

Typical Feature

- ◆ Fixed Input Voltage, isolated & unregulated, output Power 0.25W
- ◆ Efficiency up to 82%(Typ.)
- ◆ Mini SMD package, international standard pin out
- ◆ Isolation Voltage 1500VDC
- ◆ Operating Temperature from -40℃ to +105℃
- ◆ No-load input current as low as 5mA
- ◆ Plastic case with flame class UL94-V0



Test condition: Unless otherwise specified, all the data in this data sheet are tested at rated input voltage and rated load (pure resistance load), ambient temperature 25℃.

Application Filed

This series of converters can be widely used in the fields of instrument, communication, pure digital circuit, general low frequency analog circuit, relay drive circuit, data exchange circuit, etc.

Typical Product List

Certificate	Part No.	Input Voltage (VDC)		Output Voltage/Current		Input Current (mA)Typ. @Rated Voltage		Max. Capacitive Load	Ripple & Noise 20MHz (mVp-p)	Efficiency (%) @full load/rated input	
		Rated	Range	Vo (VDC)	Io (mA) Max/Min	Full load	No Load	(uF)	Max/Typ	Min	Typ
-	NNV25-05S05ANT	5	4.5-5.5	5	50/5	56	5	2400	75/40	80	82

Note - The ripple and noise are tested by the twisted pair method.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Inrush Voltage (1 Sec Max)	3.3Vdc Input	-0.7	--	7	Vdc
	5Vdc Input	-0.7	--	9	
	9Vdc Input	-0.7	--	12	
	12Vdc Input	-0.7	--	18	
	15Vdc Input	-0.7	--	21	
	24Vdc Input	-0.7	--	30	
Input filter type		Capacitor Filter			
Hot plug		Unavailable			

Output Specification

Item	Operating Condition	Min.	Typ.	Max.	Unit
Output Power		0.025	--	0.25	W
Output Voltage Accuracy		Refer to the Output Voltage Deviation Curve (Figure 1)			
Load Regulation	10%-100% load	3.3Vdc output	--	15	%
		Others output	--	10	
Line Regulation	Input voltage change ±1%	3.3Vdc output	--	1.5	--
		Others output	--	1.2	
Temperature Drift Coefficient	100% load	-	-	±0.03	%/℃
Short Circuit Protection	Continuous, Self-recovery				

