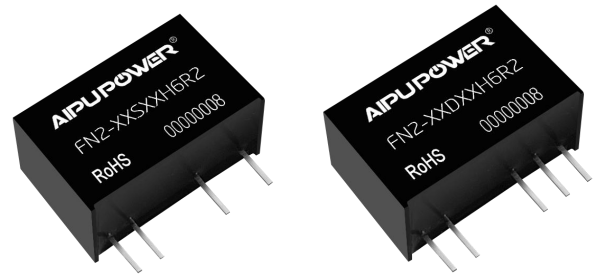


Typical Features

- ◆ Fixed input voltage, isolated & unregulated, output 2W
- ◆ Efficiency up to 81% (Typ.)
- ◆ Reinforced insulation
- ◆ Mini size SIP package
- ◆ Isolation voltage 4200VAC/6000VDC
- ◆ Continuous short circuit, self-recovery
- ◆ Operating temperature from -40℃ to +85℃
- ◆ Plastic case, flame class UL94-V0



Application Field

This series of products 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 Range		Output Voltage/Current (Vo/Io)		Input Current (mA) Typ. @nominal volt.		Max Capacitive Load	Efficiency (%) @full load nominal volt.	
		Nominal (VDC)	Range (VDC)	Vo (VDC)	Io(mA) Max/Min	Full Load	No Load	uF	Min	Typ.
-	FN2-05S05H6R2	5	4.5 - 5.5	5	400/40	480	22	1000	73	77
-	FN2-05S09H6R2			9	222/22	480	25	470	75	79
-	FN2-05S12H6R2			12	167/17	490	40	470	75	79
-	FN2-05S15H6R2			15	133/13	490	40	470	75	79
-	FN2-05D05H6R2			±5	±200/±20	481	28	470	74	78
-	FN2-05D09H6R2			±9	±110/±11	480	35	470	74	78
-	FN2-05D12H6R2			±12	±83/±8	480	31	220	74	78
-	FN2-05D15H6R2			±15	±67/±7	480	40	220	76	79
-	FN2-12S05H6R2	12	10.8 - 13.2	5	400/40	217	11	1000	72	76
-	FN2-12S12H6R2			12	167/17	200	13	470	75	79
-	FN2-12S15H6R2			15	133/13	200	17	470	77	81
-	FN2-12D05H6R2			±5	±200/±20	217	12	680	70	74
-	FN2-12D09H6R2			±9	±110/±11	200	35	470	76	80
-	FN2-12D12H6R2			±12	±83/±8	208	35	220	76	80
-	FN2-12D15H6R2			±15	±67/±7	208	14	1000	73	77
-	FN2-15S05H6R2	15	13.5 - 16.5	5	400/40	168	12	1000	73	77
-	FN2-15S15H6R2			15	133/13	186	12	470	76	80
-	FN2-24S05H6R2			5	400/40	102	8	1000	75	79
-	FN2-24S12H6R2			12	167/17	104	5	680	76	80

-	FN2-24S15H6R2	24	21.6	15	133/13	105	15	470	77	81
-	FN2-24S24H6R2		-	24	83/8	104	11	680	76	80
-	FN2-24D05H6R2		26.4	±5	±200/±20	111	15	470	75	79
-	FN2-24D12H6R2			±12	±83/±8	104	15	220	76	80
-	FN2-24D15H6R2			±15	±67/±7	100	10	220	77	81

Note 1: The maximum capacitive load is the capacitance allowed to be used when the power supply starts up at full load. The converter may not start if the capacitor exceeds this value.

Note 2: The efficiency is tested at the nominal input voltage and the rated load.

