DC/DC Converter
FW1-XXDXXD Series

Typical Features

- ◆ Fixed input voltage, Isolated & regulated output, Output power 1W
- ◆ High Efficiency up to 84%
- ◆ Small compact SIP packing
- ◆ No external component required
- ◆ Isolation Voltage 1500VDC
- ◆ Operating Temperature: -40℃～+85℃
- ◆ Plastic Case, meet UL94 V-0 standard

Test Condition: Unless otherwise specified, data in the datasheet should be tested under the conditions of inputting nominal voltage, pure resistance rated load and Ta=25℃

Application Field

It could be widely used for instrument, communication, pure digital circuit, general low frequency analog circuit, relay drive circuit, data exchange circuit, etc.

Typical Product List

Model	Input Voltage Range (VDC)		Output Voltage/Current (Vo/Io)		Input Current(mA) Nominal Voltage		Max. Capacitive Load	Ripple & Noise (Max.)	Efficiency (%)full load, input nominal voltage	
	Nominal	Range	Voltage (VDC)	Current(mA) MAX./Min.	Full load Typ.	No Load Typ.	uF	mVp-p	Min.	Typ.
FW1-05D05D	5	4.75 - 5.25	±5	±100	271	26	2000	100	73	75
FW1-05D09D			±9	±56	294	11	2000	100	65	67
FW1-05D12D			±12	±42	294	11	2000	100	66	68
FW1-05D15D			±15	±33	294	11	2000	100	66	68
FW1-12D05D	12	11.4 - 12.6	±5	±100	110	10	2000	100	74	76
FW1-12D09D			±9	±56	132	10	2000	100	61	63
FW1-12D15D			±15	±33	130	10	2000	100	64	66
FW1-24D05D	24	22.8 - 25.2	±5	±100	54	10	2000	100	72	74
FW1-24D12D			±12	±42	56	10	2000	100	74	76
FW1-24D15D			±15	±33	49	10	2000	150	82	84

Note:

1. In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor at the output side, the resistance recommended equal to 10% nominal power.

Input Specifications

Item	Conditions	Min.	Typ.	Max.	Unit
Loss	No Load	--	0.3	--	W
Input Filter	Capacitor Filter				
Remote Control	Not available				

Output Specifications

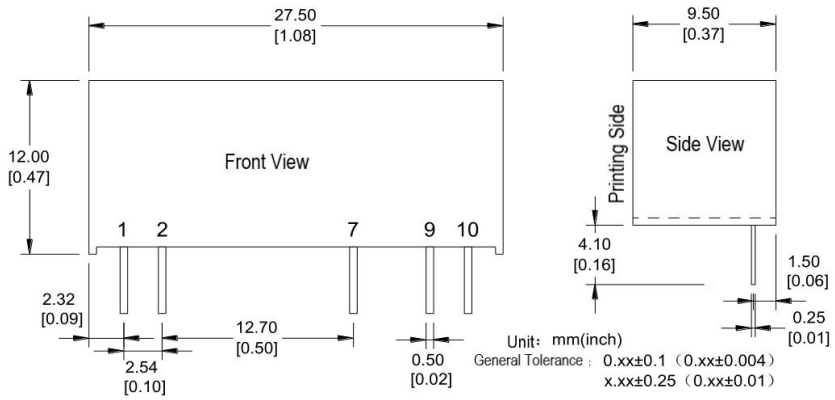
Item	Working Conditions	Min.	Typ.	Max.	Unit
Output Power	Nominal input, Full load	0.1	--	1	W
Output Voltage		--	±5.0	--	VDC
Output Voltage Accuracy		--	±2.0	±3.0	%
Load Regulation	10% ~ 100% nominal load	--	±0.5	±1.0	
Line Regulation	Input Voltage Change±1%	--	--	±0.25	
Ripple & Noise①	Nominal input, full load, 20MHZ bandwidth	--	75	100	mV
Temperature Drift Coefficient	100% Full Load	--	--	±0.03	%/°C
Capacitive Load	Full input voltage range, full load	--	--	2000	uF
Output Short Circuit Protection ②	Not Available				

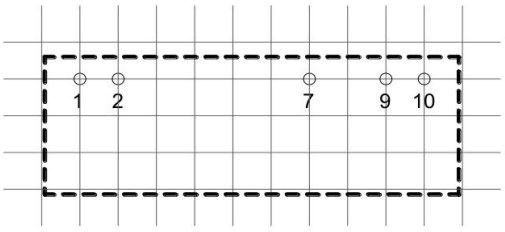
NOTE:①Ripple & Noise tested by twisted-pair method,

General Specifications

Switching Frequency		100KHz (Typ.)
Isolation Voltage	Test 1 minute, leakage current＜ 0.5mA	1500Vdc
Insulation Resistance	Insulation voltage 500VDC	100MΩ
MTBF	MIL-HDBK-217F@25℃	35X10^{5}Hrs
Case Material		Black flame-retardant heat-resistant Plastic(UL94 V-0)
Pin Withstand Soldering Temp	Distance to case 1.5mm, 10S	300℃ MAX
Product Weight		4.5g(Typ.)
Packing	Tube(525*18*10mm)	7PCS
	Box(542*110*155mm)	336PCS(Total 48 Tubes)

Packing Dimension





Printed board vertical view

Lattic spacing:2.54mm(0.1inch)

