact Information**

**Anhui Hesion Trading Co.,Ltd.**  
**Beijing Yihongtai Technology Dev.Co.,Ltd**

**TEL: +86-551-65369069,65369067**  
**Email: [alecz@ahhesion.com](mailto:alecz@ahhesion.com)**  
**Backup:[alecz@126.com](mailto:alecz@126.com)**

**V B\_KS-1WC2 Series 1.5KV isolated&unregulated single output**

**1W DC/DC Converters**

**Features**



- ◆ SIP International Standard Pin
- ◆ Low-Quiescent Current and High Conversion Efficiency
- ◆ Low Ripple Coefficient and Low Noise
- ◆ Built-in Soft-Start Technology
- ◆ 1500Vdc Isolation Voltage
- ◆ Operation Temperature :-40°C to +85°C
- ◆ 100% brn-in and sreening
- ◆ Special specifications of products can be designed according to customers' requirements

**Applications**

The B\_KS-1WC2 series products are specially designed for applications where a power source is isolated from the input power supply in a distributed power system.

The products are applicable to:

- 1)The fluctuation range of input power supply voltage is within  $\pm 10\%$ ;
- 2)Isolation is required between input and output(1500Vdc isolation voltage );
- 3)Occasions with low requirements for the output voltage stability and output ripple-noise.

**Product Naming Convention**

**BXXXXKS-1WC2**

① ② ③ ④ ⑤ ⑥

- ①Product Series  
(1500Vdc Isolation Voltage,Single Output)
- ②Input Voltage (Nominal Value)
- ③Output Voltage (Nominal Value)
- ④Package(Single Inline Package)
- ⑤Rated Output Power
- ⑥Identification Code

**Specifications**

Unless otherwise specified, all values are given at room temperature and standard atmosphere pressure, standard input voltage.

Selection Table					
Product Model	Input Voltage (Vdc) range (nominal)	Output Voltage① (Vdc)	Output Current (mA) Max(Full Load )/ Min(Light Load)	Maximum Capacitive Load (μF)②	Efficiency (%.Min/Typ) @ Full Load
B0303KS-1WC2	2.97~3.63 (3.3V)	3.3	303/30.3	200	68/72
B0305KS-1WC2		5	200/20	200	74/78
B0309KS-1WC2		9	112/11.2	200	74/78
B0312KS-1WC2		12	84/8.4	200	74/78
B0315KS-1WC2		15	67/6.7	200	74/78
B0324KS-1WC2		24	42/4.2	200	74/78
B0503KS-1WC2	4.5~5.5 (5V)	3.3	303/30.3	200	70/74
B0505KS-1WC2		5	200/20	200	76/80
B0509KS-1WC2		9	112/11.2	200	76/80
B0512KS-1WC2		12	84/8.4	200	76/80
B0515KS-1WC2		15	67/6.7	200	76/80
B0524KS-1WC2		24	42/4.2	200	76/80

Continue

Selection Table					
Product Model	Input Voltage (Vdc) range (nominal)	Output Voltage① (Vdc)	Output Current (mA) Max(Full Load )/ Min(Light Load)	Maximum Capacitive Load (μF)②	Efficiency (% ,Min/Typ) @ Full Load
B0903KS-1WC2	8.1~9.9 (9V)	3.3	303/30.3	200	72/76
B0905KS-1WC2		5	200/20	200	76/80
B0909KS-1WC2		9	112/11.2	200	76/80
B0912KS-1WC2		12	84/8.4	200	76/80
B0915KS-1WC2		15	67/6.7	200	76/80
B0924KS-1WC2		24	42/4.2	200	76/80
B1203KS-1WC2	10.8~13.2 (12V)	3.3	303/30.3	200	72/76
B1205KS-1WC2		5	200/20	200	76/80
B1209KS-1WC2		9	112/11.2	200	76/80
B1212KS-1WC2		12	84/8.4	200	76/80
B1215KS-1WC2		15	67/6.7	200	76/80
B1224KS-1WC2		24	42/4.2	200	76/80
B1503KS-1WC2	13.5~16.5 (15V)	3.3	303/30.3	200	72/76
B1505KS-1WC2		5	200/20	200	76/80
B1509KS-1WC2		9	112/11.2	200	76/80
B1512KS-1WC2		12	84/8.4	200	76/80
B1515KS-1WC2		15	67/6.7	200	76/80
B1524KS-1WC2		24	42/4.2	200	76/80
B2403KS-1WC2	21.6~26.4 (24V)	3.3	303/30.3	200	70/74
B2405KS-1WC2		5	200/20	200	76/80
B2409KS-1WC2		9	112/11.2	200	76/80
B2412KS-1WC2		12	84/8.4	200	76/80
B2415KS-1WC2		15	67/6.7	200	76/80
B2424KS-1WC2		24	42/4.2	200	76/80
BXXXXKS-1WC2	Special specifications of products can be designed according to customers' requirements, and 0.1~1W products can be provided.				
The no-load power consumption of the power modules is about 10% of the rated output power.					
①Nominal output voltage refers to the input voltage in the nominal value and output current under full load conditions.					
②The maximum capacitive load is the maximum capacity of the module power supply to output the capacitive load. Generally, the external output capacitance can not exceed the maximum capacitive load of the module power supply, otherwise, it will result in bad module startup and affect the reliability of the module's long-term work.					

