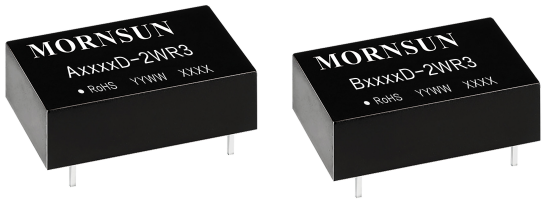
DC/DC Converter

A05_D-2WR3 & B05_D-2WR3 series

MORNSUN®

2W isolated DC-DC converter
Fixed input voltage, unregulated dual or 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 +105℃
- High efficiency up to 86%
- High power density
- I/O isolation test voltage: 1.5k VDC
- Industry standard pin-out

A05_D-2WR3 & B05_D-2WR3 series are specially designed for applications where an (two) 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

Certification	Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load*(μF) Max.
		Nominal (Range)	Voltage (VDC)	Current (mA) Max./Min.		
--	A0503D-2WR3	5 (4.5-5.5)	±3.3	±303/±30	74/78	1200
	A0505D-2WR3		±5	±200/±20	80/84	1200
	A05X7D-2WR3		±7	±143/±14	80/84	470
	A0509D-2WR3		±9	±111/±11	81/85	470
	A0512D-2WR3		±12	±83/±8	81/85	220
	A0515D-2WR3		±15	±67/±7	82/86	220
	A0524D-2WR3		±24	±42/±4	82/86	100
	B0503D-2WR3		3.3	400/40	74/78	2400
	B0505D-2WR3		5	400/40	80/84	2400
	B0509D-2WR3		9	222/22	81/85	1000
	B0512D-2WR3		12	167/17	81/85	560
	B0515D-2WR3		15	133/13	82/86	560
	B0524D-2WR3		24	83/8	82/86	220

Note: * The specified maximum capacitive load for positive and negative output is identical.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load /no-load)	5VDC input	3.3VDC output	--	513/8	541/--	mA
		5VDC/7VDC output	--	477/8	500/--	
		9VDC/12VDC output	--	471/8	494/--	
		15VDC/24VDC output	--	466/8	488/--	
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 curve (Fig. 1)			
Linear Regulation	Input voltage change: ±1%	3.3VDC output	--	--	±1.5	--
		5VDC/7VDC/9VDC/12VDC/15VDC/24VDC output	--	--	±1.2	

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Load Regulation	10%-100% load	3.3VDC output	--	12	20	%
		5VDC/7VDC output	--	9	15	
		9VDC/12VDC/15VDC output	--	7	10	
		24VDC output	--	5	10	
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≥85℃, (see Fig. 2)	-40	--	105	℃
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	100% load, nominal input voltage	--	220	--	kHz
MTBF	MIL-HDBK-217F@25℃	3500	--	--	k hours

Mechanical Specifications

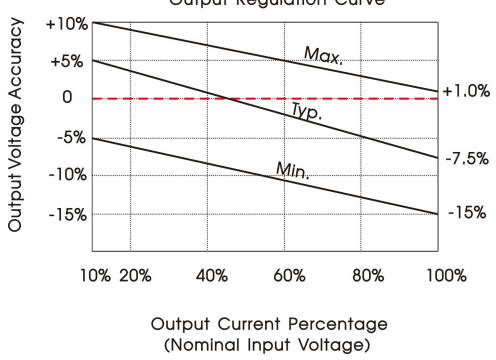
Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	20.32 x 10.16 x 8.20 mm
Weight	2.4g(Typ.)
Cooling Method	Free air convection

