B_S-1W & B_D-1W Series

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

RoHS

PART NUMBER SYSTEM

B0505S-1W

- Rated Power
- Package Style
- Output Voltage
- Input Voltage
- Product Series

FEATURES

- Efficiency up to 80%
- Miniature SIP/DIP Package
- 1KVDC Isolation
- Operating Temperature Range: -40°C ~ +85°C
- Low Temperature Rise
- No External Component Required
- PCB Mounting
- Industry Standard Pinout

APPLICATIONS

The B_S-1W & B_D-1W Series are designed for application where isolated output is required from a distributed power system.

These products apply to where:

1) Input voltage variation ≤ ±10%;
2) 1KVDC input and output isolation;
3) Regulated and low ripple noise is not required.

Such as: digital circuits, low frequency analog circuits, and IGBT power device driving circuits.

SELECTION GUIDE

Model Number	Input Voltage(VDC)	Output Voltage (VDC)	Output Current (mA)		Input Current (mA)(typ.)		Reflected Ripple Current (mA,typ.)	Max. Capacitive Load(μF)	Efficiency (%, typ.) @Max. Load	Approval
	Nominal (Range)		Max.	Min.	@Max. Load	@No Load				
B0303S/D-1W	3.3 (2.97-3.63)	3.3	303	30	417	50	15	220	72	
B0305S/D-1W		5	200	20	392				74	
B0503S/D-1W	5 (4.5-5.5)	3.3	303	30	271	31	20		72	
B0505S/D-1W		5	200	20	270				70	UL CE
B0507S/D-1W		7.2	138	14	252				72	
B0509S/D-1W		9	111	12	252				78	UL CE
B0512S/D-1W		12	83	9	248				79	UL CE
B0515S/D-1W		15	67	7	247				80	UL CE
B0524S-1W		24	42	4	240				77	
B1203S/D-1W	12 (10.8-13.2)	3.3	303	30	110	16	23		72	
B1205S/D-1W		5	200	20	116				71	UL CE
B1209S/D-1W		9	111	12	105				76	UL CE
B1212S/D-1W		12	83	9	104				78	UL CE
B1215S/D-1W		15	67	7	101				80	UL CE
B1505S/D-1W	15 (13.5-16.5)	5	200	20	92	14	18		71	
B1515S-1W		15	67	6	85				78	
B2403S/D-1W	24 (21.6-26.4)	3.3	303	30	57	8	61		71	
B2405S/D-1W		5	200	20	57				73	UL CE
B2409S/D-1W		9	111	12	52				78	UL CE
B2412S/D-1W		12	83	9	50				79	UL CE
B2415S/D-1W		15	67	7	50				80	UL CE
B2424S-1W		24	42	4	50				80	

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

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1000 ms)	3.3VDC input	-0.7	--	5	VDC
	5VDC input	-0.7	--	9	
	12VDC input	-0.7	--	18	
	15VDC input	-0.7	--	21	
	24VDC input	-0.7	--	30	
Input Filter		Capacitance Filter			

OUTPUT SPECIFICATIONS

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

Note: 1.*Test ripple and noise by “parallel cable” method. See detailed operation instructions at Testing of Power Converter section, application notes.
2.**Supply voltage must be discontinued at the end of short circuit duration.

COMMON SPECIFICATIONS

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

ENVIRONMENTAL SPECIFICATIONS

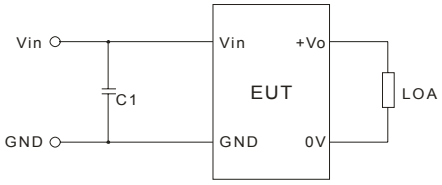
Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (above 85℃)	-40	--	85	°C
Storage Temperature		-55	--	125	
Temp. rise at full load		--	25	--	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

EMC SPECIFICATIONS

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

EMC RECOMMENDED CIRCUIT

EMI Recommended External Circuit:



(Figure 1)

B_S-1W Series

Recommended external circuit parameters:

Vin：3.3V/5V/12V/15V/24V

C1：1μF/50V

Note: Product bare input of 3V、5V、12V already meet CLASS A, increase the capacitor margin increase.