Input Specifications					
Input	Conditions	Min③	Typ	Max	Unit
Input Voltage	3.3V Input	-0.7	3.3	5	Vdc
	5V Input	-0.7	5	9	
	9V Input	-0.7	9	15	
	12V Input	-0.7	12	18	
	15V Input	-0.7	15	21	
	24V Input	-0.7	24	30	
③The series of modules have no anti-reverse input protection, the input is strictly prohibited positive and negative reverse, otherwise it will cause irreversible damage to the module.					

Output Specifications						
Output	Conditions		Min	Typ	Max	Unit
Maximum Output Power	—		—	—	1	W
Output Voltage Accuracy	—		See the error envelope diagram			
Linear Voltage Regulation	±1% Changes of input voltage	3.3V Output	—	—	±1.5	%
		Other Outputs	—	—	±1.2	
Load Regulation	10%~100% load	3.3V Output	—	18	—	
		5V Output	—	12	—	
		9V Output	—	8	—	
		12V Output	—	7	—	
		15V Output	—	6	—	
24V Output	—	5	—			
Ripple and Noise④	20MHz bandwidth		—	60	—	mV
Output Short-circuit Protection	—		—	—	1	s

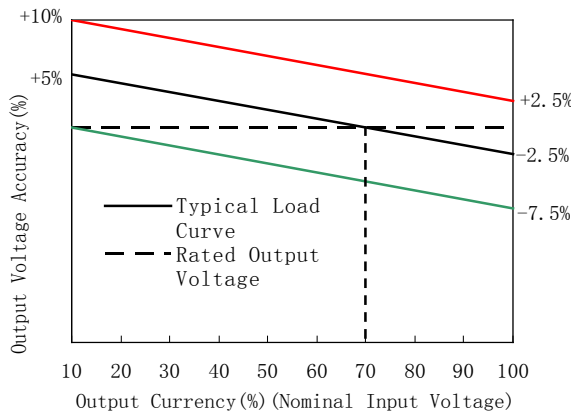
④Ripple and Noise is measured by connecting the oscilloscope probe without ground wire.

General Specifications					
General	Conditions	Min	Typ	Max	Unit
Isolation Voltage	t=60s, leak current≤1mA	1500	—	—	Vdc
Isolation Resistance	Input to Output,500Vdc	1000	—	—	MΩ
Isolation Capacitance	Input to Output 100kHz/0.1V	—	40	—	pF
Operating Temperature	Full-load states of the output voltage	-40	—	+85	°C
Storage Temperature	—	-55	—	+105	°C
Storage Humidity	non condensing	—	—	95	%RH
Temperature Coefficient	100% load	—	—	±0.03	%/°C
Soldering Temperature	1.5 mm distance between solder joint and case, 10s	—	—	300	°C
Switching Frequency	100% load, nominal input voltage	—	100	300	kHz
MTBF	—	3.5×10 <sup>6</sup> h Refer to MIL-HDFK-217F@25°C			

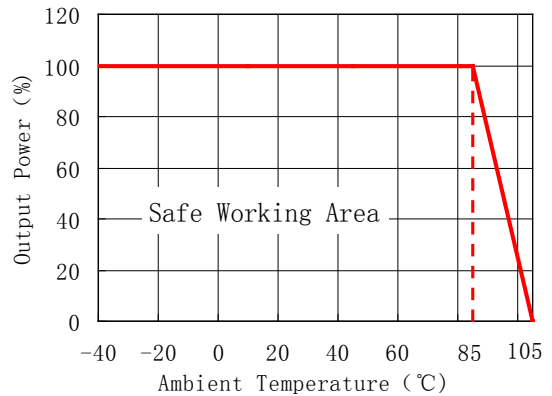
Physical Specifications	
Case material	Black flame retardant and heat-resistant epoxy (UL94-V0)
Package Size	11.68mm×10.15mm×6.00mm
Weight	1.2g typ.
Cooling mode	natural air cooling

**Characteristic Curves**

**The Error Envelope Diagram**



**Temperature vs Power**

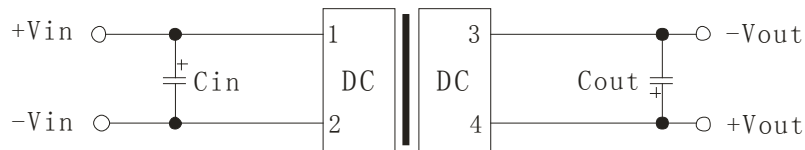


**Design Considerations**

◆ **Peripheral Recommended Circuit**

**Recommended Circuit 1:**

A filter capacitor can be connected in parallel at the input and output terminals respectively on the occasions of low requirements for ripple and noise. An external circuit is shown in the figure 1 below. The recommended values of the filter capacitors are shown in the table 1.



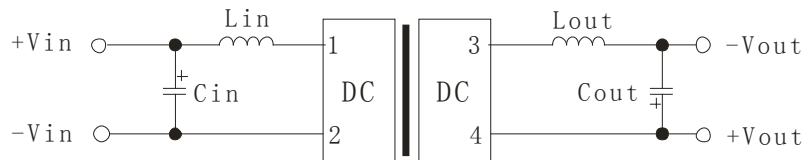
The figure 1

The table 1

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

**Recommended Circuit 2:**

The external circuit can be referred to the figure 2 on the occasions of strict requirements for ripple and noise. The recommended values of the filter capacitance and inductance are shown in the table 2.



