

1W isolated DC-DC converter  
Fixed input voltage, regulated single output



Report EN 62368-1   
 Report BS EN 62368-1   
 RoHS   
 Patent Protection

### FEATURES

- Continuous short-circuit protection
- No-load input current as low as 4mA
- Operating ambient temperature range: -40°C to +85°C
- High efficiency up to 71%
- Compact SMD package
- I/O isolation test voltage 3k VDC
- Industry standard pin-out

IF\_XT-1WR3(-TR) series are specially designed for applications where an 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.		
EN/BS EN	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
BS EN	IF0503XT-1WR3-TR	5 (4.75-5.25)	3.3	250/25	62/66	2400
	IF0505XT-1WR3-TR		5	200/20	65/69	2400
	IF0509XT-1WR3-TR		9	111/12	66/70	1000
	IF0512XT-1WR3-TR		12	84/9	67/71	560
	IF0515XT-1WR3-TR		15	67/7	67/71	560
EN/BS EN	IF1205XT-1WR3	12 (11.4-12.6)	5	200/20	65/69	2400
	IF1212XT-1WR3		12	84/9	67/71	560
	IF1215XT-1WR3		15	67/7	67/71	220
	IF1205XT-1WR3-TR		5	200/20	65/69	2400
	IF1212XT-1WR3-TR		12	84/9	67/71	560
	IF1215XT-1WR3-TR		15	67/7	67/71	220
--	IF1505XT-1WR3	15 (14.25-15.75)	5	200/20	64/68	2400
EN/BS EN	IF2405XT-1WR3	24 (22.8-25.2)	5	200/20	63/69	2400
	IF2412XT-1WR3		12	84/9	65/71	560
	IF2415XT-1WR3		15	67/7	65/71	220
	IF2405XT-1WR3-TR		5	200/20	63/69	2400
	IF2412XT-1WR3-TR		12	84/9	65/71	560
	IF2415XT-1WR3-TR		15	67/7	65/71	220

Note: \* Product model suffix "-TR" indicates reel packaging.

### Input Specifications

Item	Operating Conditions			Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5VDC input	3.3VDC output	--	303/8	323/--	mA	
		5VDC output	--	290/8	308/--		
		9VDC output	--	286/8	304/--		
	12VDC input	12VDC/15VDC output	--	282/9	299/--		
		5VDC output	--	121/8	128/--		
		12VDC/15VDC output	--	117/8	124/--		

Input Current (full load / no-load)	15VDC input	--	99/8	105/--	mA
	24VDC input	5VDC output	--	60/4	
12VDC/15VDC output		--	59/4	64/--	
Reflected Ripple Current*	5VDC input	--	30	--	
	12VDC/15VDC/24VDC input		--	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	100% load	--	--	±3	%
Linear Regulation	Input voltage change: ±1%	--	--	±0.25	
Load Regulation	10%-100% load	5VDC input	3.3VDC output	±3	
			other output	±2	
12VDC/15VDC/24VDC input		--	--	±2	
Ripple & Noise*	20MHz bandwidth	--	30	100	mVp-p
Temperature Coefficient	100% load	5VDC input		±0.03	%/°C
		12VDC/15VDC/24VDC input		±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.	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 ≥ 71°C (see Fig.1)	-40	--	85	°C
Storage Temperature		-55	--	125	
Case Temperature Rise	Ta=25°C	5VDC input	3.3VDC output	30	
			other output	25	
12VDC/15VDC/24VDC input		--	25	--	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	5VDC input	--	300	%RH
Storage Humidity	Non-condensing	5VDC input	--	95	
		12VDC/15VDC/24VDC input	5	95	
Vibration	12VDC/15VDC/24VDC input	10-150Hz, 5G, 0.75mm. along X, Y and Z			
Reflow Soldering Temperature*		Peak temp. ≤245°C, maximum duration time ≤60s over 217°C			
Switching Frequency	100% load, nominal input voltage	5VDC input		--	kHz
		12VDC/15VDC/24VDC input		260	
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 plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	15.24 x 11.40 x 7.25 mm
Weight	1.2g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility

Emissions	CE	CISPR32/EN55032	CLASS B
	RE	CISPR32/EN55032	CLASS B
Immunity	ESD	IEC/EN61000-4-2	Air ±8kV, Contact ±6kV perf. Criteria B

Note: Refer to Fig. 3 for recommended circuit test.