Note 3: Please contact Aipu sales for other output voltages requirements of this series but not listed in this table.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input inrush voltage (1Sec max.)	5Vdc Input	-0.7	-	9	VDC
	9Vdc Input	-0.7	-	12	
	12Vdc Input	-0.7	-	18	
	15Vdc Input	-0.7	-	21	
	24Vdc Input	-0.7	-	30	
Input filter	Capacitor Filter				
Hot plug	Unavailable				

Output Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Output power		0.2	--	2	W
Output voltage accuracy	Please refer to the Output Voltage Deviation Graph (Figure 1)				
Load regulation	10% - 100% load	3.3V&5V output	--	15	%
		Others	--	10	
Line voltage regulation	Input voltage change ±1%	3.3V&5V output	--	1.5	%
		Others	--	1.2	
Temperature drift coefficient	--	--	--	±0.03	%/°C
Ripple & Noise	0%-100% load, 20MHz bandwidth	--	100	150	mVp-p
Short circuit protection	Continuous, self-recovery				

Note: The Ripple & Noise is tested by the Twisted Pair Method, please refer to the following test instruction.

General Specifications

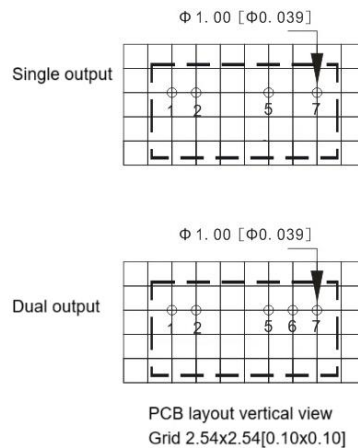
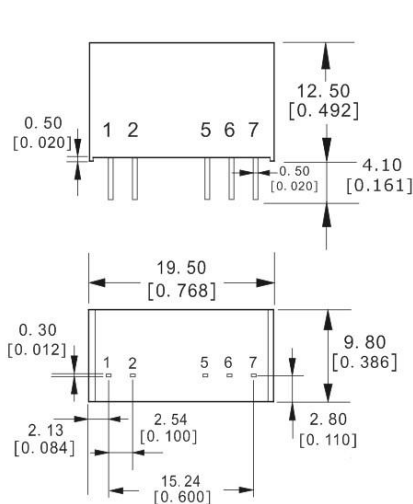
Item	Operating Condition	Min.	Typ.	Max.	Unit
Switching frequency	Nominal input voltage, full load	--	100	--	KHz
Operating temperature	Refer to the Temperature Derating Graph (Figure 2)	-40	--	85	°C
Storage temperature		-55	--	+125	°C
Case temperature rise	Within the temperature derating range	--	30°	--	°C
Pin soldering temperature	1.5mm from the case, soldering time 10S	--	--	300	°C
Relative humidity	No condensing	5	--	95	%RH

Isolation voltage	I/P-O/P, test 1 minute, leakage current <1mA	4200	--	--	VAC
		6000	--	--	VDC
Insulation resistance	I/P-O/P, @ 500VDC	1000	--	--	M Ω
Isolation capacitance	I/P-O/P, 100KHz/0.1V	--	7	--	pF
MTBF	MIL-HDBK-217F@25℃	3500	--	--	K hours
Transformer CL distance		5	--	--	mm
Transformer CR distance		5	--	--	
PCB CL&CR distances		5.5	--	--	
Vibration	10-150Hz, 5G, 30 Min. along X, Y and Z				
Case material	Plastic in Black, flame class UL94-V0				
Unit weight	2.5g (Typ.)				
Cooling method	Natural air				
Packing	Tube size (525x18x10mm)		25PCS/Tube		
	Carton size (542x110x155mm)		1400PCS/Carton (Total 56 Tubes)		
Unit dimensions	L x W x H	19.50× 9.80 × 12.50 mm		0.768 × 0.386 × 0.492 inch	

EMC Performance

EMI	CE	CISPR22/EN55032	Class B (with the Recommended EMC circuit)
	RE	CISPR22/EN55032	Class B (with the Recommended EMC circuit)
EMS	ESD	IEC/EN61000-4-2	Contact ±8kV perf. Criteria B