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 Characteristic Curves

3.3VDC output
Output Regulation Curve



5VDC/7VDC/9VDC/12VDC/15VDC/24VDC output
Output Regulation Curve

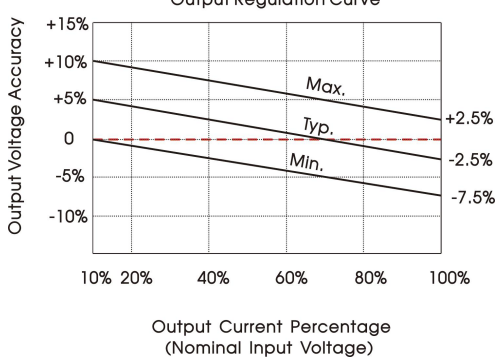


Fig. 1

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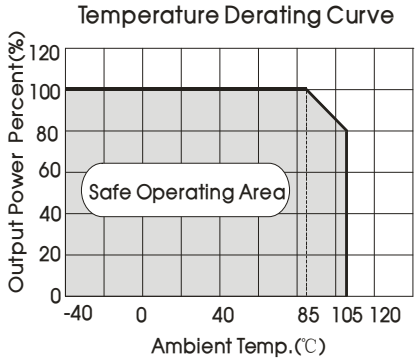
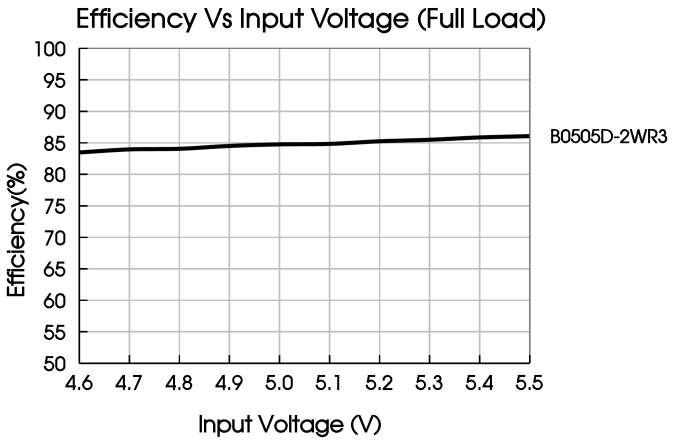
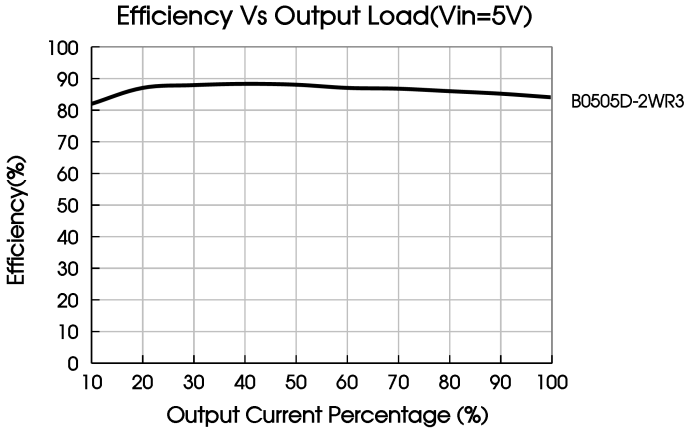


Fig. 2





Design Reference

1. Typical application

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.

