

2W isolated DC-DC converter  
Fixed input voltage, unregulated single output



Patent Protection RoHS



## FEATURES

- Continuous short-circuit protection
- No-load input current as low as 8mA
- Operating ambient temperature range: -40°C to +85°C
- High efficiency up to 84%
- I/O isolation test voltage: 1.5k VDC
- Industry standard pin-out

B\_M-2WR3 series are specially designed for applications where an isolated voltage is required in a distributed power supply system. They are suitable for: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.

## Selection Guide

Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load (μF) Max.
	Nominal (Range)	Voltage (VDC)	Current (mA) Max./Min.		
B1203M-2WR3	12 (10.8-13.2)	3.3	400/40	75/79	2400
B1205M-2WR3		5	400/40	78/82	2400
B1212M-2WR3		12	167/17	80/84	560
B2405M-2WR3	24 (21.6-26.4)	5	400/40	74/80	2400
B2415M-2WR3		15	133/13	78/84	560

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	12VDC input	3.3VDC output	--	140/8	147/--
		5VDC output	--	204/8	214/--
		12VDC output	--	199/8	209/--
	24VDC input	5VDC output	--	105/8	113/--
		15VDC output	--	100/8	107/--
			--	15	--
Reflected Ripple Current*					
Surge Voltage(1sec. max.)	12VDC input	-0.7	--	18	VDC
	24VDC input	-0.7	--	30	
Input Filter					Capacitance filter
Hot Plug					Unavailable

Note: \* Refer to DC-DC Converter Application Notes for detailed description of reflected ripple current test method.

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Voltage Accuracy		See output regulation curves (Fig. 1)			
Linear Regulation	Input voltage change: ±1%	3.3VDC output	--	--	±1.5
		Others	--	--	±1.2
Load Regulation	10%-100% load	3.3VDC output	--	10	20
		5VDC output	--	7	15
		12VDC output	--	7	10
		15VDC output	--	4	10
Ripple & Noise*	20MHz bandwidth	--	75	180	mVp-p
Temperature Coefficient	Full load	--	±0.02	--	%/°C
Short-circuit Protection		Continuous, self-recovery			

Notes: \* The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information.

### General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output electric strength test for 1 minute with a leakage current of 1mA max.	1500	--	--	VDC
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	20	--	pF
Operating Temperature	Derating when operating temperature $\geq 71^{\circ}\text{C}$ (see Fig. 2)	-40	--	85	
Storage Temperature		-55	--	125	
Case Temperature Rise	Ta=25°C	--	25	--	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	
Storage Humidity	Non-condensing	5	--	95	%RH
Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency	Full load, nominal input voltage	--	260	--	kHz
MTBF	MIL-HDBK-217F@25°C	3500	--	--	k hours

### Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	11.60 x 7.55 x 10.16 mm
Weight	1.6g(Typ.)
Cooling Method	Free air convection

### Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B
	RE	CISPR32/EN55032 CLASS B
Immunity	ESD	IEC/EN61000-4-2 Air $\pm 8\text{kV}$ , Contact $\pm 6\text{kV}$ perf. Criteria B

Note: Refer to Fig. 4 for recommended circuit test.

