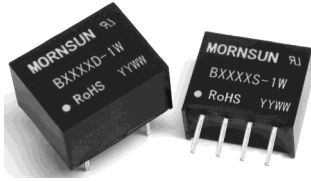


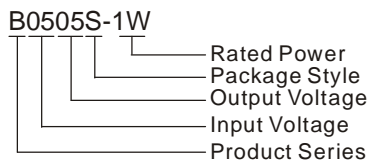
B_S-1W & B_D-1W Series

1W, FIXED INPUT ISOLATED & UNREGULATED SINGLE OUTPUT MINIATURE SIP/DIP PACKAGE



RoHS

MODEL SELECTION



PRODUCT FEATURES

- Efficiency up to 80%
- Miniature SIP/DIP Package
- 1KVDC Isolation
- Temperature Range: -40°C ~ +85°C
- Internal SMD Construction
- Industry Standard Pinout
- No Heat Sink Required
- No External Component Required
- PCB Mounting
- RoHS Compliance

APPLICATIONS

The B_S-1W & B_D-1W series are specially designed for applications where a single power supply is isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:

- 1) Where the voltage of the input power supply is fixed (Voltage variation $\leq \pm 10\%$);
- 2) Where isolation is necessary between input and output (Isolation voltage $\leq 1000\text{VDC}$);
- 3) Where the regulation of the output voltage and the output ripple and noise are not demanding.

Such as: purely digital circuits, ordinary low frequency analog circuits and IGBT power device driven circuits, etc.

PRODUCT PROGRAM

Model Number	Input Voltage(VDC) Nominal (Range)	Output Voltage (VDC)	Output Current (mA)		Input Current (mA)(typ.)		Reflected Ripple Current (mA,typ.)	Max. Capacitive Load(μF)	Efficiency (% , typ.) @Max. Load	Approval
			Max.	Min.	@Max. Load	@No Load				
B0303S/D-1W	3.3 (2.97-3.63)	3.3	303	30	417	50	15	72		
B0305S/D-1W		5	200	20	392					
B0503S/D-1W	5 (4.5-5.5)	3.3	303	30	271	31	20	72		
B0505S/D-1W		5	200	20	270					
B0507S/D-1W		7.2	138	14	252					
B0509S/D-1W		9	111	12	252					
B0512S/D-1W		12	83	9	248					
B0515S/D-1W		15	67	7	247					
B0524S-1W		24	42	4	240					
B1203S/D-1W		12 (10.8-13.2)	3.3	303	30					110
B1205S/D-1W	5		200	20	116					
B1209S/D-1W	9		111	12	105					
B1212S/D-1W	12		83	9	104					
B1215S/D-1W	15		67	7	101					
B1505S/D-1W	15 (13.5-16.5)	5	200	20	92	14	18	71		
B1515S-1W		15	67	6	85					
B2403S/D-1W	24 (21.6-26.4)	3.3	303	30	57	8	61	71		
B2405S/D-1W		5	200	20	57					
B2409S/D-1W		9	111	12	52					
B2412S/D-1W		12	83	9	50					
B2415S/D-1W		15	67	7	50					
B2424S-1W		24	42	4	50					

Note: The B_S-W2 & B_D-W2 series also are available in our company.

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Units
Input Surge Voltage (1000 ms)	3.3VDC Input Models	-0.7	--	5	VDC
	5VDC Input Models	-0.7	--	9	
	12VDC Input Models	-0.7	--	18	
	15VDC Input Models	-0.7	--	21	
	24VDC Input Models	-0.7	--	30	
Reverse Polarity Input Current*		--	--	0.4	A
Internal Power Dissipation*		--	--	0.45	W
Input Filter		C Filter			

Note: *If the product reverse did not seek to limit current or work does not limit the maximum power, may result in injury or permanent damage, testing is not recommended.

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Units	
Output Power		0.1	--	1	W	
Output Voltage Accuracy		See tolerance envelope graph				
Line Regulation	For Vin change of $\pm 1\%$ (3.3V output)	--	--	± 1.5	%	
	For Vin change of $\pm 1\%$ (others)	--	--	± 1.2		
Load Regulation	10% to 100% load	(3.3V output)	--	15	20	%
		(5V/7.2V output)	--	12.8	15	
		(9V output)	--	8.3	15	
		(12V output)	--	6.8	15	
		(15V output)	--	6.3	15	
		(24V output)	--	5	15	
Temperature Drift	100% full load	--	--	± 0.03	%/°C	
Ripple & Noise*	20MHz Bandwidth	--	75	100	mVp-p	
Short Circuit Protection**		--	--	1	s	

*Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.
**Supply voltage must be discontinued at the end of short circuit duration.

