Typical Features

- ◆ Fixed input voltage, Isolated & unregulated output, output power 0.25W
- ◆ High Efficiency up to 82%
- ◆ Small compact SIP packing
- ◆ Isolation Voltage 1500VDC
- ◆ Operating Temperature: -40℃～+105℃
- ◆ Plastic Case, meet UL94 V-0 standard

Test Condition: Unless otherwise specified, data in the datasheet should be tested under the conditions of nominal input 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 (%)@output full load, nominal input voltage	
	Nominal	Range	Voltage (VDC)	Current(mA) MAX./Min.	Full load Typ.	No Load Typ.	uF	mVp-p	Min.	Typ.
NNV25-05S05AN	5	4.5 - 5.5	5	50/5	56	8	2400	100	80	82

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	Working Conditions	Min.	Typ.	Max.	Unit
Input Overshoot Voltage (1 sec.max.)	5Vdc Input	-0.7	--	9	VDC
Input Filter	Capacitor Filter				

Output Specifications

ITEM	Working Conditions		Min.	Typ.	Max.	Unit
Output Power			0.025	--	0.25	W
Output Voltage Accuracy	Nominal input, Full load		--	±2	±5	%
Load Regulation	10% ~ 100% nominal load	3.3Vdc output	--	--	20	%
		Other output voltage	--	--	15	%

Line Voltage Regulation	Input Voltage Change±1%	3.3Vdc output	--	--	±1.5	
		Other output voltage	--	--	±1.2	%
Ripple & Noise①	Nominal input, full load, 20MHZ bandwidth		--	75	100	mVp-p
Temperature Drift Coefficient	100% Load		--	--	±0.03	%/°C
Output Short Circuit Protection	Continuous, self-recovery					

NOTE:① Ripple & Noise Tested by twisted-pair method, for details please check Design and Application Circuit.

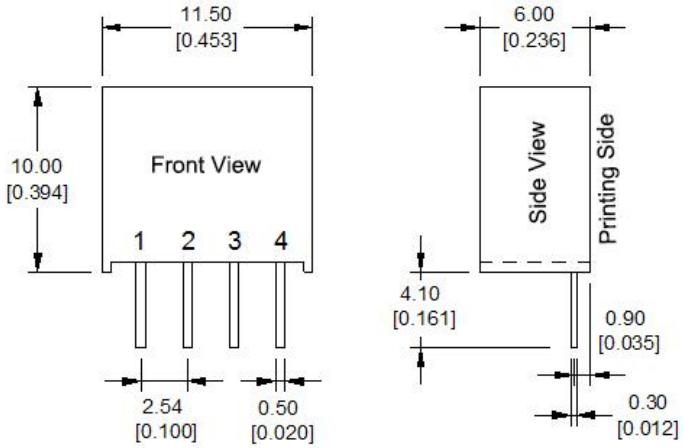
General Specifications

Switching Frequency	Full Load	330KHz (Typ.)
Operating Temperature	Refer to Temperature Derating Curve	-40℃ ~ +105℃
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 welding temp	Distance to case 1.5mm, 10s	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		1.4g(Typ.)
Package	Tube(525*18*10mm)	43PCS
	Inner Box(542*110*155mm)	3440PCS(Total 80Tubes)

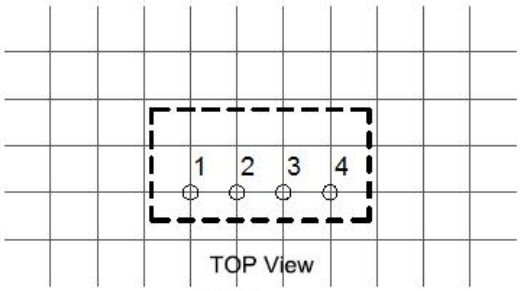
EMC Characteristics

EMI	CE	CISPR32/EN55032 CLASS B (see EMC recommend circuit)
	RE	CISPR32/EN55032 CLASS B (see EMC recommend circuit)
EMS	ESD	IEC/EN61000-4-2 Air±8kV,Contact±6kV perf.Criteria B

Packing Dimension



Packing Dimension



PCB Layout

Note: Grid 2.54x2.54mm
unit:mm[inch]
pin tolerance:±0.10[±0.004]
general tolerance:±0.50[±0.020]

Recommend PCB Circuit

Packing Code	L x W x H	
A	11.50 × 6.00 × 10.00mm	0.453 × 0.236 × 0.394inch

Pin Function

Single(S)	1	2	3	4
	GND	+Vin	-Vo	+Vo

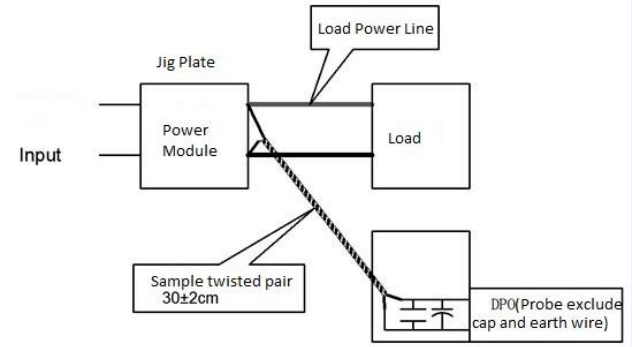
Note: if the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

