

Typical Features

- ◆ Fixed input voltage, Isolated & unregulated output, Output power 1W
- ◆ High Efficiency up to 83%
- ◆ Small compact SIP packing
- ◆ No external component required
- ◆ Isolation Voltage 3000VDC
- ◆ 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 uF	Ripple & Noise (Max.) mVp-p	Efficiency (%)full load, input nominal voltage	
	Nominal	Range	Voltage (VDC)	Current(mA) MAX./Min.	Full load Typ.	No Load Typ.			Min.	Typ.
FN1-3V3S3V3B3	3.3	3.0	3.3	303	406	38	3000	100	63	65
FN1-3V3S05B3		- 3.6	5	200	390	32	3000	150	62	64
FN1-05S3V3B3	5	4.5 - 5.5	3.3	303	256	19	3000	100	72	74
FN1-05S05B3			5	200	254	31	3000	100	75	77
FN1-05S09B3			9	111	235	24	3000	100	75	77
FN1-05S12B3			12	83	235	22	3000	150	78	80
FN1-05S15B3			15	67	215	26	3000	150	76	78
FN1-05S24B3			24	42	238	38	3000	150	77	79
FN1-12S3V3B3			12	10.8 - 13.2	3.3	303	102	6	3000	100
FN1-12S05B3	5	200			108	16	3000	100	75	77
FN1-12S09B3	9	111			101	13	3000	100	79	81
FN1-12S12B3	12	83			99	12	3000	100	79	81
FN1-12S15B3	15	67			100	14	3000	100	81	83
FN1-12S24B3	24	42			96	16	3000	100	80	82

FN1-15S05B3	15	13.5	5	200	88	12	3000	100	74	76	
FN1-15S12B3		-	12	83	79	10	3000	100	81	83	
FN1-15S15B3		16.5	15	67	87	12	3000	100	74	76	
FN1-24S05B3	24	21.6	5	200	53	6	3000	100	77	79	
FN1-24S09B3			9	111	54	8	3000	100	75	77	
FN1-24S12B3			-	12	83	50	8	3000	100	81	83
FN1-24S15B3			26.4	15	67	54	10	3000	100	78	80
FN1-24S24B3			24	42	52	8	3000	100	78	80	
FN1-05D05B3	5	4.5	±5	±100	239	17	3000	100	75	77	
FN1-05D09B3			±9	±56	235	23	3000	100	77	79	
FN1-05D12B3			-	±12	±42	237	25	3000	150	78	80
FN1-05D15B3			5.5	±15	±33	231	28	3000	100	79	81
FN1-05D24B3			±24	±21	237	33	3000	150	75	77	
FN1-12D05B3	12	10.8	±5	±100	104	12	3000	100	79	81	
FN1-12D09B3			±9	±56	102	14	3000	100	80	82	
FN1-12D12B3			-	±12	±42	105	6	3000	100	80	82
FN1-12D24B3			13.2	±24	±21	108	16	3000	120	75	77
FN1-15D15B3	15	13.5-16.5	±15	±33	80	13	3000	100	81	83	
FN1-24D12B3	24	21.6-26.4	±12	±42	50	8	3000	100	81	83	
FN1-24D15B3			±15	±33	50	8	3000	100	81	83	

- Note:**
1. "*" are models under developing.
 2. 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.
 3. The capacitive loads of positive and negative outputs are identical.

Input Specifications

Item	Test Condition	Min.	Typ.	Max.	Unit
Input Overshoot Voltage (1Second.max.)	3.3Vdc Input	-0.7	-	7	VDC
	5Vdc Input	-0.7	-	9	
	12Vdc Input	-0.7	-	18	
	15Vdc Input	-0.7	-	21	
	24Vdc Input	-0.7	-	30	
Input Filter	Capacitor Filter				

