MORNSUN®

2W, Fixed input voltage, isolated & unregulated single output

Continuous Short Circuit Protection

Patent Protection RoHS

FEATURES

- Operating temperature range: -40℃ to +85℃
- Ultra compact SIP package
- Isolation voltage: 1.5K VDC
- High power density
- No external component required
- International standard pin-out

B_M-2WR2 series are specially designed for applications where an isolated voltage is required in a distributed power supply system. They are suitable for

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

2. Where isolation between input and output is necessary (isolation voltage ≤1500VDC);

3. Where the output voltage regulation and the ripple & noise of the output voltage is not strictly required;

4. Typical application: digit circuit condition; normal low-frequency artificial circuit condition; relay drive circuit condition, etc.

Selection Guide

Part No.	Input Voltage (VDC)	Output		Efficiency (%,Min./Typ.) @ Full Load	Max. Capacitive Load (μF)
	Nominal (Range)	Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
B0505M-2WR2	5 (4.5-5.5)	5	400/40	75/79	220
B0509M-2WR2		9	223/23	80/84	
B0512M-2WR2		12	167/17	75/79	
B0515M-2WR2		15	133/13	75/79	
B0524M-2WR2		24	84/9	80/84	
B1203M-2WR2	12 (10.8-13.2)	3.3	400/40	69/73	
B1212M-2WR2		12	167/17	78/83	
B2405M-2WR2	24 (21.6-26.4)	5	400/40	75/79	
B2415M-2WR2		15	133/13	78/82	

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5V input	--	506/23	--/60	mA
	12V input	--	200/15	--/50	
	24V input	--	105/6	--/30	
Reflected Ripple Current*		--	15	--	mA
Surge Voltage (1sec. max.)	5V input	-0.7	--	9	VDC
	12V input	-0.7	--	18	
	24V input	-0.7	--	30	
Input Filter		Filter capacitor			
Hot Plug		Unavailable			

Note: *Reflected ripple current testing method please see DC-DC Converter Application Notes for specific operation.

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope graph (Fig. 1)			
Line Regulation	Input voltage change: ±1%	3.3V output	--	--	±1.5	--
		Other output	--	--	±1.2	
Load Regulation	10%-100% load	3.3V output	--	15	--	%
		Other output	--	10	--	

Ripple & Noise*	20MHz bandwidth	--	75	150	mVp-p
Temperature Coefficient	Full load	--	--	±0.03	%/℃
Short Circuit Protection**	B0505M-2WR2	Continuous, self-recovery			
	Others	--	--	1	s

Note: * Ripple and noise are measured by "parallel cable" method, please see DC-DC Converter Application Notes for specific operation;
** Supply voltage must be discontinued at the end of short circuit duration for others series.

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	1500	--	--	VDC
Insulation Resistance	Input-output, isolation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	20	--	pF
Operating Temperature	Derating if the temperature ≥71°C, (see Fig. 2)	-40	--	85	℃
Storage Temperature		-55	--	125	
Casing Temperature Rise	Ta=25℃	--	25	--	
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	
Storage Humidity	Non-condensing	--	--	95	%RH
Switching Frequency	Full load, nominal input voltage	--	100	--	KHz
MTBF	MIL-HDBK-217F@25℃	3500	--	--	K hours

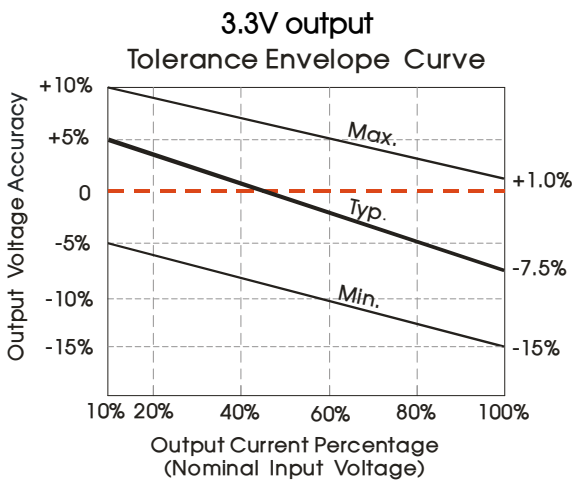
Physical Specifications

Casing Material	Black flame-retardant and heat-resistant plastic(UL94 V-0)
Dimensions	11.60*7.55*10.16 mm
Weight	1.6g(Typ.)
Cooling Method	Free air convection

