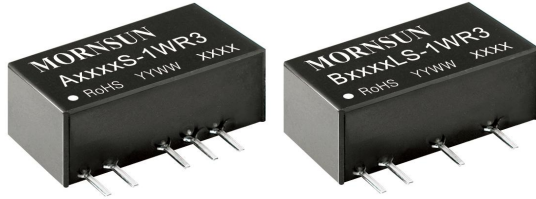


1W isolated DC-DC converter  
Fixed input voltage and unregulated dual/single output



Continuous Short  
Circuit Protection



Patent Protection RoHS

### FEATURES

- Continuous short-circuit protection
- No-load input current as low as 10mA
- Operating ambient temperature range: -40°C to +105°C
- High efficiency up to 85%
- I/O isolation test voltage: 1.5k VDC
- Industry standard pin-out
- SIP package

A03\_S-1WR3 & B03\_LS-1WR3 series are specially designed for applications where an isolated (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.		
--	A0303S-1WR3	3.3 (2.97-3.63)	±3.3	±152/±15	74/78	1200
	A0305S-1WR3		±5	±100/±10	78/82	1200
	A0309S-1WR3		±9	±56/±6	81/85	470
	A0312S-1WR3		±12	±42/±5	78/82	220
	A0315S-1WR3		±15	±34/±4	78/82	220
	A0324S-1WR3		±24	±21/±2	80/84	100
	B0303LS-1WR3		3.3	303/30	75/79	2400
	B0305LS-1WR3		5	200/20	78/82	2400
	B0309LS-1WR3		9	111/11	81/85	1000
	B0312LS-1WR3		12	83/8	78/82	560
	B0315LS-1WR3		15	67/7	78/82	560
	B0324LS-1WR3		24	42/4	80/84	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)	3.3VDC input	3.3VDC output	--	384/10	405/--	mA
		Others output	--	370/18	389/--	
Reflected Ripple Current*			--	15	--	
Surge Voltage (1sec. max.)	3.3 VDC input		-0.7	--	5	VDC
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 curve(Fig. 1)			
Linear Regulation	Input voltage change: ±1%	3.3 VDC output	--	--	±1.5	--
		Other output	--	--	±1.2	

Load Regulation	10%-100% load	3.3VDC output	--	12	18	%
		Others output	--	8	15	
Ripple & Noise*	20MHz bandwidth	3.3VDC/5VDC/9VDC/ 12VDC/15VDC output	--	30	75	mVp-p
		24VDC output	--	50	100	
Temperature Coefficient	100% load		--	±0.02	--	%/°C
Short-circuit Protection			Continuous, self-recovery			
Note:* 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 if the temperature ≥85°C (see Fig. 2)	-40	--	105	°C
Storage Temperature		-55	--	125	
Case Temperature Rise	Ta=25°C	3.3VDC output	--	25	
		Others	--	15	--
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	
Storage Humidity	Non-condensing	5	--	95	%RH
Switching Frequency	100% load, nominal input voltage	--	220	--	kHz
MTBF	MIL-HDBK-217F@25°C	3500	--	--	k hours

### Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)
Dimensions	19.65 x 6.00 x 10.16mm
Weight	2.1g(Typ.)
Cooling methods	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

