1W isolated DC-DC converter
Fixed input voltage, unregulated dual 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 81%
- High power density
- I/O isolation test voltage: 1.5k VDC
- Industry standard pin-out
- DIP Package

A05_D-1WR3 series are specially designed for applications where 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-1WR3	5 (4.5-5.5)	±3.3	±152/±15	70/74	1200
	A0505D-1WR3		±5	±100/±10	76/80	1200
	A0509D-1WR3		±9	±56/±6	77/81	470
	A0512D-1WR3		±12	±42/±5	77/81	220
	A0515D-1WR3		±15	±34/±4	77/81	220

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

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Current (full load / no-load)	5VDC input	3.3VDC output	--	270/5	286/25	mA
		5VDC output	--	251/8	264/--	
		9VDC/12VDC/ 15VDC output	--	247/8	260/--	
Reflected Ripple Current*			--	15	--	
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%	3.3VDC output	--	--	±1.5	--
		Other output	--	--	±1.2	
Load Regulation	10%-100% load	3.3VDC output	--	15	20	%
		5VDC output	--	10	15	
		9VDC output	--	9	10	
		12VDC output	--	8	10	
		15VDC output	--	7	10	
Ripple & Noise*	20MHz bandwidth		--	50	100	mVp-p
Temperature Coefficient	100% load		--	±0.02	--	%/℃
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 when operating temperature≥85℃, (see Fig. 2)		-40	--	105	℃
Storage Temperature			-55	--	125	℃
Case Temperature Rise	Ta=25℃	3.3VDC output	--	25	--	℃
		Other output	--	15	--	℃
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds		--	--	300	℃
Storage Humidity	Non-condensing		--	--	95	%RH
Switching Frequency	100% load, nominal input voltage		--	300	--	kHz
MTBF	MIL-HDBK-217F@25℃		3500	--	--	k hours

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	20.00 x 10.00 x 7.00 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

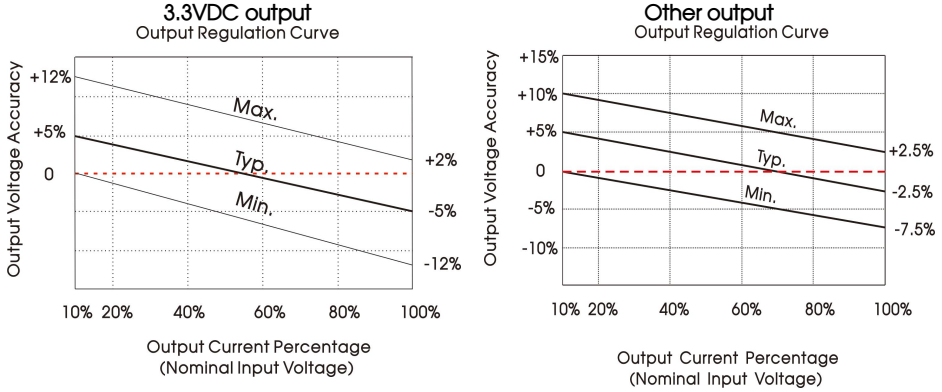


Fig. 1

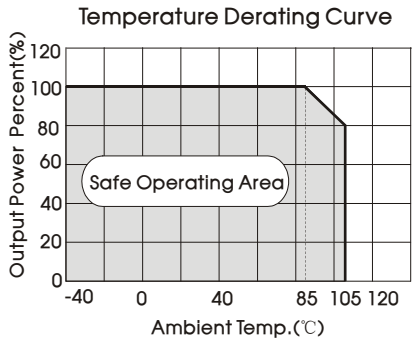
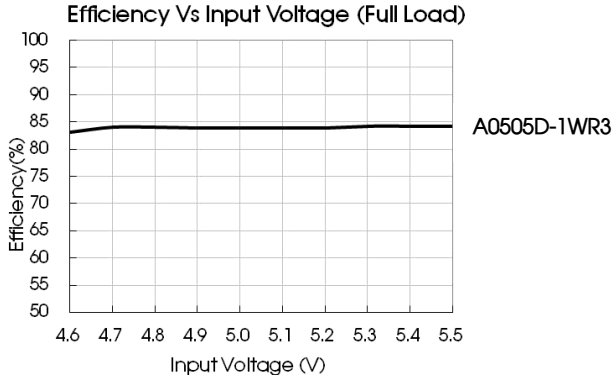
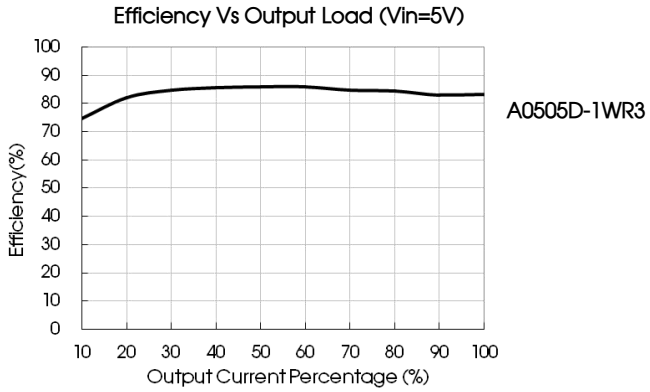


Fig. 2





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.