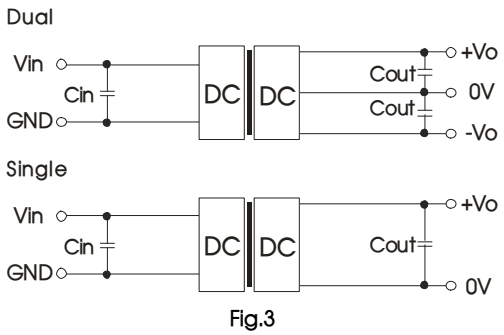


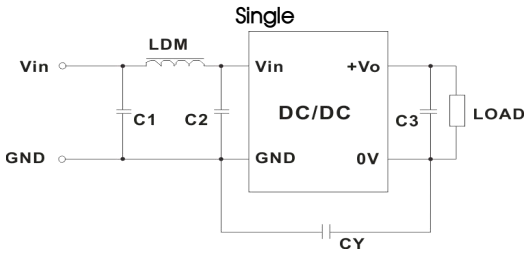
Fig.3

Table 1: Recommended input and output capacitor values

Vin	Cin	Dual Vout	Cout*	Single Vout	Cout
5VDC	4.7μF/16V	±3.3VDC	4.7μF/16V	3.3VDC	10μF/16V
--	--	±5VDC	4.7μF/16V	5VDC	10μF/16V
--	--	±7VDC	4.7μF/16V	9VDC	2.2μF/25V
--	--	±9VDC	1μF/16V	12VDC	2.2μF/25V
--	--	±15VDC	1μF/25V	15VDC	2.2μF/25V
--	--	±12VDC	1μF/25V	24VDC	1μF/50V
--	--	±24VDC	0.47μF/50V	--	--

Note: *The capacitor value of the positive and the negative output is identical.

2. EMC compliance circuit



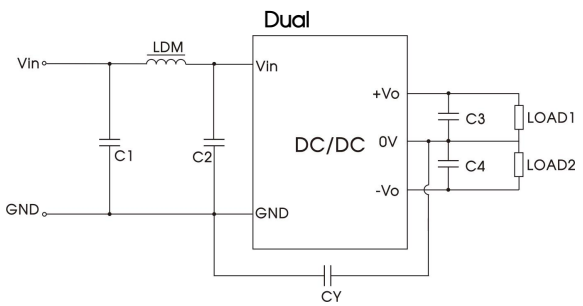


Fig.4

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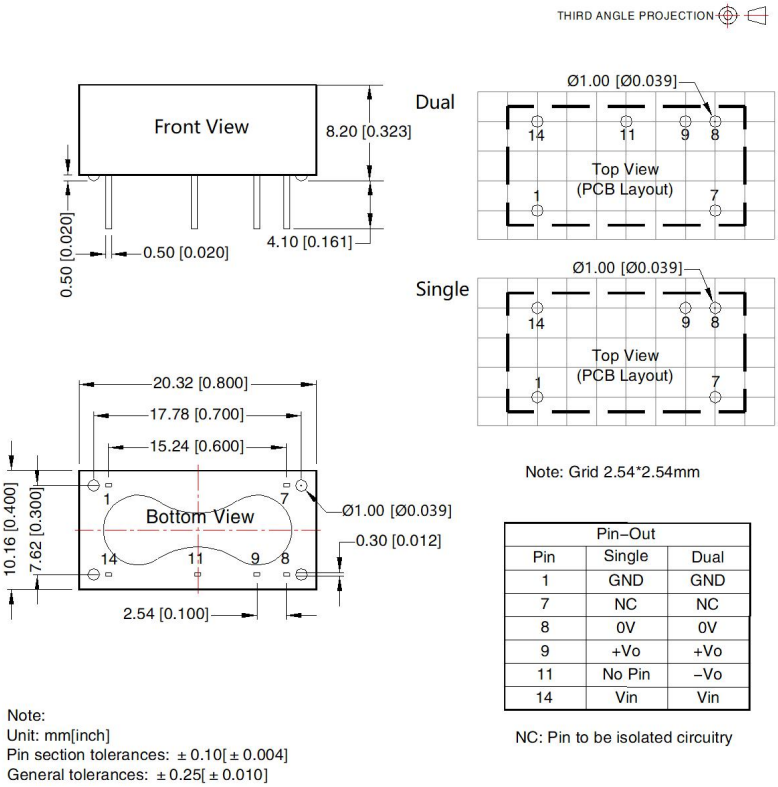
Emissions	C1/C2	4.7μF/16V
	CY	270pF/2kV
	C3/C4	Refer to the Cout in Fig.3
	LDM	6.8μH

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–Out		
Pin	Single	Dual
1	GND	GND
7	NC	NC
8	0V	0V
9	+Vo	+Vo
11	No Pin	–Vo
14	Vin	Vin

NC: Pin to be isolated circuitry

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: 58200009;
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.

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 www.mornsun-power.com

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