Typical Characteristic Curves

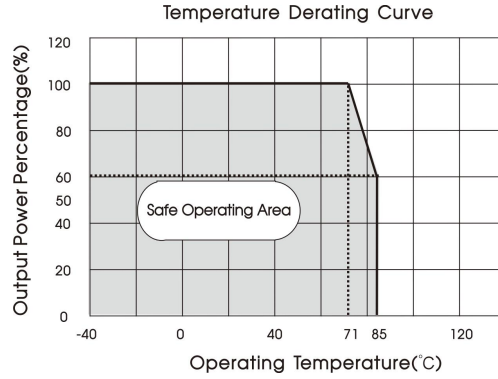
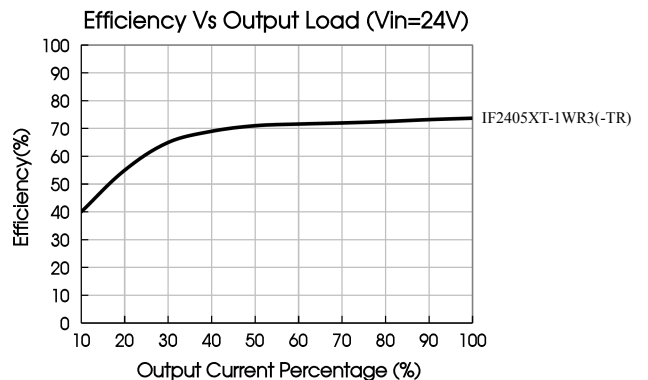
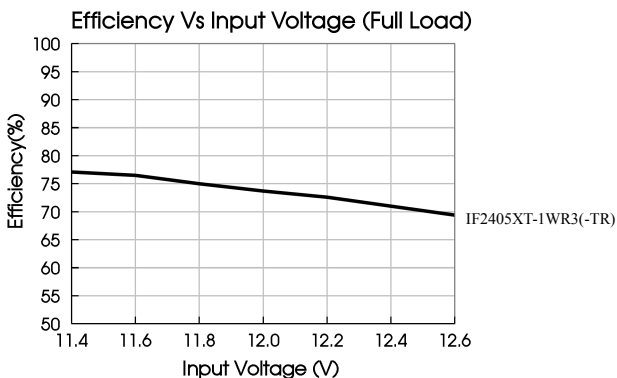
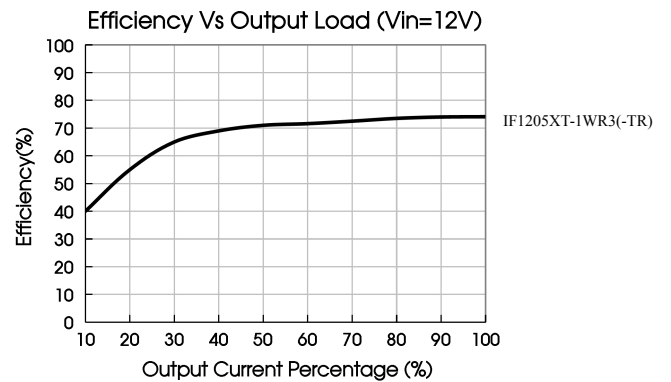
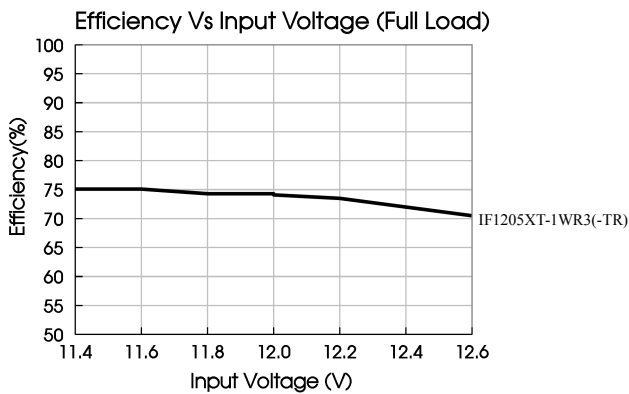
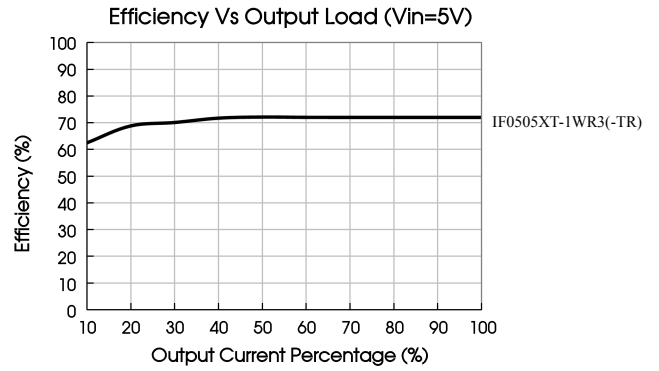
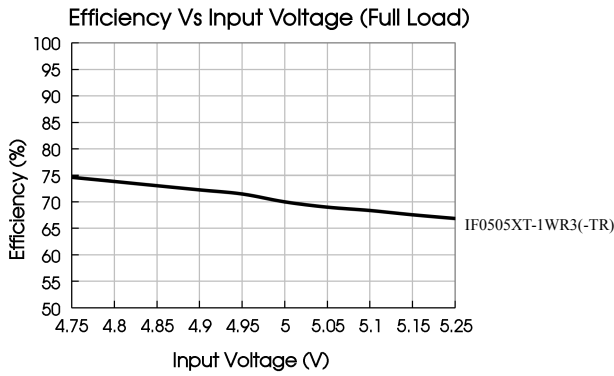