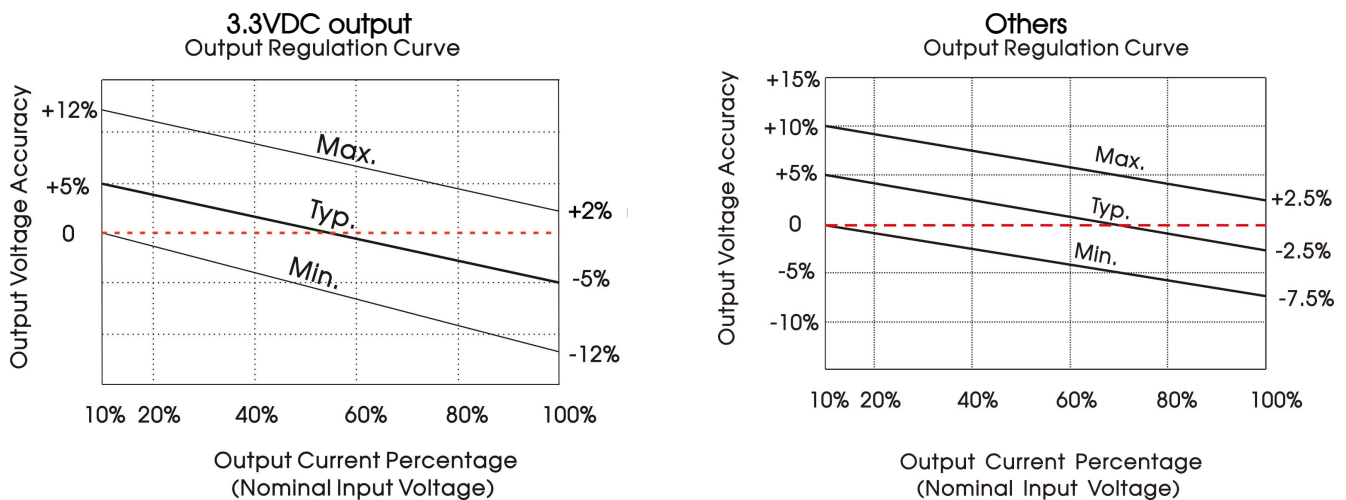


Fig. 1

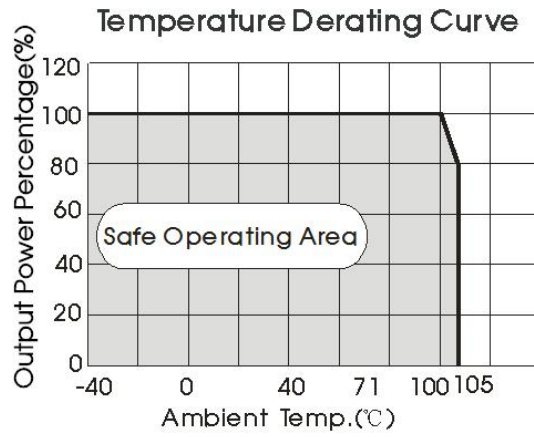
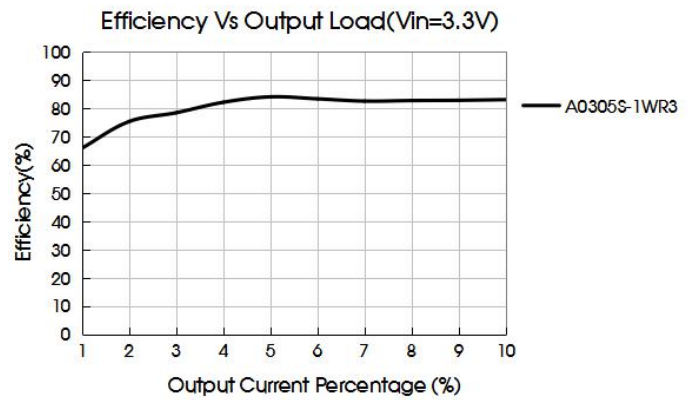
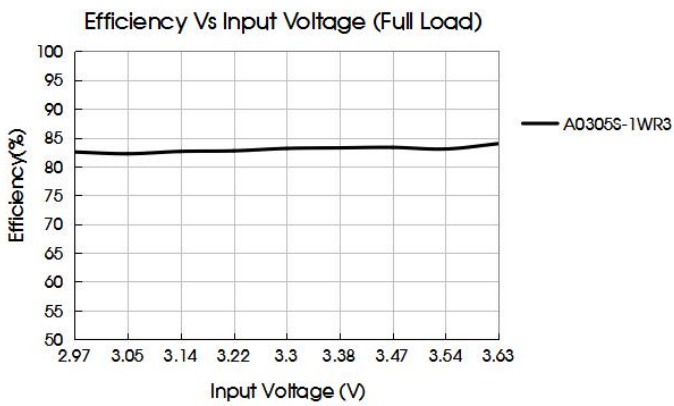
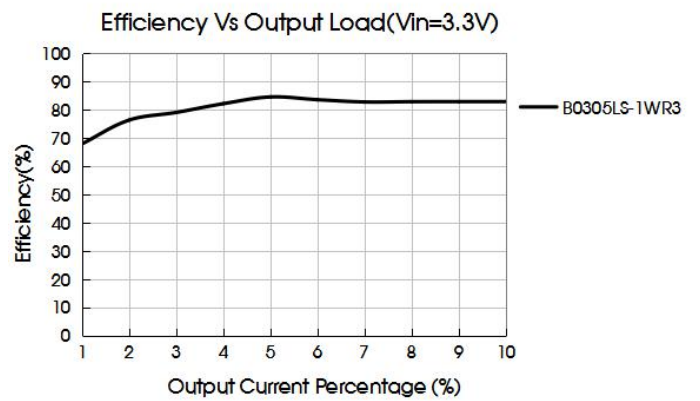
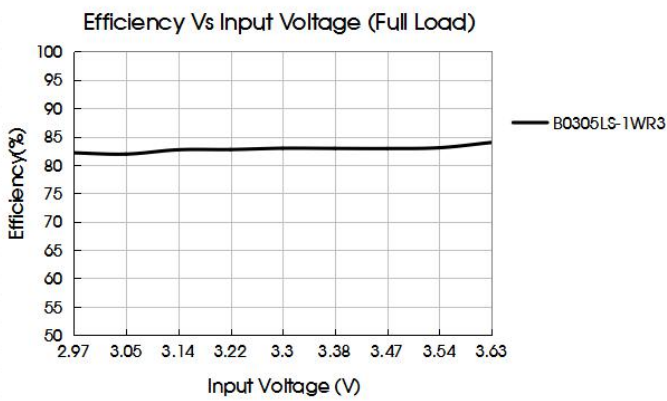


Fig. 2



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.