### Typical Performance Curves

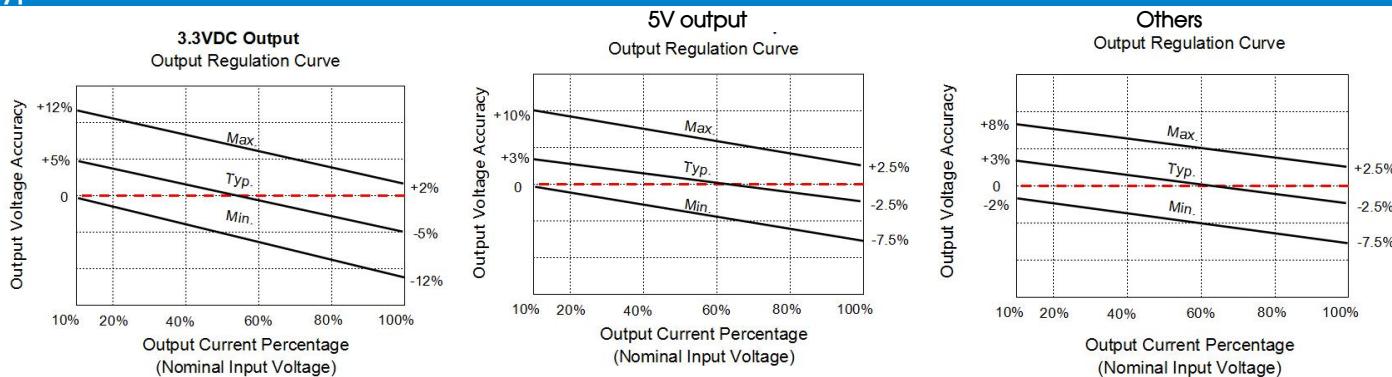


Fig. 1

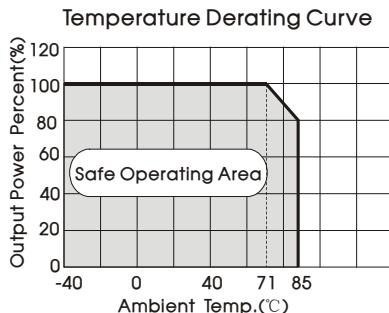
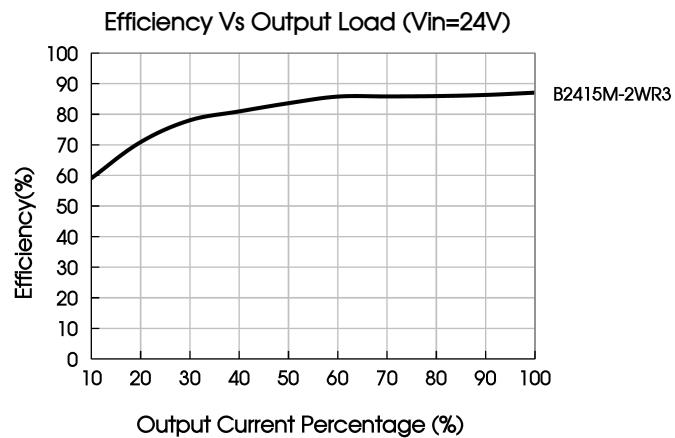
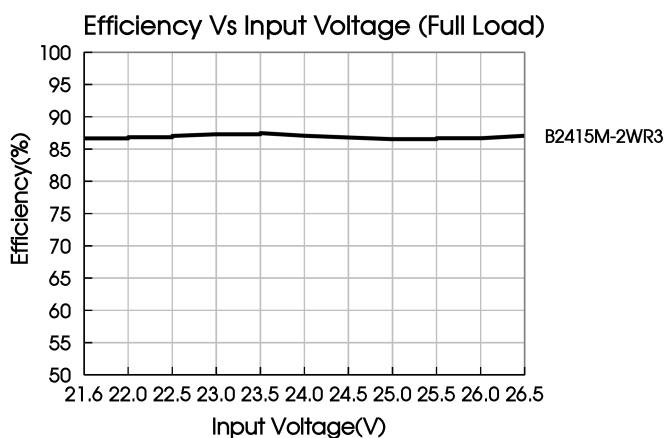


Fig. 2



## Design Reference

### 1. Typical application circuit

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig. 3.

Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.

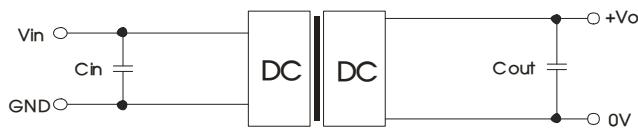


Fig. 3

Table 1: Recommended input and output capacitor values

Vin	Cin	Vo	Cout
12VDC	1μF/25V	3.3VDC/5VDC	10μF/16V
24VDC	1μF/50V	12VDC/15VDC	1μF/25V

