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

Patent Protection RoHS

3 years Warranty

Continuous Short Circuit Protection

FEATURES

- Continuous short-circuit protection
- No-load input current as low as 8mA
- Operating ambient temperature range: -40℃ to +85℃
- High efficiency up to 86%
- 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.		
B0505M-2WR3	5 (4.5-5.5)	5	400/40	77/81	2400
B0509M-2WR3		9	222/22	80/84	1000
B0512M-2WR3		12	167/17	77/81	560
B0515M-2WR3		15	133/13	77/81	560
B0524M-2WR3		24	83/8	80/84	220
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
B2424M-2WR3		24	83/8	80/86	220

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5VDC input	5VDC/12VDC/15VDC output	--	494/8	520/--	mA
		9VDC/24VDC output	--	477/8	500/--	
	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/--	
		24VDC output	--	97/8	104/--	
Reflected Ripple Current*			--	15	--	
Surge Voltage(1sec. max.)	5VDC input		-0.7	--	9	VDC
	12VDC input		-0.7	--	18	
	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	--
			Other output	--	--	±1.2	
Load Regulation	10%-100% load	5VDC input	5VDC output	--	11	20	%
			9VDC/12VDC/15VDC output	--	8	15	
			24VDC output	--	6	15	
		12/24VDC input	3.3VDC output	--	10	20	
			5VDC output	--	7	15	
			12VDC output	--	7	10	
			15VDC output	--	4	10	
			24VDC output	--	3	10	
Ripple & Noise*	20MHz bandwidth	5VDC input		--	75	200	mVp-p
		12/24VDC input	Other output	--	75	180	
			24VDC output	--	200	300	
Temperature Coefficient	Full load			--	±0.02	--	%/℃
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≥71℃ (see Fig. 2)		-40	--	85	℃
Storage Temperature			-55	--	125	
Case Temperature Rise	Ta=25℃		--	25	--	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds		--	--	300	
	Wave-soldering, max. 10 seconds		255	260	265	
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	5VDC input	--	220	--	kHz
		12/24VDC input	--	260	--	
MTBF	MIL-HDBK-217F@25℃		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
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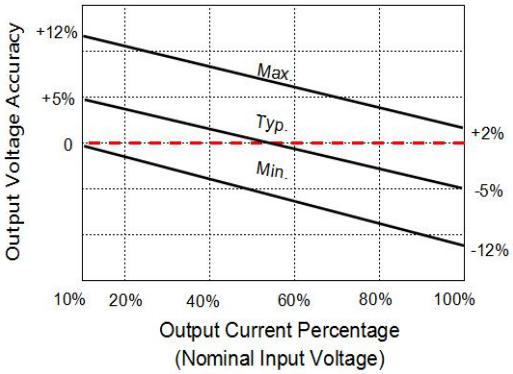
Immunity	ESD	IEC/EN61000-4-2	Air ±8kV, Contact ±6kV perf. Criteria B

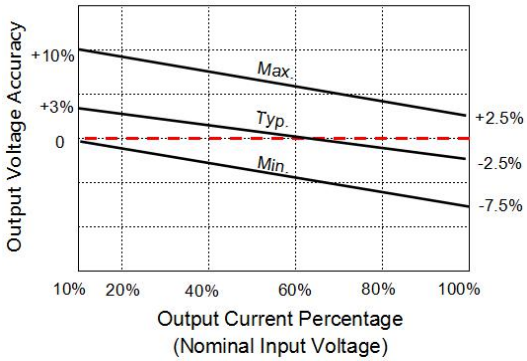
Note: Refer to Fig. 4 for recommended circuit test.

