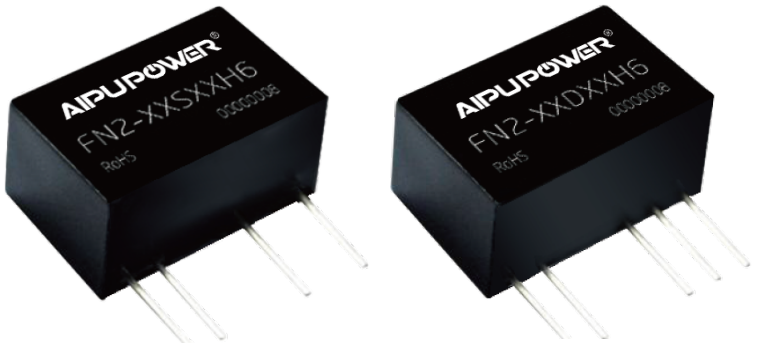
Typical Features

- ◆ Fixed input voltage, Isolated & unregulated output, Output power 2W
- ◆ Efficiency up to 84%(Type.)
- ◆ Small compact SIP packing
- ◆ No external component required
- ◆ Isolation Voltage 6000VDC
- ◆ 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

Model	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) MAX./Min.	Full load Typ.	No Load Typ.	uF	mVp-p	Min.	Typ.
FN2-05S05H6	5	4.5 - 5.5	5	400	474	22	1000	150	79	81
FN2-05S09H6			9	222	470	25	470	150	81	83
FN2-05S12H6			12	167	519	50	470	150	75	77
FN2-05S15H6			15	133	519	50	470	150	75	77
FN2-05S24H6			24	83	506	50	470	150	77	79
FN2-12S05H6	12	10.8 - 13.2	5	400	200	11	1000	150	80	82
FN2-12S09H6			9	222	190	10	470	150	84	86
FN2-12S12H6			12	167	189	13	1000	150	86	88
FN2-12S15H6			15	133	193	17	1000	150	84	86
FN2-15S05H6	15	13.5 - 16.5	5	400	168	12	1000	150	79	81
FN2-24S05H6	24	21.6 - 26.4	5	400	102	8	1000	150	79	81
FN2-24S09H6			9	222	100	8	680	150	80	82
FN2-24S12H6			12	167	96	5	680	150	84	86
FN2-24S15H6			15	133	105	15	470	150	80	82
FN2-24S24H6			24	83	98	11	680	150	83	85
FN2-05D05H6	5	4.5	±5	±200	481	28	680	150	74	76

FN2-05D12H6		-	±12	±83	425	31	680	150	79	81
FN2-05D15H6		5.5	±15	±67	519	80	220	150	76	78
FN2-12D05H6	12	10.8	±5	±200	202	12	680	150	81	83
FN2-12D09H6		-	±9	±110	214	35	470	150	76	78
FN2-12D12H6		13.2	±12	±83	208	35	220	150	76	78
FN2-12D15H6			±15	±67	190	14	1000	150	84	86
FN2-15D15H6	15	13.5 - 16.5	±15	±67	186	12	470	150	80	82
FN2-24D05H6	24	21.6	±5	±200	111	15	470	150	75	77
FN2-24D12H6		-	±12	±83	104	15	220	150	78	80
FN2-24D15H6		26.4	±15	±67	98	10	1000	150	84	86

Note:

1. * marked part has been developed in process.
2. 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.
3. The capacitive loads of positive and negative outputs are identical.

Input Specifications

Item	Test Condition	Min.	Typ.	Max.	Unit
Input Overshoot Voltage (1Second.max.)	5Vdc Input	-0.7	-	9	VDC
	12Vdc Input	-0.7	-	18	
	15Vdc Input	-0.7	-	21	
	24Vdc Input	-0.7	-	30	
Input Filter	Capacitor Filter				

