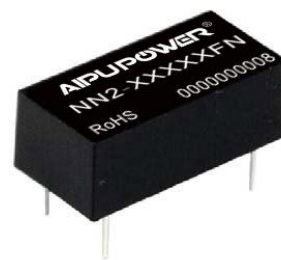


Typical Features

- ◆ Fixed input voltage, Isolated & unregulated output, Output power 2W
- ◆ High Efficiency up to 86%
- ◆ Small compact DIP packing
- ◆ 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

Part No.	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)	Full load Typ.	No Load Typ.	uF	mVp-p	Min.	Typ.
NN2-05S3V3FN	5	4.5	3.3	400/40	513	8	2400	150	74	78
NN2-05S05FN			5	400/40	476	8	1200	150	77	80
NN2-05S12FN		-	12	167/17	455	18	560	150	77	80
NN2-05S15FN		5.5	15	133/13	455	20	560	150	80	83
NN2-05S24FN			24	83/8	450	15	220	150	79	82
NN2-12S05FN	12	10.8	5	400/40	195	10	2400	150	81	84
NN2-12S12FN		-	12	167/17	186	10	560	150	83	86
NN2-12S15FN		13.2	15	133/13	192	10	560	150	80	83
NN2-24S05FN	24	21.6	5	400/40	98	8	2400	150	79	82
NN2-24S12FN		-	12	400/40	95	8	560	150	83	86
NN2-24S15FN		26.4	15	167/17	96	8	560	150	80	83
NN2-05D05FN	5	4.5	±5	±200/±20	476	8	1200	150	77	80
NN2-05D12FN		-	±12	±83/±8	455	18	220	150	77	80
NN2-05D15FN		5.5	±15	±67/±7	455	20	220	150	77	80
NN2-12D05FN	12	10.8	±5	±200/±20	195	10	1200	150	81	84
NN2-12D12FN		-	±12	±83/±8	186	10	220	150	83	86
NN2-12D15FN		13.2	±15	±67/±7	192	10	220	150	80	83
NN2-24D05FN	24	21.6	±5	±200/±20	98	8	1200	150	79	82
NN2-24D09FN			±9	±111/±11	98	8	1000	150	80	83
NN2-24D12FN		-	±12	±83/±8	95	8	220	150	83	86
NN2-24D15FN		26.4	±15	±67/±7	96	8	220	150	80	83

Note1. To ensure that the module can work efficiently and reliably, its minimum output load cannot be less than 10% of the rated load

when in use. If the power you need is indeed small, please connect a resistor in parallel at the output end. The recommended resistance value is equivalent to 10% of the rated power.

Note 2. The capacitive load of the positive and negative outputs is the same.

Input Specifications

Item	Working Conditions	Min.	Typ.	Max.	Unit
Input Overshoot Voltage (1Second.max.)	5Vdc Input	-0.7	--	9	VDC
	12Vdc Input	-0.7	--	18	
	24Vdc Input	-0.7	--	30	
Input Filter	Capacitor Filter				