B_D-1W Series

Recommended external circuit parameters:

Vin 3.3V/5V：

C1：1μF/50V

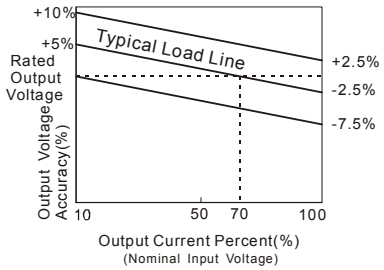
Vin ：12V/15V/24V

C1：2.2μF/50V

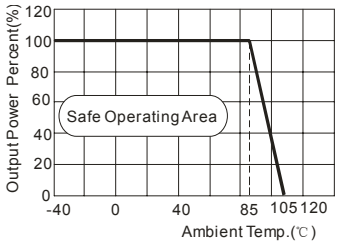
Note: Product bare input of 3.3V already meet CLASS A, increase the capacitor margin increase.

PRODUCT TYPICAL CURVE

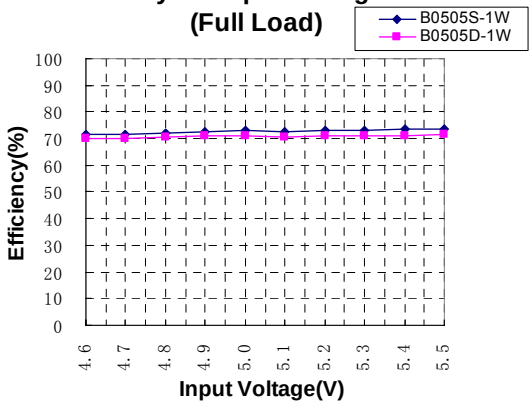
Tolerance Envelope Curve



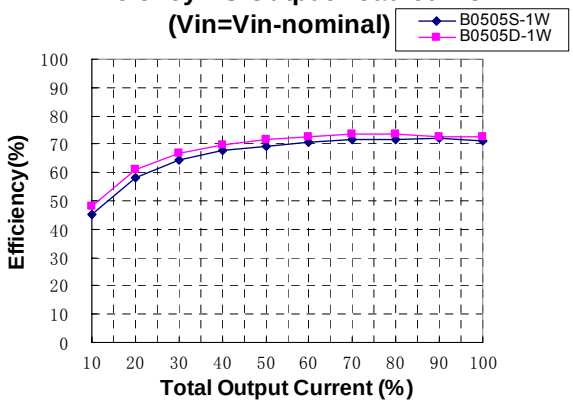
Temperature Derating Curve



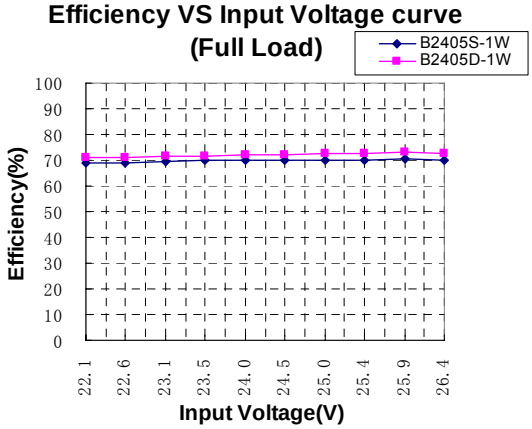
Efficiency VS Input Voltage curve (Full Load)



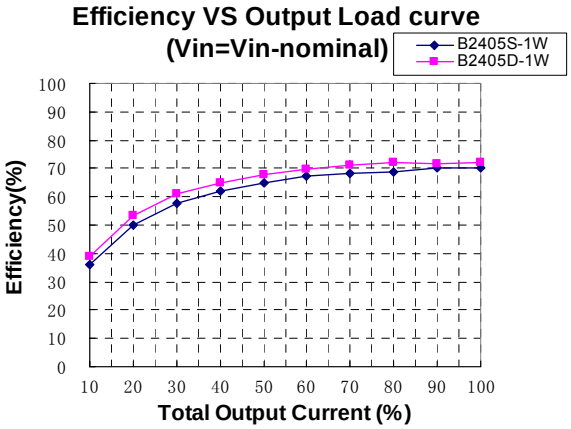
Efficiency VS Output Load curve (Vin=Vin-nominal)



Efficiency VS Input Voltage curve (Full Load)

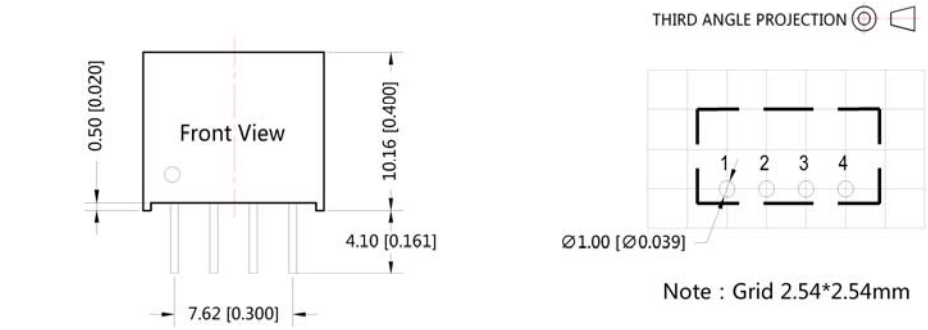


Efficiency VS Output Load curve (Vin=Vin-nominal)