Output Specifications

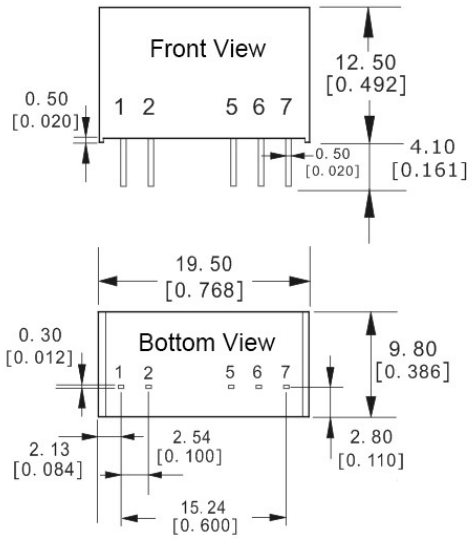
ITEM	Working Conditions		Min.	Typ.	Max.	Unit
Output Power			0.2	--	2	W
Output Voltage Accuracy	Nominal input, Full load		--	±2	±5	%
Load Regulation	10% ~ 100% nominal load	3.3Vdc Output	--	--	20	
		Other Output	--	--	15	
Line Voltage Regulation	Input Voltage Change±1%	3.3Vdc Output	--	--	±1.5	%
		Other Output	--	--	±1.2	
Ripple & Noise①	Nominal input,full load, 20MHZ bandwidth		--	100	150	mVp-p
Temperature Drift Coefficient	100% Full Load		--	--	±0.03	%/°C
Output Short Circuit Protection②	12V input		Unavailable			
	Other input		Continuous short-circuit protection, self-recovery			

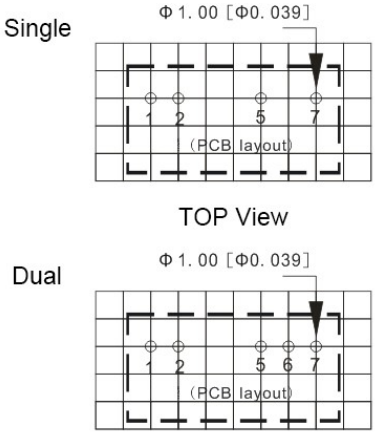
Note: ① The ripple & noise test method uses the twisted pair method. ② A small part can only be guaranteed within 5 seconds.

General Specifications

Switching Frequency	typical	100KHz (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 Soldering Temp	Distance to Case 1.5mm, 10S	300℃ MAX
Isolation Voltage	Test 1 minute, leakage current < 0.5mA	6000Vdc
Isolation Capacitor	Input/Output,100KHz/0.1V	20 pF (Typ.)
MTBF	MIL-HDBK-217F@25℃	35X10^{5}Hrs
Product Weight		3.7g (Typ.)
Packing	Tube(225*20.5*12.5mm)	10PCS
	Box(245*155*85mm)	480PCS(Total 48Tubes)

Packing Dimension





Note:
Grid Spacing 2.54*2.54mm
Unit: mm [inch]
Terminal section tolerance: ±0.10[±0.04]
Unmarked tolerance: ±0.50[±0.020]

Packing Code	L x W x H	
H	19.50× 9.80 × 12.50mm	0.768 × 0.386 × 0.492inch

Pin Function

Pin No.	1	2	3, 4	5	6	7
Single(S)	+Vin	GND	NP	-Vo	NP	+Vo
Dual(D)	+Vin	GND	NP	-Vo	COM	+Vo

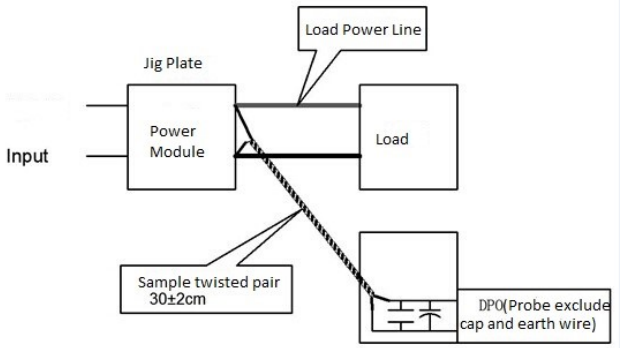
Note: if the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