Typical Performance Curves

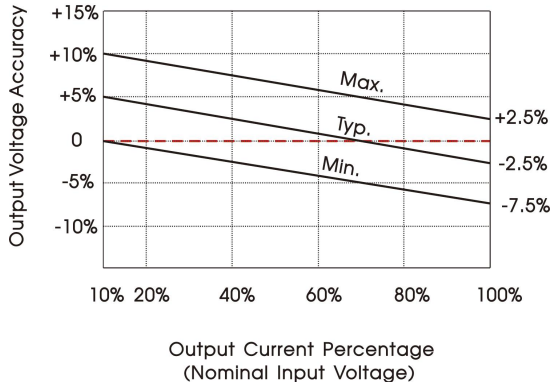
12/24V input 3.3V output
Output Regulation Curve



12/24V input 5V output
Output Regulation Curve



5V input
Output Regulation Curve



12/24V input Other output
Output Regulation Curve

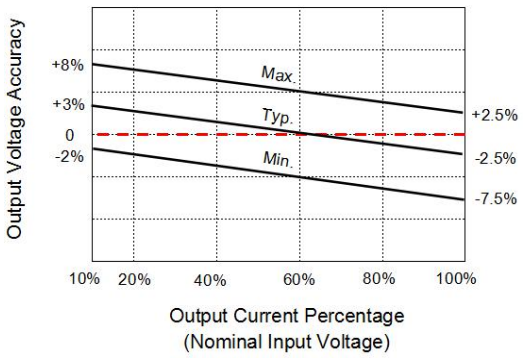


Fig. 1

Temperature Derating Curve

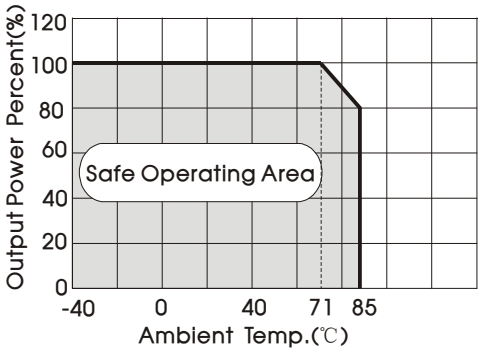
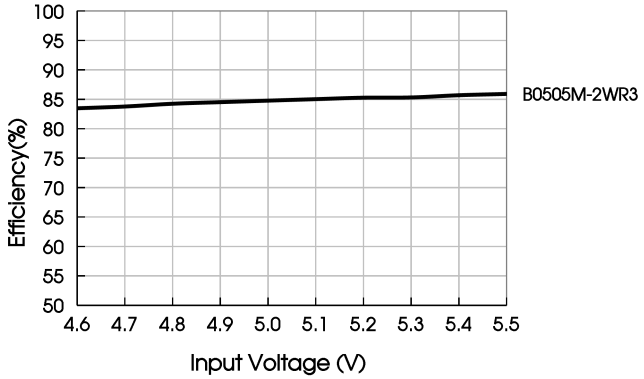
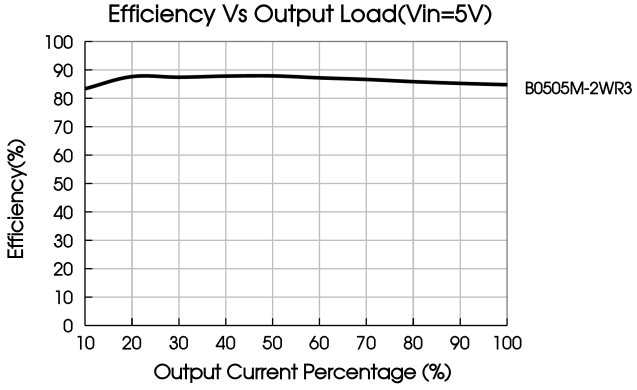