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Units	
Isolation Voltage	Tested for 1 minute and 1mA max	1000	--	--	VDC	
Isolation Resistance	Test at 500VDC	1000	--	--	MΩ	
Isolation Capacitance	Input/Output, 100KHz/1V	B2424S-1W	--	100	--	pF
		Other Models	--	30	--	
Switching Frequency	Full load, nominal input	--	100	--	KHz	
MTBF	MIL-HDBK-217F@25°C	3500	--	--	K hours	
Case Material		Plastic(UL94-V0)				
Weight	B_S-1W Series	--	1.2	--	g	
	B_D-1W Series	--	1.8	--		

ENVIRONMENTAL SPECIFICATIONS

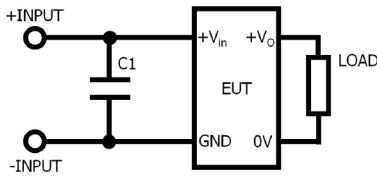
Item	Test Conditions	Min.	Typ.	Max.	Units
Storage Humidity		--	--	95	%
Operating Temperature	Power derating (above 85°C)	-40	--	85	°C
Storage Temperature		-55	--	125	
Temp. rise at full load		--	25	--	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

EMC SPECIFICATIONS

EMI	CE	CISPR22/EN55022 CLASS A (External Circuit Refer to Figure1)
EMS	ESD	IEC/EN61000-4-2 Contact $\pm 8KV$ perf. Criteria B

EMC RECOMMENDED CIRCUIT

EMI Recommended External Circuit
(CLASS A):



(Figure 1)

B_S-1W Series

Recommended external circuit parameters:

Vin: 3.3V/5V/12V/15V/24V

C1: 1 μ F/50V 1210

Remarks: Product bare input of 3V, 5V, 12V can be tested by the CLASS A, increase the capacitor margin increase.

B_D-1W Series

Recommended external circuit parameters:

Vin 3.3V/5V:

C1: 1 μ F/50V 1210

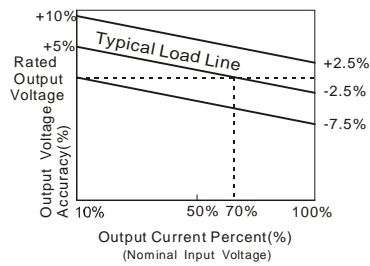
Vin : 12V/15V/24V

C1: 2.2 μ F/50V 1210

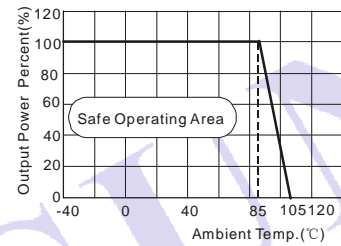
Remarks: Product bare input of 3.3V can be tested by the CLASS A, increase the capacitor margin increase.

PRODUCT TYPICAL CURVE

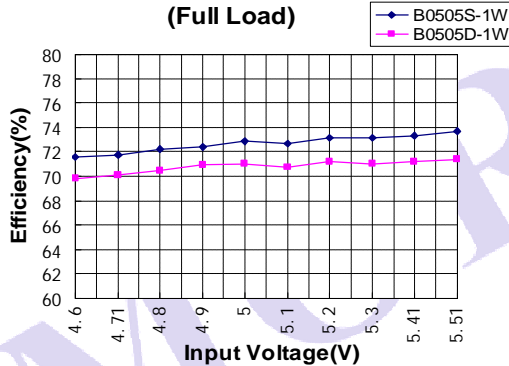
Tolerance Envelope Graph



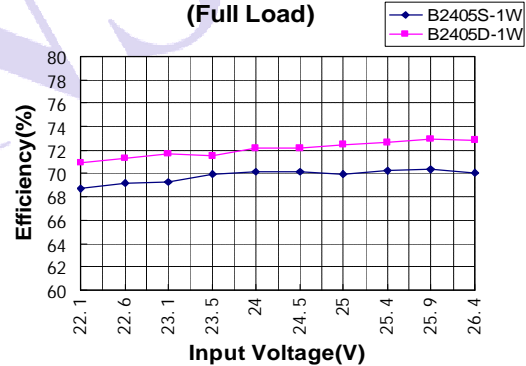
Temperature Derating Graph



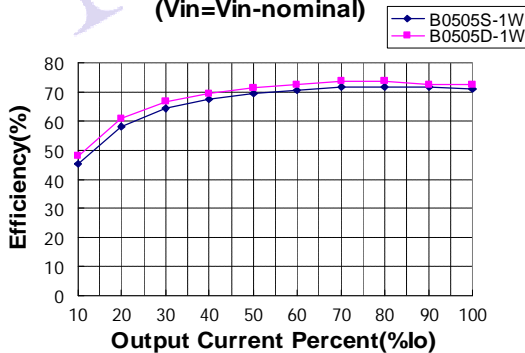
Efficiency VS Input Voltage curve
(Full Load)



