

### Typical Features

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



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### Application Field

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### Typical Product List

Part no.	Input Voltage Range (VDC)		Output Voltage/ Current (Vo/Io)		Input Current (mA) Nominal Voltage		Max. Capacitive Load	Ripple & Noise (Max.)	Efficiency (%)@Output full load, input nominal voltage	
	Nominal	Range	Voltage (VDC)	Current (mA) MAX./Min.	Full load typ.	No load typ.	uF	mVp-p	Min.	Typ.
NW1-24S3V3B	24	22.8 - 25.2	3.3	303	58	8	3000	100	67	71

To ensure this module operate efficiently and reliably, the minimum output load could not be less than 10% of the nominal load during operation. If the actual output power is too small, please connect a resistor in parallel at the output, the resistance recommended equal to 10% nominal power;

### Input Specifications

Item	Test Condition	Min.	Typ.	Max.	Unit
Input Overshoot Voltage (1sec. max.)	5Vdc Input	-0.7	--	9	Vdc
	12Vdc Input	-0.7	--	18	
	24Vdc Input	-0.7	--	30	
Input Filter	Capacitor Filter				

### Output Specifications

Item	Working Conditions	Min.	Typ.	Max.	单位
Output power		0.1	--	1	W
Output Voltage Accuracy	Nominal input, full	--	±2	±3	%



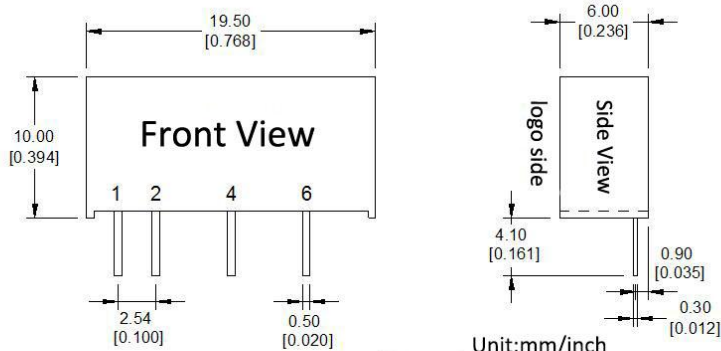
Load Regulation	10% ~ 100% nominal load	--	--	1.0	
		--	--	±0.25	
Ripple & Noise①	Nominal input, full load,20MHZ bandwidth	--	75	100	mVp-p
Temperature Drift	100% full load	--	--	±0.03	%/°C
Output short circuit Protection	Not Available				

NOTE:① Ripple & Noise Tested by twisted-pair method

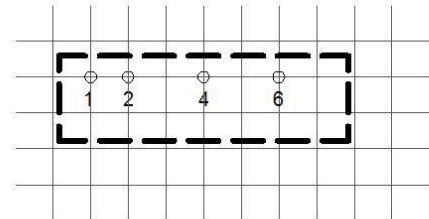
### General Specifications

Switching Frequency	Typical	100KHz (Typ.)
Operating Temperature	Refer to Temperature Derating Curve	-40°C ~ +85°C
Storage Temperature		-55°C ~ +125°C
Shell temperature rising when	Within Temperature Derating Curve	25°C(Typ.)
Relative Humidity	No condensing	5%~95%
Case Material		Black flame-retardant heat-resistant Plastic(UL94-V0)
Pin Withstand Welding 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 <sup>5</sup> Hrs
Product Weight		2.1g (Typ.)
Package	Tube (525*18*10mm)	25PCS
	Carton (542*110*155mm)	2000PCS(Total 80 Tubes)

### Packing Dimension



Package Dimensions



Printed board vertical view

Lattice spacing:2.54mm(0.1inch)

Recommended Printed Board Diagram

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
	+Vin	GND	NP	-Vo	NP	+Vo
Single(S)	Input Positive	GND	No Pin	Output Negative	No pin	Output Positive