Fig. 1



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. 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.



Fig. 2

Table 1: Recommended capacitive load value table

Vin	Cin	Vo	Cout
5VDC	4.7µF/16V	3.3/5VDC	10µF/16V
12VDC	2.2µF/16V	9/12VDC	2.2µF/25V
15VDC	1µF/25V	15VDC	0.47µF/25V
24VDC	1µF/50V	--	--

2. EMC compliance circuit

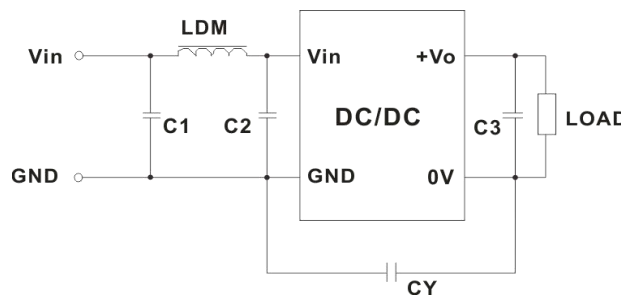


Fig. 3

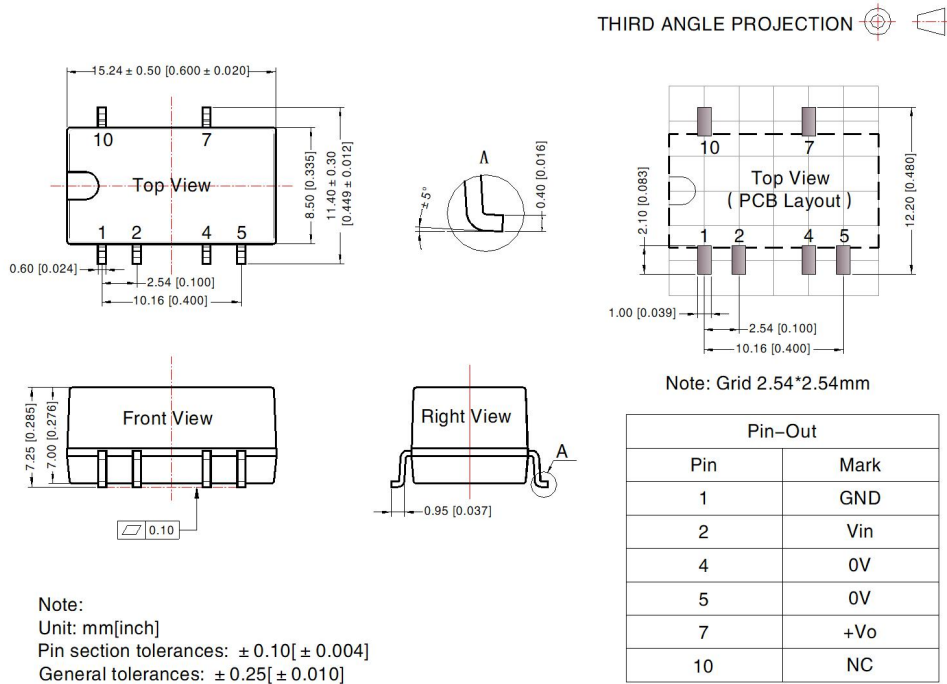
Table 2: Recommended EMC filter values

Input voltage	5VDC		12VDC/15VDC/24VDC
Output voltage	3.3/5/9VDC	12/15VDC	--
Emissions	C1/C2	4.7µF /25V	4.7µF /25V
