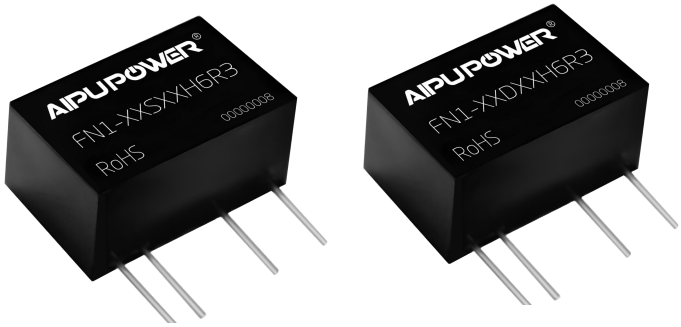
Features

- ◆ Fixed input voltage, Isolated & unregulated output, Output power 1W
- ◆ Efficiency up to 83%
- ◆ Small SIP package
- ◆ Isolation Voltage 5000VAC or 6000VDC
- ◆ Operating Temperature: -40℃～+105℃
- ◆ 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

Certificate	Model	Input Voltage Range (VDC)		Output Voltage/Current (Vo/Io)		Input Current(mA) Nominal Voltage		Max. Capacitive Load	Ripple & Noise① (20MHZ bandwidth) Max./ Typ.	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.
ETL	FN1-05S05H6R3	5	4.5 - 5.5	5	200/20	240	20	2200	120/100	78	81
-	FN1-05S12H6R3			12	84/9	230	20	470	120/100	80	83
-	FN1-05S15H6R3			15	67/7	230	20	470	120/100	80	83
-	FN1-05D05H6R3			±5	±100/ ±10	240	15	1000	120/100	78	81
-	FN1-05D07H6R3			±7.2	±70/ ±7	225	15	470	120/100	79	83
-	FN1-05D12H6R3			±12	±42/ ±5	230	15	220	120/100	79	83
-	FN1-05D15H6R3			±15	±34/ ±4	230	15	220	120/100	79	83

Note: ① The ripple & noise test method adopts the twisted pair method.

Input Specifications

Item	Test Condition	Min.	Typ.	Max.	Unit
Input Overshoot Voltage (1Second.max.)	5Vdc Input	-0.7	-	9	VDC
Input Filter	Capacitor Filter				
Hot plug	Unavailable				

Output Specifications

ITEM	Working Conditions	Min.	Typ.	Max.	Unit
Output Power		0.1	--	1	W
Output Voltage Accuracy		See the error envelope curve			
Load Regulation	10% ~ 100% nominal load	--	10	15	%
Line Voltage Regulation	Input Voltage Change±1%	--	--	1.2	--
Temperature Drift Coefficient	100% Load	--	--	±0.03	%/°C
Output Short Circuit Protection②	Continuous short-circuit protection, self-recovery				

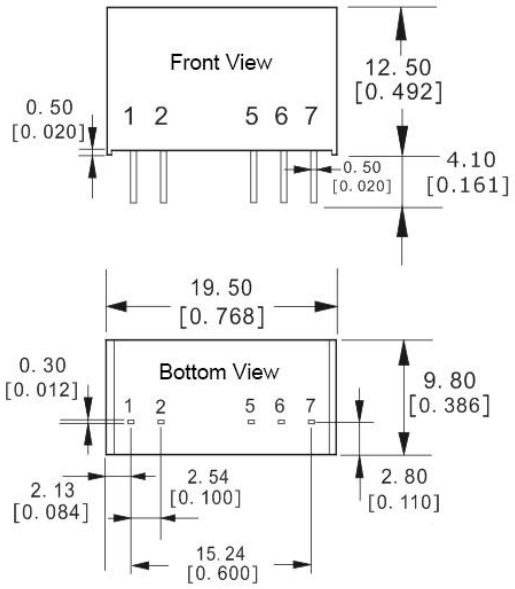
General Specifications

ITEM	Working Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	Nominal input voltage full load		260		KHz
Operating Temperature	Refer to Temperature Derating Curve	-40	--	+105	℃
Storage Temperature		-55	--	+125	
Shell temperature rise during work	Ta=25℃	--	25	--	
Pin resistance soldering temperature	Distance to Case 1.5mm, 10 seconds	--	--	300	
Relative Humidity	No condensing	5	--	95	%RH
Isolation Voltage	I/P-O/P, test 1 minute, leakage current＜1mA	5000	--	--	VAC
		6000	--	--	VDC
Insulation resistance	I/P-O/P, insulation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitor	Input/Output,100KHz/0.1V	--	6	--	pF
Vibration		10-150Hz, 5G, 30 Min. along X, Y and Z			
MTBF	MIL-HDBK-217F@25℃	19360			K hours
Case Material	Black flame retardant and heat resistant plastic (UL94-V0)				
Product Weight	3.7g (Typ.)				
Cooling Method	Natural air cooling				
Packing	Tube(525*20*13mm)			25PCS	
	Box(542*110*155mm)			1400PCS（Total 56 tubes）	
Dimension	L x W x H	19.50× 9.80 × 12.50mm		0.768 × 0.386 × 0.492inch	