The figure 2

The table 2

Vin(Vdc)	Cin	Lin	Cout (Vdc)	Lout
3.3/5/9/12/15/24	See the table 1	4.7μH	See the table 1	4.7μH

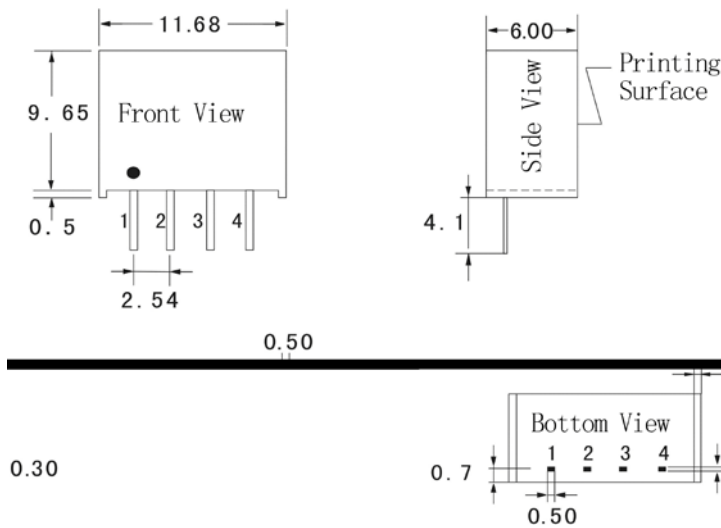


◆ **Precautions for product use**

- **Input requirement:** Ensure that the output voltage fluctuations of the power supply do not exceed the input voltage range of the DC/DC module. And the output power of the power supply must be greater than the input power of the DC/DC module.
- **Output load requirement:** Try to avoid no-load use. When the actual power consumption of the load is less than 10% of the rated power of the module or there is no load, pseudo loads are recommended to be connected at the output terminals. the pseudo load can be calculated from 5 ~ 10% of the rated power of the module, resistance =  $V_{out}^2 / (1W * 10\%)$ .
- **Overload protection:** Under the normal working conditions, the product has no output overload protection. The simplest approach is to connect a self-recovery fuse in series at the input, or to add a circuit breaker to the circuit.
- **The external capacitance of the output terminals should not be too large, otherwise it is easy to cause over-current even failure during the starting up of the converter.**

**Outline Diagram and recommended layout**

1) Outline Diagram

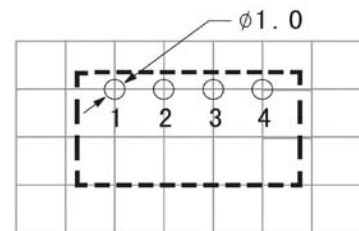


Unites:mm Tolerances:XX±0.25

2) Pin Definition

1	+Vin	Positive Input
2	-Vin	Negative Input
3	-Vout	Negative Output
4	+Vout	Positive Output

3) Recommended Layout



Note:grid distance:2.54mm\*2.54mm

**Application Data**

**Quality Statement**

The converters are manufactured in accordance with ISO 9001 system requirements, and are monitored 100% by auto-testing system, 100% burn in. The warranty for the converters is 2-year.

**Contact Information**

**Anhui Hesion Trading Co.,Ltd.**  
**Beijing Yihongtai Technology Dev.Co.,Ltd**

**TEL: +86-551-65369069,65369067**  
**Email: [alecz@ahhesion.com](mailto:alecz@ahhesion.com)**  
**Backup:[alecz@126.com](mailto:alecz@126.com)**



Input Specifications					
Input	Conditions	Min	Typ	Max	Unit
Input Impulse Voltage	5V Input	-0.7	—	9	Vdc
Input Current (full load /no load)	3.3V/5V Output	—	270/6	286/10	mA
	9V/12V Output	—	241/12	254/20	
	15V/24V Output	—	241/18	254/30	
Reflected ripple current	—	—	15	—	mA
Input filter	—	capacitive filtering			
Hot plug	—	not supported			

Output Specifications						
Output	Conditions	Min	Typ	Max	Unit	
Output Voltage Accuracy	—	See the error envelope diagram(the figure1)				
Linear Voltage Regulation	±1% Changes of input voltage	3.3V Output	—	—	±1.5	%
		Other Outputs	—	—	±1.2	
Load Regulation	10%~100% load	3.3V Output	—	15	20	
		5V Output	—	10	15	
		9V Output	—	8	10	
		12V Output	—	7	10	
		15V Output	—	6	10	
Ripple and Noise③	20MHz bandwidth	Other Outputs	—	30	75	mV
		24V Output	—	50	100	
Output Short-circuit Protection	—	ustainable,automatic recovery				
③Ripple and Noise is measured by connecting the oscilloscope probe without ground wire.						

