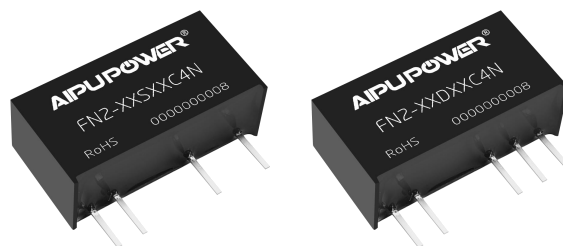


Typical Features

- ◆ Fixed input voltage, isolated & unregulated, output 2W
- ◆ Efficiency up to 86% (Typ.)
- ◆ Mini size SIP package
- ◆ Isolation voltage 4000VDC
- ◆ Operating temperature from -40°C to +105°C
- ◆ Plastic Case, flame class UL94 V-0



Test Condition: Unless otherwise specified, all parameter values had been tested at nominal input voltage, pure resistive rated load, and at room temperature 25°C.

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 (VDC)		Output Voltage/Current (Vo/Io)		Input Current (mA) Typ. @Nominal Voltage		Max. Capacitive Load	Ripple & Noise (20MHz) Max/Typ.	Efficiency (%) @full load/nom. voltage	
		Nom.	Range	Vo (VDC)	Io(mA) Max/Min	Full Load	No Load	uF	mVp-p	Min	Typ.
-	FN2-05S3V3C4N	5	4.5 - 5.5	3.3	400/40	328	10	2400	150/80	77	80
-	FN2-05S05C4N			5	400/40	456	8	2400	150/80	80	83
-	FN2-05S09C4N			9	222/22	450	8	1000	150/80	81	84
-	FN2-05S12C4N			12	167/17	445	10	560	150/80	82	85
-	FN2-05S15C4N			15	133/13	440	16	560	150/80	82	85
-	FN2-05S24C4N			24	83/8	435	18	220	150/100	82	85
-	FN2-05D05C4N			±5	±200/±20	456	10	1200	150/80	77	80
-	FN2-05D09C4N			±9	±111/±11	450	8	470	150/80	80	83
-	FN2-05D12C4N			±12	±83/±8	445	8	220	150/80	81	84
-	FN2-05D15C4N			±15	±67/±7	440	16	220	150/80	82	85
-	FN2-05D24C4N			±24	±42/±4	435	18	100	150/100	82	85
-	FN2-12S3V3C4N	12	10.8 - 13.2	3.3	400/40	130	8	2400	150/80	77	80
-	FN2-12S05C4N			5	400/40	192	8	2400	150/80	80	83
-	FN2-12S09C4N			9	222/22	190	8	1000	150/80	80	83
-	FN2-12S12C4N			12	167/17	188	8	560	150/80	83	86
-	FN2-12S15C4N			15	133/13	185	8	560	150/80	83	86
-	FN2-12S24C4N			24	83/8	180	10	220	150/100	82	85
-	FN2-12D05C4N			±5	±200/±20	192	8	1200	150/80	80	83
-	FN2-12D09C4N			±9	±111/±11	190	8	470	150/80	80	83

-	FN2-12D12C4N	15	13.5 - 16.5	±12	±83/±8	187	8	200	150/80	83	86
-	FN2-12D12V5C4N			±12.5	±80/±8	185	8	200	150/80	83	86
-	FN2-12D15C4N			±15	±67/±7	182	8	220	150/80	83	86
-	FN2-12D24C4N			±24	±42/±4	180	10	100	150/100	80	83
-	FN2-15S05C4N	15	13.5 - 16.5	5	400/40	155	8	2400	150/80	80	83
-	FN2-15S12C4N			12	167/17	150	8	560	150/80	80	83
-	FN2-15S15C4N			15	133/13	150	8	560	150/80	83	86
-	FN2-15S24C4N			24	83/8	145	8	220	150/100	83	86
-	FN2-15D05C4N			±5	±200/±20	155	8	1200	150/80	80	83
-	FN2-15D12C4N			±12	±83/±8	150	8	220	150/80	80	83
-	FN2-15D15C4N			±15	±67/±7	150	8	220	150/80	83	86
-	FN2-15D24C4N			±24	±42/±4	145	8	100	150/100	83	86
-	FN2-24S3V3C4N	24	21.6 - 26.4	3.3	400/40	68	8	2400	150/80	77	80
-	FN2-24S05C4N			5	400/40	96	8	2400	150/80	80	83
-	FN2-24S09C4N			9	222/22	94	8	1000	150/80	81	84
-	FN2-24S12C4N			12	167/17	92	8	560	150/80	83	86
-	FN2-24S15C4N			15	133/13	90	8	560	150/80	83	86
-	FN2-24S24C4N			24	83/8	90	8	220	150/100	82	85
-	FN2-24D05C4N			±5	±200/±20	96	8	1200	150/80	80	83
-	FN2-24D09C4N			±9	±111/±11	94	8	470	150/80	81	84
-	FN2-24D12C4N			±12	±83/±8	92	8	220	150/80	83	86
-	FN2-24D15C4N			±15	±67/±7	90	8	220	150/80	83	86
-	FN2-24D24C4N			±24	±42/±4	90	8	100	150/100	82	85

