DC/DC Converter
NNV25-XXSXXANT Series

AIPUPOWER®

Typical Feature

◆ Fixed Input Voltage, isolated & regulated output, output power 0.25W

◆ Continuous short circuit protection

◆ Operating Temperature: -50℃ to +105℃

◆ Small SMD package, international standard pin out

◆ Isolation Voltage 1500VDC

◆ High efficiency up to 82%

◆ No-load input current as low as 5mA

Application Filed

NNV25-XXSXXANT products are suitable for pure digital circuits, general low-frequency analog circuits, relay drive circuits, etc. They are specially designed for applications where a set of voltages isolated from the input power supply need to be generated in the on-board power supply system.

This product is suitable for:

1. The input power supply voltage is relatively stable (voltage variation range ±10%Vin);

2. Isolation is required between input and output (isolation voltage ≤1500VDC);

3. The requirements for output voltage stability and output ripple noise are not high.

Typical Product List

Part No	Input Voltage		Input Specification		Max capacitive load	Ripple& Noise 20MHz （Typ./Max.）	Efficiency (Min./Typ.)
	Range		Voltage	Current			
	(VDC)		(VDC)	(mA) Max./Min.	uF	mVp-p	%
NNV25-05S05ANT	5 （4.5-5.5）		5	50/5	2400	50/100	80/82

Note 1: The typical value of output efficiency is based on the product being aged at full load for half an hour.

Note 2: The full load efficiency fluctuation range in the table is ±2%. The full load output efficiency is equal to the total output power divided by the input power of the power module.

Note 3: The ripple and noise test method uses the twisted pair test method. For specific test methods and matching, please refer to the following (Ripple & Noise Test Instructions).

Input Specification

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input current (Full Load / No Load)	5Vdc Input	-	56/5	64/10	mA
Reflected ripple current	-	-	15	-	
Impulse voltage	5Vdc Input	-0.7	-	9	VDC
Impulse current	-	-	0.8	-	A
Input filter type	Capacitor Filter				
Hot plug	Unavailable				

Output Specification

Item	Operating Condition	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Nominal input, full load	See Error Envelope Curve			
Line Regulation	Input voltage change ±1%	-	-	±1.5	%
Load Regulation	10%-100% load	-	10	15	%
Temperature Drift Coefficient	100% load	-	-	±0.03	%/℃
Short Circuit Protection	Continuous, Self-recovery				

General Specification

Item	Operating Condition	Min.	Typ.	Max.	Unit
Insulation Withstand Voltage	Input-output, test for 1 minute, leakage current is less than 0.5mA	1500	-	-	VDC
Insulation Resistance	Input-output, insulation voltage 500VDC	1000	-	-	MΩ
Isolation Capacitor	Input-output, 100KHz/0.1V	-	20	-	PF
Operating Temperature	Temperature ≥105℃, use at derating (see derating curve)	-50	-	115	℃
Case Temperature Rise	Test environment temperature 25℃	-	15	-	℃
Storage Temperature	-	-55	-	135	℃
Reflow Temperature	Peak temperature Tc≤250℃, the maximum time above 217℃ is 60S				
Storage Humidity	No condensation	-	-	95	%RH
Switching Frequency	Full load @ 5Vdc input	-	360	-	KHz
MTBF	MIL-HDBK-217F@25℃	3000			K hours

Physical Characteristic

Case Material		Black flame retardant and heat resistant epoxy resin (UL94V-0)
Dimension	SMD Package	12.7X11.20X7.25 mm
Weight		1.4g（Typ.）
Cooling Method		Natural air cooling

