DC/DC Converter
D050505D-1WR3

MORNSUN®

1W isolated DC-DC converter
Fixed input voltage, unregulated dual output

Patent Protection

Continuous Short Circuit Protection

CE Report EN 62368-1

UKCA Report BS EN62368-1

RoHS

3 years Warranty

FEATURES

- Continuous short-circuit protection
- Operating ambient temperature range: -40℃ to +105℃
- High efficiency up to 84%
- Input-output isolation test voltage 1.5k VDC, Output-output isolation test voltage 1k VDC
- Compact DIP package

D050505D-1WR3 is specifically designed for applications that require four independent sets of power supplies that are isolated from the input power supply. These products apply to:

1. Where the voltage of the input power supply is fixed (Voltage variation ⩽ ±10%);

2. Where isolation is necessary between input and output (Isolation voltage ⩽1500VDC);

Such as: purely digital circuits, ordinary low frequency analog circuits, and multi-channel isolated power supply 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.			
			Vo1	Vo2	Io1	Io2		
EN/BS EN	D050505D-1WR3	5 (4.5-5.5)	5	5	100/10	100/10	80/84	680

Note: *Each of the two outputs has the same maximum capacitive load.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Current (full load / no-load)	5VDC input	--	238/10	250/30	mA
Reflected Ripple Current*		--	15	--	
Surge Voltage (1sec. max.)	5VDC input	-0.7	--	9	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%	--	--	±1.2	--
Load Regulation*	10%-100% load	--	--	15	%
Ripple & Noise**	20MHz bandwidth	--	50	75	mVp-p
Temperature Coefficient	100% load	--	±0.03	--	%/℃
Short-circuit Protection		Continuous, self-recovery			

Note: *All the above indexes were measured under balanced load condition.
**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
	Output-output electric strength test for 1 minute with a leakage current of 1mA max.	1000	--	--	

Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	40	--	pF
Operating Temperature	Derating when operating temperature≥85℃, (see Fig. 2)	-40	--	105	℃
Storage Temperature		-55	--	125	
Case Temperature Rise	Ta=25℃	--	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	--	270	--	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 7.00mm
Weight	2.5g(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	Contact ±4kV perf. Criteria B

Typical Characteristic Curves

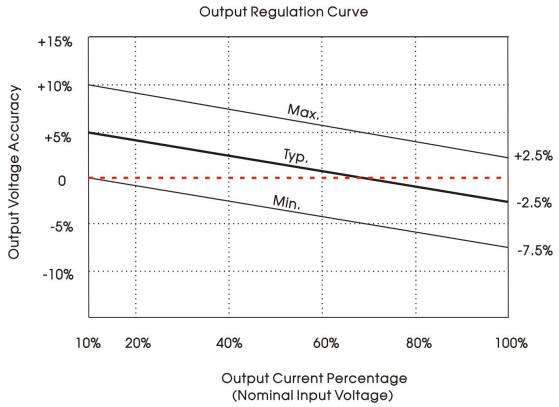


Fig. 1

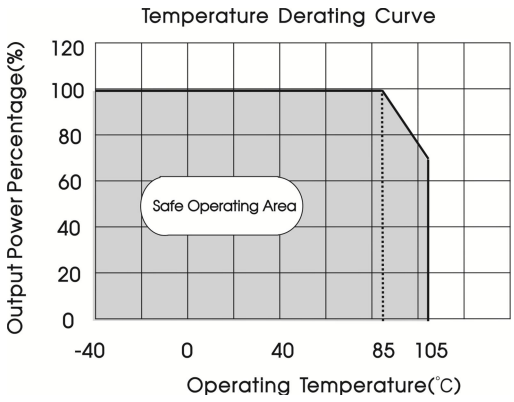
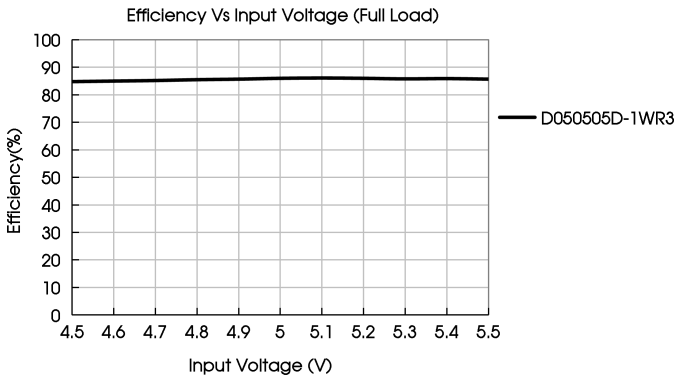
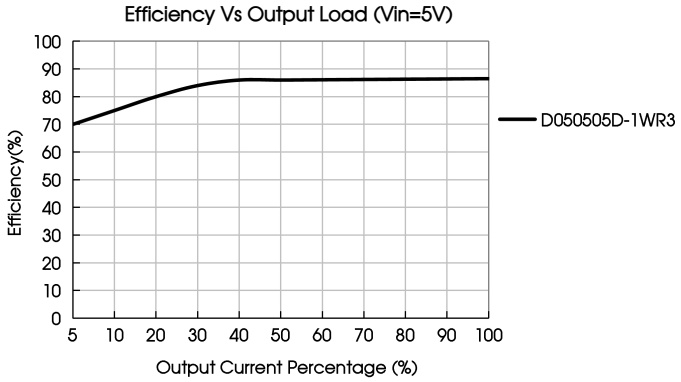


Fig. 2





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.

