2W, Ultra Compact fixed input voltage, isolated & unregulated single output

Patent Protection RoHS

FEATURES

- Subminiature SIP package
- High Power Density
- Operating temperature range: -40℃ to +85℃
- Efficiency up to 84%
- Internal SMD construction
- No external component required
- International standard pin-out

B_M-2W series is specially designed for applications where an isolated voltage is required in a distributed power supply system. It is suitable for

1.Where the voltage of the input power supply is stable (voltage variation: ±10%Vin);

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

3.Where do not has high requirement of line regulation and load regulation;

4.Such as: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.

Selection Guide

Part No.	Input Voltage (VDC)	Output		Efficiency (%,Min./Typ.) @ Full Load	Max. Capacitive Load (μF)
		Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
B0505M-2W	4.5-5.5 (5VDC nominal)	5	400/40	74/80	220
B0512M-2W		12	167/17	78/83	
B0515M-2W		15	133/14	79/84	
B1203M-2W	10.8-13.2 (12VDC nominal))	3.3	400/40	69/74	
B1205M-2W		5	400/40	74/80	
B1209M-2W		9	222/23	79/84	
B1212M-2W		12	167/17	78/83	
B1215M-2W		15	133/14	78/84	
B4803M-2W	43.2-52.8 (48VDC nominal)	3.3	400/40	65/70	

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5V input	--	500/25	--	mA
	12V input	--	208/15	--	
	48V input	--	60/6	--	
Surge Voltage (1sec. max.)	5V input	-0.7	--	9	VDC
	12V input	-0.7	--	18	
	48V input	-0.7	--	54	
Reflected Ripple Current		--	15	--	mA
Input Filter		Capacitor filter			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope graph (Fig. 1)			
Line Regulation	Input voltage change: ±1%		--	--	±1.2	--
Load Regulation	10%-100% load	3.3VDC output	--	15	20	%
		5VDC output	--	10	15	
		9VDC output	--	9	15	
		12VDC output	--	8	15	
		15VDC output	--	7	15	

Ripple & Noise*	20MHz bandwidth	--	75	150	mVp-p
Temperature Drift Coefficient	100% load	--	--	±0.03	%/°C
Short Circuit Protection		--	--	1	s
Note: * Ripple and noise tested with "parallel cable" method, please see *DC-DC Converter Application Notes* for specific operation methods.					

General Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Insulation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA		1000	--	--	VDC
Insulation Resistance	Input-output, insulation voltage 500VDC		1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V		--	90	--	pF
Operating Temperature	3.3V/5V output	Derating if the temperature ≥71°C, (see Fig.2-Graph 2)	-40	--	71	°C
	Other output	Derating if the temperature ≥85°C, (see Fig.2-Graph 1)	-40	--	85	
Storage Temperature			-55	--	125	
Casing Temperature Rise	Ta=25°C		--	25	--	
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds		--	--	300	
Storage Humidity	Non-condensing		--	--	95	%
Switching Frequency	100% load, nominal input voltage		--	100	--	KHz
MTBF	MIL-HDFK-217F@25°C		3500	--	--	K hours

Physical Specifications

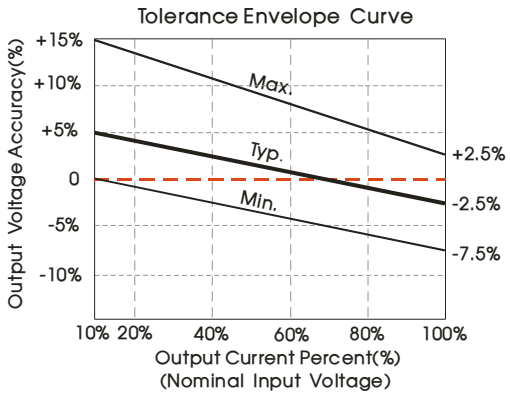
Casing Material	Black flame-retardant heat-proof epoxy resin (UL94-V0)
Package Dimensions	11.60*7.50*10.20mm
Weight	1.8g (Typ.)
Cooling Methods	Free air convection

EMC Specifications

EMI	Conducted disturbance	CISPR22/EN55022	CLASS B (see Fig. 4 for recommended circuit)
	Radiated emission	CISPR22/EN55022	CLASS B (see Fig. 4 for recommended circuit)
EMS	Electrostatic discharge	IEC/EN61000-4-2	Contact ±8KV perf. Criteria B

