

### FEATURES

1. Continuous short-circuit protection
2. No-load input current as low as 8mA
3. Operating ambient temperature range: -40°C to +85°C
4. High efficiency up to 75%
5. I/O isolation test voltage 3k VDC
6. 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.		
IF0503S-1WR3	5 (4.75-5.25)	3.3	250/25	63/67	2400
IF0505S-1WR3		5	200/20	66/70	2400
IF0509S-1WR3		9	111/12	67/71	1000
IF0512S-1WR3		12	84/9	68/72	560
IF0515S-1WR3		15	67/7	69/73	560
IF0524S-1WR3		24	41/4	69/73	100
IF1205S-1WR3	12 (11.4-12.6)	5	200/20	69/73	2400
IF1209S-1WR3		9	111/12	69/73	1000
IF1212S-1WR3		12	83/9	69/73	560
IF1215S-1WR3		15	67/7	71/75	560
IF1505S-1WR3	15 (14.25-15.75)	5	200/20	69/73	2400
IF1515S-1WR3		15	67/7	71/75	560
IF2403S-1WR3	24 (22.8-25.2)	3.3	250/25	65/71	2400
IF2405S-1WR3		5	200/20	67/73	2400
IF2409S-1WR3		9	111/12	67/73	1000
IF2412S-1WR3		12	83/9	67/73	560
IF2415S-1WR3		15	67/7	67/73	560

### Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5V input	3.3VDC/5VDC output	-	286/8	303/-	mA
		9VDC/12VDC output	-	282/12	299/-	
		15VDC/24VDC output	-	274/18	290/-	
Input Current (full load / no-load)	12V input	5VDC/9VDC/12VDC output	-	115/8	121/-	mA
		15VDC output	-	112/8	118/-	
	15V input	5VDC output	-	92/8	97/-	
		15VDC output	-	89/8	94/-	
	24V input	3.3VDC output	-	59/8	65/-	
		5VDC/9VDC/12VDC/15VDC output	-	58/8	63/-	
Reflected Ripple Current*			-	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			-	-	±3	%	
Linear Regulation	Input voltage change: ±1%		-	-	±0.25		
Load Regulation	10%-100% load	3.3VDC output	-	-	±3		
		Other output	-	-	±2		
Ripple & Noise*	20MHz bandwidth	5V input	Other output	-	30	75	mVp-p
			24VDC output	-	50	100	
		Other input	Other output	-	30	100	
			15VDC output	-	80	150	
Temperature Coefficient	100% load		-	±0.02	-	%/°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 ≥ 71°C(see Fig.1)		-40	-	85	°C
Storage Temperature			-55	-	125	
Case Temperature Rise	Ta=25°C	5V input	3.3VDC output	-	30	
			Other output	-	25	-
		Other input	-	25	-	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds		-	-	300	
Storage Humidity	Non-condensing	5V input	-	-	95	%RH
		Other input	5	-	95	
Vibration	12/15/24VDC input		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency	100% load, nominal input voltage	5V input	-	270	-	kHz
		Other input	-	260	-	
MTBF	MIL-HDBK-217F@25°C		3500	-	-	k hours

### Mechanical Specifications

<b>Case Material</b>	Black plastic; flame-retardant and heat-resistant (UL94V-0)
<b>Dimensions</b>	19.65 x 6.00 x 10.16mm
<b>Weight</b>	2.1g(Typ.)
<b>Cooling Method</b>	Free air convection

### Electromagnetic Compatibility (EMC)

<b>Emissions</b>	<b>CE</b>	CISPR32/EN55032 CLASS B
	<b>RE</b>	CISPR32/EN55032 CLASS B
<b>Immunity</b>	<b>ESD</b>	IEC/EN61000-4-2 Air ±8kV, Contact ±6kV perf. Criteria B
Note: Refer to Fig. 3 for recommended circuit test.		