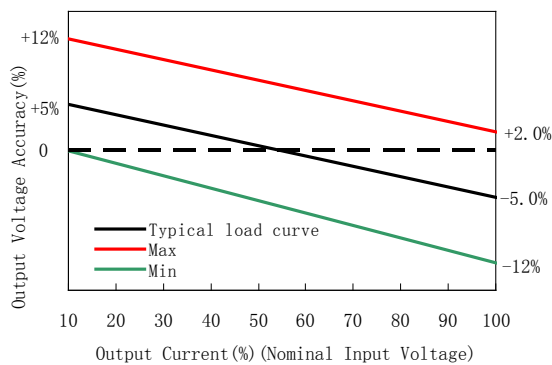
General Specifications						
General	Conditions	Min	Typ	Max	Unit	
Isolation Voltage	t=60s, leak current≤1mA	1500	—	—	Vdc	
	t=1s, leak current≤1mA	3000	—	—		
Isolation Resistance	Input to Output,500Vdc	1000	—	—	MΩ	
Isolation Capacitance	Input to Output 100kHz/0.1V	—	20	—	pF	
Operating Temperature	temperature≥85℃, see the figure 2 for derating	-40	—	+105	℃	
Storage Temperature	—	-55	—	+125	℃	
The case temperature rise during operation	Ta=25℃	3.3V Output	—	25	—	℃
		Other Outputs	—	15	—	
Storage Humidity	non condensing	—	—	95	%RH	
Temperature Coefficient	100% load	—	—	±0.02	%/℃	
Soldering Temperature	1.5 mm distance between solder joint and case, 10s	—	—	300	℃	
Switching Frequency	100% load, nominal input voltage	—	200	—	kHz	
MTBF	—	3.5×10 <sup>6</sup> h Refer to MIL-HDFK-217F@25℃				

Physical Specifications	
Case material	Black flame retardant and heat-resistant epoxy (UL94-V0)
Package Size	11.68mm×10.15mm×6.00mm
Weight	1.3g typ.
Cooling mode	natural air cooling

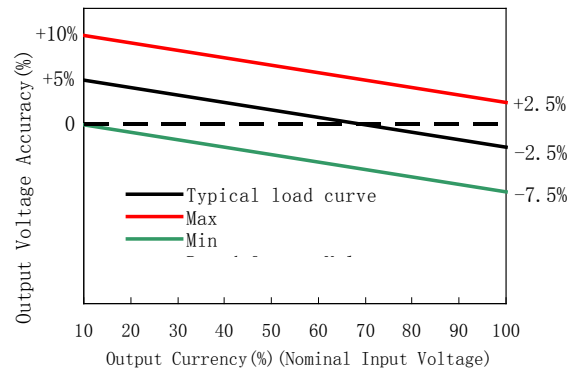
EMC Specifications		
EMI	Conducted Emission	CISPR32/EN55032 CLASS B (the recommended circuit is shown in the figure 4)
	Radiated Emission	CISPR32/EN55032 CLASS B (the recommended circuit is shown in the figure 4)
EMS	Electrostatic Discharge	IEC/EN61000-4-2 Air±8kV, Contact±4kV perf.Criteria B

### Characteristic Curves

The Error Envelope Diagram (3.3V Output)

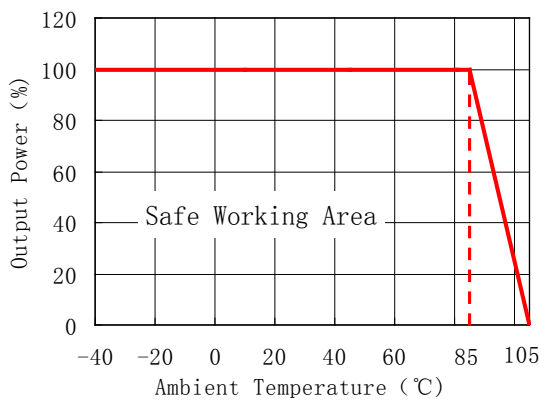


The Error Envelope Diagram (Other Outputs)



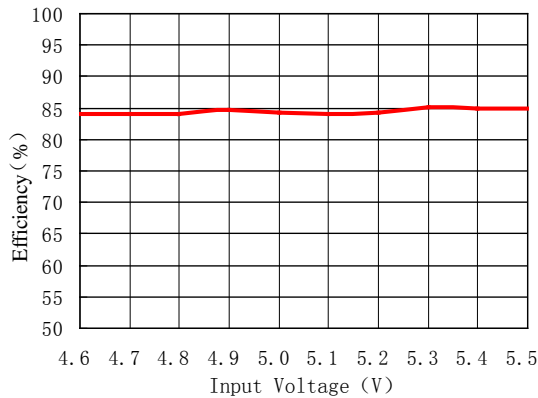
The figure 1

Temperature vs Power

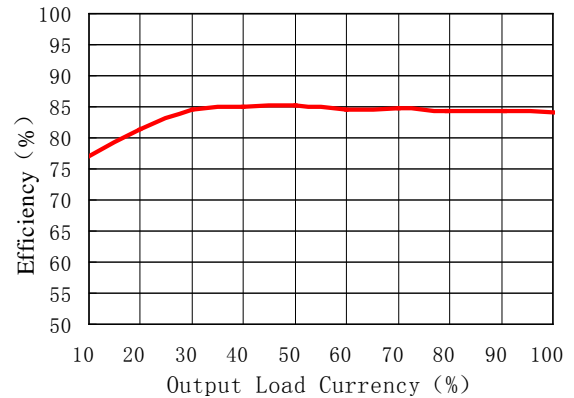


The figure 2

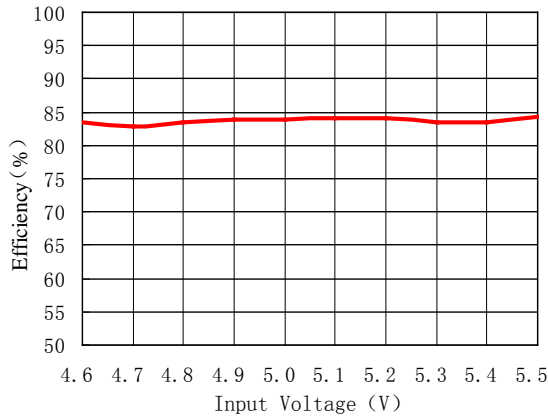
**Efficiency vs Input Voltage(full load)  
B0505S-1WC3**



