

Typical Features

- ◆ Fixed input voltage, Isolated & unregulated output, Output power 1W
- ◆ High Efficiency up to 80%
- ◆ Small compact SIP packing
- ◆ No external component required
- ◆ Isolation Voltage 1500VDC
- ◆ Operating Temperature: -40°C~+85°C
- ◆ 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°C

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 (%)@ output full load, nominal input voltage			
	Nominal	Range	Voltage (VDC)	Current(mA) MAX./Min.	Full load Typ.	No Load Typ.			Min.	Typ.		
FN1-3V3S3V3BN	3.3	2.97	3.3	303	436	40	220	150	68	72		
FN1-3V3S05BN		- 3.63	5	200	436	30					74	78
FN1-05S3V3BN	5	4.5 - 5.5	3.3	303	281	19	470	150	76	80		
FN1-05S05BN			5	200	281	19					76	80
FN1-05S09BN			9	111	281	23					76	80
FN1-05S12BN			12	83	281	22					76	80
FN1-05S15BN			15	67	281	25					76	80
FN1-05S24BN			24	42	281	33					76	80
FN1-12S3V3BN			12	10.8 - 13.2	3.3	303					106	16
FN1-12S05BN	5	200			106	10	76	80				
FN1-12S09BN	9	111			106	15	76	80				
FN1-12S12BN	12	83			106	14	76	80				
FN1-12S15BN	15	67			106	13	76	80				
FN1-12S24BN	24	42			106	14	76	80				

FN1-15S05BN	15	13.5 - 16.5	5	200	84	11	470	150	76	80
FN1-15S12BN			12	83	84	12	470	150	76	80
FN1-15S15BN			15	67	84	11	470	150	76	80
FN1-15S24BN			24	42	84	12	470	150	76	80
FN1-24S3V3BN	24	21.6 - 26.4	3.3	303	54	7	470	150	70	74
FN1-24S05BN			5	200	54	7	470	150	79	83
FN1-24S09BN			9	111	54	7	470	150	76	80
FN1-24S12BN			12	83	54	7	470	150	76	80
FN1-24S15BN			15	67	54	7	470	150	76	80
FN1-24S24BN			24	42	54	7	470	150	76	80
FN1-05D05BN	5	4.5 - 5.5	±5	±100	281	30	220	150	76	80
FN1-05D09BN			±9	±56	281	26	220	150	76	80
FN1-05D12BN			±12	±42	281	27	220	150	76	80
FN1-05D15BN			±15	±33	281	31	220	150	76	80
FN1-05D24BN			±24	±21	281	30	220	150	76	80
FN1-12D05BN	12	10.8 - 13.2	±5	±100	106	9	220	150	76	80
FN1-12D09BN			±9	±56	106	16	220	150	76	80
FN1-12D12BN			±12	±42	106	14	220	150	76	80
FN1-12D15BN			±15	±33	106	12	220	150	76	80
FN1-12D24BN			±24	±21	106	16	220	150	76	80
FN1-15D05BN	15	13.5 - 16.5	±5	±100	84	11	220	150	76	80
FN1-15D12BN			±12	±42	84	15	220	150	76	80
FN1-15D15BN			±15	±33	84	14	220	150	76	80
FN1-24D05BN	24	21.6 - 26.4	±5	±100	54	22	220	150	76	80
FN1-24D09BN			±9	±56	54	7	220	150	76	80
FN1-24D12BN			±12	±42	54	8	220	150	76	80
FN1-24D15BN			±15	±33	54	9	220	150	76	78

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.

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		0.1	--	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	mVp-p
		24Vdc output	--	100	120	
Temperature Drift Coefficient	100% Full Load	--	--	±0.03	%/°C	
Output Short Circuit Protection②	Continuous short-circuit protection, self-recovery					

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

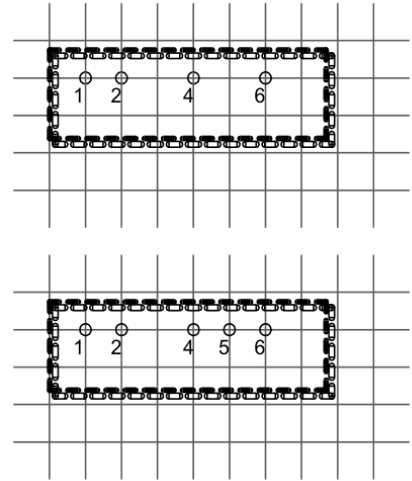
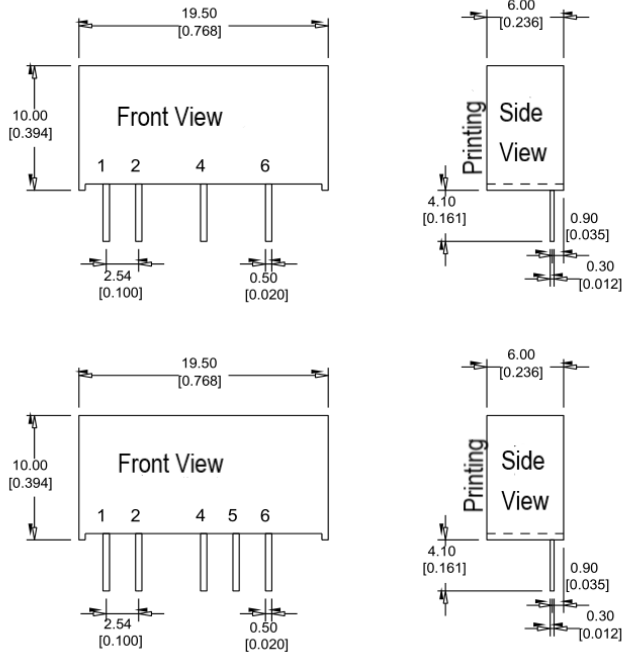
General Specifications

