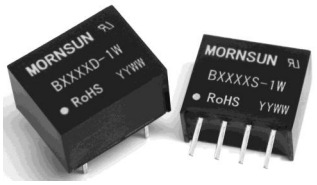
MORNSUN

B_S-1W & B_D-1W Series

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



multi-country patent protection **RoHS**

FEATURES

- Efficiency up to 80%
- Small Footprint
- 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

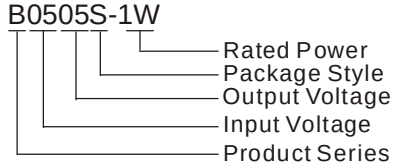
APPLICATIONS

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 ≤ ±10%);
2) Where isolation is necessary between input and output (isolation voltage ≤1000VDC);
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.

MODEL SELECTION



PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (%, Typ.)	UL CE
	Voltage (VDC)		Voltage (VDC)	Current (mA)			
	Nominal	Range		Max.	Min.		
B0303S/D-1W	3.3	2.97-3.63	3.3	303	30	72	
B0305S/D-1W			5	200	20	74	
B0503S/D-1W	5	4.5-5.5	3.3	303	30	72	
B0505S/D-1W			5	200	20	70	UL CE
B0509S/D-1W			9	111	12	78	UL CE
B0512S/D-1W			12	83	9	79	UL CE
B0515S/D-1W			15	67	7	80	UL CE
B1203S/D-1W	12	10.8-13.2	3.3	303	30	72	
B1205S/D-1W			5	200	20	71	UL CE
B1209S/D-1W			9	111	12	76	UL CE
B1212S/D-1W			12	83	9	78	UL CE
B1215S/D-1W			15	67	7	80	UL CE
B2405S/D-1W	24	21.6-26.4	5	200	20	73	UL CE
B2409S/D-1W			9	111	12	78	UL CE
B2412S/D-1W			12	83	9	79	UL CE
B2415S/D-1W			15	67	7	80	UL CE

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

COMMON SPECIFICATION

Item	Test Conditions	Min.	Typ.	Max.	Units
Storage humidity				95	%
Operating temperature		-40		85	℃
Storage temperature		-55		125	
Temp. rise at full load			15	25	
Lead temperature	1.5mm from case for 10 seconds			300	
Short circuit protection*				1	S
Cooling		Free air convection			
Case material		Plastic(UL94-V0)			
MTBF		3500			K hours
Weight			1.6		g

*Supply voltage must be discontinued at the end of short circuit duration.

ISOLATION 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

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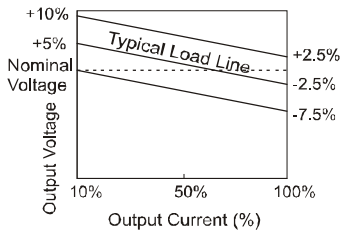
OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Units
Output power		0.1		1	W
Line regulation	For Vin change of 1%(3.3V output)			1.5	%
	For Vin change of 1%(others)			1.2	
Load regulation	10% to 100% load (3.3V output)		15	20	
	10% to 100% load (5V output)		12.8	15	
	10% to 100% load (9V output)		8.3	10	
	10% to 100% load (12V output)		6.8	10	
	10% to 100% load (15V output)		6.3	10	
Output voltage accuracy		See tolerance envelope graph			
Temperature drift	100% full load			0.03	%/°C
Ripple & Noise*	20MHz Bandwidth		75	100	mVp-p
Switching frequency	Full load, nominal input		100		KHz

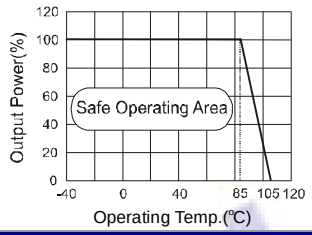
*Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

TYPICAL CHARACTERISTICS

Tolerance Envelope Graph



Temperature Derating Graph



APPLICATION NOTE

Requirement on output load

To ensure this module can operate efficiently and reliably, During operation, the minimum output load is not less than 10% of the full load, and that this product should never be operated under no 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).

Recommended circuit

If you want to further decrease the input/output ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, see (Figure 1).

It should also be noted that the inductance and the frequency of the "LC" filtering network should be staggered with the DC/DC frequency to avoid mutual interference. However, the capacitance of the output 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 greatest capacitance of its filter capacitor sees (Table 1).

