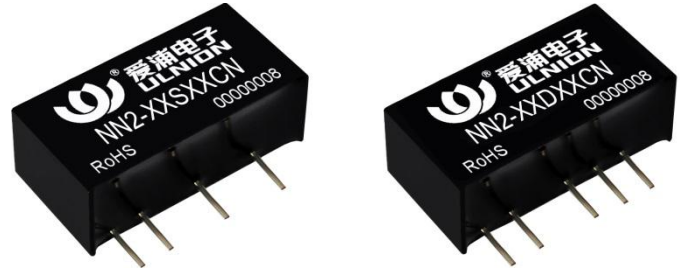
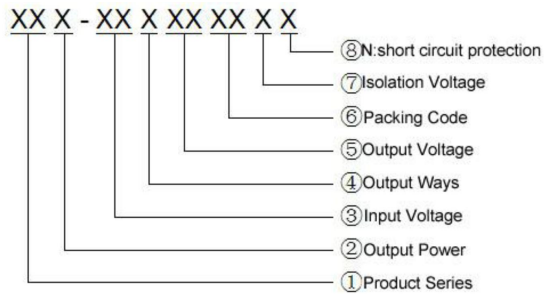


Typical Features

- ◆ Fixed input voltage, isolated & unregulated output, Output Power 2W
- ◆ Transfer efficiency up to 79%
- ◆ Miniature SIP package
- ◆ No external component required
- ◆ Isolation voltage 1500VDC
- ◆ Operating temperature range: -40℃~+85℃
- ◆ Plastic case, meet UL94-V0 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℃.

Product Named Method:

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Surge Voltage (1sec. max.)	5Vdc Input	-0.7	--	9	Vdc
	12Vdc Input	-0.7	--	18	
	15Vdc Input	-0.7	--	21	
	24Vdc Input	-0.7	--	30	
Input Filter		Filter capacitor			

Output Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Output Power		0.2	--	2	W
Output Voltage Accuracy	Nominal input, full load	--	±2	±5	%
Load Regulation	10% - 100% load	3.3Vdc output	--	20	
		Other output	--	15	
Line Regulation	Input voltage change: ±1%	3.3Vdc output	--	±1.5	
		Other output	--	±1.2	
Ripple & Noise①	Nominal input, full load, 20MHz bandwidth	--	100	150	mVp-p
Temperature Coefficient	100% load	--	--	±0.03	%/°C
Output Short Circuit Protection②	5V Input	Short circuit continuous time: ≤3S, self-recovery			
	12V Input	Short circuit continuous time: ≤1S, self-recovery			
	15V Input				
	24V Input	Short circuit continuous time: ≤3S, self-recovery			

Note: ① Ripple and noise are measured by twisted pair method.

② There are a small portion can only be guaranteed to be within 5 seconds.

General Specifications

Switching Frequency	typical	100KHz (Typ.)
Operating Temperature	Refer to temperature derating	-40°C ~ +85°C
Storage Temperature	-	-55°C ~ +125°C
Casing Temperature Rise	Within temperature derating curve	25°C(Typ.)
Storage Humidity	Non-condensing	5%~95%
Case Material	-	Black flame-retardant heat-resistant Plastic (UL94-V0)
Weight	-	3.0g (Typ.)
Isolation Voltage	Test 1 minute, leakage current < 0.5mA	1500Vdc
Isolation Capacitor	Input/output, 100KHz/0.1V	20pF (Typ.)
MTBF	MIL-HDBK-217F@25°C	35X10 ⁵ Hrs

Typical Product List

Part No.	Input Voltage(VDC)		Output Voltage/Current (Vo/Io)		Input Current(mA) Nominal Voltage		Max. Capacitive Load uF	Ripple & Noise (Max.) mVp-p	Efficiency (%) Typ.
	Nominal	Range	Voltage (V)	Current (mA)	Full load Typ.	No load Typ.			