Output Specifications

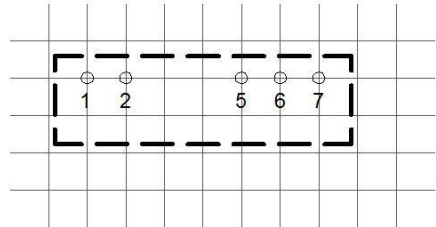
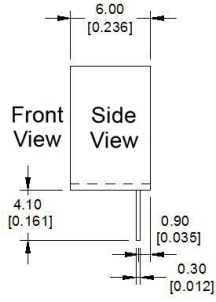
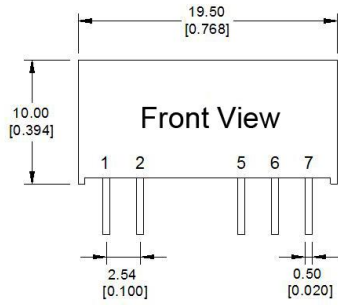
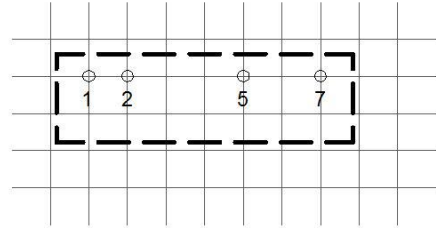
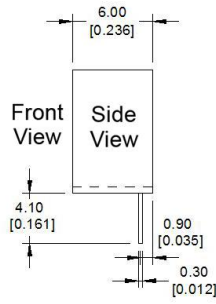
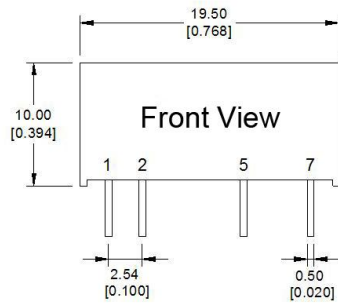
ITEM	Working Conditions	Min.	Typ.	Max.	Unit	
Output Power		0.2	--	1	W	
Output Voltage Accuracy	Nominal input, Full load	--	±2	±5	%	
Load Regulation	10% ~ 100% nominal load	3.3Vdc output	--	--		20
		Other output	--	--		15
Line Voltage Regulation	Input Voltage Change±1%	3.3Vdc output	--	--		±1.5
		Other output	--	--		±1.2
Ripple & Noise①	Nominal input, full load, 20MHZ bandwidth	Other output	--	75	100	
		24Vdc output	--	100	120	
Temperature Drift Coefficient	100% Full Load	--	--	±0.03	%/°C	
Output Short Circuit Protection②	Not Available					

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

General Specifications

Switching Frequency	typical	100KHz (Typ.)
Operating Temperature	Refer to Temperature Derating Curve	-40°C ~ +85°C
Storage Temperature		-55°C ~ +125°C
Shell temperature rise during work	Within Temperature Derating Curve	25°C
Relative Humidity	No condensing	5%~95%
Case Material		Black flame-retardant heat-resistant Plastic(UL94 V-0)
Pin Welding withstand Temperature	Distance to case 1.5mm, 10s	300°C MAX
Isolation Voltage	Test 1 minute, leakage current < 0.5mA	3000Vdc
Isolation Capacitor	Input/Output, 100KHz/0.1V	20 pF (Typ.)
MTBF	MIL-HDBK-217F@25°C	35X10 ⁵ Hrs
Product Weight		2.4g(Typ.)
Package	Tube(528*18*10mm)	25PCS
	Inner Box(542*110*155mm)	2000PCS(Total 80 tubes)

Packing Dimension



Print board vertical view
Grid: 2.54mm(0.1inch)

Packing Code	L x W x H	
B	19.50× 6.00 × 10.00mm	0.768 × 0.236 × 0.394inch

Pin Function

Pin Function	1	2	3	4	5	6	7
Single(S)	+Vin	GND	NP	NP	-Vo	NP	+Vo
Dual(D)	+Vin	GND	NP	NP	-Vo	COM	+Vo

