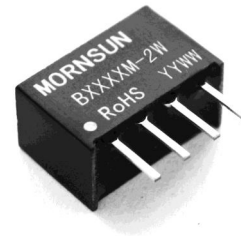


B_M-2W Series

2W, SUPERMINIATURE FIXED INPUT ISOLATED & UNREGULATED SINGLE OUTPUT DC-DC CONVERTER



RoHS

FEATURES

Efficiency up to 82%
Small Footprint
Miniature SIP Package Style
Temperature Range: -40°C to +85°C
1KVDC Isolation
Industry Standard Pinout
Internal SMD construction
No Heat sink Required
No External Component Required
RoHS Compliance

APPLICATIONS

The B_M-2W 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.

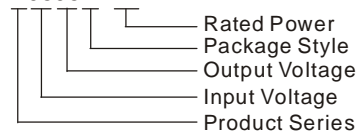
These products apply to:

- 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.

MODEL SELECTION

B0505M-2W



MORNSUN America

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PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (% Typ)	Switching Frequency (KHz Typ)
	Voltage (VDC)		Voltage (VDC)	Current (mA)			
	Nominal	Range		Max	Min		
B0505M-2W	5	4.5-5.5	5	400	40	78	65
B0509M-2W			9	222	23	78	60
B0512M-2W			12	167	17	79	56
B0515M-2W			15	133	14	79	65
B1205M-2W	12	10.8-13.2	5	400	40	78	70
B1209M-2W *			9	222	23	80	-
B1212M-2W			12	167	17	80	66
B1215M-2W *			15	133	14	82	-

* Designing.
Note: The B_M-1W series also are available in our company.

ISOLATION SPECIFICATIONS

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1 mA max	1000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance			90		pF

OUTPUT SPECIFICATIONS

Item	Test condition	Min	Typ	Max	Units
Output power		0.2		2	W
Line regulation	For Vin change of $\pm 1\%$			± 1.2	%
Load regulation	10% to 100% load (5V output)		10	15	
	10% to 100% load (9V output)		8.3	15	
	10% to 100% load (12V output)		6.8	15	
	10% to 100% load (15V output)		6.3	15	
Output voltage accuracy		See tolerance envelope graph			
Temperature drift	100% full load			0.03	%/°C
Ripple & Noise*	20MHz Bandwidth		75	150	mVp-p

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

Note:

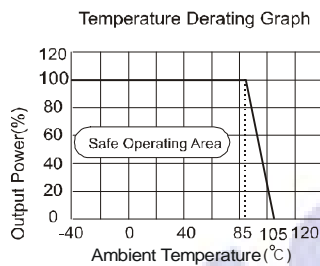
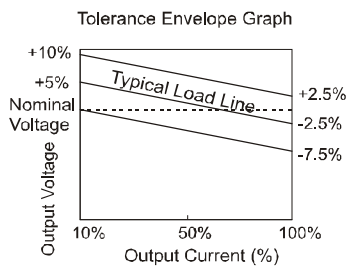
1. All specifications measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. See below recommended circuits for more details.

COMMON SPECIFICATION

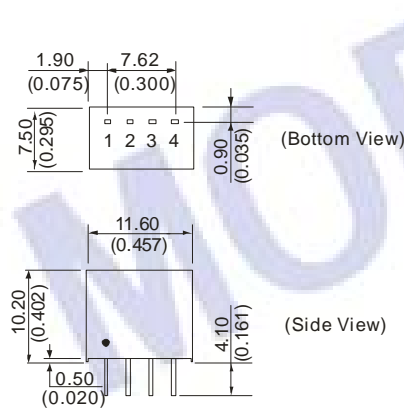
Item	Test condition	Min	Typ	Max	Units
Storage humidity				95	%
Operation temperature		-40		85	°C
Storage temperature		-55		125	
Temp. rise at full load			15	25	
Lead temperature	1.5mm from case for 10 seconds			300	
Short circuit protection*				1	s
Cooling		Free air convection			
Case material		Plastic (UL94-V0)			
MTBF		3500			K hours
Weight			1.8		g

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

TYPICAL CHARACTERISTICS

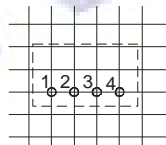


OUTLINE DIMENSIONS & PIN CONNECTIONS



First Angle Projection

RECOMMENDED FOOTPRINT
Top view, grid: 2.54*2.54mm (0.1*0.1inch)
diameter: 1.00mm (0.039inch)



FOOTPRINT DETAILS

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

Note:
Unit:mm (inch)
Pin Section: 0.50*0.30mm (0.020*0.012inch)
Pin Section tolerance: ±0.10mm (±0.004inch)
General tolerances: ±0.25mm (±0.010inch)

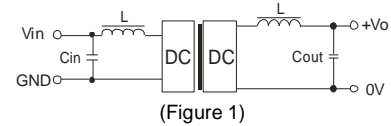
APPLICATION NOTE

Requirement On Output Load

To ensure this module can operate efficiently and reliably, a minimum load is specified for this kind of DC/DC converter in addition to a maximum load (namely full load). During operation, make sure the specified range of input voltage is not exceeded, 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_M -1W Series).

Recommended and testing circuit

To get an extreme low ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, which may produce a more significant filtering effect. 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 (see figure 1).



In some circuits which are sensitive to noise and ripple, a filtering capacitor may be added to the DC/DC output end and input end to reduce the noise and ripple. However, the capacitance of the output filter capacitor must proper. If the capacitance is too big, a startup problem might arise. For every channel of output, providing the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor sees (Table 1).

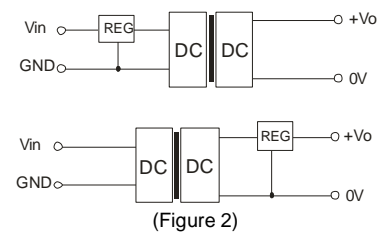
EXTERNAL CAPACITOR TABLE (Table 1)

Vin (VDC)	Cin (uF)	Vout (VDC)	Cout (uF)
5	4.7	5	10
12	2.2	9	4.7
--	--	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.

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 (see Figure 2).



Overload Protection

Under normal operating conditions, the output circuit of these products has no protection against over-current and short-circuits. 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.