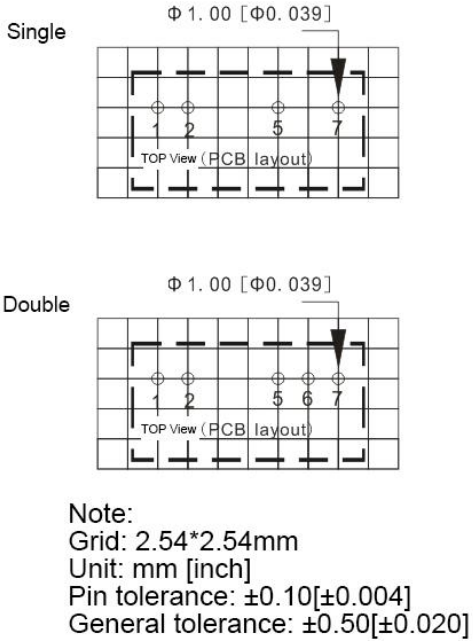
EMC Characteristics

EMI	CE	CISPR32/EN55032 CLASS B （EMC Recommended Circuit）
		EN60601-1-2/CISPR 11 GROUP1 CLASS B（EMC Recommended Circuit）
	RE	CISPR32/EN55032 CLASS B （EMC Recommended Circuit）
		EN60601-1-2/CISPR 11 GROUP1 CLASS B（EMC Recommended Circuit）
EMS	ESD	EN60601-1-2（IEC/EN61000-4-2 Contact ±6KV perf.Criteria B

Packing Dimension



Package size drawing



Recommended printed circuit board drawing

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

Pin Function

Pin Function	1	2	3, 4	5	6	7
Single(S)	+Vin	GND	NP	-Vo	NP	+Vo
Dual(D)	+Vin	GND	NP	-Vo	0V	+Vo

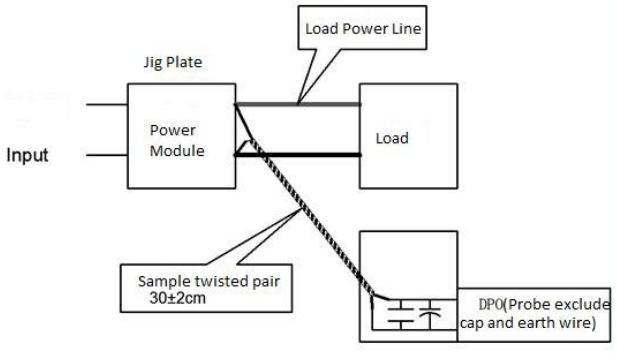
Note: if the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

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

Test Method:

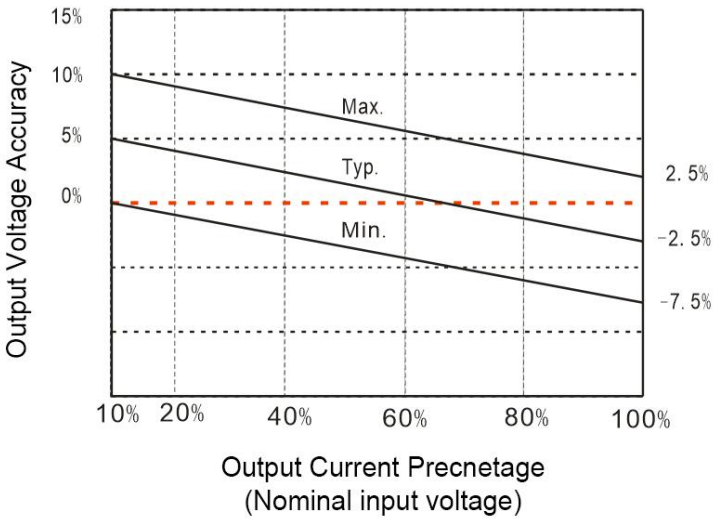
a.12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

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.

