

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



CE Patent Protection RoHS

FEATURES

- High efficiency up to 74%
- I/O isolation test voltage 3k VDC
- Operating ambient temperature range -40°C to +85°C
- Compact SMD package
- Internal surface mounted design
- No external components required
- Industry standard pin-out
- EN60950 Approval

IF_XT-1WR2 series are specially designed for applications where an isolated voltage is required in a distributed power supply system with the following application characteristics:

1. The voltage to the input of the power supply is relatively stable with a variation of $\pm 5\%V_{in}$ nominal;
2. High Input to Output isolation of up to 3000VDC is necessary;
3. Applications with a tight line and load regulation requirement combined with low ripple & noise on the output.

Selection Guide

Certification	Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load (μ F) Max.	
		Nominal (Range)	Voltage (VDC)	Current (mA) Max./Min.			
CE	IF0503XT-1WR2	5 (4.75-5.25)	3.3	243/25	54/58	220	
	IF0505XT-1WR2		5	200/20	68/72		
	IF0512XT-1WR2		12	83/9	69/73		
	IF0515XT-1WR2		15	67/7	70/74		
	IF1205XT-1WR2	12 (11.4-12.6)	5	200/20	69/73		
	IF1212XT-1WR2		12	83/9	69/73		
	IF2405XT-1WR2		24 (22.8-25.2)	5	200/20		69/73
	IF2412XT-1WR2			12	83/9		68/72

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5V input series	--	270/15	--/40	mA
	12V input series	--	115/10	--/30	
	24V input series	--	56/7	--/20	
Surge Voltage (1sec. max.)	5V input series	-0.7	--	9	VDC
	12V input series	-0.7	--	18	
	24V input series	-0.7	--	30	
Reflected Ripple Current*		--	15	--	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: $\pm 1\%$	--	--	± 0.25	
Load Regulation	10%-100% load	3.3VDC output	--	3	
		All other output voltages	--	2	

Ripple*	20MHz bandwidth	--	10	30	mVp-p
Noise*		--	50	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	--	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	--	100	--	KHz
MTBF	MIL-HDBK-217F@25°C	3500	--	--	K hours

Mechanical Specifications

Case Material	Black Epoxy resin; flame-retardant and heat-resistant (UL94-V0)
Dimensions	15.24 x 11.20 x 7.25mm
Weight	2.0g(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 Contact ±6KV perf. Criteria B

Typical Characteristic Curves

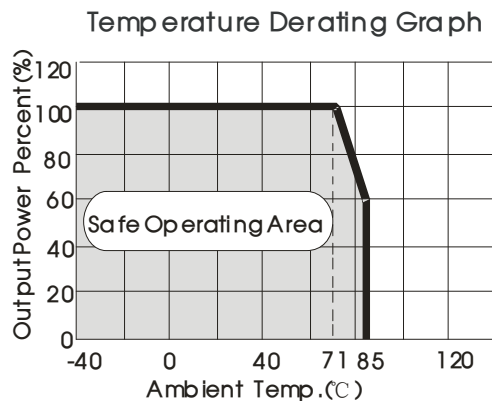
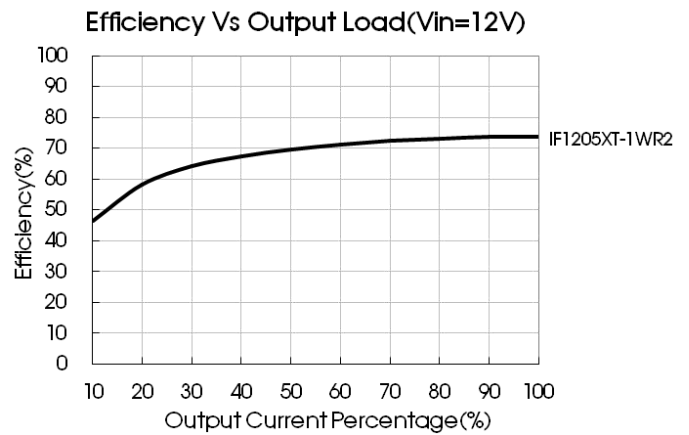
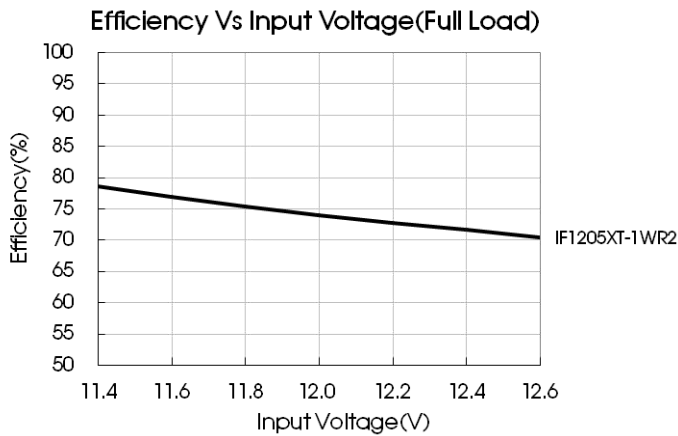
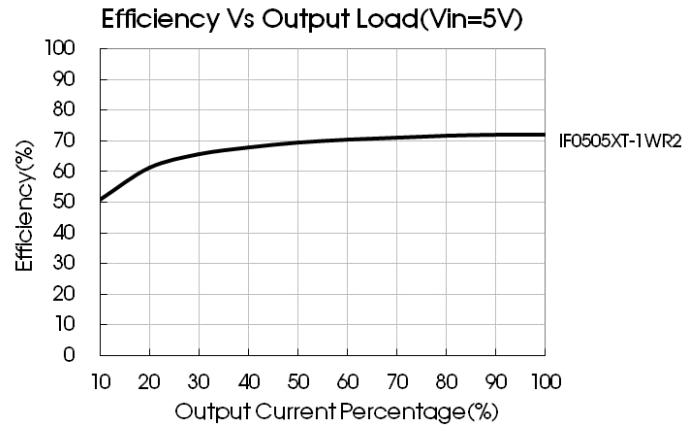
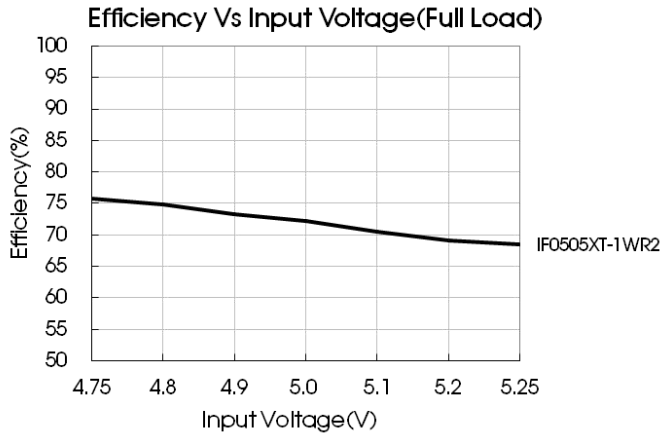