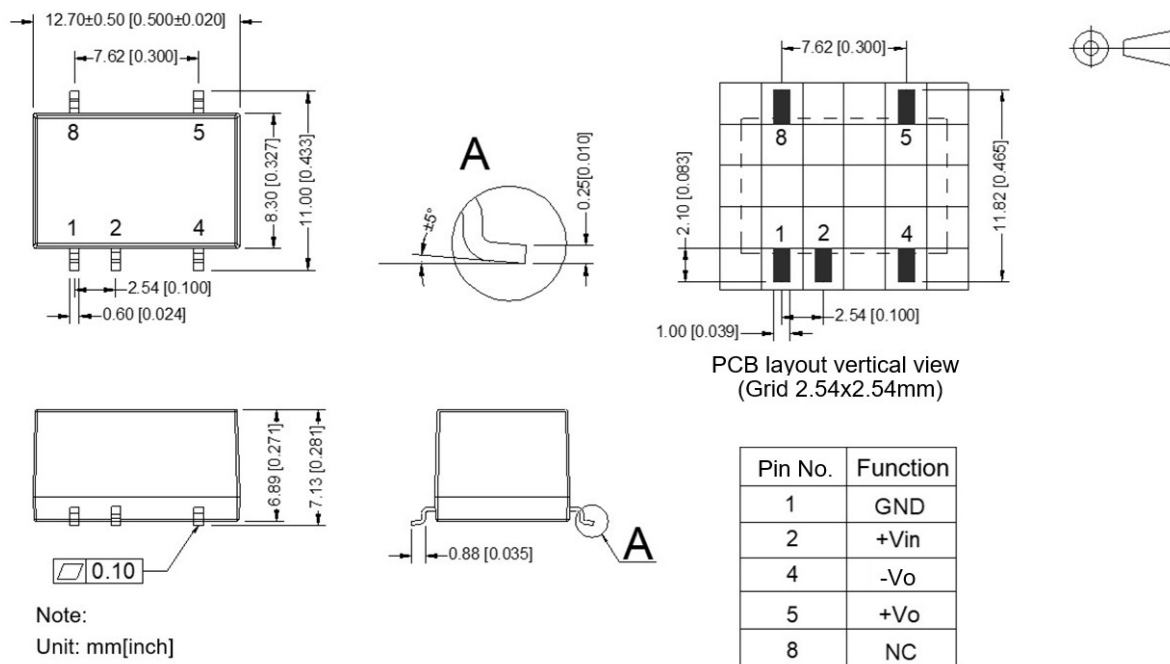
General Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Switching Frequency	Full load @ rated input	--	330	--	KHz
Operating Temperature	Refer to the temperature derating curve (figure 2)	-40	--	105	°C
Storage Temperature	-	-55	--	125	
Case Temperature Rise	Operating at 25℃	--	30°	--	
Pin soldering Temp.	1.5mm from the case, 10 Sec.	--	--	300	
Reflow Temperature	Peak temperature Tc≤250℃, the maximum time 60S above 217℃				
Storage Humidity	No condensation	5	--	95	%RH
Isolation Voltage	Input-output, 1 minute, leakage current 1<mA	1500	--	--	VDC
Insulation Resistance	Input-output @ 500VDC	1000	--	--	MΩ
Isolation Capacitor	Input-output, 100KHz/0.1V	-	20	-	PF
MTBF	MIL-HDBK-217F@25℃	3500	--	--	K hours
Case Material	Plastic in Black, flame class UL94V-0				
Unit Weight	1.4g (Typ.)				
Cooling Method	Natural air				
Unit dimensions	L x W x H	12.70X11.00X7.13 mm		0.500X0.433X0.281 inch	

EMC Performance

EMI	CE	CISPR32/EN55032 CLASS B (with Recommended EMC Circuit)
	RE	CISPR32/EN55032 CLASS B (with Recommended EMC Circuit)
EMS	ESD	IEC/EN61000-4-2 Air $\pm 8\text{kV}$, Contact $\pm 6\text{kV}$ perf.Criteria B

Mechanical dimensions



Note:

Unit: mm[inch]

Pin section tolerance: ± 0.10 [0.004]General tolerance: ± 0.25 [0.010]

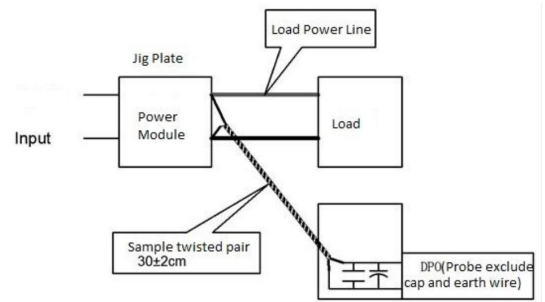
NC should not connect to any circuit

Note: Please take the pin definition on the product label as the right one which is different than the one defined in this data sheet.

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

1) The Ripple & noise test need 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the Sample Mode.

2) The test diagram is shown on the right. The converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the location is as close as possible to the output pins or terminals. The test can be started after input power on.