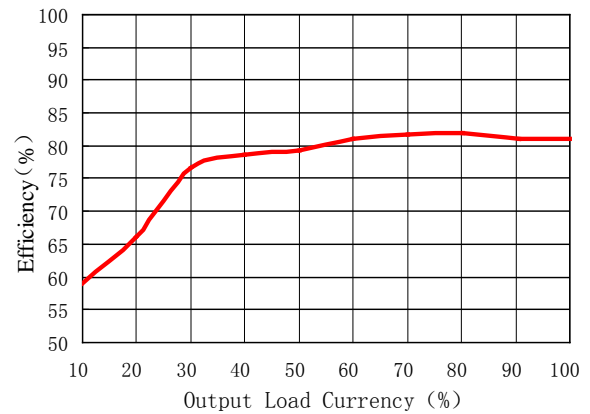
**Efficiency vs Output Load Current(Vin=5V)  
B0505S-1WC3**



**Efficiency vs Input Voltage(full load)  
B0515S-1WC3**



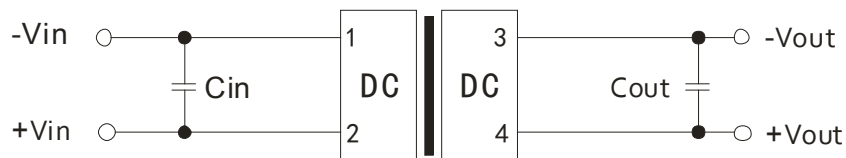
**Efficiency vs Output Load Current (Vin=5V)  
B0515S-1WC3**



## Design Considerations

### ◆ Typical application

A filter capacitor can be connected in parallel at the input and output terminals respectively on the occasions of low requirements for ripple and noise. An external circuit is shown in the figure 3, but attention should be paid to the selection of appropriate filter capacitance. If the capacitance is too large, it is likely to cause startup problems. For each output, under the condition of ensuring safe and reliable operation, the recommended values of the filter capacitors are shown in the table 1.



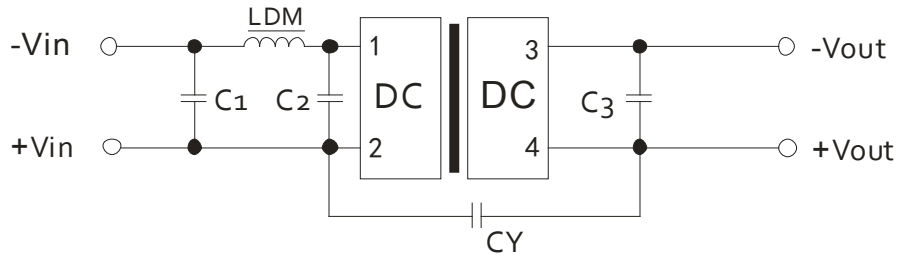
The figure 3

The table 1

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

◆ **EMC recommended circuit**

The external circuit can be referred to the figure 4 on the occasions of strict requirements for ripple and noise. The recommended values of the filter capacitance and inductance are shown in the table 2.



The figure 4

The table 2

Input Voltage (Vdc) 5Vdc	Output Voltage (Vdc)	3.3/5/9	12/15/24	
	EMI	C1/C2	4.7μF/25V	4.7μF/25V
		CY	—	1nF/4kVdc VISHAY HGZ102MBP TDK CD45-E2GA102M-GKA
		C3	See the table 1	
		LDM	6.8μH	6.8μH

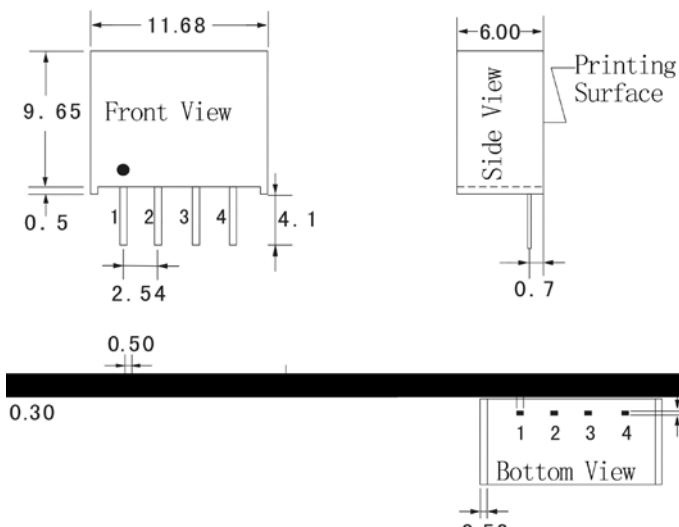
Note: it is suggested to add CY capacitor when EMI is highly required in actual use.

◆ **Precautions for product use**

- Input requirement: Ensure that the output voltage fluctuations of the power supply do not exceed the input voltage range of the DC/DC module. And the output power of the power supply must be greater than the input power of the DC/DC module.
- Output load requirement: Try to avoid no-load use. When the actual power consumption of the load is less than 10% of the rated power of the module or there is no load, pseudo loads are recommended to be connected at the output terminals. the pseudo load can be calculated from 5 ~ 10% of the rated power of the module, resistance =  $V_{out}^2 / (1W * 10\%)$ .
- The external capacitance of the output terminals should not be too large, otherwise it is easy to cause over-current even failure during the starting up of the converter.