### Typical Characteristic Curves

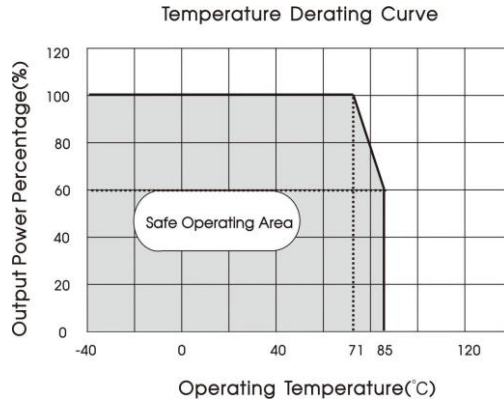
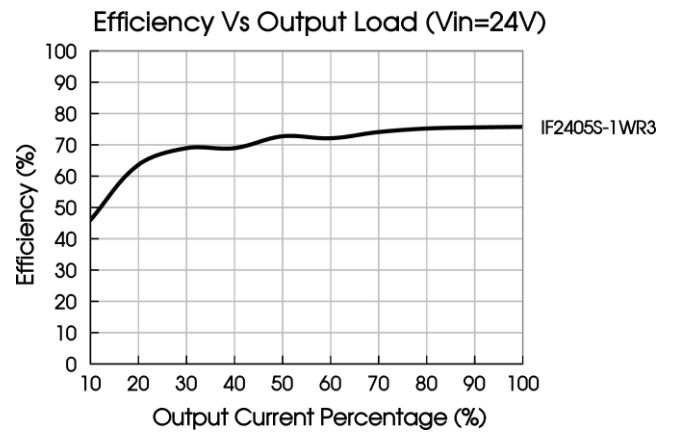
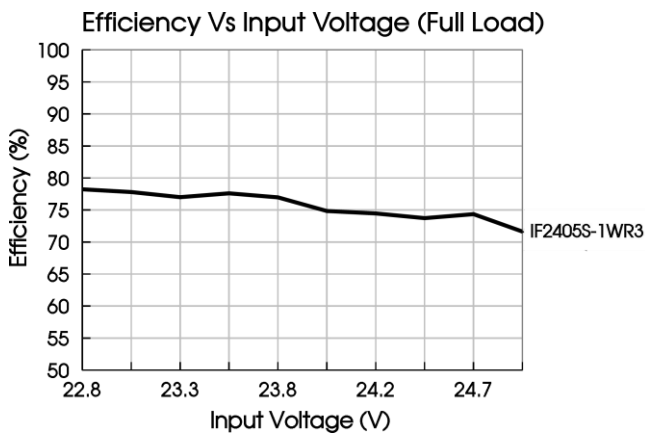
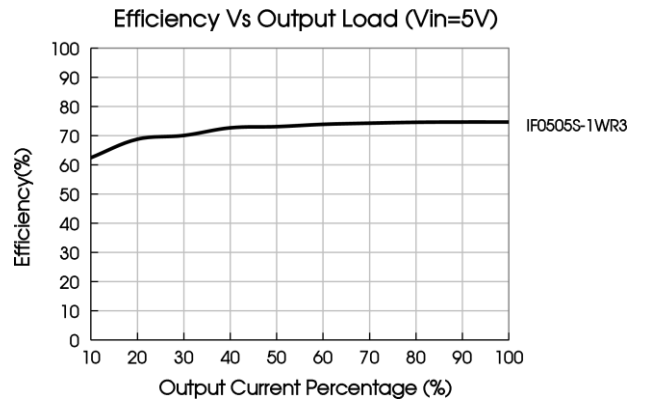
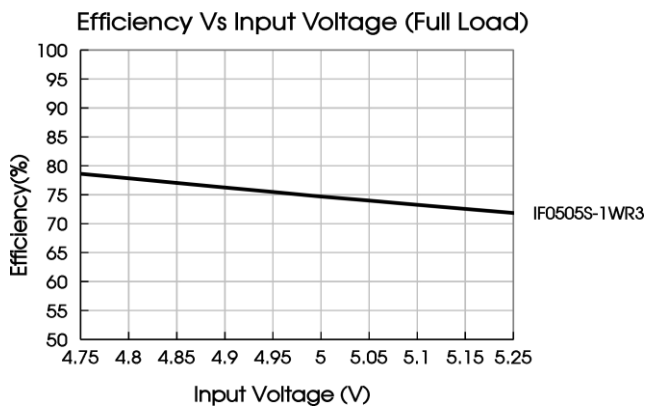


Fig. 1



### 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 input and output capacitor values

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

#### 2. EMC compliance circuit

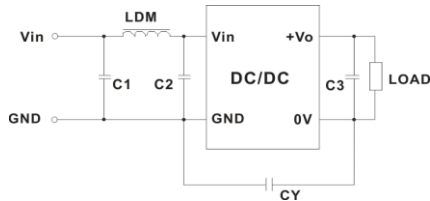
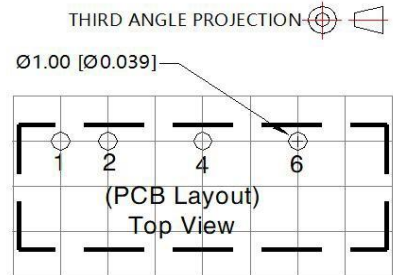
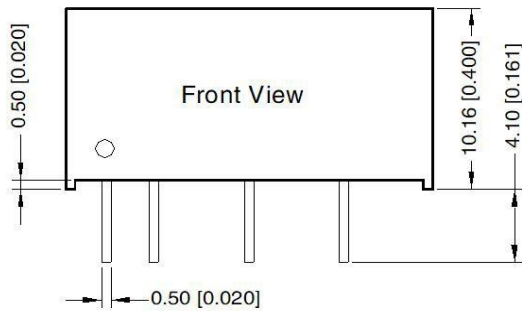


Fig. 3

Table 2: Recommended EMC filter values

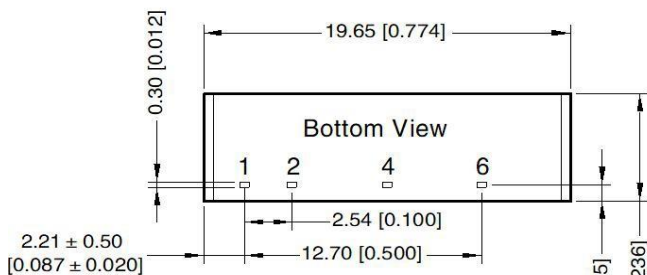
Input voltage	5V input		Other input
Output voltage	3.3/5/9VDC	12/15/24VDC	-
EMI	C1/C2	4.7μF /25V	4.7μF /50V
	CY	100pF /4kV	270pF /4kV
	C3	Refer to the Cout in table 1	
	LDM	6.8μH	

### Dimensions and Recommended Layout



Note: Grid 2.54\*2.54mm

Pin-Out	
Pin	Mark
1	Vin
2	GND
4	0V
6	+Vo



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

## Notes & Instructions

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  $<75\%RH$ , 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;