Descriptions

1W isolated, DC/DC Converter



RoHS

UL62368-1 EN62368-1 BS EN62368-1

Features

- Continuous short-circuit protection
- No-load input current as low as 8mA
- Operating ambient temperature range: -40℃ to +85℃
- High efficiency up to 75%
- I/O isolation test voltage 3k VDC
- Industry standard pin-out

Applications

- Industrial control
- Home appliances
- Instrumentation
- Communication
- Civil applications

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	DFS1-IF0503	5 (4.75-5.25)	3.3	250/25	63/67	2400
UL/EN/BS EN	DFS1-IF0505		5	200/20	66/70	2400
EN/BS EN	DFS1-IF0509		9	111/12	67/71	1000
UL/EN/BS EN	DFS1-IF0512		12	84/9	68/72	560
EN/BS EN	DFS1-IF0515		15	67/7	69/73	560
	DFS1-IF0524		24	41/4	69/73	100
UL/EN/BS EN	DFS1-IF1205	12 (11.4-12.6)	5	200/20	69/73	2400
EN/BS EN	DFS1-IF1209		9	111/12	69/73	1000
	DFS1-IF1212		12	83/9	69/73	560
	DFS1-IF1215		15	67/7	71/75	560
	DFS1-IF1505	15 (14.25-15.75)	5	200/20	69/73	2400
	DFS1-IF1515		15	67/7	71/75	560
	DFS1-IF2403	24 (22.8-25.2)	3.3	250/25	65/71	2400
	DFS1-IF2405		5	200/20	67/73	2400
	DFS1-IF2409		9	111/12	67/73	1000
	DFS1-IF2412		12	83/9	67/73	560
	DFS1-IF2415		15	67/7	67/73	560

Notes: *Product images are for reference only; the actual product shall prevail.

Specifications

Product Specifications	Item	Operating Conditions			Min.	Typ.	Max.	Unit
Input Specifications	Input Current (full load / no-load)	5V input	3.3/5VDC output		--	286/8	303/--	mA
			9/12VDC output		--	282/12	299/--	
			15/24VDC output		--	274/18	290/--	
		12V input	5/9/12VDC output		--	115/8	121/--	
			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/--	
			5/9/12/15VDC output		--	58/8	63/--	
	Reflected Ripple Current				--	15	--	
	Input Filter				Capacitance Filter			
	Hot Plug				Unavailable			
Output Specifications	Voltage Accuracy				--	--	±3	%
	Linear Regulation	Input voltage change: ±1%			--	--	±0.25	
	Load Regulation	10%-100% load		3.3VDC output	--	--	±3	
				Other output	--	--	±2	
	Ripple & Noise①	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	--	%/℃
	Short-circuit Protection				Continuous, self-recovery			
General Specifications	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 requirements (see Fig.1)			-40	--	85	℃
	Storage Temperature				-55	--	125	
	Case Temperature Rise	Ta=25℃	5V input	3.3VDC output	--	30	--	
				Other output	--	25	--	
			Other input		--	25	--	
	Pin Soldering Resistance Temperature②	Soldering spot is 1.5mm away from the case, 10 seconds max.			--	--	+300	
		Wave soldering, maximum 10 seconds			255	260	265	
	Storage Humidity	Non-condensing			5	--	95	%RH
	Vibration				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℃			3500	--	--	k hours
Mechanical Specifications	Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)						
	Dimensions	19.65 x 6.00 x 10.16mm						

	Weight	2.1g(Typ.)
	Cooling Method	Free air convection

Note:
①The "parallel cable" method is used for Ripple and Noise test;
②The pin soldering temperature tolerance is not the actual temperature set by the soldering iron but the temperature required for proper solder joints. The actual temperature set by the customer should be determined comprehensively based on factors such as PCB thickness, copper coverage, soldering iron power, and soldering iron tip selection.

Electromagnetic Compatibility (EMC)

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.