EMC Specifications

EMI	CE	CISPR32/EN55032 CLASS B (see Fig. 4 for recommended circuit)
	RE	CISPR32/EN55032 CLASS B (see Fig. 4 for recommended circuit)
EMS	ESD	IEC/EN61000-4-2 Contact ±8KV perf. Criteria B

Product Characteristic Curve



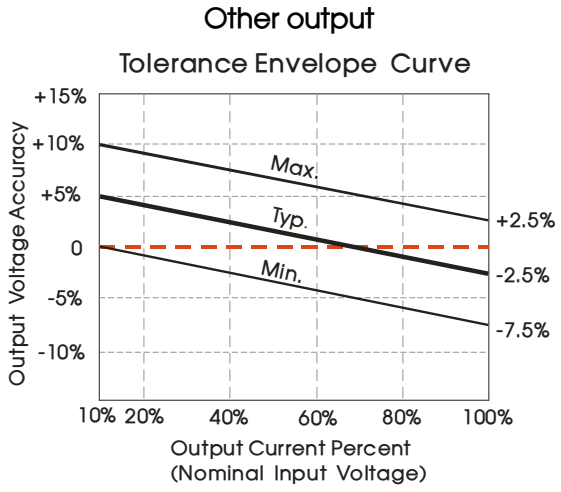


Fig. 1

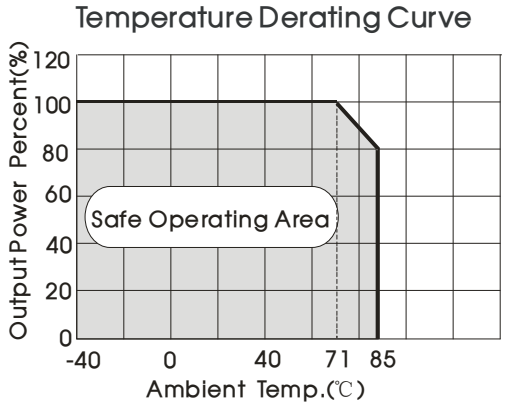
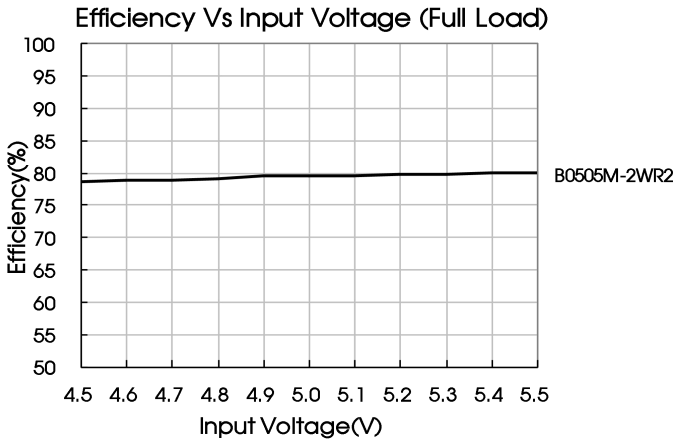
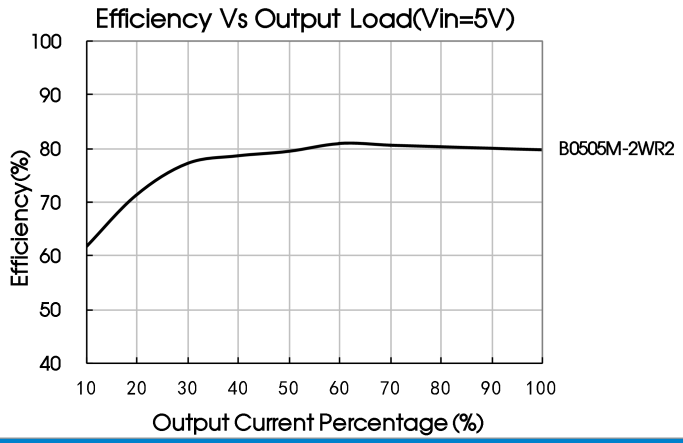


