

### FEATURES

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



3 years  
Warranty

### Selection Guide

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
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
IF1505XT-1WR3	15 (14.25-15.75)	5	200/20	64/68	2400
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

### 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/15VDC output	--	282/9	299/--	
	12VDC input	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		66/--
		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	
				3.3VDC output	

Load Regulation	10%-100% load	5VDC input	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	
Storage Humidity	Non-condensing		5VDC input		--	95	%RH
			12VDC/15VDC/24VDC input		5	--	
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		--	250	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

## EMC Specifications

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

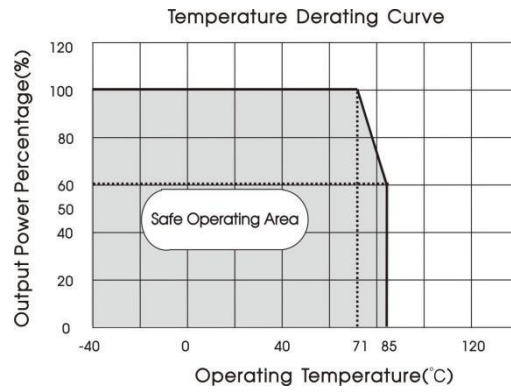
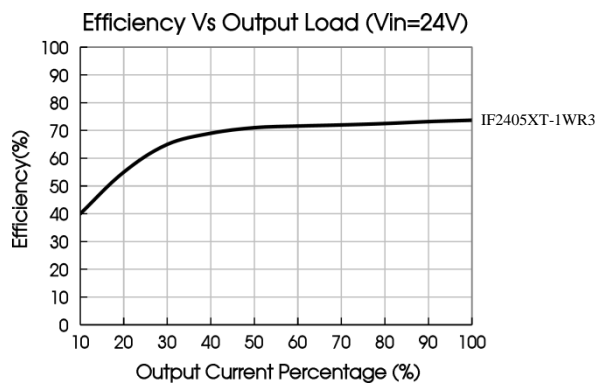
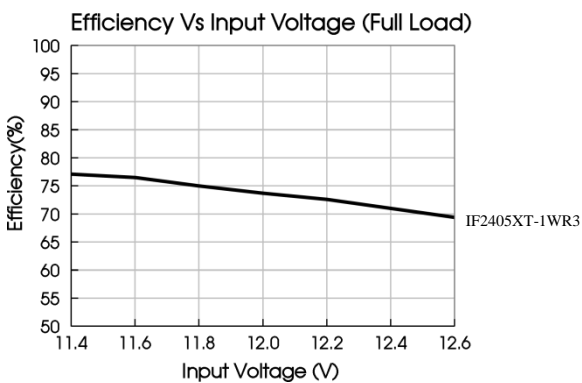
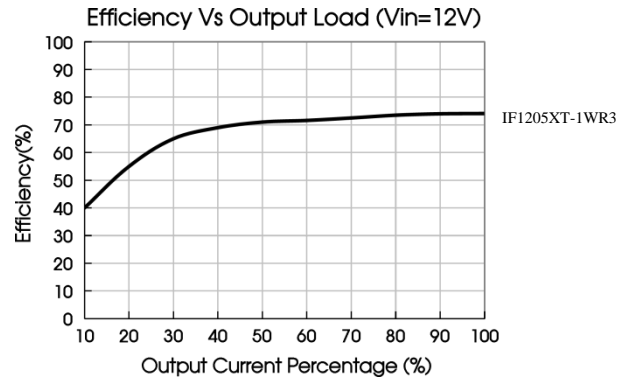
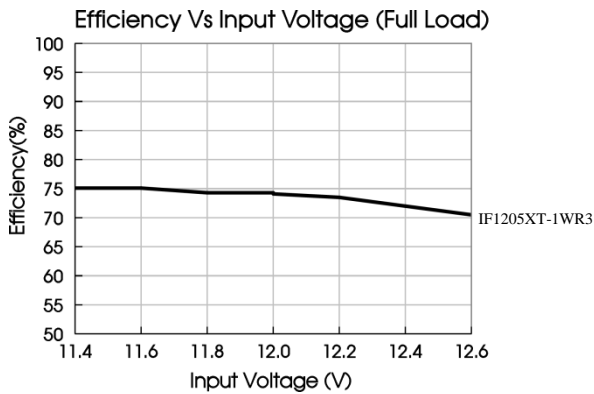
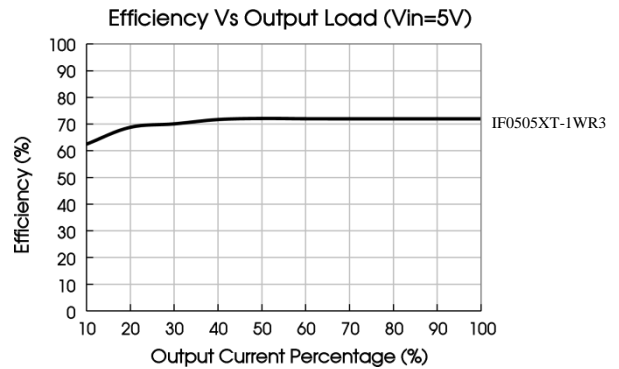
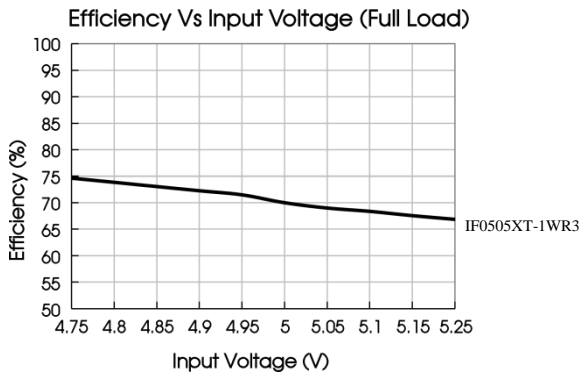