### 2. EMC compliance circuit

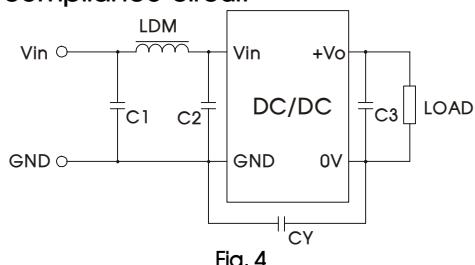
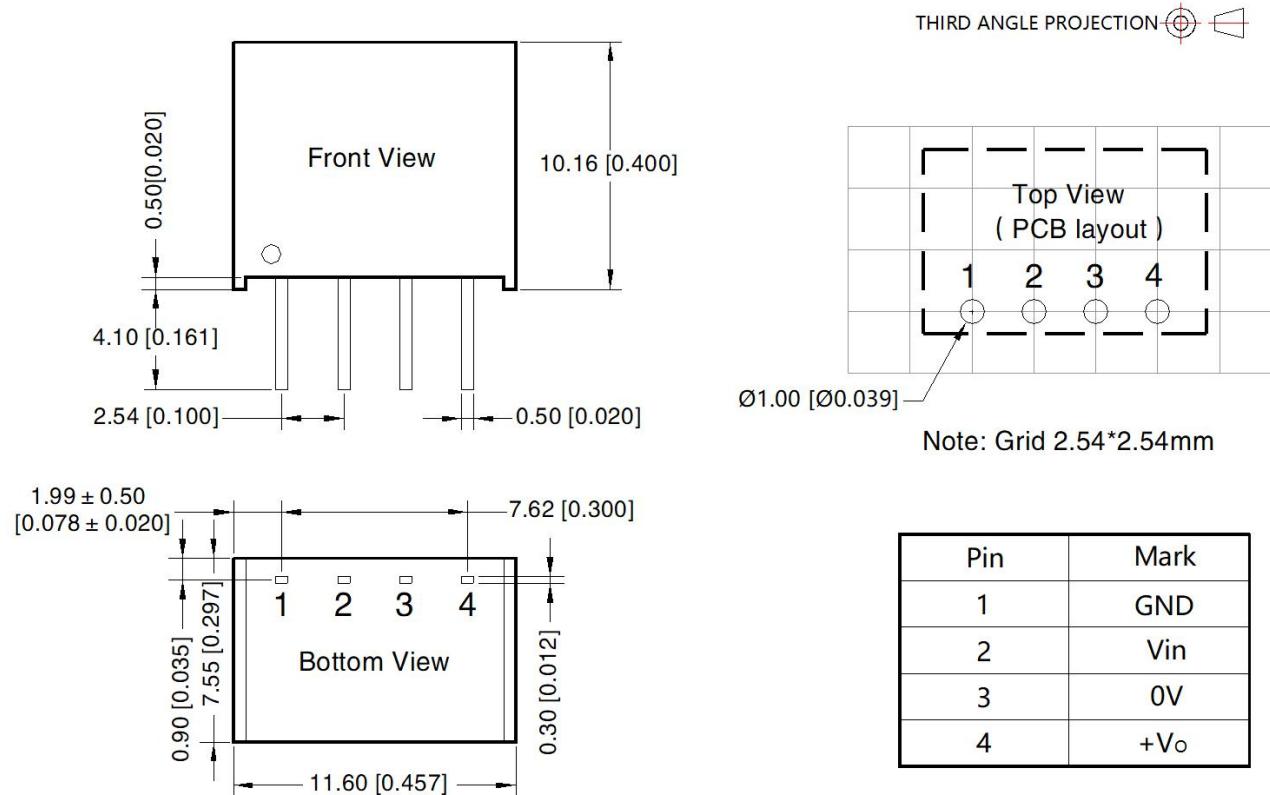


Fig. 4

Emissions	C1/C2	4.7μF /50V
	CY	270pF /2kV
	C3	Refer to Cout in Fig. 3
	LDM	6.8μH

3. For additional information please refer to DC-DC converter application notes on [www.mornsun-power.com](http://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]

Notes:

1. For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging 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  $T_a=25^\circ\text{C}$ , humidity<75%RH with nominal input voltage and rated output load;
5. All index testing methods in this datasheet are based on our company 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.

**MORNSUN Guangzhou Science & Technology Co., Ltd.**

Address: No. 5, Kehui St. 1, Kehui development center, Science Ave., Guangzhou Science City, Huangpu district, Guangzhou, P.R.China

Tel: 86-20-38601850

Fax: 86-20-38601272

E-mail: [info@mornsun.cn](mailto:info@mornsun.cn)

[www.mornsun-power.com](http://www.mornsun-power.com)