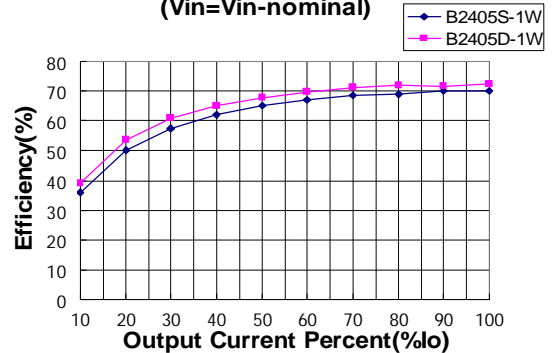
Efficiency VS Input Voltage curve
(Full Load)



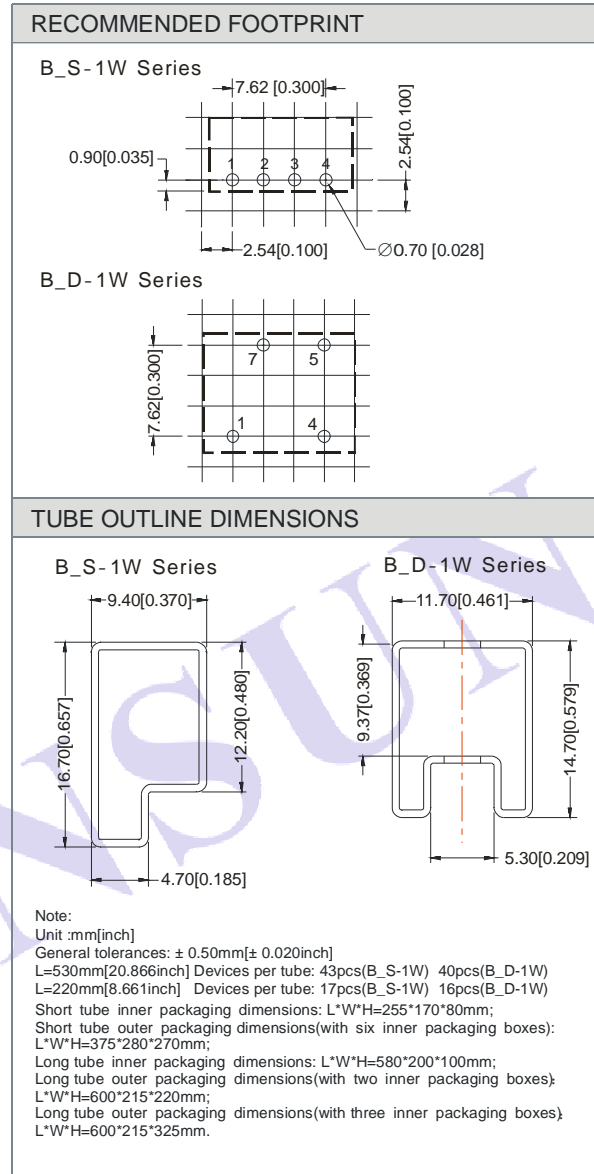
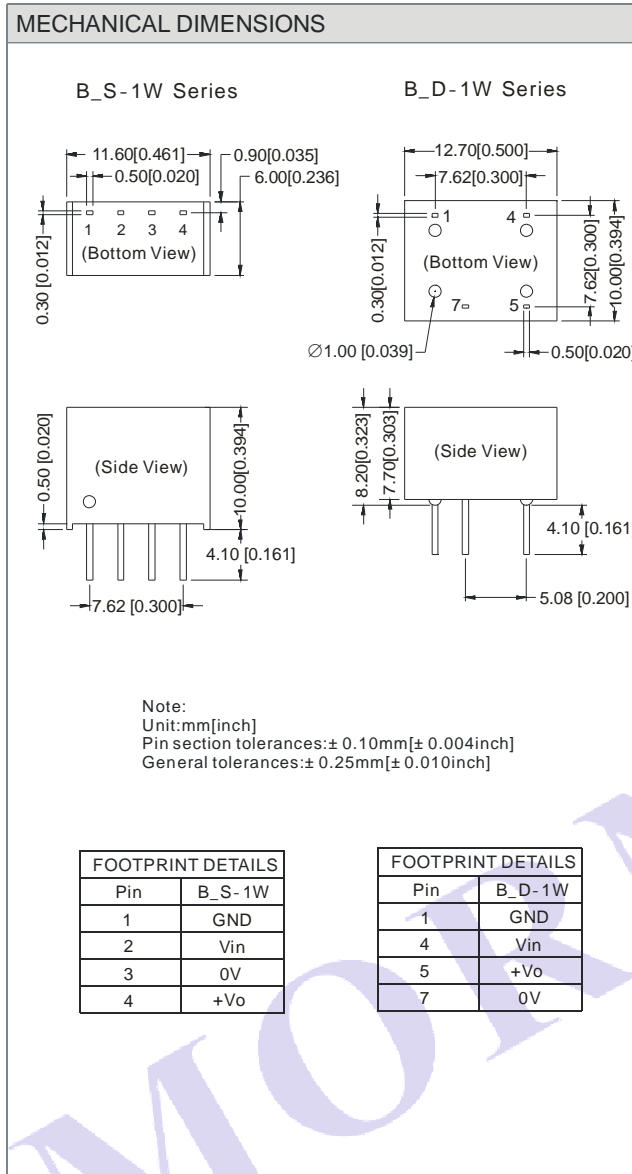
Output Load VS Efficiency curve
(Vin=Vin-nominal)