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

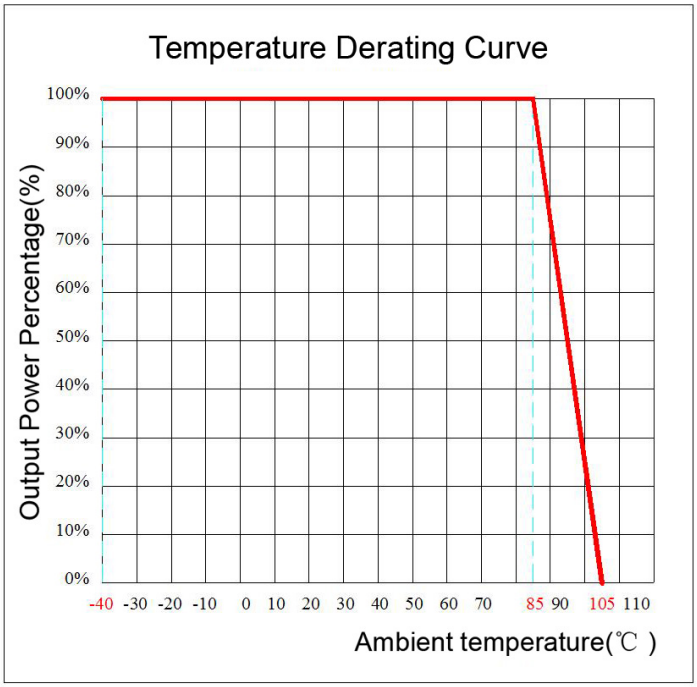
Test Method:

1) 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 on the Sample Mode.

2) The output ripple noise 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.



Temperature Curve



Recommendation for Application

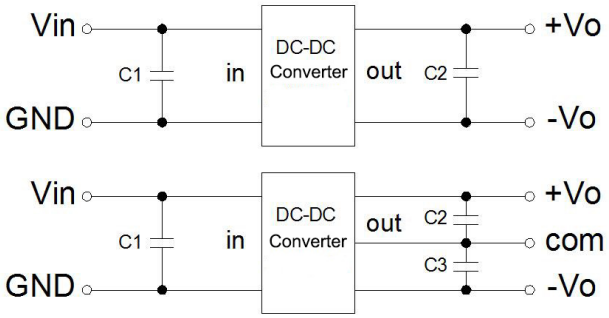
1. Output load requirements

a. In order to ensure the converter working reliably with high efficiency, the minimum load should not less than 10% of the rated load. Please connect a resistor to the output in parallel, the resistance should be ≥10% load if the needed power is indeed small.

b. The maximum capacitive load is tested at rated input and full load. The convertor may not start up or be damaged if the capacitor load exceeds this value.

2. Typical application circuit

In order to decrease the input/output ripple and noise, capacitor filters should be connected at input and output as below application circuit. The filter capacitor is very critical, too large capacitance may cause start-up failure. The capacitive load values are recommended as shown in Table 1 below to ensure the module operating safely and reliably. (We suggest not to connect external capacitor for which the actual output power is less than 0.5W)



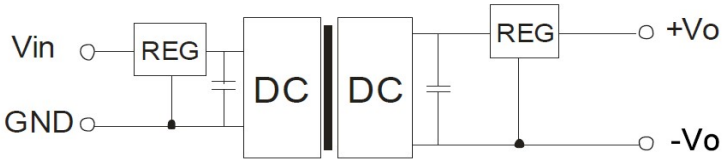
Recommended capacitive load value(Table 1)

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

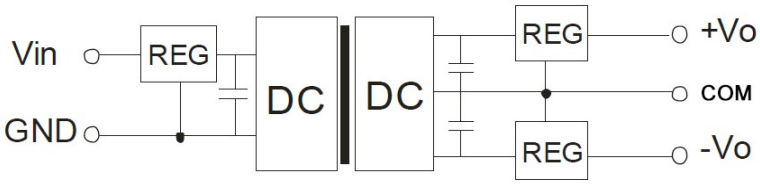
3. Output regulated voltage and over voltage protection circuit

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.

Single Output



Positive Negative Dual Output



Note:

1.This product should not 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 defined.

3. All values or indicators in this manual had been tested based on Aipupower test specifications.

4. The product specifications may be modified without prior notice. Please refer to the published data sheet at Aipupower website.

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