

1W isolated DC-DC converter with Fixed Input Voltage and Regulated Single Output



Continuous Short Circuit Protection



Patent Protection **RoHS**

## FEATURES

- Continuous short-circuit protection
- No-load input current as low as 5mA
- Operating ambient temperature -40°C ~ +85°C
- I/O isolation test voltage 3000 VDC
- Industry standard pin-out
- Compact SMD package

IF05\_XT-1WR3 series are specially designed for applications where an isolated voltage is required in a distributed power supply system. They are suitable for occasions of: pre-interference isolation, ground interference elimination, pure digital circuit, voltage isolation conversion, general low frequency analog circuit, relay drive circuit, etc.

## 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.		
--	IF0503XT-1WR3	5 (4.75-5.25)	3.3	250/25	62/66	2400
	IF0505XT-1WR3		5	200/20	65/69	2400
	IF0509XT-1WR3		9	111/12	66/70	1000
	IF0512XT-1WR3		12	84/9	67/71	560
	IF0515XT-1WR3		15	67/7	67/71	560

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	3.3VDC output	--	303/5	323/10	mA
	5VDC output	--	290/5	308/10	
	9VDC output	--	286/6	304/20	
	12VDC/15VDC output	--	282/9	299/30	
Reflected Ripple Current*		--	30	--	mA
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	100% load	--	--	±3	%
Linear Regulation	Input voltage change: ±1%	--	--	±0.25	
Load Regulation	10%-100% load	3.3VDC output	--	±3	
		All other output voltages	--	±2	
Ripple*	20MHz bandwidth	--	30	75	mVp-p
Noise*		--	60	100	
Temperature Coefficient	100% load	--	--	±0.03	%/°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.	3000	--	--	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 up to 71°C (See Fig. 1)	-40	--	85	°C	
Storage Temperature		-55	--	125		
Case Temperature Rise	Ta =25°C	3.3VDC output	--	30		--
		All other output voltages	--	25		--
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300		
Reflow Soldering Temperature*		Peak temperature ≤245°C, duration ≤60s max. over 217°C. See IPC/JEDEC J-STD-020D.1.				
Storage Humidity	Non-condensing	--	--	95	%RH	
Switching Frequency	100% load, nominal input voltage	--	250	--	KHz	
MTBF	MIL-HDBK-217F@25°C	3500	--	--	K hours	
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1	Level 1				

Note: \* For actual application, please refer to IPC/JEDEC J-STD-020D.1.

Mechanical Specifications

Case Material	Black Epoxy resin; flame-retardant and heat-resistant (UL94-V0)
Dimensions	15.24 x 11.40 x 7.25mm
Weight	1.2g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B (see Fig. 3 for recommended circuit)
	RE	CISPR32/EN55032 CLASS B (see Fig. 3 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2 Air ±8kV , Contact ±4kV perf. Criteria B

Typical Characteristic Curves

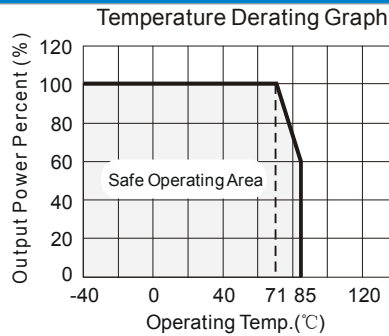
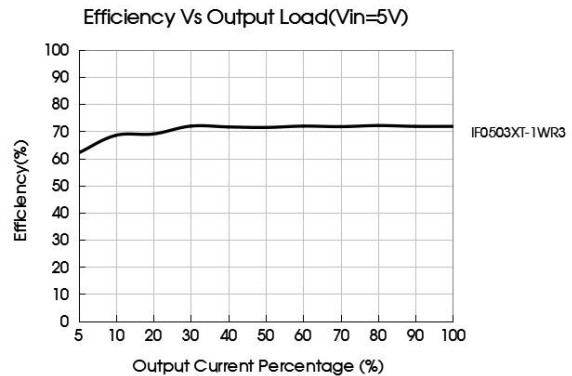
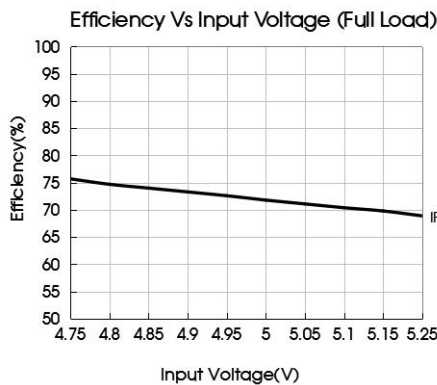


Fig. 1



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.2.