Product Characteristic Curve

3.3 VDC /5VDC output



Other output

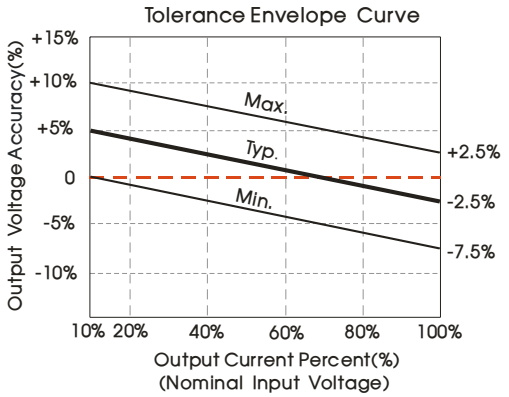


Fig. 1

Temperature Derating Graph

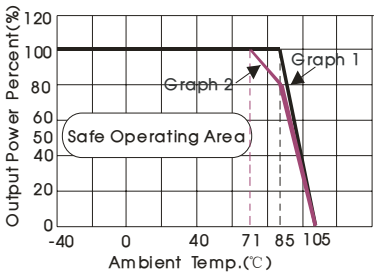
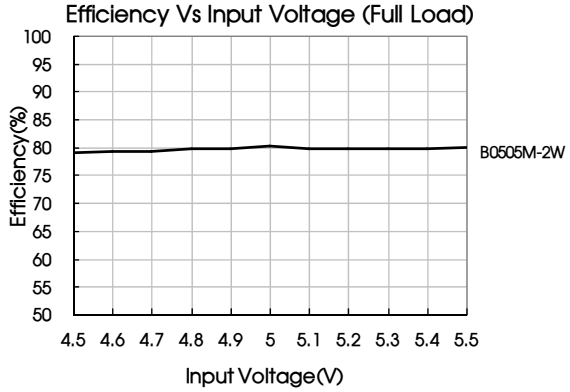
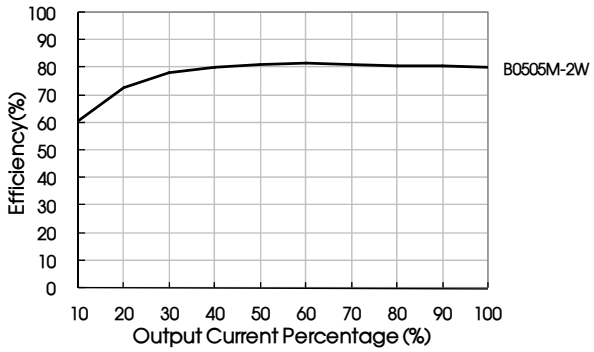


Fig. 2

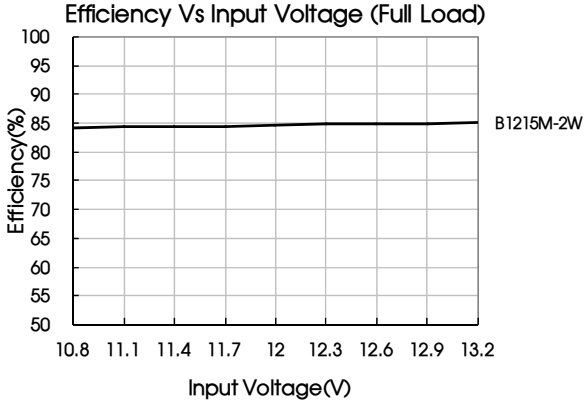
Efficiency Vs Input Voltage (Full Load)



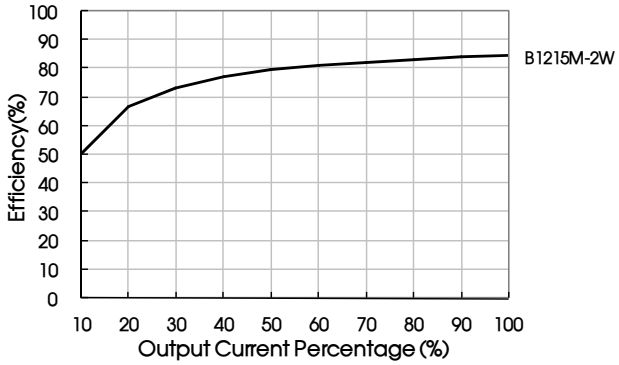
Efficiency Vs Output Load(Vin=Vin-nominal)



Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load(Vin=Vin-nominal)



Design Reference

1. Typical application

If it is required to further reduce input and output ripple, a filter capacitor can be connected to the input and output terminals, see Fig.3. Moreover, choosing suitable filter capacitor is very important, start-up problems may be caused by too large capacitance. To ensured the modules running well, the recommended capacitive load values as shown in Table 1.