Characteristic Curve

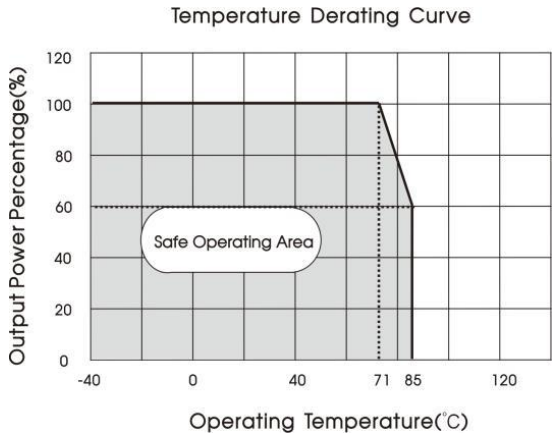
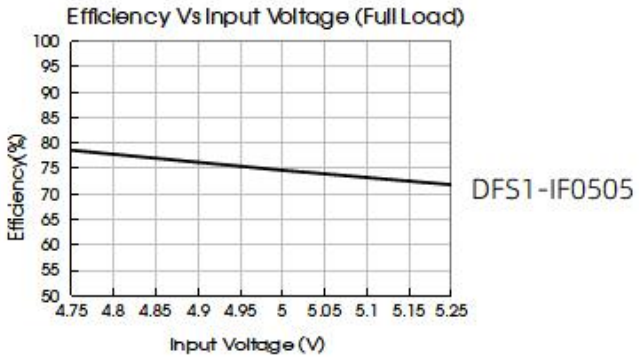
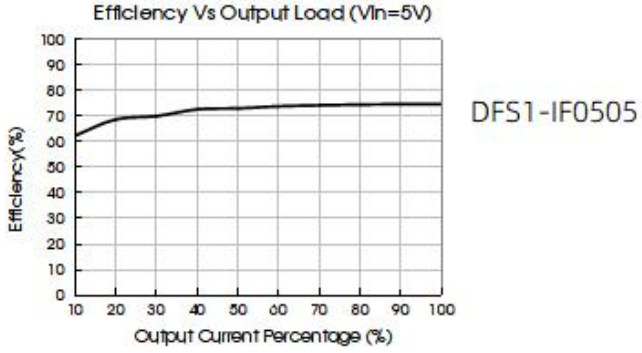
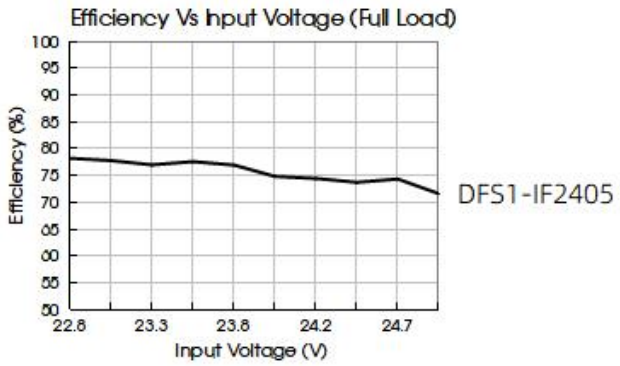
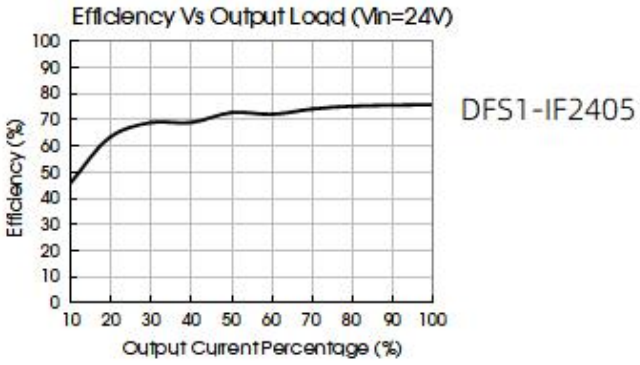


Fig. 1









Design Reference

1. Typical application circuit

①Input 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.

②Choosing 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.

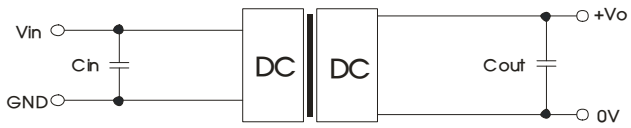


Fig. 2

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

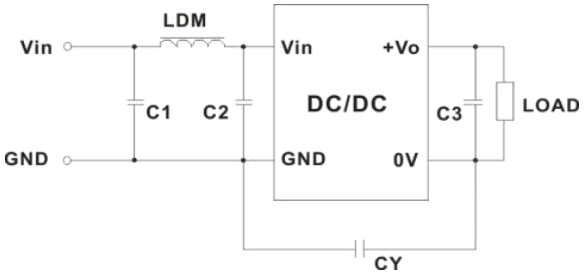
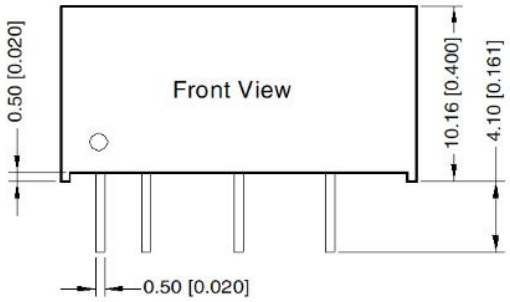


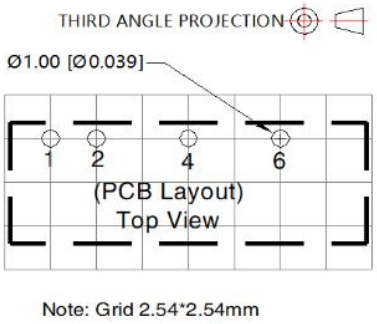
Fig. 3

Table 2: Recommended EMC filter values

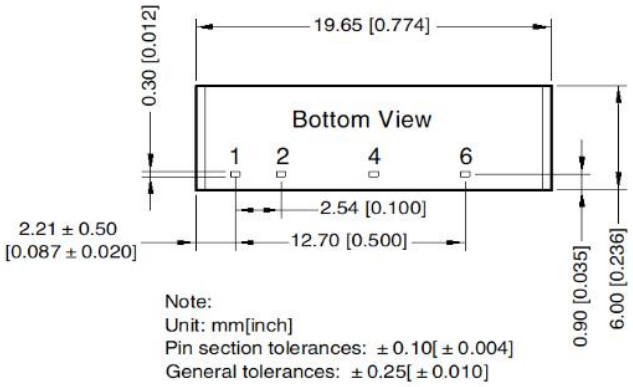
Input voltage		5V input		Other input
Output voltage		3.3/5/9VDC	12/15/24VDC	--
EMI	C1/C2	4.7μF /25V	4.7μF /25V	4.7μF /50V
	CY	100pF /4kV	1000pF /4kV	270pF /4kV
	C3	Refer to the Cout in table 1		
	LDM	6.8μH		

Dimensions and Recommended Layout





Note: Grid 2.54*2.54mm



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

Notes:

1. 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;
2. The maximum capacitive load offered were tested at input voltage range and full load;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
7. The image certification marks are for reference only; please refer to the selection table for actual specifications. Certification is based on the physical mark or packaging label.