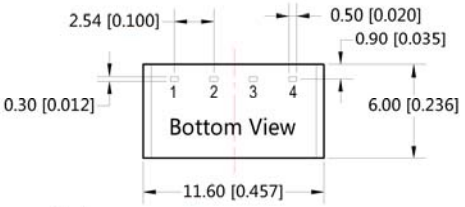


OUTLINE DIMENSIONS, RECOMMENDED FOOTPRINT & PACKAGING

B_S-1WR2



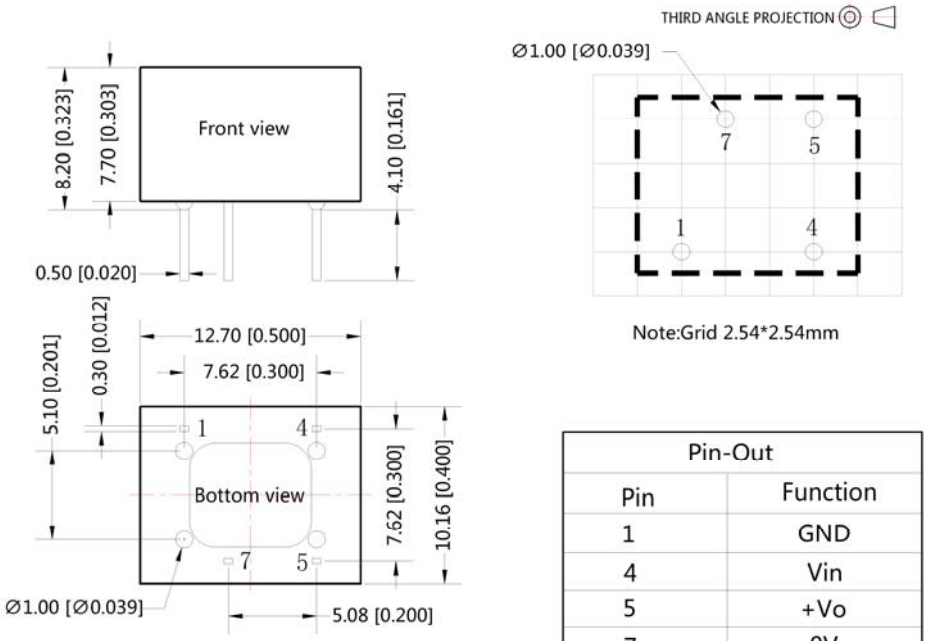
Note : Grid 2.54*2.54mm



Pin-Out	
Pin	Function
1	GND
2	Vin
3	0V
4	+Vo

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

B_D-1WR2



Note:Grid 2.54*2.54mm

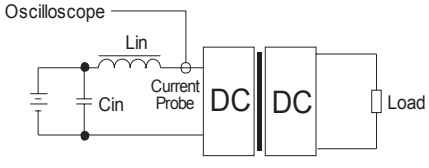
Pin-Out	
Pin	Function
1	GND
4	Vin
5	+Vo
7	0V

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

TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor Lin and Capacitor Cin to simulate source impedance.



Lin(4.7μH) Cin(220μF, ESR < 1.0Ω at 100 KHz)

DESIGN 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).

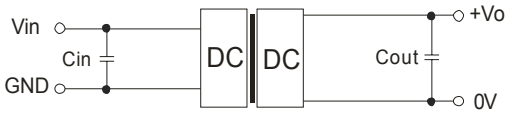
2) Overload Protection

Under normal operating conditions, the output circuit of these products has no protection against overload. The simplest method is add a circuit breaker to the circuit.

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)

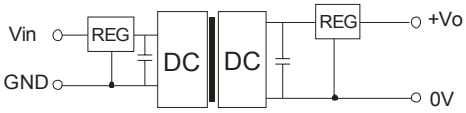
EXTERNAL CAPACITOR TABLE (TABLE 1)

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) Cannot use in parallel and hot swap

Note:

1. Operation under minimum load will not damage the converter; However, they may not meet all specification listed.
2. Max. Capacitive Load tested at input voltage range and full load.
3. All date in the datasheet are measured according to nominal input voltage, rated output load, TA=25℃, humidity<75%, unless otherwise specified.

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