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(Typ.)
Relative Humidity	No condensing	5%~95%
Case Material		Black flame-retardant heat-resistant Plastic(UL94 V-0)
Pin Withstand Soldering Temp	Distance to Case 1.5mm, 10S	300°C MAX
Isolation Voltage	Test 1 minute, leakage current < 0.5mA	1500Vdc
Isolation Capacitor	Input/Output,100KHz/0.1V	20 pF (Typ.)
MTBF	MIL-HDBK-217F@25°C	35X10 ⁵ Hrs



Product Weight		2.1g(Typ.)
Packing	Tube(525*18*10mm)	25PCS
	Box(542*110*155mm)	2000PCS(Total 80Tubes)

Packing Dimension



Printed board vertical view
Lattice spacing:2.54mm(0.1inch)

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

Pin Function

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

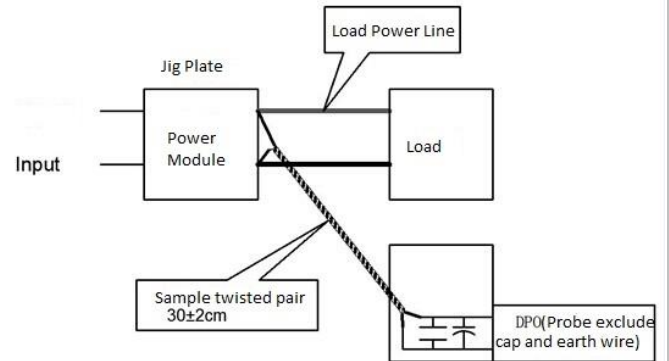
Note: if the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

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

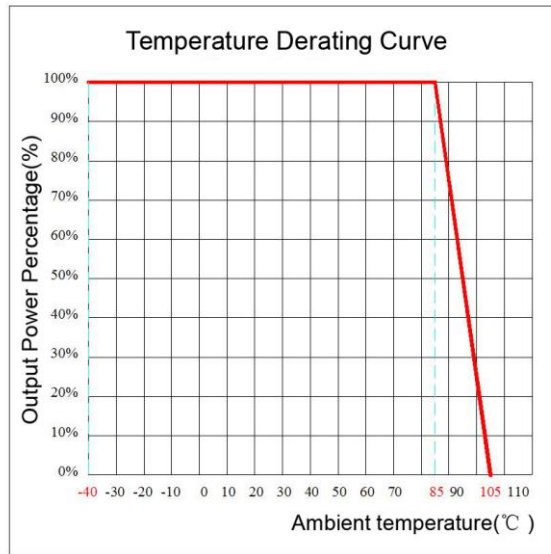
Test Method:

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



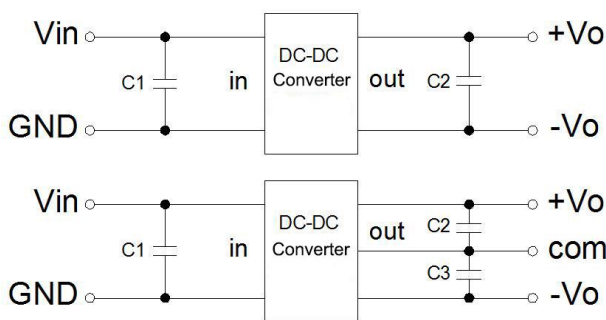
Design and Application Circuit Recommended

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)

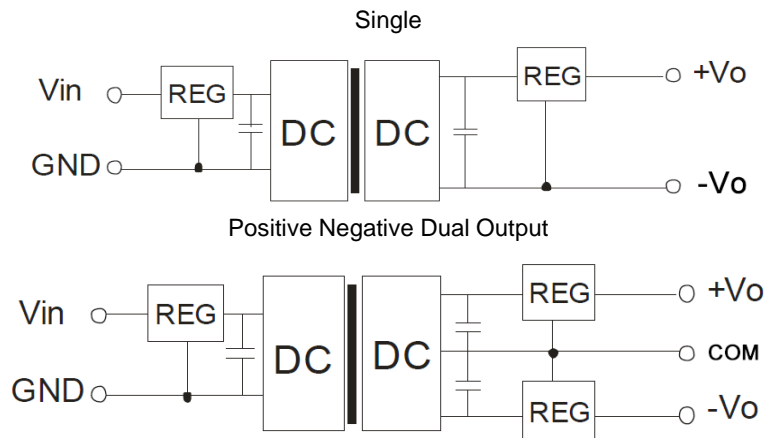


Recommended capacitive load value (Table 1)

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.