Packing Code	L x W x H	
D	27.50× 9.50 × 12.00mm	1.08 × 0.374× 0.472inch

Pin Function

Pin Function	1	2	7	9	10
Dual(D)	+Vin	GND	+Vo	-Vo	0V

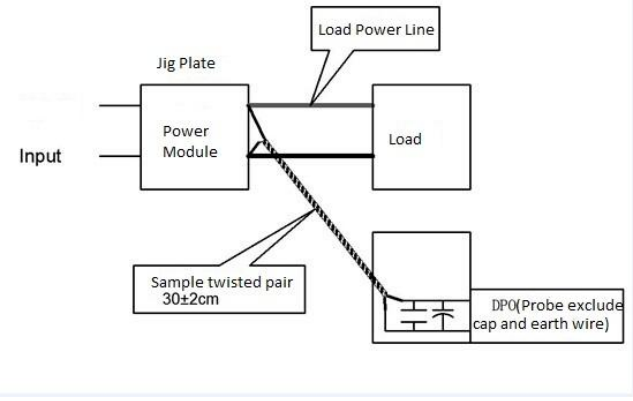
Note: if the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

Ripple& Noise Test: (Twisted Pair Method 20MHZ bandwidth)

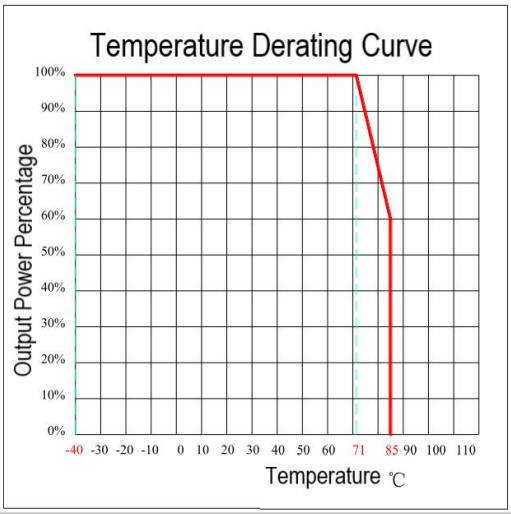
Test Method:

a.12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

b. Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm±2 cm sampling line, Power line selected from corresponding diameter wire with insulation according to the flow of output current.



Temperature Curve



Design and Application Circuit Recommended

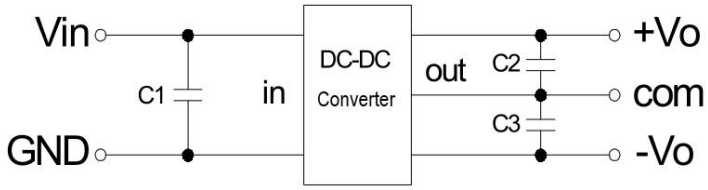
1. Output load requirements

a. In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor at the output side, the resistance equal to 10% nominal load.

b. The maximum capacitive load is tested under nominal input full load, and cannot exceed the maximum capacitive load of output terminal under operation, otherwise it will cause it difficult to start up and damage the product.

2. Recommended circuit

In order to ensure the input/output ripple and noise decreased, capacitor filter net could be connected to input and output terminal, application circuit as below photo 1; choosing suitable filter capacitor is very important, start-up problems may be caused by too large capacitance. To ensure the modules running safely and reliably, the recommended capacitive load values as shown in Table 1. (But for the actual output power of application circuit is less than 0.5W, suggest not to connect external capacitor)



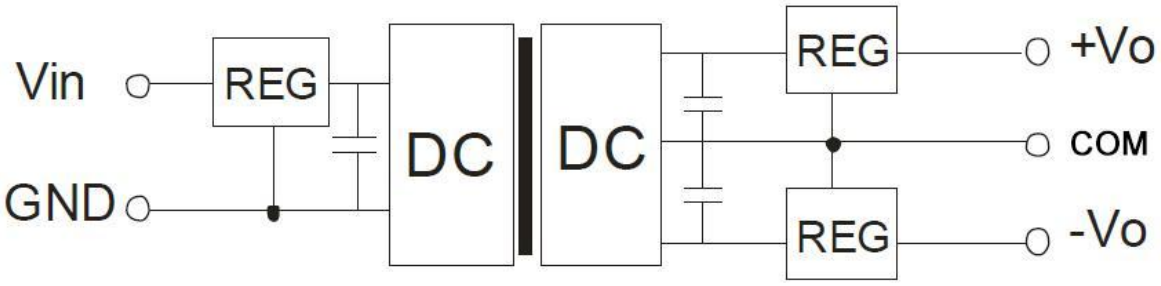
Recommended Capacitive Load(Table 1)

Vin (Vdc)	C1 (μF)	Vout (Vdc)	C2 (μF)	Vout (Vdc)	C2,C3 (μF)
3.3/5	4.7	3.3/5	10	±3.3/±5	4.7
12	2.2	9	4.7	±9	2.2
15	1	12	2.2	±12	1
24	1	15	1	±15	0.47
--	--	24	0.47	±24	0.22

3. Output regulated voltage and over voltage protection circuit

The simplest device to protect output regulated voltage, over voltage and over current is to cascade a linear regulator with overheat protection at input or output terminal, and connect a capacitor filter net(see below picture), filter capacitive value recommended see table 1, Linear regulator is chosen according to the actual voltage, current needed in working.

Dual Output



Note:

1.This product cannot be used in parallel, and do not support hot-plugging;

2.If the product works below the minimum required load, it cannot guarantee that the product performance meets all performance indicators in this manual;

3. All index testing methods in this datasheet are based on our Company's corporate standards

4. The product specification may be changed at any time without prior notice.

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