Output Specifications

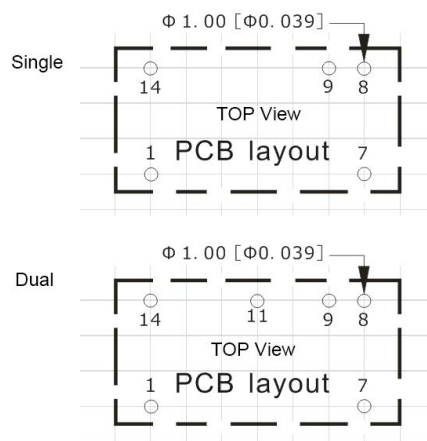
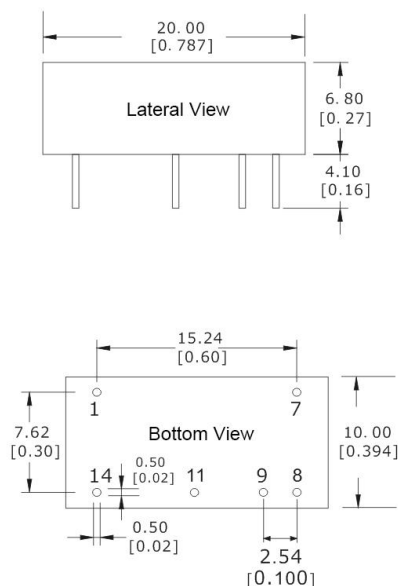
Item	Working Conditions	Min.	Typ.	Max.	Unit
Output Power		0.2	--	2	W
Output Voltage Accuracy	Nominal input, Full load	--	±2	±5	%
Load Regulation	10% ~ 100% nominal load	--	--	15	
Line Voltage Regulation	Input Voltage Change±1%	--	--	±1.2	
Ripple & Noise①	Nominal input, full load, 20MHZ bandwidth	--	75	150	mVp-p
Temperature Drift Coefficient	100% Full Load	--	--	±0.03	%/°C
Output Short Circuit Protection	Continuous short-circuit protection, self-recovery				

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

General Specifications

Switching Frequency	Nominal input, full load	260KHz (Typ.)
Operating Temperature	Refer to Temperature Derating Curve	-40℃ ~ +85℃
Storage Temperature		-55℃ ~ +125℃
Shell temperature rise during work	Within Temperature Derating Curve	25℃(Typ.)
Relative Humidity	No condensing	5%~95%
Case Material		Black flame-retardant heat-resistant Plastic(UL94 V-0)
Pin withstand solder temperature	Distance to case 1.5mm, 10Seconds	300℃ 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℃	35X10 ⁵ Hrs
Product Weight		2.5g (Typ.)
Packing	Tube(525*18*10mm)	25PCS
	Box(542*110*155mm)	1800PCS(Total 72tubes)

Packing Dimension



Note:
Grid distance: 2.54*2.54mm
Unit: mm[inch]
Terminal section tolerance: $\pm 0.10[\pm 0.004]$
Unmarked tolerance: $\pm 0.50[\pm 0.020]$

Packing Code	L x W x H	
F	20.00 × 10.00 × 6.80 mm	0.787 × 0.394 × 0.270 inch

Pin Function

Pin Function	1	7	8	9	11	14
Single(S)	GND	NC	-Vo	+Vo	NP	+Vin
Dual(D)	GND	NC	COM	+Vo	-Vo	+Vin

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

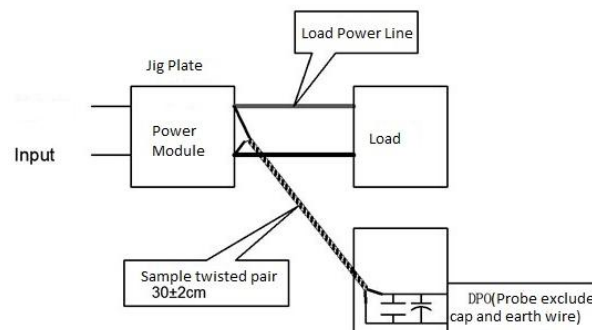
Ripple & Noise Test Description (Twisted Pair Method 20MHz Bandwidth)

Test method:

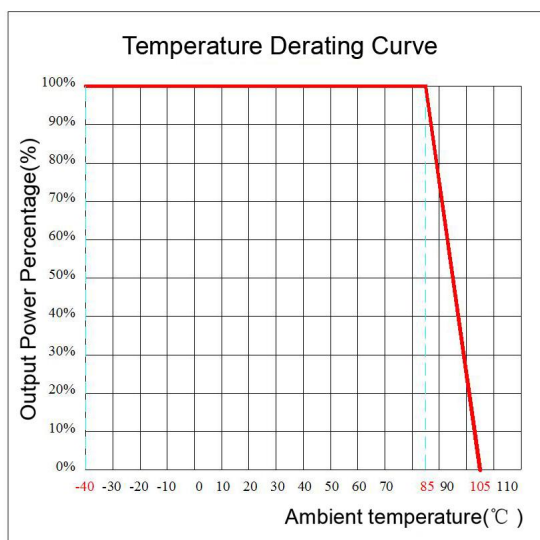
1. Ripple noise is connected using 12# twisted pair cable, the oscilloscope bandwidth is set to 20MHz, 100M bandwidth probe, and 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor are connected in parallel on the probe end, and the oscilloscope sampling uses Sample sampling mode.