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.

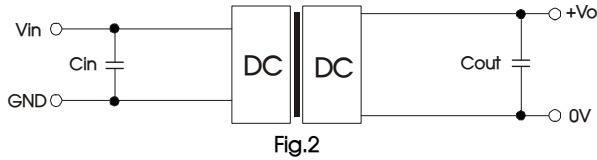


Table 1: Recommended capacitive load value table

Vin(VDC)	Cin(μF)	Vo (VDC)	Cout(μF)
5	4.7	3.3/5	10
--	--	9/12	2.2
--	--	15	1

2. EMC compliance circuit

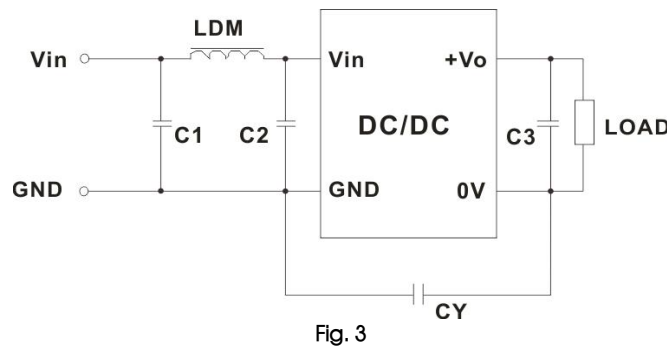


Table 2: Recommended EMC filter values

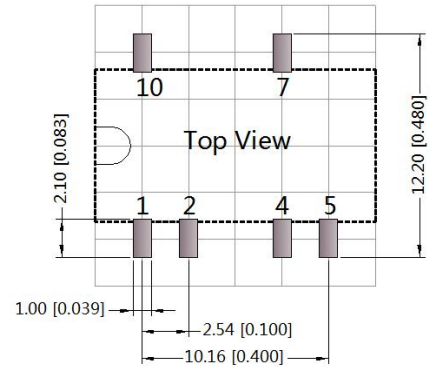
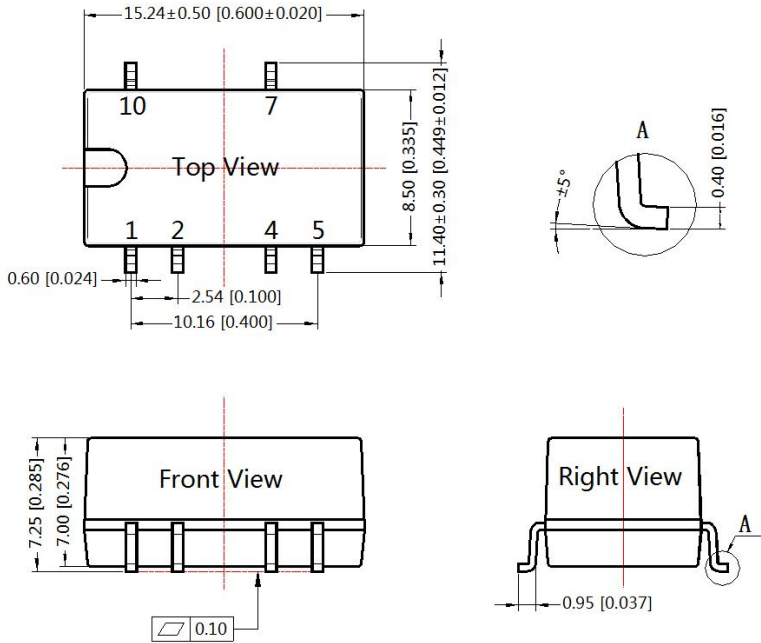
Input voltage 5VDC	Output voltage (VDC)		
	3.3/5/9	12/15	
EMI	C1/C2	4.7μF /25V	4.7μF /25V
	CY	--	1nF/4KVDC VISHAY HGZ102MBP TDK CD45-E2GA102M-GKA
	C3	Refer to the Cout in table 1	
	LDM	6.8μH	