Output Load VS Efficiency curve
(Vin=Vin-nominal)



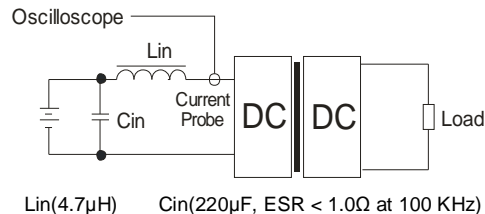
OUTLINE DIMENSIONS, RECOMMENDED FOOTPRINT & PACKAGING



TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor L_{in} and C_{in} to simulate source impedance.



DESIGN & APPLY CONSIDERATIONS

1) Requirement on output load

To ensure this module can operate efficiently and reliably, During operation, the minimum output load **could not be less than 10% of the full load**. If the actual output power is very small, please connect a resistor with proper resistance at the output end in parallel to increase the load, or use our company's products with a lower rated output power (B_S-W2 & B_D-W2 Series).

2) Overload Protection

Under normal operating conditions, the output circuit of these products has no protection against overload. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit.

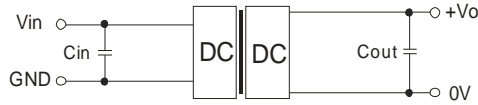
Input Fuse Selection Guide

3.3VDC Input Models	500mA slow-Blow Type	15VDC Input Models	100mA slow-Blow Type
5VDC Input Models	500mA slow-Blow Type	24VDC Input Models	100mA slow-Blow Type
12VDC Input Models	200mA slow-Blow Type		

3) Recommended circuit

If you want to further decrease the input/output ripple, an capacitor filtering network may be connected to the input and output ends of the DC/DC converter, see (Figure 2).

It should also be noted that the capacitance of filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the recommended capacitance of its filter capacitor sees (Table 1).



(Figure 2)

EXTERNAL CAPACITOR TABLE (TABLE 1)

Vin (VDC)	Cin (μF)	Vout (VDC)	Cout (μF)
3.3/5	4.7	3.3/5	10
12	2.2	7.2/9	4.7
15	1	12	2.2
24	1	15	1
--	--	24	0.47

It's not recommended to connect any external capacitor in the application field with less than 0.5 watt output.

4) Output Voltage Regulation and Over-voltage Protection Circuit

The simplest device for output voltage regulation, over-voltage and over-current protection is a linear regulator and an capacitor filtering network with overheat protection that is connected to the input or output end in series (Figure 3), the recommended capacitance of its filter capacitor sees (Table 1), linear regulator based on the actual voltage and current to reasonable selection.



(Figure 3)

5) No parallel connection or plug and play

Note:

1. Operation under minimum load will not damage the converter; However, they may not meet all specification listed, and that will reduce the life of product.
2. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
3. In this datasheet, all the test methods of indications are based on corporate standards.
4. Only typical models listed, other models may be different, please contact our technical person for more details.
5. Our company offer custom products.
6. Specifications subject to change without notice.

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