Fig. 1



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.

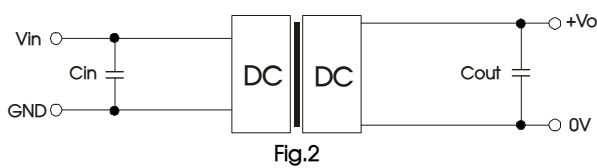
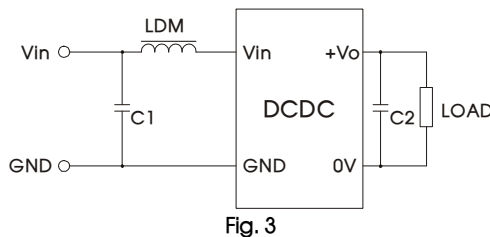


Table 1: Recommended capacitive load value table

Vin(VDC)	Cin(μF)	Vo (VDC)	Cout(μF)
5	4.7	3.3/5	10
12	2.2	12	2.2
24	1	15	1

2. EMC compliance circuit



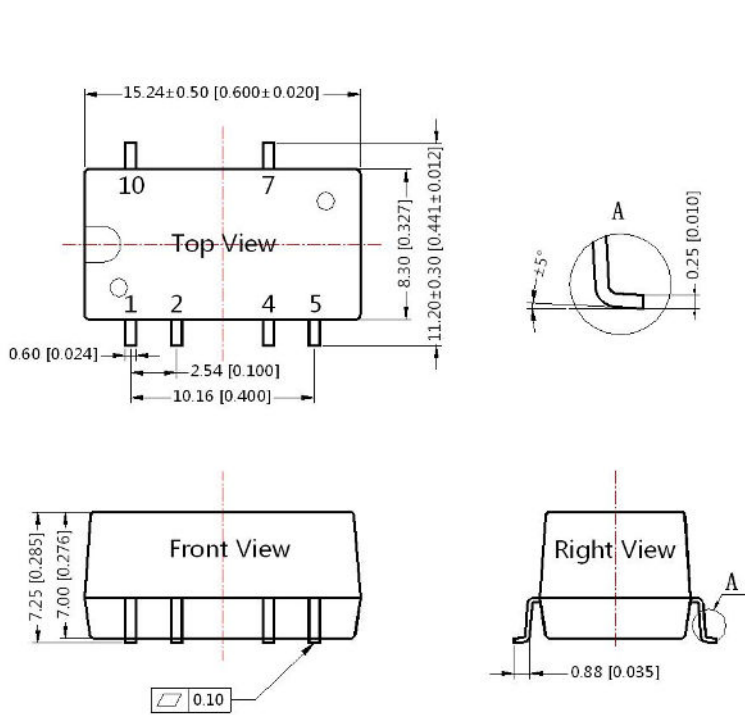
Input voltage (V)		5/12/24
EMI	C1	4.7μF /50V
	C2	Refer to the Cout in Fig.2
	LDM	6.8μH

3. Minimum Output load requirements

For a reliable and efficient operation of the converter, the minimum load should never be less than 10% of the rated output load. If the total required output power is below 10%, a parallel bleeding resistor is required on the output, ensuring that the sum of the power consumption is always maintained at 10% minimum.

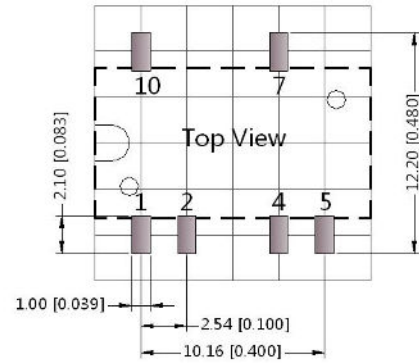
4. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout



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

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

Notes:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number 58210023, Roll packaging bag number:58210034;
- 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's 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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