2. Output ripple noise test diagram:

Connect the power input end to the input power supply, and the power output is connected to the electronic load through the fixture board. The test is performed using a 30cm ± 2 cm sampling line to directly sample from the power output port. The power line selects the corresponding wire diameter with insulated wire according to the output current.



Temperature Curve



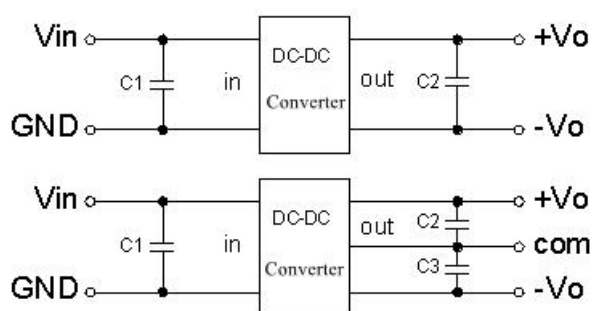
Design and Application Circuit Recommended

① Output load requirements

- In order to ensure that the power module can work efficiently and reliably, it is recommended that its minimum load should not be less than 10% of the rated resistive load; if the power you need is indeed small, please connect a resistor equivalent to 10% of the rated load in parallel at the output end.
- The maximum capacitive load of the product is obtained from the nominal full load test. When in use, it cannot exceed the maximum capacitive load at the output end, otherwise it is likely to cause startup difficulties and damage the product.

② Recommended circuit

- In order to ensure effective reduction of input and output ripple and noise, a capacitor filter network can be connected to the input and output ends. The application circuit is shown in Figure 1 below; but a suitable filter capacitor should be selected. If the capacitor is too large, it may affect the startup of the product. To ensure that each output works under safe and reliable conditions, the recommended capacitive load value is detailed in Table 1 below.



Recommended capacitive load value (Table 1)

V_{in} (Vdc)	$C1$ (μ F)	V_{out} (Vdc)	$C2$ (μ F)	V_{out} (Vdc)	$C2, C3$ (μ F)
3.3/5	4.7	3.3/5	10	$\pm 3.3/\pm 5$	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

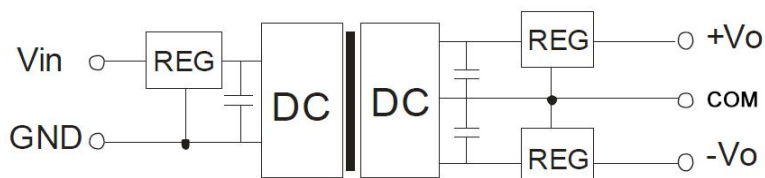
③ Output voltage regulation and overvoltage protection circuit

The simplest device for output voltage regulation, overvoltage and overcurrent protection is to connect a linear voltage regulator with overheat protection in series at its input or output end and connect a capacitor filter network (see the figure below). The recommended value of the filter capacitor is detailed in (Table 1). The linear voltage regulator should be reasonably selected according to the voltage and current required for actual work; or our NW series products can be selected.

Single Output



Dual Output

**Note:**

1. This product cannot be used in parallel and does not support hot swapping;
2. If the product operates below the minimum required load, it cannot be guaranteed that the product performance meets all performance indicators in this manual;
3. All indicator test methods in this article are based on the company's corporate standards;
4. Product specifications are subject to change without prior notice.

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