**Outline Diagram and recommended layout**

1) Outline Diagram

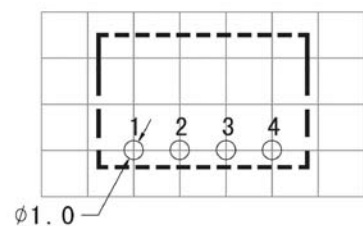


Unites:mm Tolerances:XX±0.25

2) Pin Definition

1	-Vin	Negative Input
2	+Vin	Positive Input
3	-Vout	Negative Output
4	+Vout	Positive Output

3) Recommended Layout



Note:grid distance:2.54mm\*2.54mm

## Application Data

### Quality Statement

The converters are manufactured in accordance with ISO 9001 system requirements, and are monitored 100% by auto-testing system, 100% burn in.  
The warranty for the converters is 2-year.

### Contact Information

*Anhui Hesion Trading Co.,Ltd.*  
*Beijing Yihongtai Technology Dev.Co.,Ltd*

*TEL: +86-551-65369069,65369067*

*Email: [alecz@ahhesion.com](mailto:alecz@ahhesion.com)*

*Backup:[alecz@126.com](mailto:alecz@126.com)*

**VII B\_LS-1WC3 Series 1.5KV isolated & unregulated single output with output short-circuit protection**

**1W DC/DC Converters Features**



- ◆ SIP International Standard Pin
- ◆ Sustainable short circuit protection
- ◆ No-Load input current can be as low as 6mA
- ◆ High efficiency up to 85%
- ◆ Low Ripple Coefficient and Low Noise
- ◆ Isolation Voltage: 1500Vdc/min,3000Vdc/1s
- ◆ Operation Temperature :-40°C to +105°C
- ◆ 100% burn-in and screening
- ◆ Special specifications of products can be designed according to customers' requirements

**Applications Product Naming Convention**

The B\_LS-1WC3 series products are specially designed for applications where a power source is isolated from the input power supply in a distributed power system. The products are applicable to: pure digital circuits, general low frequency analog circuits, relay drive circuits, data exchange circuits etc.

**BXXXXLS-1WC3**

- ① ② ③ ④ ⑤ ⑥
- ① Product Series
  - ② Input Voltage (Nominal Value)
  - ③ Output Voltage (Nominal Value)
  - ④ Package (Single Inline Package)
  - ⑤ Rated Output Power
  - ⑥ With output short-circuit protection (C3)

**Specifications**

Unless otherwise specified, all values are given at room temperature and standard atmosphere pressure, standard input voltage.

Selection Table					
Product Model	Input Voltage (Vdc) range (nominal)	Output Voltage① (Vdc)	Output Current (mA) Max(Full Load )/ Min(Light Load)	Maximum Capacitive Load (μF)②	Efficiency (% ,Min/Typ) @ Full Load
B0503LS-1WC3	4.5~5.5 (5V)	3.3	303/30.3	2400	70/74
B0505LS-1WC3		5	200/20	2400	82/87
B0509LS-1WC3		9	112/11.2	1000	79/83
B0512LS-1WC3		12	84/8.4	560	79/83
B0515LS-1WC3		15	67/6.7	560	79/83
B0524LS-1WC3		24	42/4.2	220	81/85
BXXXXLS-1WC3	Products with input voltage of 3.3 can be designed according to customers' requirements				
The no-load power consumption of the power modules is about 10% of the rated output power.					
① Nominal output voltage refers to the input voltage in the nominal value and output current under full load conditions.					
② The maximum capacitive load is the maximum capacity of the module power supply to output the capacitive load. Generally, the external output capacitance can not exceed the maximum capacitive load of the module power supply, otherwise, it will result in bad module startup and affect the reliability of the module's long-term work.					



Input Specifications					
Input	Conditions	Min	Typ	Max	Unit
Input Impulse Voltage	5V Input	-0.7	—	9	Vdc
Input Current (full load /no load)	3.3V/5V Output	—	270/6	286/10	mA
	9V/12V Output	—	241/12	254/20	
	15V/24V Output	—	241/18	254/30	
Reflected ripple current	—	—	15	—	mA
Input filter	—	capacitive filtering			
Hot plug	—	not supported			

Output Specifications						
Output	Conditions	Min	Typ	Max	Unit	
Output Voltage Accuracy	—	See the error envelope diagram(the figure1)				
Linear Voltage Regulation	±1% Changes of input voltage	3.3V Output	—	—	±1.5	%
		other Outputs	—	—	±1.2	
Load Regulation	10%~100% load	3.3V Output	—	15	20	
		5V Output	—	10	15	
		9V Output	—	8	10	
		12V Output	—	7	10	
		15V Output	—	6	10	
Ripple and Noise ③	20MHz bandwidth	other Outputs	—	30	75	mV
		24V Output	—	50	100	
Output Short-circuit Protection	—	Sustainable,automatic recovery				
③Ripple and Noise is measured by connecting the oscilloscope probe without ground wire.						