Product Performance Curves

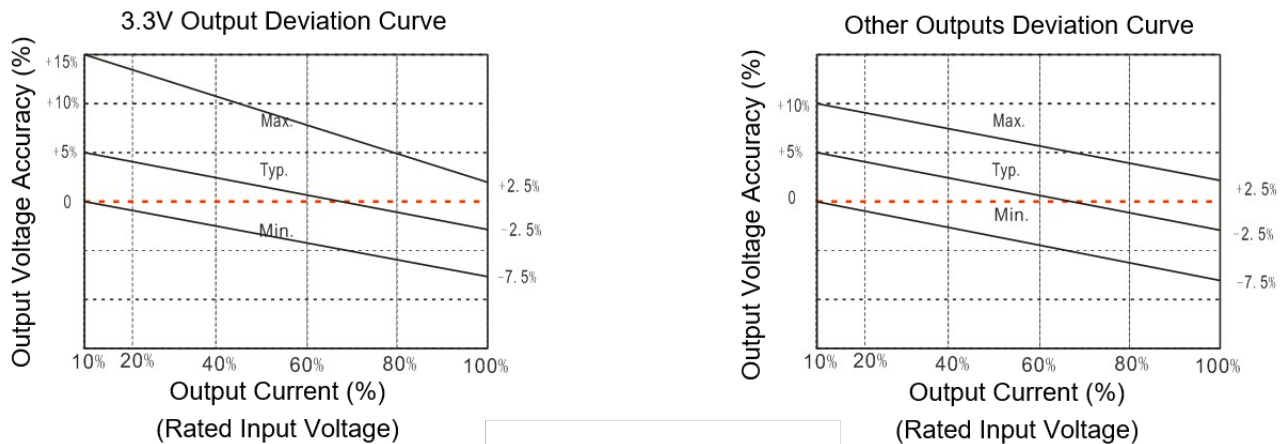


Figure 1

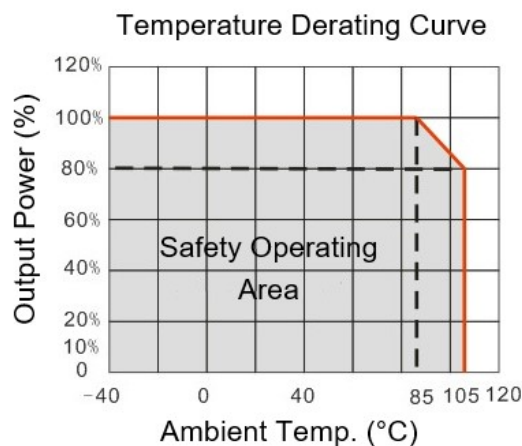


Figure 2

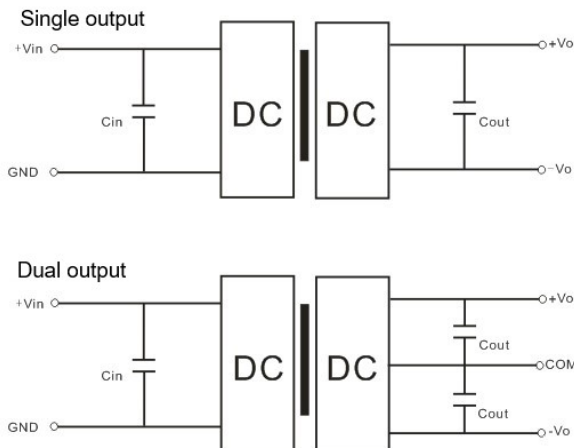
Recommendation for Application

① Output load requirements

The maximum capacitive load of the product was tested at the Rated full load. The converter may not start or be damaged if the output capacitor exceeds this value.

② Recommended circuits for application

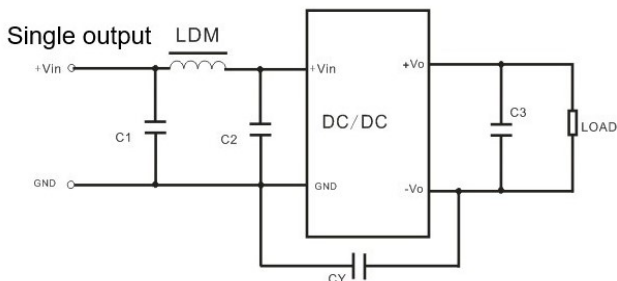
To effectively decrease the input and output ripple and noise, a capacitor filter should be connected at the input and output, the application circuit is shown in the figure below. The suitable filter capacitors should be chosen as the recommended capacitive load values in Table 1. The converter could not start if the capacitance is too big.