Single Output:

NN2-05S3V3CN	5	4.5 - 5.5	3.3	600	533	50	100	150	75
NN2-05S05CN			5	400	519		100		77
NN2-05S09CN			9	220	513		47		78
NN2-05S12CN			12	167	513		47		78
NN2-05S15CN			15	133	506		47		79
NN2-05S24CN			24	83	506		22		79
NN2-09S3V3CN	9	8.1 - 9.9	3.3	600	296	25	100	75	
NN2-09S05CN			5	400	289		100	77	
NN2-09S09CN			9	220	289		47	77	
NN2-09S12CN			12	167	285		47	78	
NN2-09S15CN			15	133	285		47	78	
NN2-09S24CN			24	83	285		22	78	
NN2-12S3V3CN	12	10.8 - 13.2	3.3	600	222	18	100	75	
NN2-12S05CN			5	400	214		100	78	
NN2-12S09CN			9	220	211		47	79	
NN2-12S12CN			12	167	211		47	79	
NN2-12S15CN			15	133	216		47	77	
NN2-12S24CN			24	83	211		22	79	
NN2-15S3V3CN	15	13.5 - 16.5	3.3	600	178	15	100	75	
NN2-15S05CN			5	400	173		100	77	
NN2-15S09CN			9	220	173		47	77	
NN2-15S12CN			12	167	171		47	78	
NN2-15S15CN			15	133	171		47	78	
NN2-15S24CN			24	83	169		22	79	
NN2-24S3V3CN	24	21.6 - 26.4	3.3	600	113	10	100	74	
NN2-24S05CN			5	400	108		100	77	
NN2-24S09CN			9	220	107		47	78	
NN2-24S12CN			12	167	105		47	79	

NN2-24S15CN			15	133	105		47		79
NN2-24S24CN			24	83	105		22		79

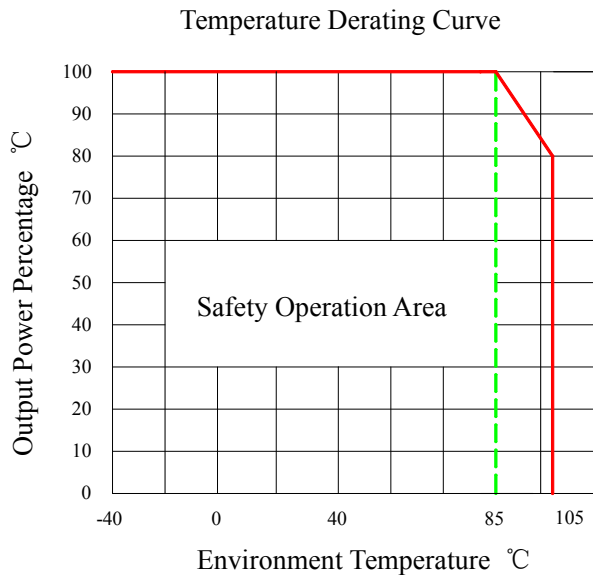
Positive Negative Dual Output:

NN2-05D05CN	5	4.5	±5	±200	519	50	100	150	77
NN2-05D09CN			±9	±110	513		47		78
NN2-05D12CN		5.5	±12	±83	513		47		78
NN2-05D15CN			±15	±67	506		47		79
NN2-12D05CN	12	10.8	±5	±200	214	18	100	150	78
NN2-12D09CN			±9	±110	211		47		79
NN2-12D12CN		13.2	±12	±83	211		47		79
NN2-12D15CN			±15	±67	216		47		77
NN2-15D15CN	15	13.5 16.5	±15	±67	210		45		78
NN2-24D05CN	24	21.6	±5	±200	108	10	100	150	77
NN2-24D09CN			±9	±110	107		47		78
NN2-24D12CN		26.4	±12	±83	105		47		79
NN2-24D15CN			±15	±67	105		47		79

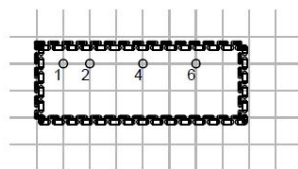
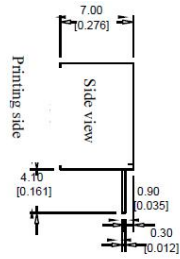
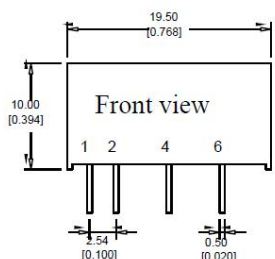
Note:1. “*” is model under developing;

2. To ensure the module work efficiently and reliably, during the operation, the min. output load should be no less than 10% of the rated load. If the actual power is too low, please parallel a resistor to the output terminal, with a recommended resistance which is 10% of the rated power.