EMC Characteristic

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

Output Voltage Error Envelope Curve

3.3V 5V Output Error Envelope Curve

Other Output Error Envelope Curve
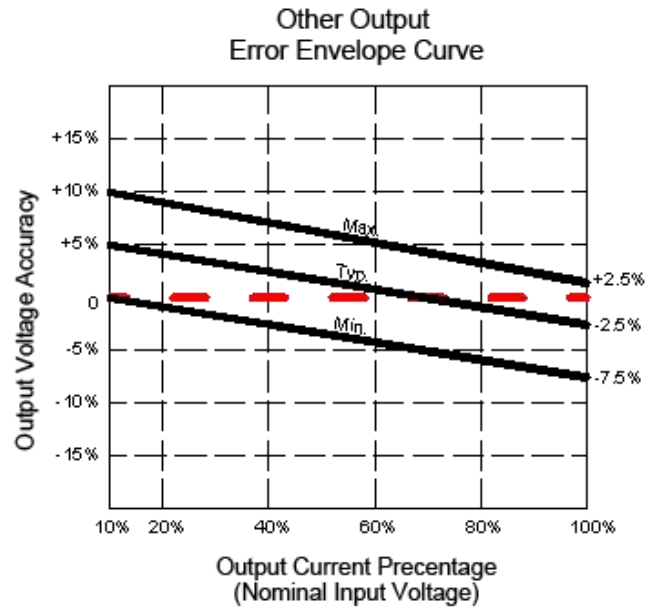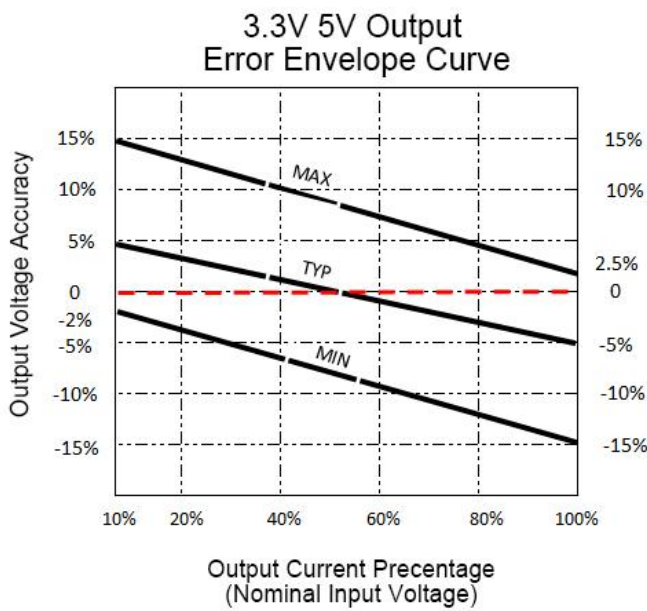
Products Characteristic Curve

Temperature Derating Curve
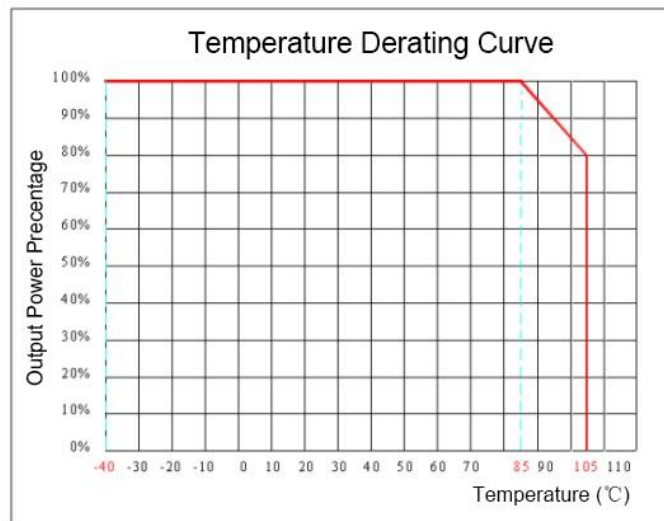
Application Circuit

**1. Typical Applications**

If you need to further reduce the input and output ripples, you can connect a capacitor filter network at the input and output ends. The application circuit is shown in the figure below.

But you should pay attention to choosing a suitable filter capacitor. If the capacitor is too large, it is likely to cause startup problems.
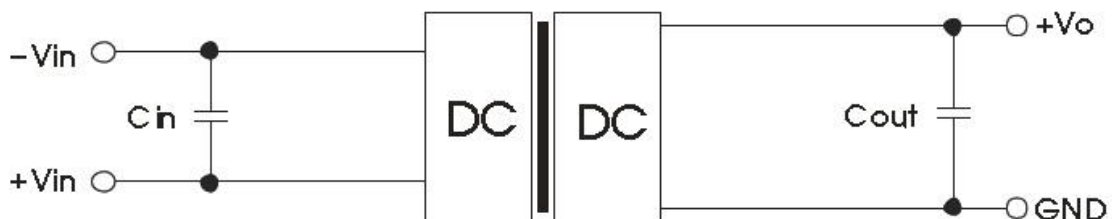
Note1: Cin is 4.7uF/50V，Cout is 10uF/50V