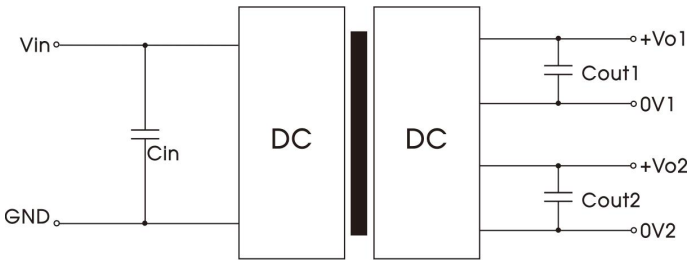


Fig. 3

Recommended capacitive load value table (Table 1)

Vin	Cin	Vout	Cout
5VDC	4.7μF/10V	5VDC	10μF/10V

2. EMC (CLASS B) compliance circuit

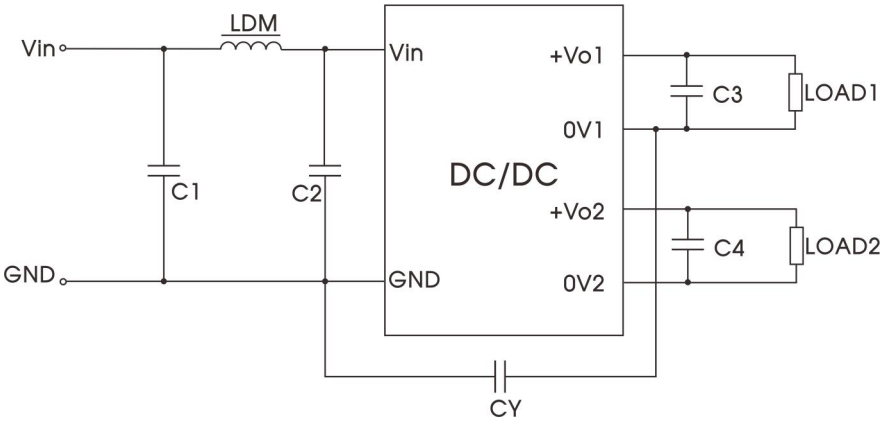


Fig. 4

EMC recommended circuit value table (Table 2)

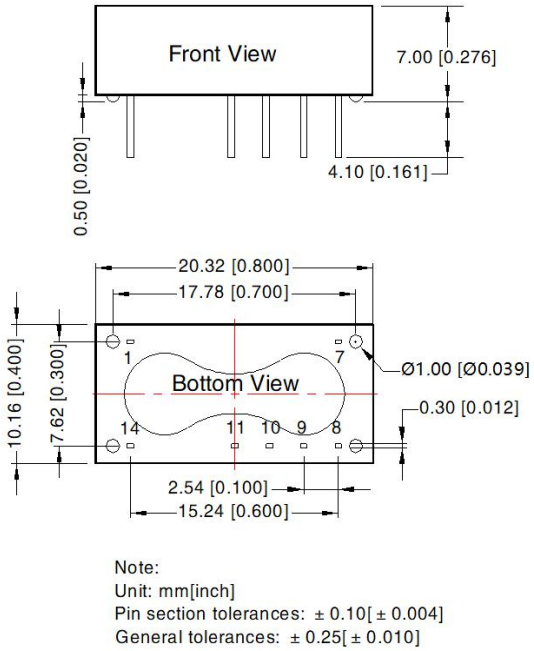
Input voltage 5VDC	Output voltage		5VDC
	Emissions	C1/C2	4.7μF /10V
		CY	47pF /2000V
		C3/C4	10μF /10V
		LDM	6.8μH

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

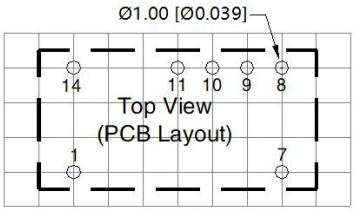
3. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.25[± 0.010]



Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Mark
1	GND
7	NC
8	+Vo2
9	0V2
10	+Vo1
11	0V1
14	Vin

NC: Pin to be isolated circuitry

Note:

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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