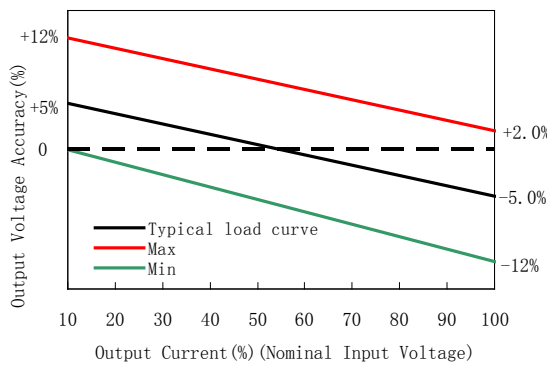
General Specifications					
General	Conditions	Min	Typ	Max	Unit
Isolation Voltage	t=60s, leak current≤1mA	1500	—	—	Vdc
	t=1s, leak current≤1mA	3000	—	—	
Isolation Resistance	Input to Output,500Vdc	1000	—	—	MΩ
Isolation Capacitance	Input to Output 100kHz/0.1V	—	20	—	pF
Operating Temperature	temperature≥85℃, see the figure 2 for derating	-40	—	+105	℃
Storage Temperature	—	-55	—	+125	℃
The case temperature rise during operation	Ta=25℃	3.3V Output	—	25	℃
		other Outputs	—	15	
Storage Humidity	non condensing	—	—	95	%RH
Temperature Coefficient	100% load	—	—	±0.02	%/℃
Soldering Temperature	1.5 mm distance between solder joint and case, 10s	—	—	300	℃
Switching Frequency	100% load, nominal input voltage	—	200	—	kHz
MTBF	—	3.5×10 <sup>6</sup> h Refer to MIL-HDFK-217F@25℃			

Physical Specifications	
Case material	Black flame retardant and heat-resistant epoxy (UL94-V0)
Package Size	19.50mm×10.00mm×6.00mm
Weight	2.4g typ.
Cooling mode	natural air cooling

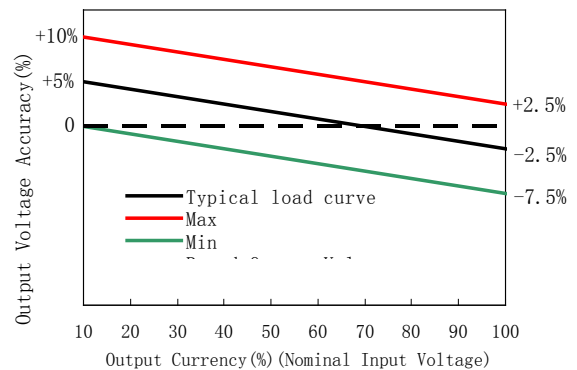
EMC Specifications		
EMI	Conducted Emission	CISPR32/EN55032 CLASS B (the recommended circuit is shown in the figure 4)
	Radiated Emission	CISPR32/EN55032 CLASS B (the recommended circuit is shown in the figure 4)
EMS	Electrostatic Discharge	IEC/EN61000-4-2 Air±8kV, Contact±4kV perf.Criteria B

### Characteristic Curves

The Error Envelope Diagram (3.3V Output)

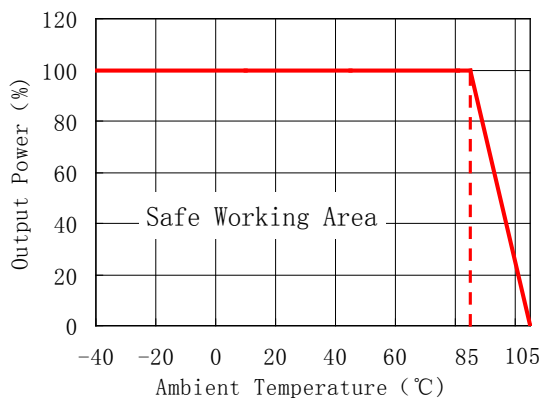


The Error Envelope Diagram (other Outputs)



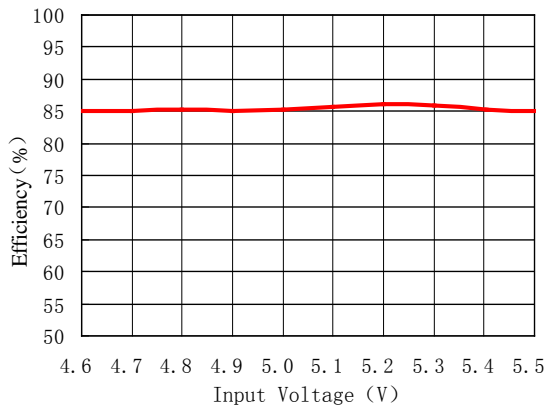
The figure 4

Temperature vs Power

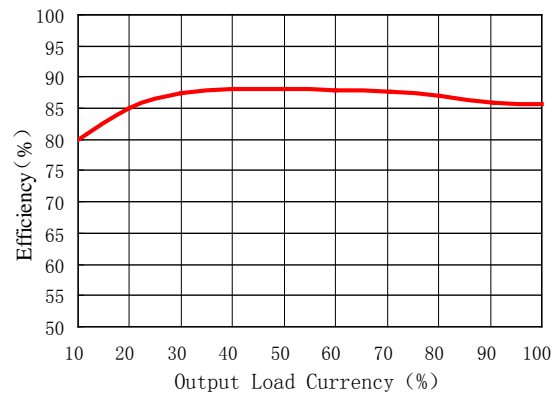


The figure 2

**Efficiency vs Input Voltage(full load)  
B0505LS-1WC3**



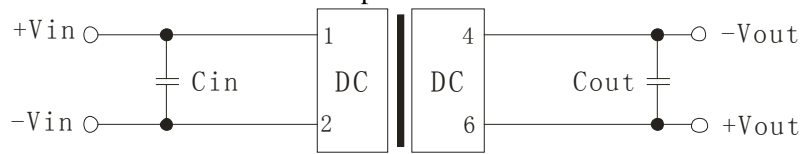
**Efficiency vs Output Load Current(Vin=5V)  
B0505LS-1WC3**