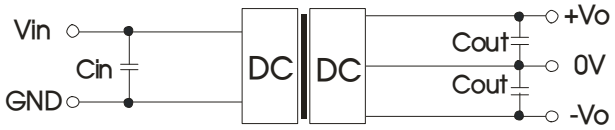


Fig. 3

Recommended capacitive load value table (Table 1)

Vin	Cin	Vo	Cout
5VDC	4.7μF/16V	±3.3VDC/±5VDC	4.7μF/16V
--	--	±9/±12VDC	1μF/25V
--	--	±15VDC	0.47μF/50V

2. EMC compliance circuit

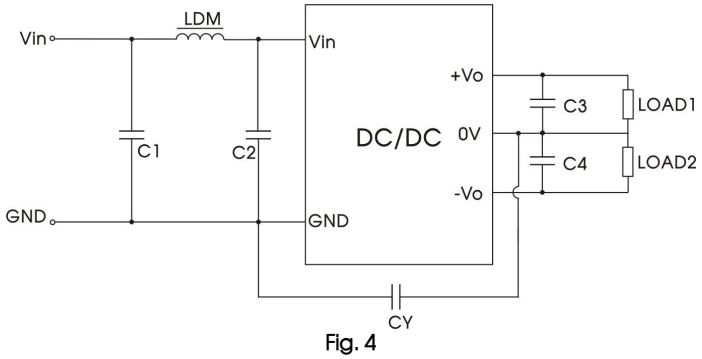


Fig. 4

EMC recommended circuit value table (Table 2)

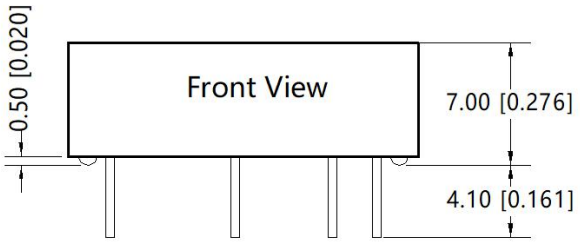
Output voltage		3.3/5/9VDC	12/15VDC
Emissions	C1/C2	4.7μF /25V	4.7μF /25V
	CY	100pF /2kVDC	1000pF /2kVDC
	C3/C4	Refer to the Cout in table 1	
	LDM	6.8μH	6.8μH

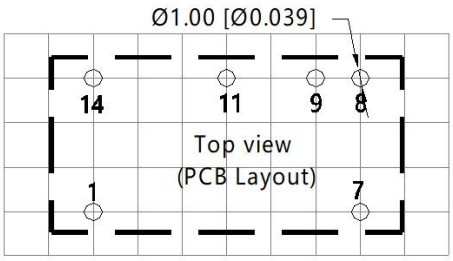
Note: In the case of actual use, the requirements for EMI are high, it is subject to CY.

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

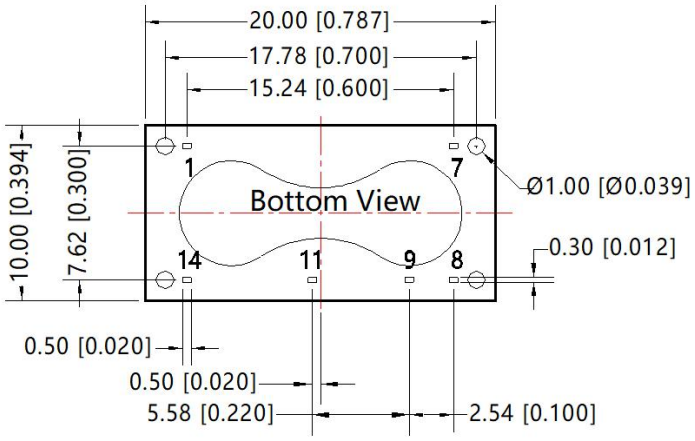
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





Note: Grid 2.54*2.54mm



Pin-Out	
Pin	Mark
1	GND
7	NC
8	0V
9	+Vo
11	-Vo
14	Vin

NC: No connection

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.

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