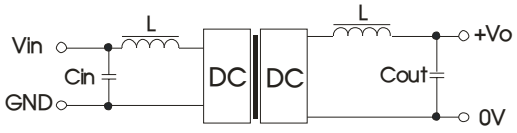


Fig.3

Recommended capacitive load value table (Table 1)

Vin(VDC)	Cin(μF)	Vo (VDC)	Cout(μF)
5	4.7	3.3	10
12	2.2	5	10
48	1	9	4.7
--	--	12	2.2
-	--	15	1

It is not recommended to connect any external capacitor when output power is less than 0.5W.

2. EMC typical recommended circuit (CLASS B)

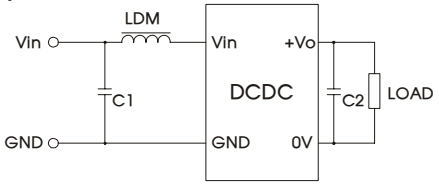


Fig. 4

Input voltage (VDC)		5/12/	48
EMI	C1	4.7μF /50V	4.7μF /100V
	C2	Refer to the Cout in Fig.3	
	LDM	6.8μH	6.8μH

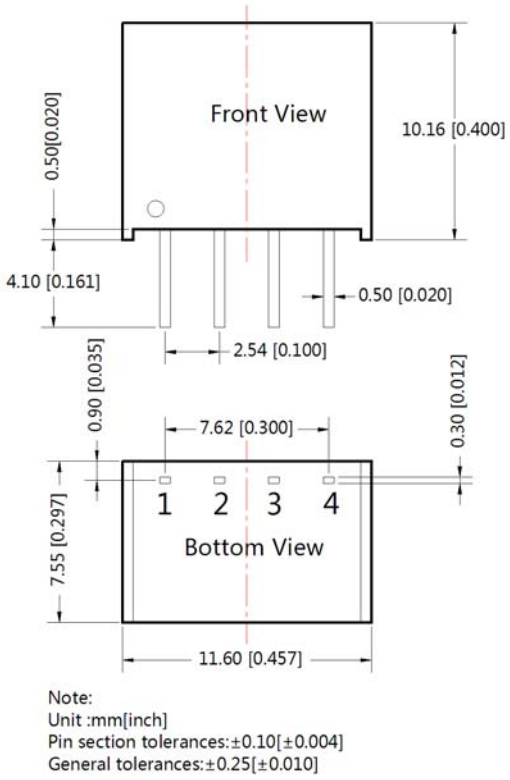
Note: 1.It is not needed to add the component in the peripheral circuit when parameter with the symbol of "--".

3. Output load requirements

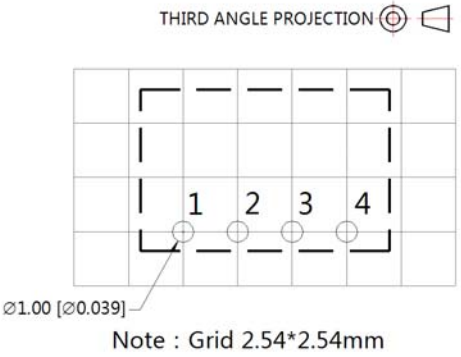
To ensure the module work efficiently and reliably, during the operation, the min. output load should be no less than 10% of the full load. If the actual output power is low, please connect a resister to the output terminal in parallel, with a recommenced resistance which is 10% of the rated power, and derating is required during operation.

4. For more information please find the application notes on www.mornsun-power.com

Dimensions and Recommended Layout



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



Note : Grid 2.54*2.54mm

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

Note:

1. Packing Information please refer to 'Product Packing Information'. Packing bag number: 58200003;
2. If the product is operated under the min. required load, the product performance cannot be guaranteed to comply with all performance indexes in this datasheet;
3. The max. capacitive load should be tested within the input voltage range and under full load conditions;
4. Unless otherwise specified, data in this data sheet should be tested under the conditions of Ta=25°C, humidity<75% when inputting nominal voltage and outputting rated load;
5. All index testing methods in this datasheet are based on our Company's corporate standards;
6. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technicians for specific information;
7. We can provide product customization service;
8. Specifications of this product are subject to changes without prior notice.

MORNSUN Guangzhou Science & Technology Co., Ltd.
Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Luogang District, Guangzhou, P. R. China
Tel: 86-20-38601850-8801 Fax: 86-20-38601272 E-mail: info@mornsun.cn