Output Voltage Regulation and Over-voltage Protection Circuit

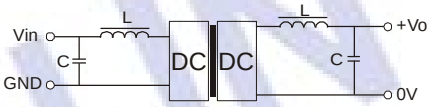
The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (Figure 2).

Overload Protection

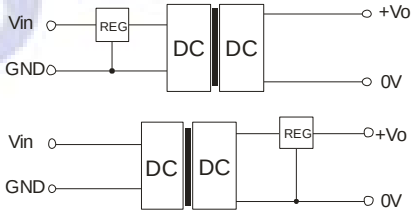
Under normal operating conditions, the output circuit of these products has no protection against overload. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit.

No parallel connection or plug and play

RECOMMENDED CIRCUIT



(Figure 1)



(Figure 2)

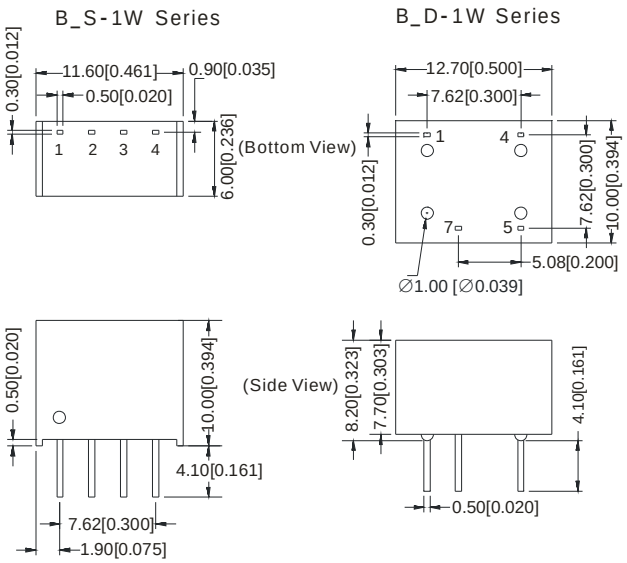
EXTERNAL CAPACITOR TABLE (TABLE 1)

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

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

OUTLINE DIMENSIONS & FOOTPRINT DETAILS

MECHANICAL DIMENSIONS



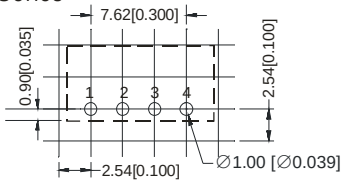
FOOTPRINT DETAILS	
Pin	B_S-1W
1	GND
2	Vin
3	0V
4	+Vo

FOOTPRINT DETAILS	
Pin	B_D-1W
1	GND
4	Vin
5	+Vo
7	0V

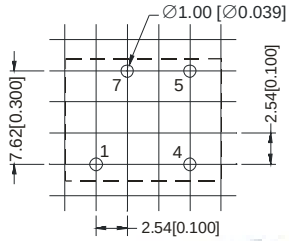
Note:
Unit:mm[inch]
Pin section tolerances:±0.10mm[±0.004inch]
General tolerances:±0.25mm[±0.010inch]

RECOMMENDED FOOTPRINT

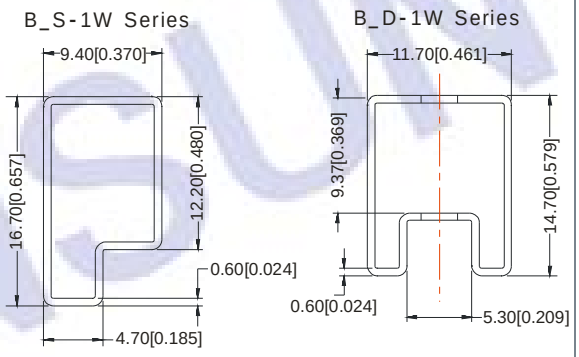
B_S-1W Series



B_D-1W Series



TUBE DUTLINE DIMENSIONS



Note:
Unit :mm[inch]
General tolerances: ±0.50mm[±0.020inch]
L=530mm[20.866inch] Tube Quantity: 43pcs(B_S-1W) 40pcs(B_D-1W)
L=220mm[8.661inch] Tube Quantity: 17pcs(B_S-1W) 16pcs(B_D-1W)

Note:
1. Operation under minimum load will not damage the converter; However, they may not meet all specification listed.
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.

Specifications subject to change without notice.