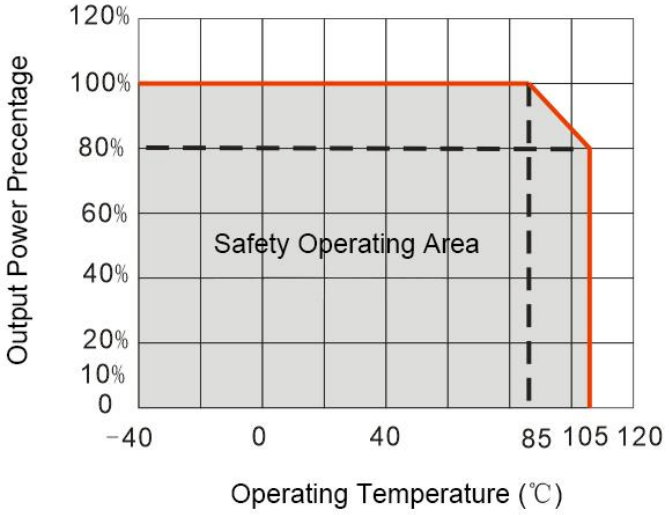


Product Characteristic Curve

Error Envelope Curve



Temperature Derating Curve



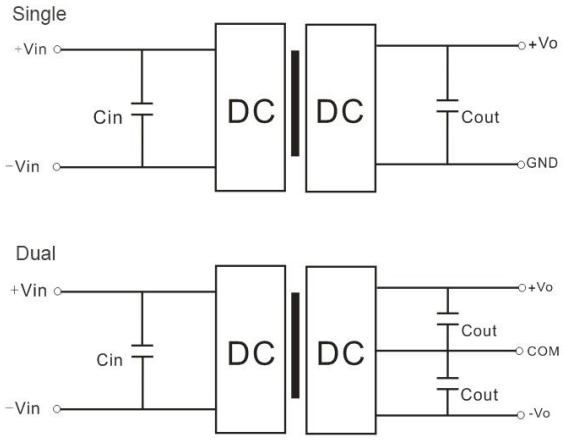
Design and Application Circuit Recommended

① Output load requirements

The maximum capacitive load of the product is obtained from the nominal full load test. It should not exceed the maximum capacitive load of the output when used, otherwise it is likely to cause startup difficulties and damage the product.

② Recommended circuit

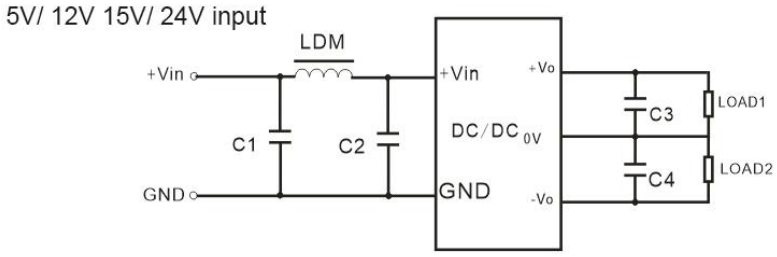
To ensure effective reduction of input and output ripple and noise, a capacitor filter network can be connected to the input and output ends. The application circuit is shown in the figure below; however, a suitable filter capacitor should be selected. If the capacitance is too large, it may affect the startup of the product. To ensure that each output works under safe and reliable conditions, the recommended capacitive load value is detailed in Table 1 below.



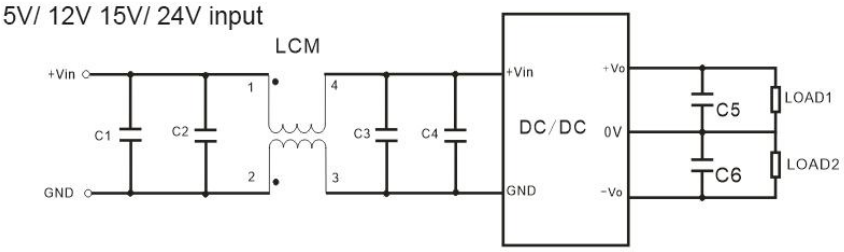
Recommended Capacitive Load Value Table (Table 1)

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

③EMC Recommended Circuit



Input Voltage		5V/12/15/24VDC
EMI	C1/C2	1μF/50V
	C3/C4	100μF/30V
	LDM	33μH



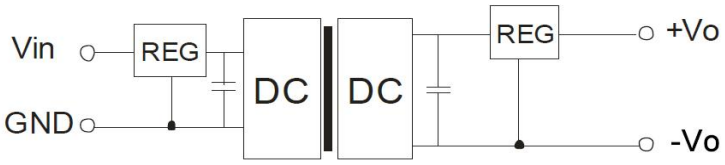
Input Voltage		5V/12/15/24VDC
EMI	C1/C2	4.7μF/50V
	C3/C4	1μF/50V
	C5/C6	100μF/30V
	LCM	22μH (CMC)

EMC Recommended Circuit

④ Output voltage regulation and overvoltage protection circuit

The simplest device for output voltage regulation, overvoltage and overcurrent protection is to connect a linear voltage regulator with overheat protection in series at its input or output end and connect a capacitor filter network (see the figure below). The recommended value of the filter capacitor is detailed in (Table 1). The linear voltage regulator should be reasonably selected according to the voltage and current required for actual work.

Single



Note:

1.This product cannot be used in parallel, and do not support hot-plugging;

2.If the product works below the minimum required load, it cannot guarantee that the product performance meets all performance indicators in this manual;

3. All index testing methods in this datasheet are based on our Company's corporate standards

4. The product specification may be changed at any time without prior notice.

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