Temperature Curve



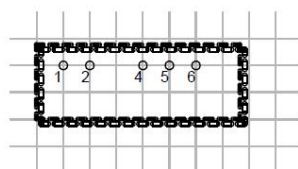
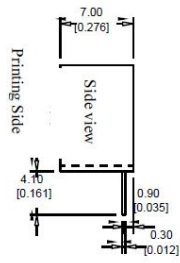
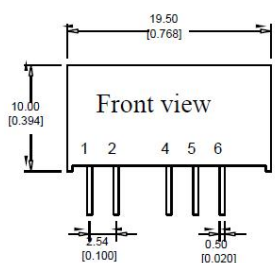
Packing Dimension, Pin Function, Recommended PCB layout



Printed board vertical view

Lattice spacing: 2.54mm (0.1inch)

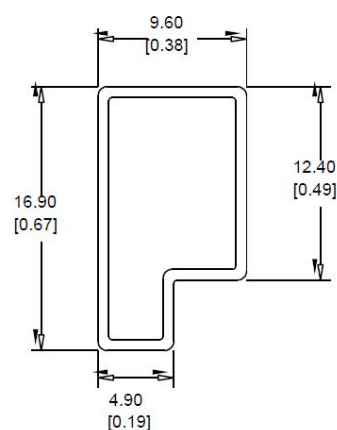
Unit: mm[inch]
General tolerance: 0.xx±0.1(0.xx±0.004)
x.xx±0.25(0.xx±0.01)



Printed board vertical view

Lattice spacing: 2.54mm (0.1inch)

Unit: mm[inch]
General tolerance: 0.xx±0.1(0.xx±0.004)
x.xx±0.25(0.xx±0.01)



Unit: mm[inch]
General tolerance: x.x±0.5mm[x.x±0.020inch]
0.x±0.2mm[0.x±0.008inch]

Packing Dimension

Recommended PCB layout

Packing

Pin Function	Single (S) Dual (D)	1	2	3	4	5	6
		+Vin	GND	--	-Vo	--	+Vo
		+Vin	GND	--	-Vo	COM	+Vo

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

Packing Dimension

Packing Code	L x W x H
C	19.50×7.00 × 10.00mm 0.768 × 0.276 × 0.394inch

Design and Application Circuit Reference

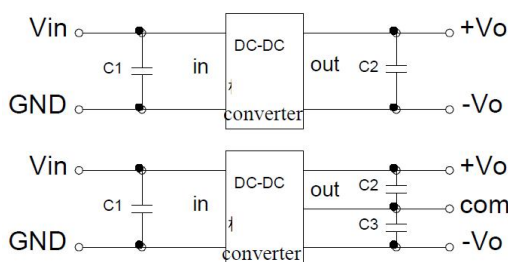
1. Output load request

- To ensure the module work efficiently and reliably, the min. output load should be no less than 10% of the nominal load during operation; If the actual output power is indeed low, please connect a resistor to the output terminal in parallel, with a recommended resistance which is 10% of the rated power.
- The maximum capacitive load is test under nominal input full load, and it cannot exceed the maximum capacitive load of output when using, otherwise it will make it difficult to startup and damage the product.

2. Recommended Circuit

In order to ensure the ripple and noise of input and output reduced, a filter capacitor net can be connected to the input and output terminals, application circuit see Photo 1. But choosing suitable filter capacitor is very important, start-up problems may be caused by too large capacitance. To ensured the modules running well, the recommended capacitive load values as shown in Table 1.(but for actual output power of application circuit less than 0.5W, recommend not to connect external capacitor)

Photo 1



Recommended capacitive load value(Table1)

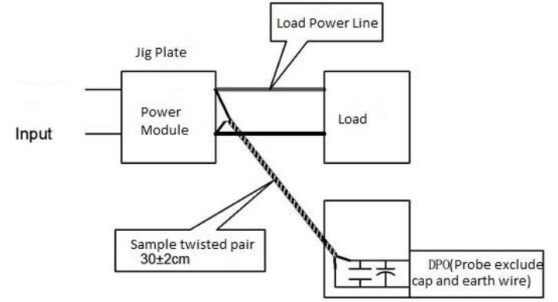
Vin (Vdc)	C1 (μF)	Vout (Vdc)	C2 (μF)	Vout (Vdc)	C2,C3 (μF)
3.3/5	4.7	3.3/5	10	±3.3/±5	4.7
12	2.2	9	4.7	±9	2.2
15	1	12	2.2	±12	1
24	1	15	1	±15	0.47
--	--	24	0.47	±24	0.22