Mechanical Dimensions



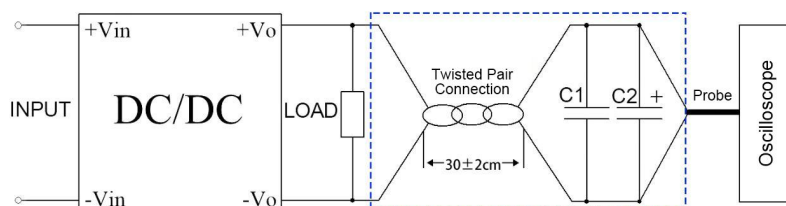
Unit: mm[inch]
Pin section tolerance: ±0.10[±0.004]
General tolerance: ±0.50[±0.020]

Pin-out Function Description

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

Note: Please take the pin definition on the product label as the right one if it is different than the data sheet description.

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



1. The Ripple & noise test needs 12# twisted pair cables, an oscilloscope which should be set at the Sample Mode, bandwidth 20MHz. 100M bandwidth probe with cap and ground removed. C1(0.1uF) polypropylene capacitor and C2(10uF) high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes and one side of the twisted pair.
2. The power supply output connects to the load by the cables. The other side of the twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the polarity of the output and the oscilloscope probe should not be reversed. The test can start after input power on.
3. It is recommended to connect a ≥5% load or a high-frequency low resistance electrolytic capacitor (≥100uF) load to the output to avoid the output ripple increasing.