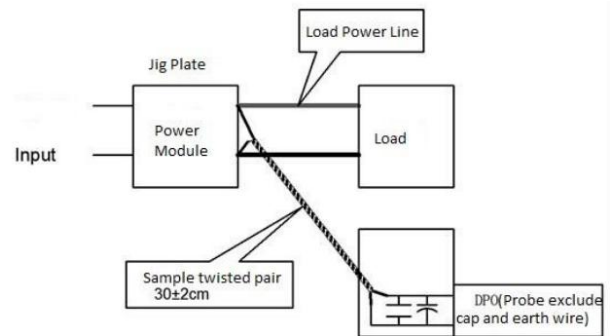
注意：电源模块的各管脚定义如与选型手册不符，应以实物标签上的标注为准。

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

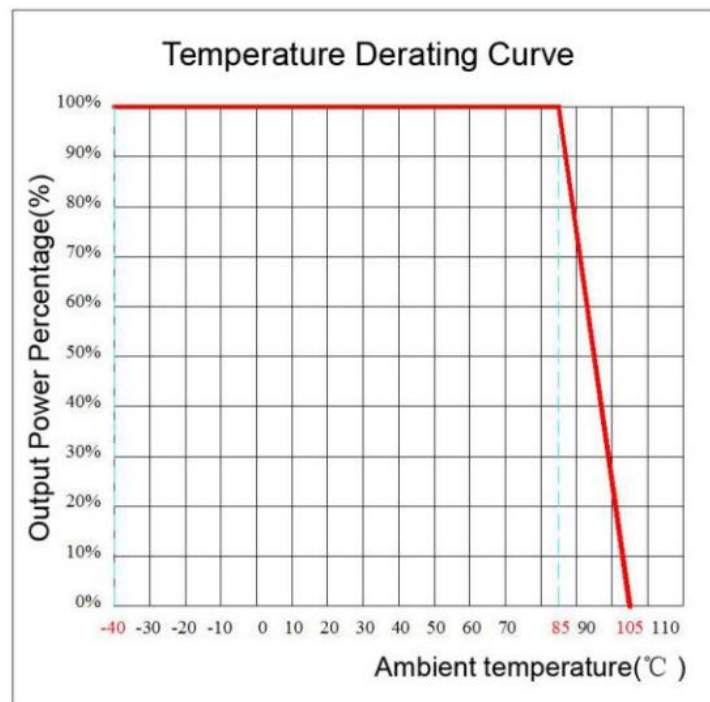
Test Method:

1. 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.

2. 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.



## Product Characteristic Curve



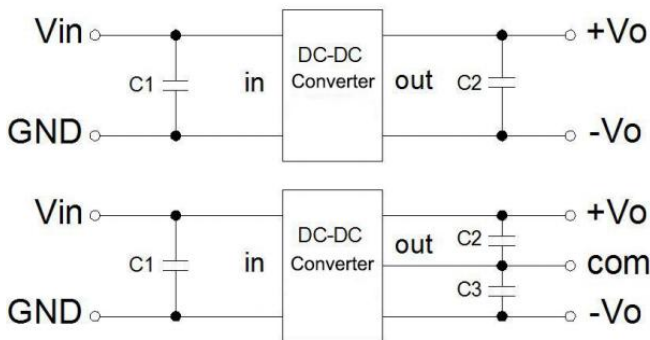
## Design and Application Circuit Recommended

### 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 3; 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)

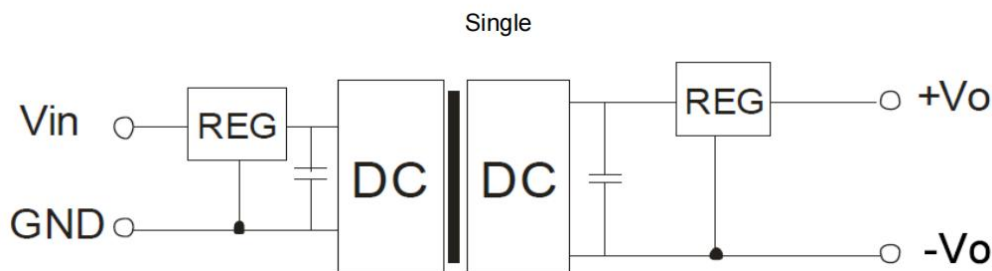


Recommended capacitive load value (Table 1)

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