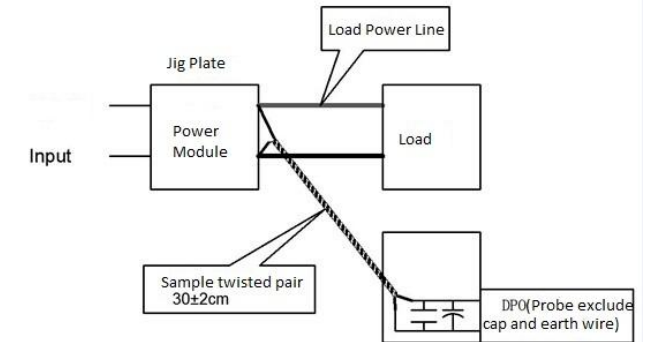
Note: if the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

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

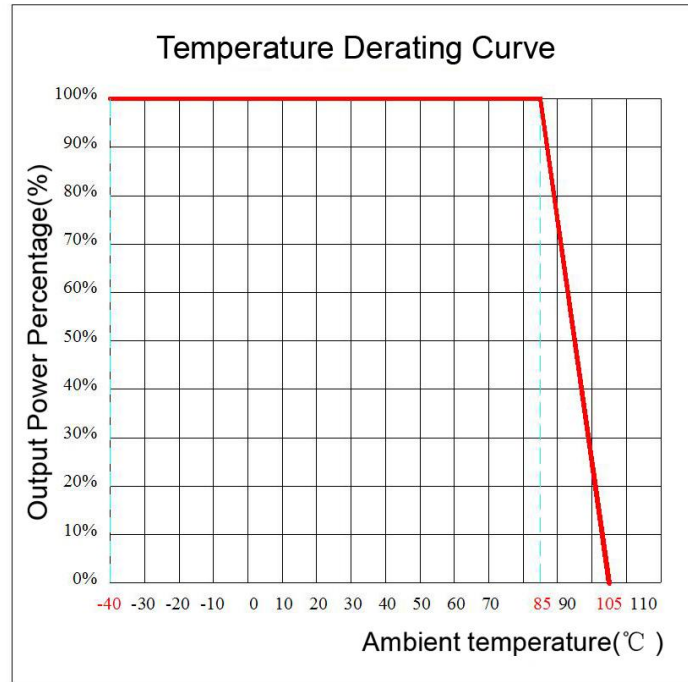
Test Method:

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



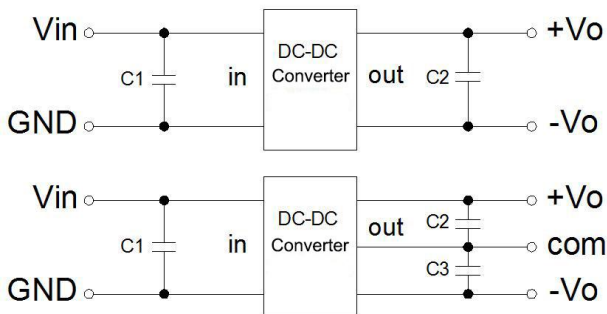
Design and Application Circuit Recommended

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)

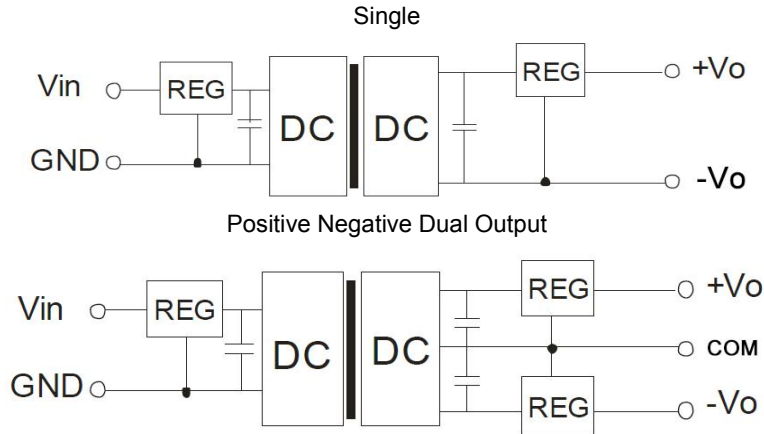


Recommended capacitive load value (Table 1)

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, or choose our NW series products.



- 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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