3. Ripple & Noise Test: (Twisted Pair Method 20MHz bandwidth)

Test Method:

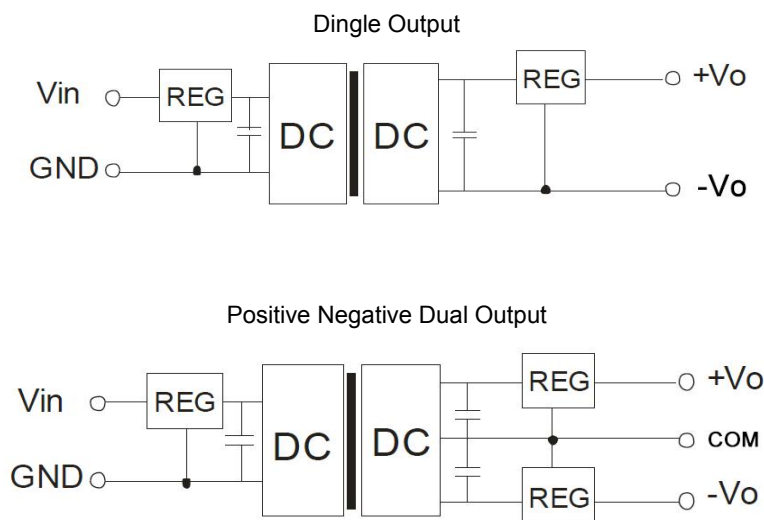
a. 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 47uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

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.



4. 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 side, and connect a filter capacitor net(see picture below), filter capacitance recommended value see table 1, linear regulator is chosen according to the actual operating voltage and current needed, or choose our NW series product.



Note:

1. This product cannot be used in parallel, and do not support hot-plug;
2. If the product is operated below the required minimum load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. All index testing methods in this datasheet are based on our Company's corporate standards;
4. Specifications are subject to change without prior notice.

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [Power Management Modules](#) category:

Click to view products by [Aipu](#) manufacturer:

Other Similar products are found below :

[FPF1C2P5BF07A](#) [FPF1C2P5MF07AM](#) [FH2000NPBAP](#) [B0505S-2W](#) [HLK-5D1205](#) [HLK-10D4805B](#) [B0505XT-1WR2-R](#) [B0505S-1W](#)
[B1224S-1WR2](#) [AP24N20-HV](#) [TAS25-24-W](#) [TAS10-5-W](#) [TAS10-24-W](#) [TAD10-1505-NI](#) [LS03-13B09R3](#) [HCES1-05D12](#) [HCS2-12D15](#)
[DC2626A](#) [DFR0756](#) [CS-POWEEVER-02](#) [CS-POWEEVER-01](#) [01D-6R5-2A](#) [11D-05S05NANL](#) [12D-03S05N3KVAC](#) [12D-](#)
[05S05N3WNL](#) [12D-05S05RNL](#) [12D-24S05R2W](#) [12DA-05S05N2W](#) [13D-05S05NCNL](#) [13DS1-12D09NNL](#) [13DSB-05S05N1.5KV](#) [14D-](#)
[12S03R1KVNL](#) [14DB-05S05N1.5KV](#) [14DZ-05S05R2W](#) [MEE1S0309SC](#) [22D-12D12NCNL](#) [EN5322QI](#) [LTM4624EY#PBF](#) [1SP0340V2M0-](#)
[45](#) [IGD515EI](#) [1SP0335D2S1-5SNA0750G650300](#) [2SP0115T2A0-FF600R12ME4](#) [2SP0115T2A0-12](#) [2SD106AI-17](#) [UL](#) [2SC0635T2A1-45](#)
[2SC0115T2A0-12](#) [2SC0108T2F1-17](#) [1SD210F2-MBN1200H45E2-H_Opt1](#) [A0505S-1W](#) [A0505S-1WR2](#)