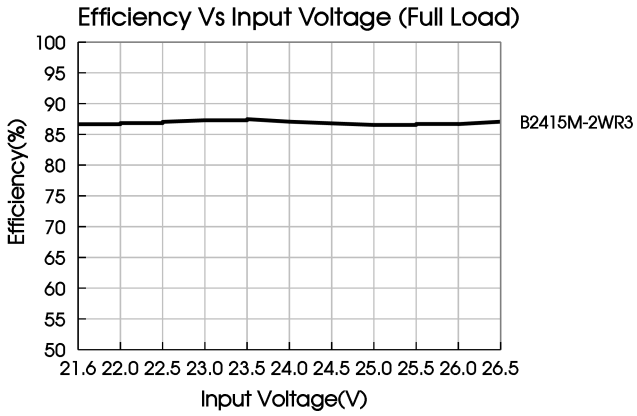
Fig. 2

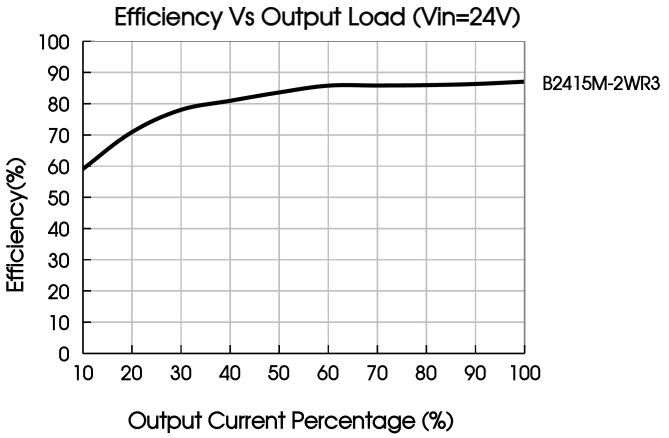
Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load(Vin=5V)







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
5VDC	4.7μF/16V	5VDC	10μF/16V
--	--	9VDC	2.2μF/25V
--	--	12VDC	2.2μF/25V
--	--	15VDC	1μF/25V
--	--	24VDC	1μF/50V
12VDC	1μF/25V	3.3VDC/5VDC	10μF/16V
24VDC	1μF/50V	12VDC/15VDC	1μF/25V
--	--	24VDC	1μF/50V

2. EMC compliance circuit

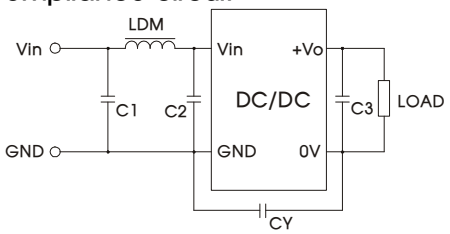
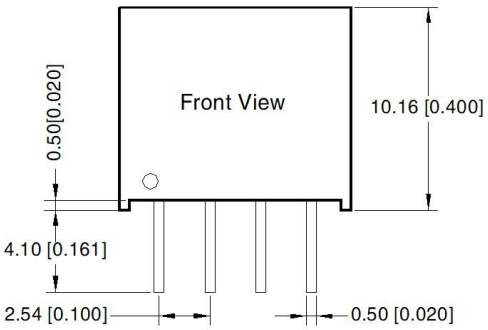


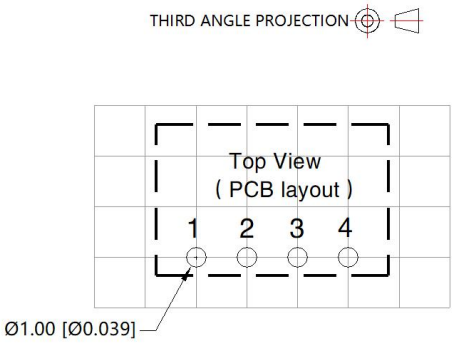
Fig. 4

Input Voltage		5V input	12/24 input
Emissions	C1/C2	4.7μF /16V	4.7μF /50V
	CY	270pF /2kV	
	C3	Refer to Cout in Fig. 3	
	LDM	6.8μH	

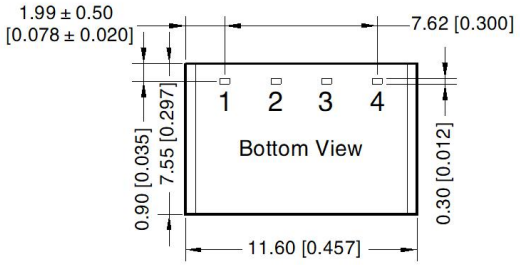
3. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout





Note: Grid 2.54*2.54mm



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

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. 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 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 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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