Fig. 1



## Circuit Design and Application

### 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

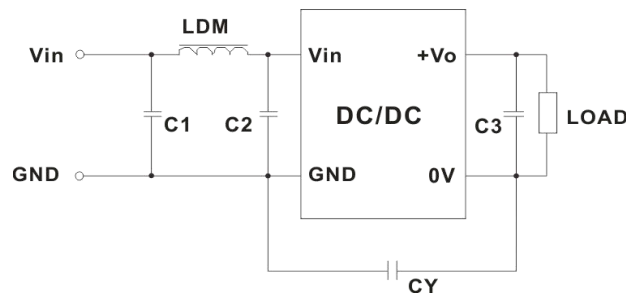


Fig. 3

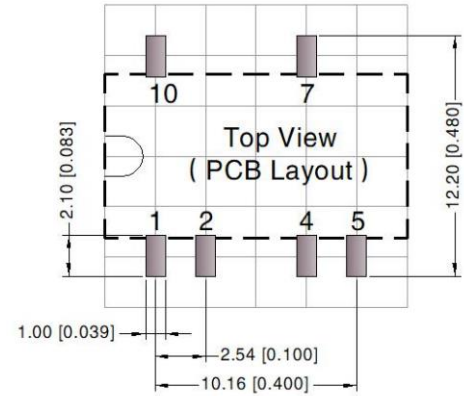
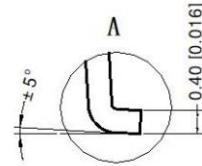
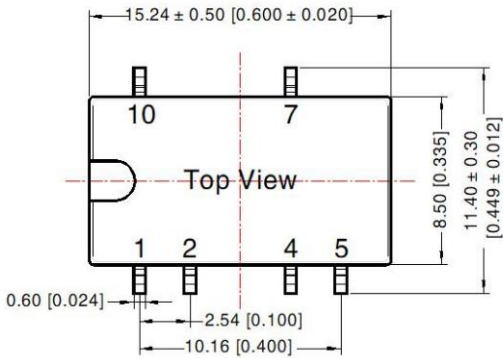
Table 2: Recommended EMC filter values

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	

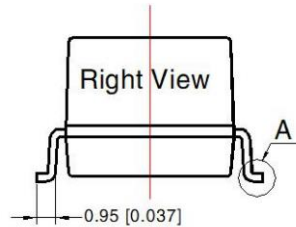
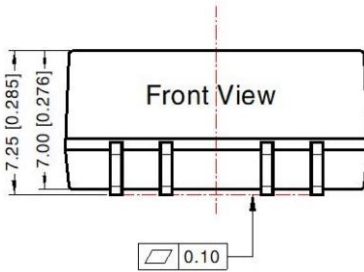
Note: In the case of actual use, the requirements for EMI are high, it is subject to CY (1nF/4kV).

### Dimensions and Recommended Layout

THIRD ANGLE PROJECTION 



Note: Grid 2.54\*2.54mm



Pin-Out	
Pin	Mark
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:  $\pm 0.10[\pm 0.004]$
- General tolerances:  $\pm 0.25[\pm 0.010]$

**Note:**

1. If the product works under the minimum required load, it cannot guarantee that the performance of the product complies with all the performance indicators in this manual;
2. The maximum capacitive load is tested under the input voltage range and full load condition;
3. Unless otherwise stated, all indexes in this manual are measured at  $T_a=25^\circ\text{C}$ , humidity  $<75\%\text{RH}$ , nominal input voltage and rated output load;
4. All index testing methods in this manual are based on the enterprise standards of the company;
5. Our company can provide product customization, specific needs can directly contact our technical staff;