Note: In the case of actual use, the requirements for EMI are high, it is subject to CY (1nF/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 

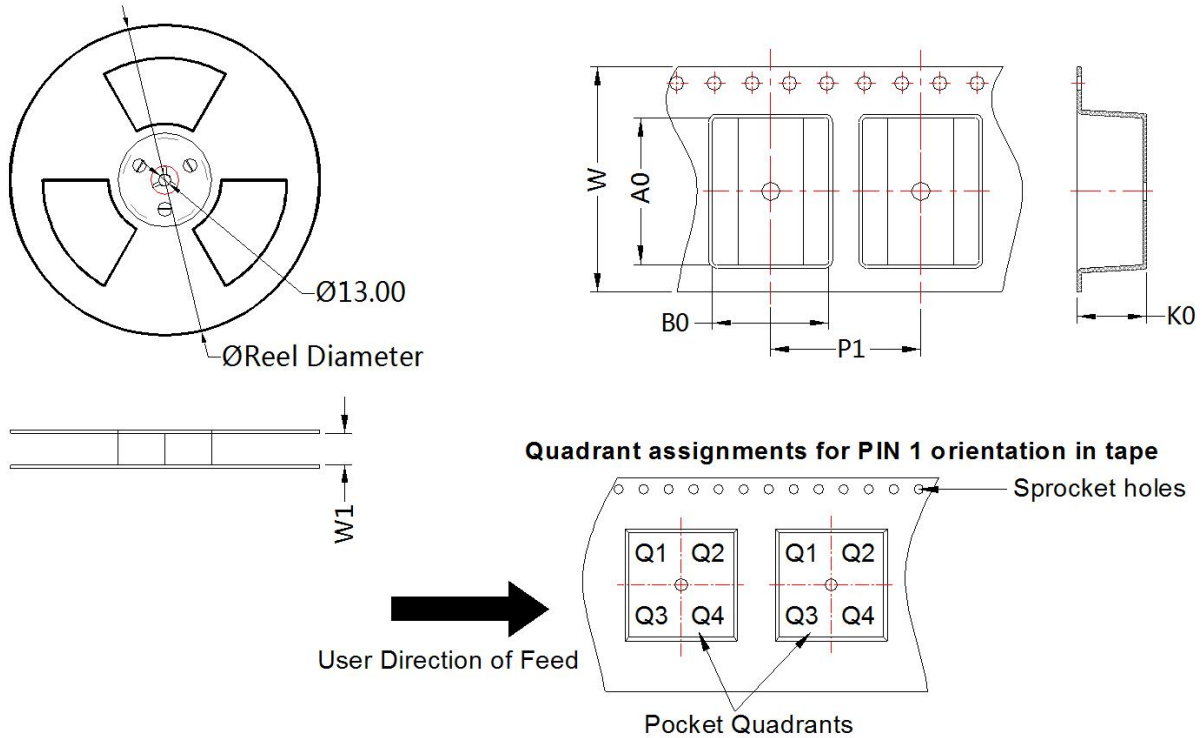


Note: Grid 2.54\*2.54mm

Pin-Out	
Pin	Function
1	GND
2	Vin
4	0V
5	0V
7	+Vo
10	NC

NC: Pin to be isolated from circuitry

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



Device	Package Type	Pin	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
IF05_XT-1WR3	SMD	6	500	330.0	24.5	15.64	12.4	7.45	16.0	24.0	Q1

Notes:

1. For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number 58210023, Roll packaging bag number:58210034;
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  $T_a=25^{\circ}\text{C}$ , 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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