

**RoHS**  
multi-country patent protection

## B\_M-2W Series

FIXED INPUT ISOLATED & UNREGULATED  
2W OUTPUT SINGLE OUTPUT  
SUPERMINIATURE SIP PACKAGE

### FEATURES

- Efficiency up to 82%
- Small Footprint
- Miniature SIP Package Style
- Single Output Voltage
- 1kVDC Isolation
- Temperature Range: -40°C~+85°C
- Industry Standard Pinout
- 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 = 1000VDC);
- 3) Where the regulation of the output voltage and the output ripple and noise are not demanding.

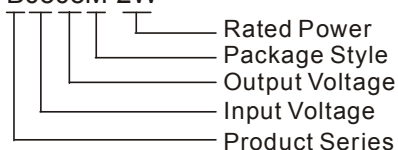
Such as: purely digital circuits, ordinary low frequency analog circuits and IGBT power device driven circuits, etc.

These products don't apply to:

- 1) Where the input supply voltage is varied (variation  $\geq \pm 10\%$ ), otherwise our company's WRA series is recommended;
- 2) Where the isolation voltage between input and output is required to be >1000VDC, otherwise our company's FM Series products are recommended;
- 3) Circuits in which the output voltage regulation is demanding, otherwise our company's IB Series or WRB Series are recommended;
- 4) The output load's actual power consumption is less than nominal output, otherwise our company's B\_M-1W Series are recommended.

### MODEL SELECTION

B0505M-2W



### PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (% Typ)	Package Style
	Voltage (VDC)		Voltage (VDC)	Current (mA)			
	Nominal	Range		Max	Min		
B0505M-2W	5	4.5~5.5	5	400	40	78	SIP
B0509M-2W			9	222	23	78	SIP
B0512M-2W			12	167	17	79	SIP
B0515M-2W			15	133	14	79	SIP
B1205M-2W	12	10.8~13.2	5	400	40	78	SIP
B1209M-2W			9	222	23	80	SIP
B1212M-2W			12	167	17	80	SIP
B1215M-2W			15	133	14	82	SIP

### COMMON SPECIFICATION

Short circuit protection	1 second
Temperature rise at full load	25°C MAX, 15°C TYP
Cooling	Free air convection
No load power consumption	10% nominal power (typical)
Operation temperature range	-40°C~+85°C
Storage temperature range	-55°C ~+125°C
Lead temperature*	300°C (1.5mm from case for 10 seconds)
Storage humidity range	$\leq 95\%$
Case material	Plastic (UL94-V0)
MTBF	>3,500,000 hours

### ISOLATION SPECIFICATIONS

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute	1000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ

### OUTPUT SPECIFICATIONS

Item	Test condition	Min	Typ	Max	Units
Output power		0.2		2	W
Line regulation	For Vin change of 1%			1.2	%
Load regulation	10% to 100% full load			15	%
Output voltage accuracy	See tolerance envelope graph				
Temperature drift	100% full load			0.03	%/°C
Output ripple	20MHz Bandwidth		75	150	mVp-p
Noise	20MHz Bandwidth		150	250	
Switching frequency	Full load, nominal input		70		KHz

Note:

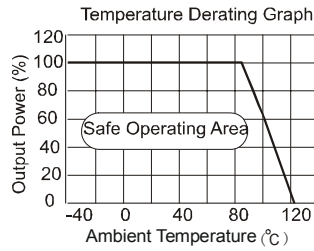
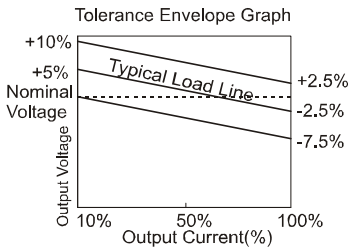
1. All specifications measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. See below recommended circuits for more details.



**MORNSUN America LLC**

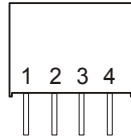
43 Broad Street  
Hudson, MA 01749  
Tel: 978-567-9610  
Fax: 978-567-9601  
Http: //www.mornsunamerica.com

## TYPICAL CHARACTERISTICS

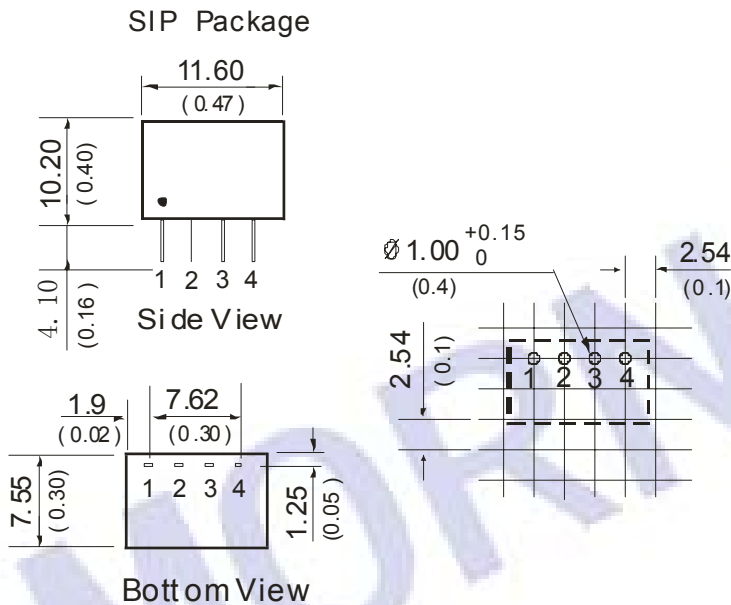


## FOOTPRINT DETAILS

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



## OUTLINE DIMENSIONS & RECOMMENDED FOOTPRINT



Note: All Pins on a 2.54mm pitch; All Pin diameters are 0.50 mm; Unit: mm(inch)

## APPLICATION NOTE

### Requirement On Output Load

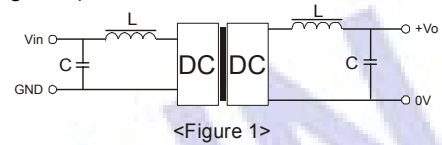
To ensure this module can operate efficiently and reliably, a minimum load is specified for this kind of DC/DC converter in addition to a maximum load (namely full load). During operation, make sure the specified range of input voltage is not exceeded, the minimum output load is **not less than 10%** 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).

### 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.

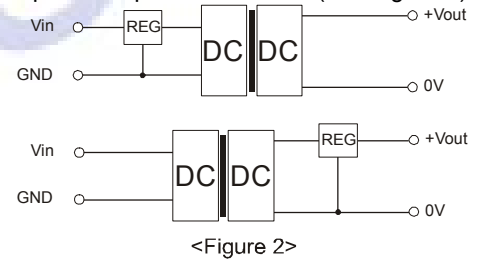
## Filtering

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 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 the external capacitor table. To get an extremely 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).



## 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 that is connected to the input or output end in series (see Figure 2).



## External Capacitor Table

V <sub>in</sub>	External capacitor	V <sub>out</sub>	External capacitor
5VDC	4.7uF	5VDC	10uF
12VDC	2.2uF	9VDC	4.7uF
		12VDC	2.2uF
--	--	15VDC	1uF

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