Note: The Ripple & Noise is tested by the twisted pair method.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input inrush voltage (1Sec 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	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	3.3VDC output	--	15	20	%
		Others output	--	10	15	
Line voltage regulation	Input voltage change $\pm 1\%$	3.3VDC output	--	--	1.5	--
		Others output	--	--	1.2	
Temperature drift coefficient	100% Load		--	--	± 0.03	%/°C
Short circuit protection	Continuous, self-recovery					

General Specifications

Item	Operating Condition		Min.	Typ.	Max.	Unit
Switching frequency	Nominal input voltage, full load		--	260	--	KHz
Operating temperature	Refer to the Temperature Derating Graph (Figure 2)		-40	--	+105	°C
Storage temperature			-55	--	+125	°C
Case temperature rise	Ta=25°C		--	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		4000	--	--	VDC
Insulation resistance	I/P-O/P, @ 500VDC		1000	--	--	M Ω
Isolation capacitance	I/P-O/P, 100KHz/0.1V		--	20	--	pF
Vibration			10-150Hz, 5G, 30 Min. along X, Y and Z			
MTBF	MIL-HDBK-217F@25°C		3500	--	--	K hours
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)		2000PCS/Carton (Total 80 Tubes)			
Unit dimensions	L x W x H	19.50× 7.00 × 10.10 mm		0.768 × 0.276 × 0.398 inch		

EMC Performance

EMI	CE	CISPR32/EN55032 CLASS B (with the Recommended EMC circuit)
	RE	CISPR32/EN55032 CLASS B (with the Recommended EMC circuit)
EMS	ESD	IEC/EN61000-4-2 Air ± 8 kV, Contact ± 6 kV perf. Criteria B