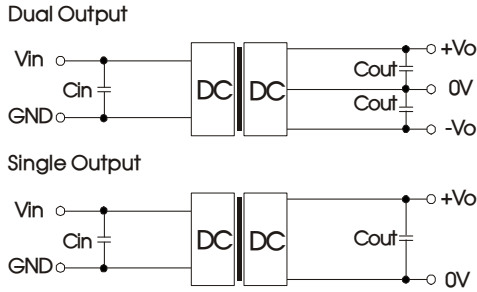


Fig. 3

Recommended capacitive load value table (Table 1)

Vin	Cin	Single output	Cout	Dual output	Cout
3.3VDC	10uF/16V	3.3/5VDC	10uF/16V	±3.3/±5VDC	10uF/16V
--	--	9/12VDC	2.2uF/25V	±9/±12VDC	2.2uF/25V
--	--	15/24VDC	1uF/50V	±15/±24VDC	1uF/50V

2. EMC (CLASS B) compliance circuit

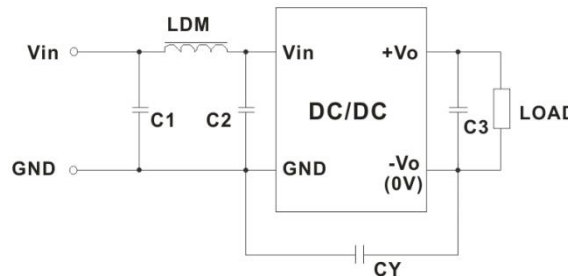


Fig. 4

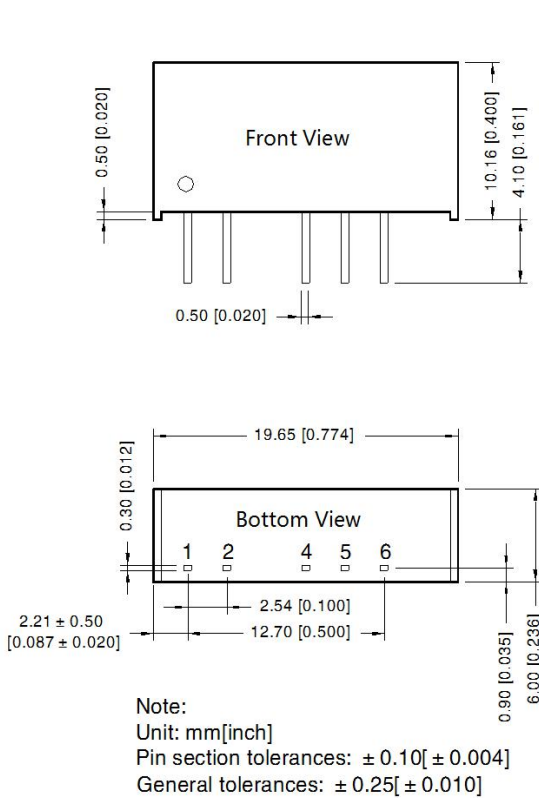
EMC recommended circuit value table (Table 2)

Input voltage 5VDC	Emissions	Output voltage	3.3/5VDC	9/12/15/24VDC
		C1/C2	4.7μF /16V	
		CY	--	270pF /2kVDC VISHAY HGZ102MBP TDK CD45-E2GA102M-GKA
		C3	Refer to the Cout in table 1	
		LDM	6.8μH	

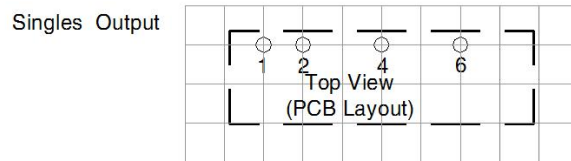
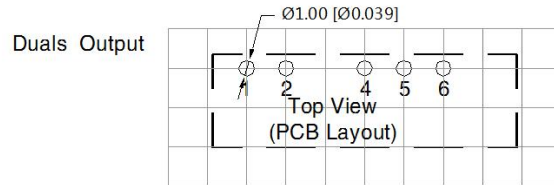
Note: In the case of actual use, the requirements for EMI are high, it is subject to CY (CY: 270pF /4kV).

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



THIRD ANGLE PROJECTION



Note: Grid 2.54\*2.54mm

Pin	Pin-Out	
	Singles	Duals
1	Vin	Vin
2	GND	GND
4	0V	-Vo
5	No Pin	0V
6	+Vo	+Vo

Notes:

- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58200001;
- 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;
- The maximum capacitive load offered were tested at input voltage range and full load;
- 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;
- All index testing methods in this datasheet are based on our company corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- 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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