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

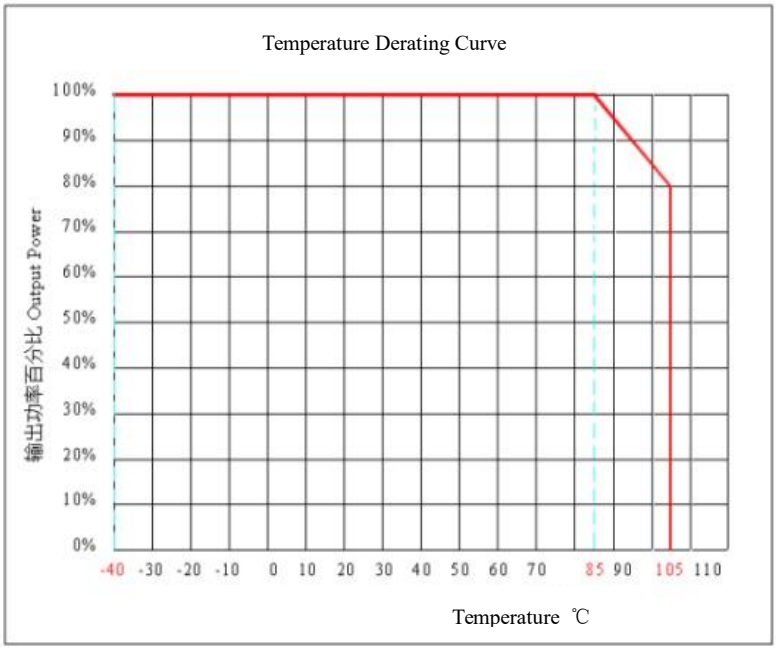
Test Method:

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.



Product Characteristic Curve



Design and Application Circuit Recommended

1. Output load requirements

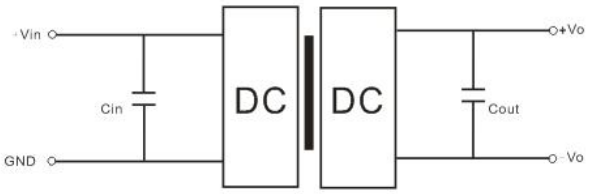
a. In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor at the output side, the resistance equal to 10% nominal load.

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.

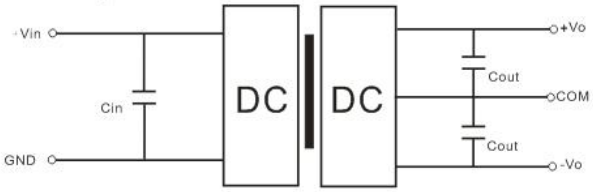
2. Recommended circuit

a. 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 application circuits with actual output power less than 0.5W, it is recommended not to connect external capacitors)）

Single Output



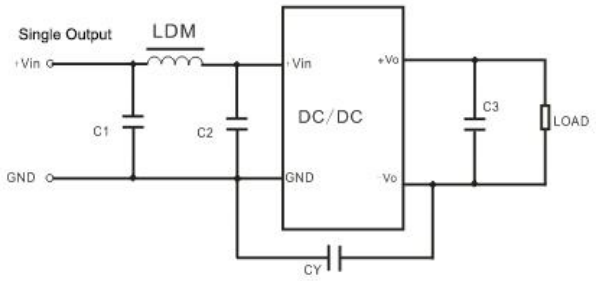
Dual Output



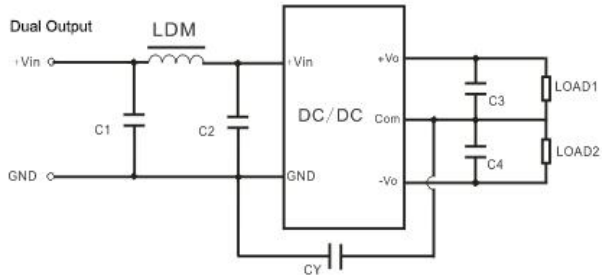
Recommended capacitive load value(Table 1)

Vin (Vdc)	Cin	Single Vout Vdc	Cout (μF)	Dual Vout (Vdc)	Cout (μF)
5	10μF/16V	3.3	10μF/16V	±3.3	4.7μF/16V
12	2.2μF/25V	5	10μF/16V	±5	4.7μF/16V
15	2.2μF/25V	9	2.2μF/25V	±9	2.2μF/25V
24	1μF/50V	12	2.2μF/25V	±12	1μF/25V
--	--	15	1μF/25V	±15	1μF/16V
--	--	24	1μF/50V	±24	0.47μF/50V

3. EMC typical recommended circuit



Input Voltage		5VDC	12/15/24VDC
EMI	C1/C2	4.7μF/16V	4.7μF/50V
	CY	270pF/2kV	270pF/2kV
	C3	Refer to Cout Spes	according to Table 1
	LDM	6.8μH	6.8μH

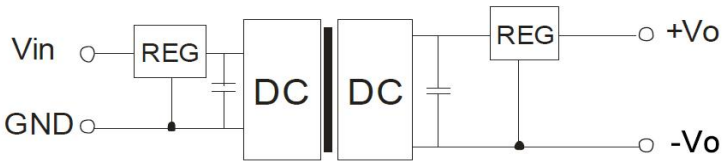


Input Voltage		5VDC	12/15/24VDC
EMI	C1/C2	4.7μF/16V	4.7μF/50V
	CY	270pF/3kVdc	270pF/3kVdc
	C3/C4	Refer to Cout Spes	according to Table 1
	LDM	6.8μH	6.8μH

④Output voltage stabilization and over-voltage protection circuit

The simplest device for output voltage regulation, over-voltage and over-current protection is to connect a linear regulator with overheating protection in series to its input or output end and connect a capacitor filter network (see the figure below). The recommended value of the filter capacitor See (Table 1) for details. The linear voltage regulator should be selected reasonably according to the voltage and current required for actual work; or choose our company's NW series products.

Single 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.