	CY	100pF/4kVDC	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).

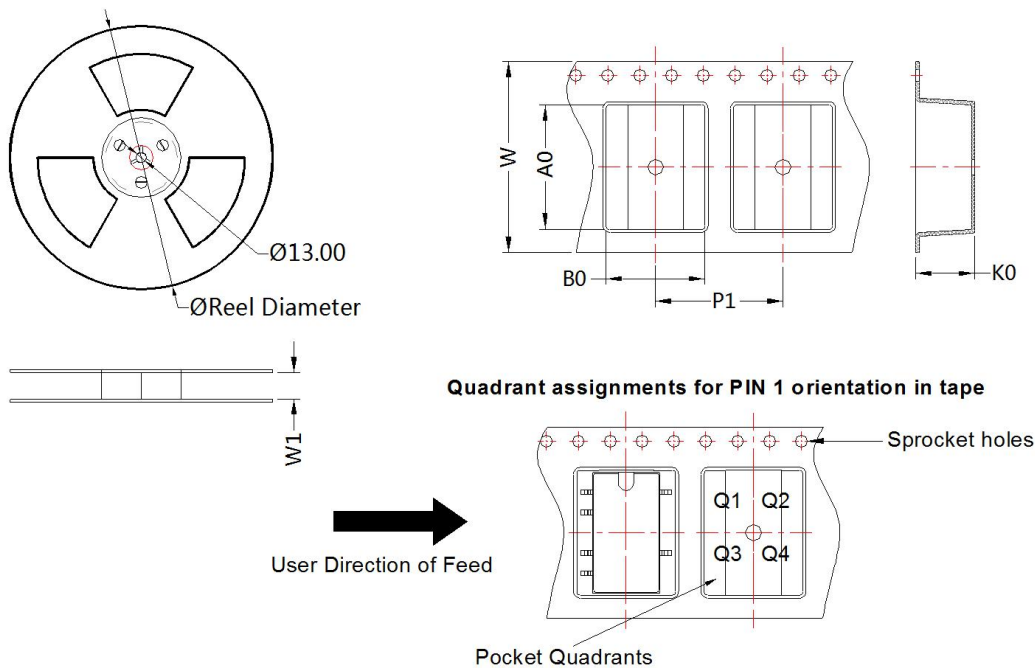
Dimensions and Recommended Layout



Note:  
Unit: mm[inch]  
Pin section tolerances:  $\pm 0.10[\pm 0.004]$   
General tolerances:  $\pm 0.25[\pm 0.010]$

NC: Pin to be isolated from circuitry

Tape and Reel Info



Device	Package Type	Pin	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
IF_XT-1WR3(-TR)	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). Tube 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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