Recommended capacitive load values (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

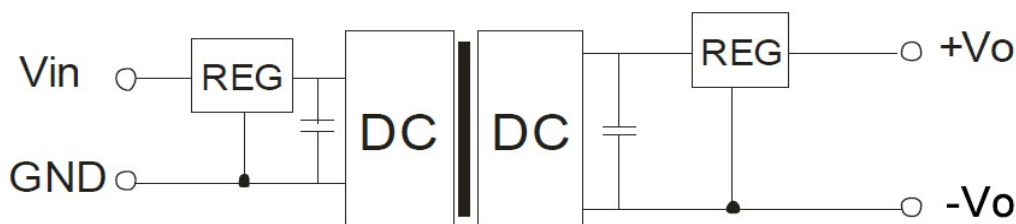
③ Recommended EMC Circuit



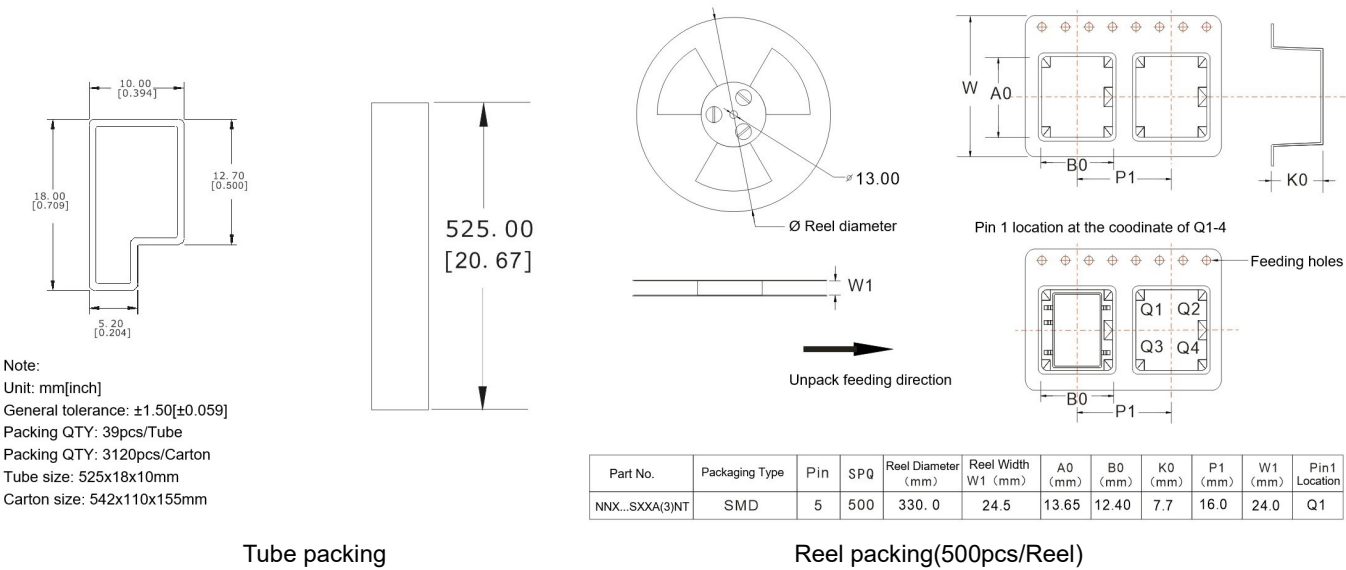
Input voltage		5VDC	12/15/24VDC
EMI	C1/C2	4.7μF/16V	4.7μF/50V
	CY	270pF/2KV	270pF/2KV
	C3	Refer to Cout in Table 1	
	LDM	6.8 μH	6.8 μH

④ Output voltage regulation and over voltage protection

The simple solution to achieve the output regulated voltage, over voltage and over current protections is to connect a linear regulator with overheat protection at input or output, and a capacitor filter connected in parallel as below circuit. Filter capacitive value recommended see table 1, Linear regulator should be chosen according to the actual voltage & current for operating. Or Aipu NW series products are recommended instead.



Packing Information



Application Notice

- 1.This product cannot be used in parallel, and it does not support hot-plugging.
- 2.The product performance in this manual cannot be guaranteed if it works at a lower load than the minimum load condition.
3. All values or indicators in this manual had been tested based on Aipupower test specifications.

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