**Design Considerations**

◆ **Typical application**

A filter capacitor can be connected in parallel at the input and output terminals respectively on the occasions of low requirements for ripple and noise. An external circuit is shown in the figure 3, but attention should be paid to the selection of appropriate filter capacitance. If the capacitance is too large, it is likely to cause startup problems. For each output, under the condition of ensuring safe and reliable operation, the recommended values of the filter capacitors are shown in the table 1.



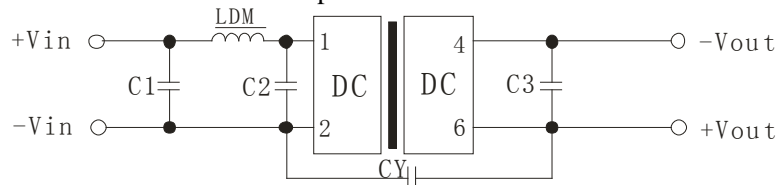
The figure 3

The table 1

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

◆ **EMC recommended circuit**

The external circuit can be referred to the figure 4 on the occasions of strict requirements for ripple and noise. The recommended values of the filter capacitance and inductance are shown in the table 2.



The figure 4

The table 2

Input Voltage (Vdc)	Output Voltage (Vdc)		3.3/5/9	12/15/24	
	EMI	C1/C2	4.7μF/25V	4.7μF/25V	
		CY	—	1nF/4kVdc VISHAY HGZ102MBP TDK CD45-E2GA102M-GKA	
		C3	See the table 1		
		LDM	6.8μH	6.8μH	

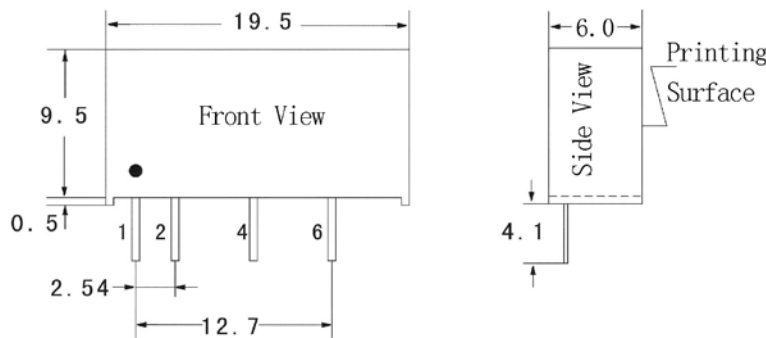
Note: it is suggested to add CY capacitor when EMI is highly required in actual use.

◆ **Precautions for product use**

- **Input requirement:** Ensure that the output voltage fluctuations of the power supply do not exceed the input voltage range of the DC/DC module. And the output power of the power supply must be greater than the input power of the DC/DC module.
- **Output load requirement:** Try to avoid no-load use. When the actual power consumption of the load is less than 10% of the rated power of the module or there is no load, pseudo loads are recommended to be connected at the output terminals. the pseudo load can be calculated from 5 ~ 10% of the rated power of the module, resistance =  $V_{out}^2 / (1W * 10\%)$ .
- The external capacitance of the output terminals should not be too large, otherwise it is easy to cause over-current even failure during the starting up of the converter.

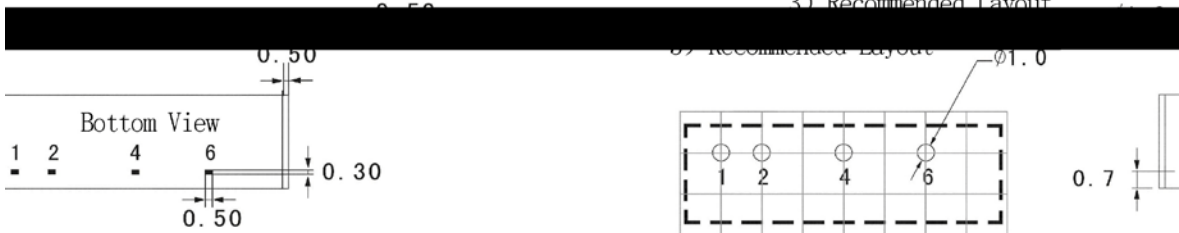
**Outline Diagram and recommended layout**

1) Outline Diagram



2) Pin Definition

1	+Vin	Positive Input
2	-Vin	Negative Input
3	No Pin	No Pin
4	-Vout	Negative Output
5	No Pin	No Pin
6	+Vout	Positive Output



**Application Data**

**Quality Statement**

The converters are manufactured in accordance with ISO 9001 system requirements, and are monitored 100% by auto-testing system, 100% burn in. The warranty for the converters is 2-year.

**Contact Information**

**Anhui Hesion Trading Co.,Ltd.**  
**Beijing Yihongtai Technology Dev.Co.,Ltd**

**TEL: +86-551-65369069,65369067**  
**Email: [alecz@ahhesion.com](mailto:alecz@ahhesion.com)**  
**Backup: [alecz@126.com](mailto:alecz@126.com)**