Product Characteristics Graphs

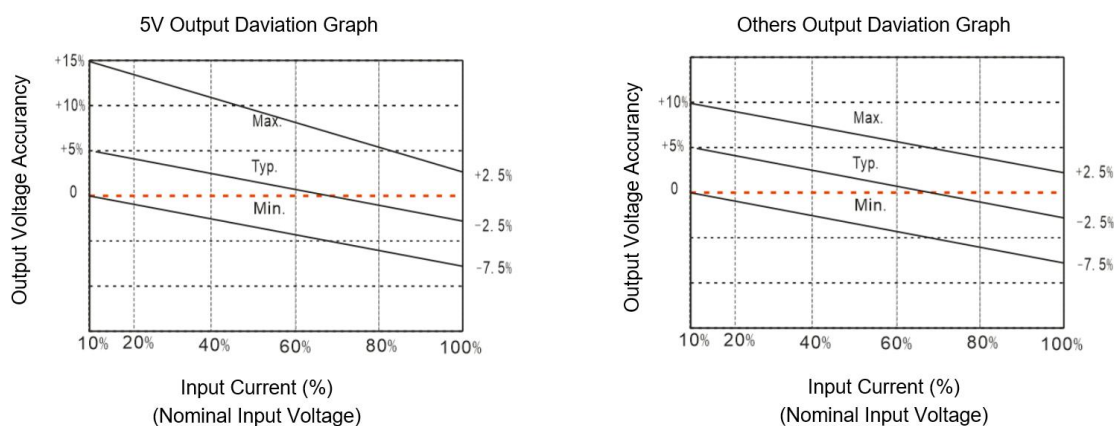


Figure 1

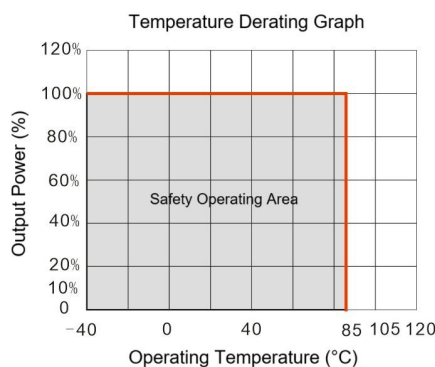


Figure 2

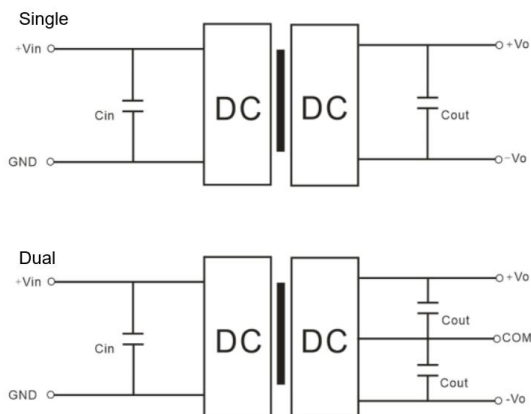
Recommended Circuits for Application

1. Requirement for the output load

The maximum capacitive load was tested at the rated full load. The converter may not start or be damaged if the output capacitors exceed this value.

2. Typical application circuits

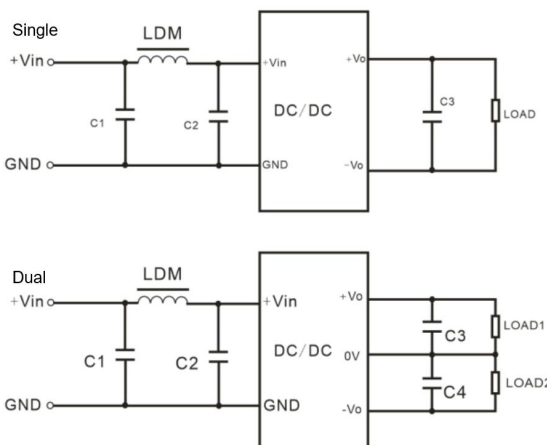
To ensure effectively decrease the input and output ripple and noise, a capacitor filter can be connected at the input and output, the application circuit is shown in the figure below. The suitable filter capacitors should be chosen as the recommended capacitive load values in Table 1. The converter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



Recommended Capacitive Load Values (Table 1)

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

3. Recommended EMC circuit diagram

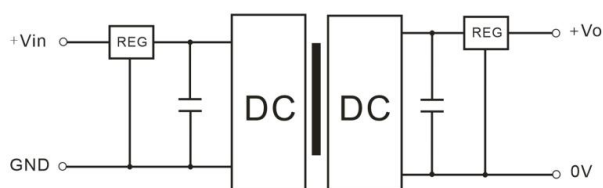


Output Volt. (single)		3.3/5Vdc	12/15/24Vdc
EMI	C1/C2	4.7uF/16V	4.7uF/50V
	C3	Cout value refer to Table 1	
	LDM	6.8uH	6.8uH

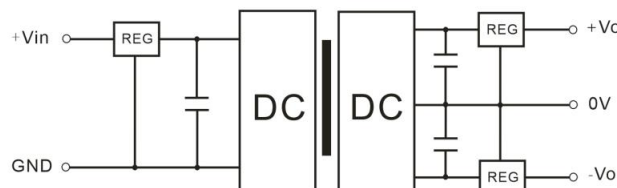
Output Volt. (dual)		3.3/5Vdc	12/15/24Vdc
EMI	C1/C2	4.7uF/16V	4.7uF/50V
	C3	Cout value refer to Table 1	
	LDM	6.8uH	6.8uH

4. Output voltage regulation and overvoltage 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 circuits diagrams. 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



Dual output

Application Notice

1. This series of products cannot be connected in parallel to increase the output power, and do not support hot-plug.
2. The product should be used according to the specifications, otherwise it could be permanently damaged.
3. The product performance cannot be guaranteed if it works at a lower load than the minimum load defined.
4. The product performance cannot be guaranteed if it works under the over-load condition.
5. Unless otherwise specified, all values or indicators on this datasheet are tested at $T_a=25^{\circ}\text{C}$, humidity<75%RH, nominal input voltage and rated load (pure resistance load).
6. All values or indicators on this datasheet have been tested based on Aipupower test specifications.
7. The specifications are specially for the parts listed on this datasheet, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirements.
8. Aipupower can provide customization service.

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