DC/DC Converter
B05_M-2WR3 Series

MORNSUN®

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 84%
- I/O isolation test voltage: 1.5k VDC
- Industry standard pin-out

B05_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

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/--	
Reflected Ripple Current*			--	15	--	
Surge Voltage(1sec. max.)			-0.7	--	9	VDC
Input Filter			Capacitance filter			
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
Voltage Accuracy			See output regulation curves (Fig. 1)			
Linear Regulation	Input voltage change: ±1%		--	--	±1.2	--
Load Regulation	10%-100% load	5VDC output	--	11	20	%
		9VDC/12VDC/15VDC output	--	8	15	
		24VDC output	--	6	15	
Ripple & Noise*	20MHz bandwidth		--	75	200	mVp-p
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	
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	--	220	--	kHz
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 (see Fig. 4 for recommended circuit)
	RE	CISPR32/EN55032	CLASS B (see Fig. 4 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2	Air ±8kV, Contact ±6kV perf. Criteria B

Typical Performance Curves

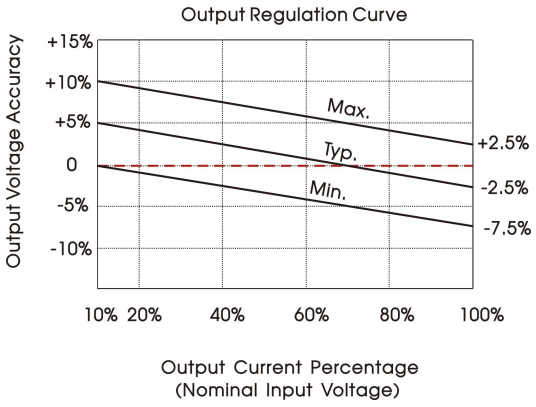


Fig. 1

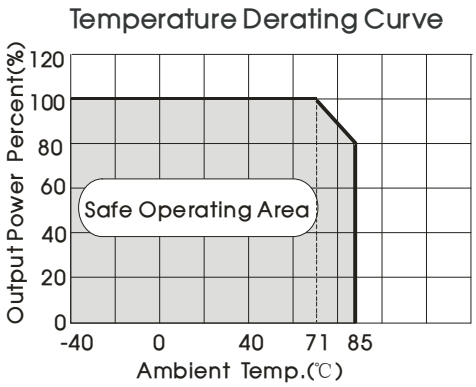
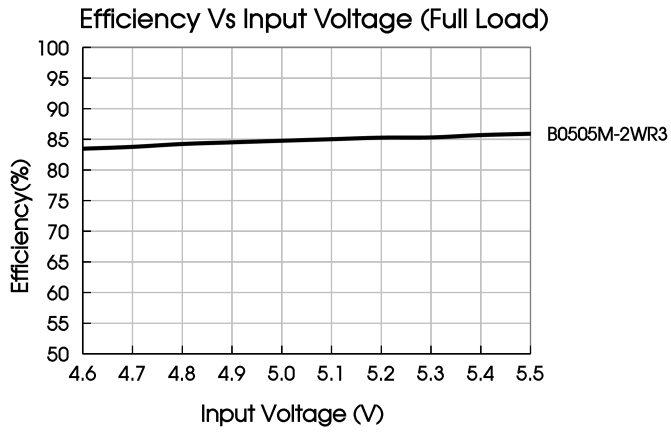
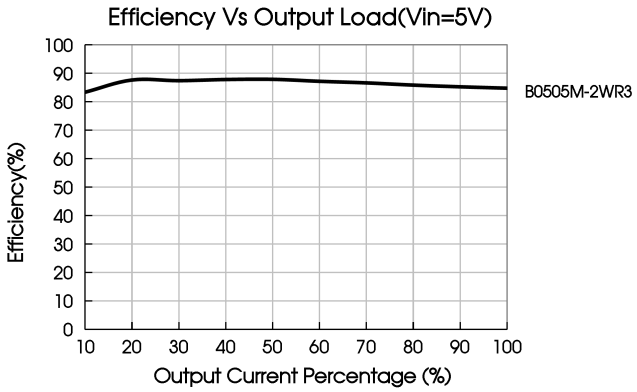


Fig. 2





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.

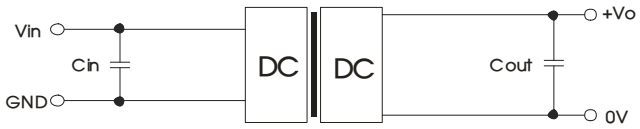


Fig. 3

Table 1: Recommended input and output capacitor values

Vin	Cin	Vo	Cout
5VDC	4.7μF/16V	5VDC	10μF/16V
--	--	9VDC	2.2μF/25V
--	--	12VDC	2.2μF/25V
--	--	15VDC	1μF/25V
--	--	24VDC	1μF/50V

2. EMC compliance circuit

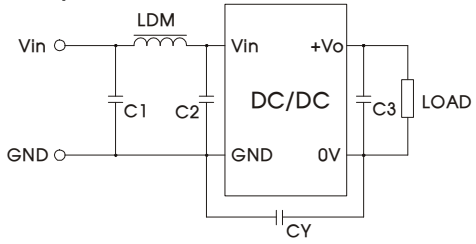
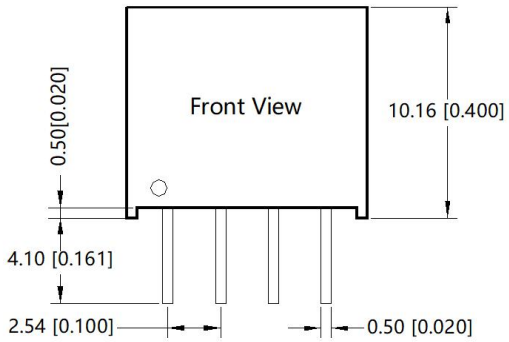


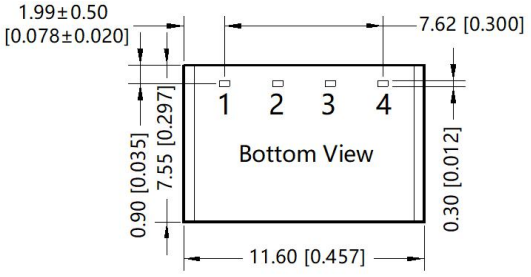
Fig. 4

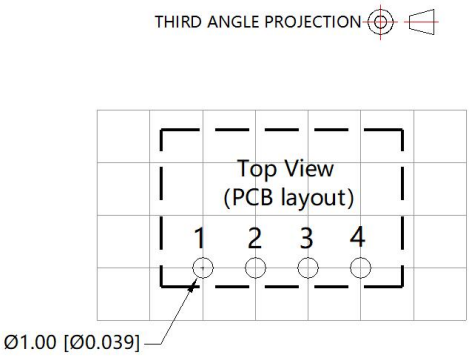
Emissions	C1/C2	4.7μF /16V
	CY	270pF /2kV
	C3	Refer to Cout in Fig. 3
	LDM	6.8μH

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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