2. EMC Recommended Circuit
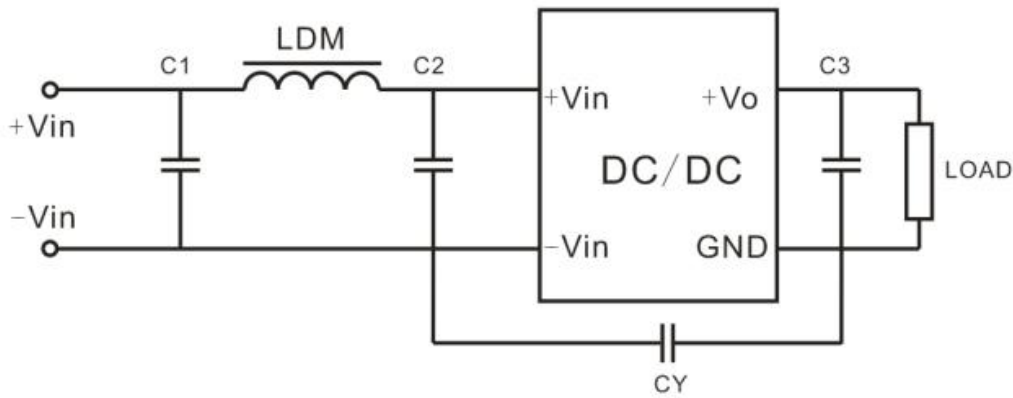
EMC Recommended Circuit

Note 2: C1, C2 are 4.7uF/50V, LDM is 6.8uH, CY is 270pF/1500VDC, C3 can refer to the typical circuit

3. Ripple & Noise Test Instructions (Twisted Pair Method 20MHz Bandwidth)

1) Ripple noise is connected using 12# twisted pair, the oscilloscope bandwidth is set to 20MHz, 100M bandwidth probe, and 0.1uF polypropylene capacitor and 4.7uF high-frequency low-resistance electrolytic capacitor are connected in parallel on the probe end. The oscilloscope sampling uses the Sample sampling mode.

2) Output ripple noise test diagram: Connect the power input to the input power supply, and the power output is connected to the electronic load through the fixture board. The test uses 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.
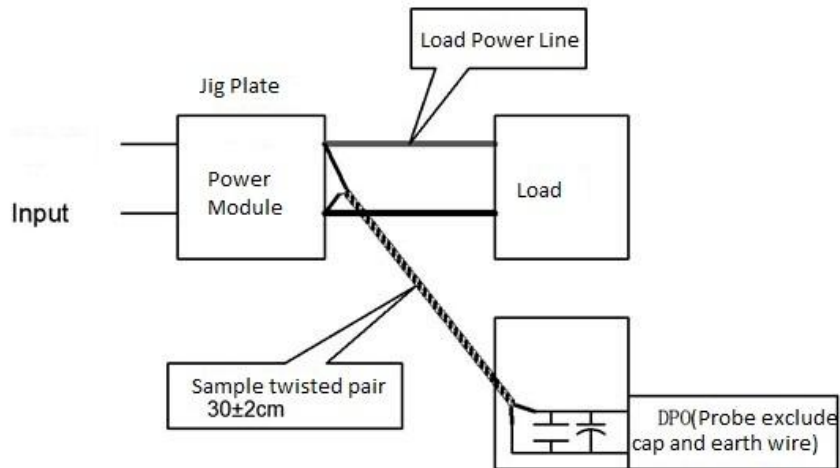
4. Output Load Requirement

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 to the output end (the sum of the power consumed by the resistor and the actual power used is greater than or equal to 10% of the rated power).

AIPUPOWER®

RoHS Compliant | IATF16949 | ISO 9001

Package Dimension

THIRD ANGLE PROJECTION

Note: Grid: 2.54*2.54mm

Pin-out	
Pin	Mark
1	-Vin
2	+Vin
4	GND
5	+Vo
8	NC

NC: Pin to be isolated from circuitry

Note:
Unit:mm[inch]
Pin section tolerances: ±0.10mm[±0.004 inch]
General tolerances: ±0.25mm[±0.010inch]

Note: If the pin definitions of the power module are inconsistent with those in the selection manual, the markings on the actual label shall prevail.

Packaging Information

Note:
Unit:mm(inch)
General tolerance:±1.50[±0.059]
Single tube packing qty:39pcs
Carton packing qty:3120pcs
Size of single tube:525x18x10mm
Size of carton:542x110x155mm

Device	Package Type	PIN	SPQ	Reel Diameter (mm)	Reel Width W1(mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	PIN1 Quadrant
NNV25-XXSXXANT	SMD	5	500	330	24.5	13.1	11.7	7.5	16.0	24	Q1

Tube Packaging	Taping packaging (500pcs per roll)

Note:

1. If the product works below the minimum required load, it cannot be guaranteed that the product performance meets all performance indicators in this manual;

2. The maximum capacitive load is tested within the input voltage range and full load conditions;

3. Unless otherwise specified, all indicators in this manual are measured at Ta=25℃, humidity<75%RH, nominal input voltage and output rated load;

4. All indicator test methods in this manual are based on our company's corporate standards;

5. Our company can provide product customization. For specific details, please contact our technical staff directly.

Guangzhou Aipu Electron Technology Co., Ltd

Address: Building 4, HEDY Park, No.63, Punan Road, Huangpu Dist, Guangzhou, China.

Tel: 86-20-84206763   Fax: 86-20-84206762   HOTLINE: 400-889-8821

E-mail: sales@aipu-elec.com   Website: https://www.aipupower.com