Fig. 2





Design Reference

1. Typical application circuit

If it is required to further reduce input and output ripple, a filter capacitor may be connected to the input and output terminals, see Fig.3. Moreover, choosing a suitable filter capacitor is very important, start-up problems may be caused if the capacitance is too large. Under the condition of safe and reliable operation, the recommended capacitive load values are shown in Table 1.

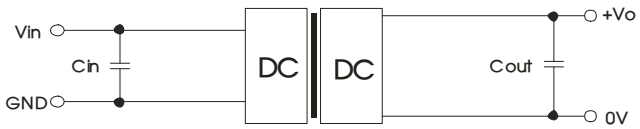


Fig.3

Recommended capacitive load value table (Table 1)

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

2. EMC solution-recommended circuit

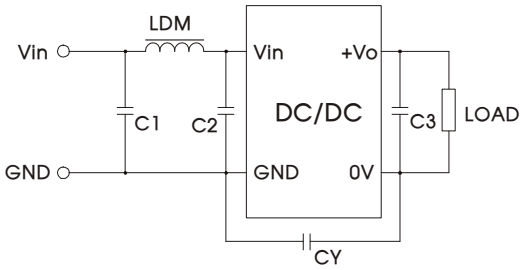


Fig. 4

Input voltage (VDC)		5/12	24
EMI	C1/C2	4.7μF /50V	
	CY	--	1nF/2KV
	C3	Refer to the Cout in Fig.3	
	LDM	6.8μH	

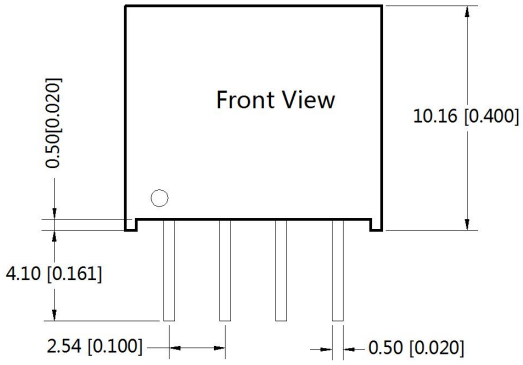
Note: 1. 24V input series is subject to CY (CY : 1nF/2KV).
2. It is not needed to add the component in the peripheral circuit when parameter with the symbol of "--".

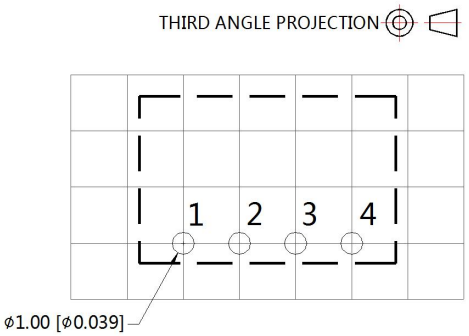
3. Output load requirements

In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor on the output side (The sum of the efficient power and resistor consumption power is not less than 10%).

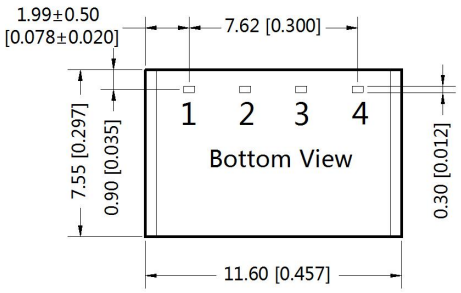
4. For more information please find DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout





Note : Grid 2.54*2.54mm



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

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

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58200003;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. The maximum capacitive load offered were tested at input voltage range and full load;
4. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
5. All index testing methods in this datasheet are based on our Company's corporate standards;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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