Product Characteristics Graphs

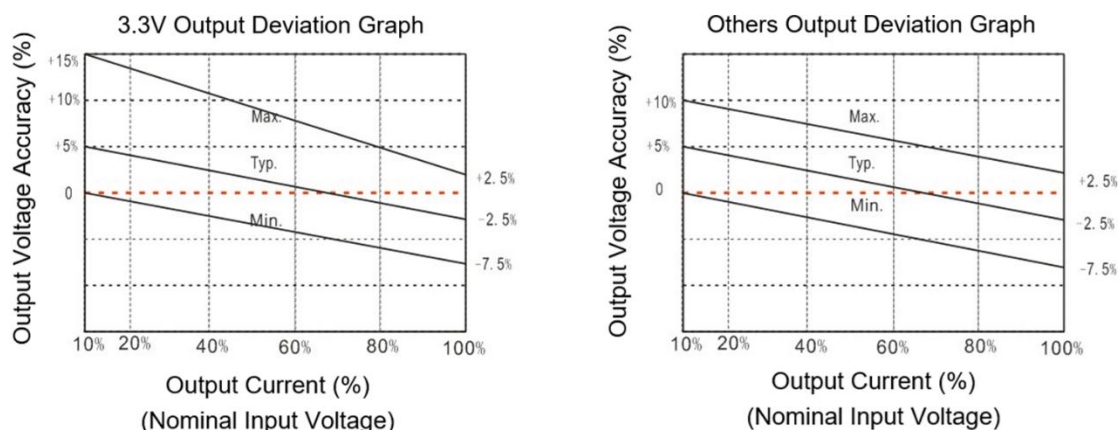


Figure 1

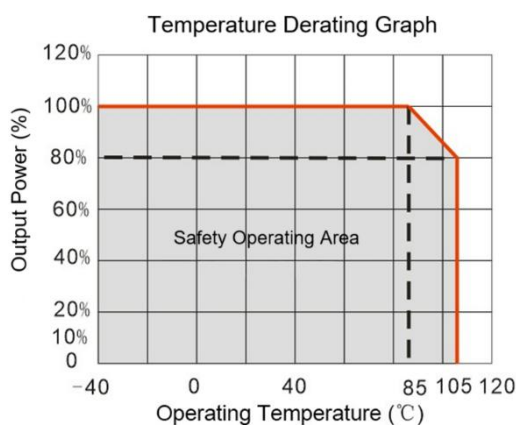


Figure 2

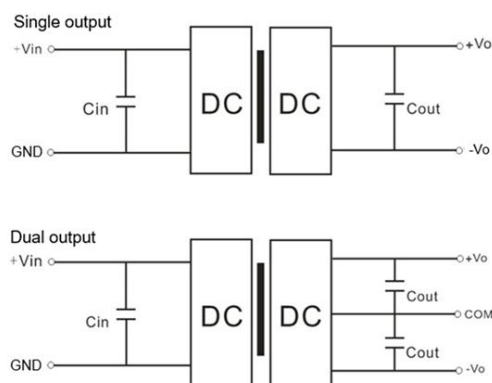
Recommended Circuits for Application

1. Requirement for 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

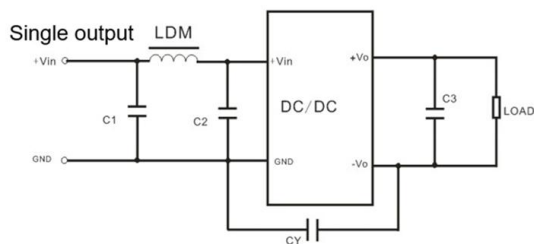
To ensure effectively decrease the input and output ripple and noise, a capacitor filter can be connected at the input and output, the application circuit is shown in the figure below. The suitable filter capacitors should be chosen as the recommended capacitive load values in Table 1. The converter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



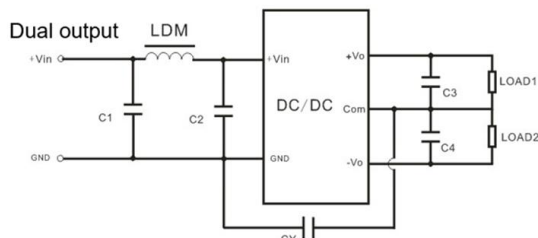
Recommended Capacitive Load Value Table (Table 1)

Vin (Vdc)	Cin	Single Vout (Vdc)	Cout (μF)	Dual Vout (Vdc)	Cout (μF)
5	10 μF/16V	3.3	10 μF/16V	±3.3	4.7 μF/16V
12	2.2 μF/25V	5	10 μF/16V	±5	4.7 μF/16V
15	2.2 μF/25V	9	2.2 μF/25V	±9	2.2 μF/25V
24	1 μF/50V	12	2.2 μF/25V	±12	1 μF/25V
--	--	15	1 μF/25V	±15	1 μF/25V
--	--	24	1 μF/50V	±24	0.47 μF/50V

3. Recommended EMC circuit diagram



Input voltage		5VDC	12/15/24VDC
EMI	C1/C2	4. 7 μ F/16V	4. 7 μ F/50V
	CY	270pF/4KV	270pF/4KV
	C3	Refer to Cout in Table 1	
	LDM	6. 8 μ H	6. 8 μ H



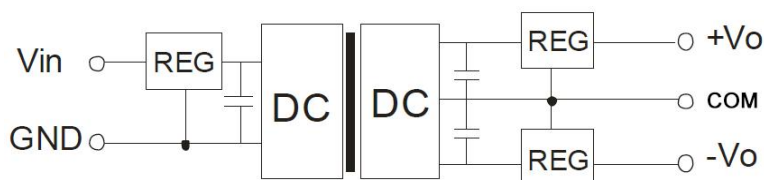
Input voltage		5VDC	12/15/24VDC
EMI	C1/C2	4. 7 μ F/16V	4. 7 μ F/50V
	CY	270pF/4KV	270pF/4KV
	C3/C4	Refer to Cout in Table 1	
	LDM	6. 8 μ H	6. 8 μ H

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 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



Dual outputs

Application Notice

1. This series of converters should not be used by connecting in parallel, and they do not support hot-plugging.
2. The product performance cannot be guaranteed if it works at a lower load than the minimum load condition.
3. All values or indicators on this datasheet have been tested based on Aipupower test specifications.

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