FN1 series

1W, constant voltage input

DC-DC module power supply

◆Sustainable short circuit protection

◆Isolation voltage: 1500VDC

◆Small SIP package, high power density

◆Low ripple noise

◆High efficiency, low loss

◆

This series module power supply is suitable for the occasions where the input voltage is stable, the output load changes little, and the stability of the output voltage is not required.

Selection list					
Model number	input	exportation		Full-load efficiency (%_ Typ)	Maximum capacitive load(uF)
	Input voltage rating (VDC) (Range value)	Output voltage(Typ) (VDC)	Output current(Max) (mA)		
FN1-05S05B3N	4.50-5.50 (5VDC)	5.0	200	81	1000

Input characteristic						
item	Working condition		Min	Typ	Max	unit
Input current (full load/no load)	3.3 V input	3.3V，5V exportation	--	10	15	mA
	5V input	3.3V，5V exportation	--	5	10	
		12V，15V exportation	--	15	20	
		24V exportation	--	10	15	
	12 V input	3.3V，5V exportation	--	5	10	
		12V，15V exportation	--	5	10	
		24V exportation	--	10	15	
	24V input	5V exportation	--	5	10	
		12V，15V exportation	--	5	10	
		24V exportation	--	5	10	
Input impulse voltage (1 second)	3.3V，5V input		-0.3	--	8	Vdc
	12V input		-0.3	--	20	
	24V input		-0.3	--	30	
Input filter	/		Capacitive filtering			
Hot swap	/		nonsupport			

Output characteristic						
item	Working condition		Min	Typ	Max	unit
Output voltage accuracy	Rated input @ full load	3.3V，5V exportation	-5	--	+3	%
		12V，15V exportation	-3	--	+2	
		24V exportation	-2	--	+1	
Linear adjustment rate	The input voltage changes ±1%	3.3V exportation	--	--	1.5	
		Other voltage output	--	--	1.2	
Load adjustment rate	10%-100%load	3.3V，5V exportation	--	10	20	
		12V，15Vexportation	--	6	15	

		24V exportation	--	5	10	
Ripple & Noise	20MHz bandwidth@Vin_nom,100%load		--	50	100	mVp-p
Output short-circuit protection	/		Sustainable, self-healing			

Other characteristics					
item	Working condition	Min	Typ	Max	unit
Insulation voltage	input-output，60 秒@Leakage current≤1mA	3000	--	3300	Vdc
Insulation resistance	input-output，Test voltage500VDC	1000	--	--	MΩ
Isolation capacitance	input-output，100KHz/0.1V	--	30	--	pF
Switching frequency	100%load@Vin_nom	200	--	400	kHz
Operating ambient temperature	Meet the product characteristic curve (4)	-40	--	+85	℃
Product working temperature rise	100%负载@Vin_nom,Ta=25℃	--	25	--	
Storage temperature		-55	--	+125	
Storage humidity	non-condensing	5	--	95	%RH
Coefficient of temperature drift	Nominal input @100% load	--	±0.03	--	%/℃
Welding temperature	Hand welding	370±10℃@3～5Sec			
	Wave soldering welding	260±10℃@5～10Sec			
MTBF	MIL-HDBK-217F@25℃	2000	--	--	Kh
Housing material	Black flame-retardant plastic housing				
Package size	19.6*6*10.10mm（L*W*H）				
weight	2.0g(Typ)				
Cooling mode	Natural air cooling				

EMC peculiarity		
EMI	Conduction disturbance	CISPR32/EN55032 CLASS B
	Radiation disturbance	CISPR32/EN55032 CLASS B
EMS	Electrostatic discharge	IEC/EN61000-4-2 Ari：±8kV，Contact：±6kV perf.criteria B
Note: Refer to EMC recommended circuit test		

2, output load constancy consideration:

During the use of the product, the change of output load will also cause the change of output voltage, as shown in the "Relationship curve between output voltage and output load" in the section of "Product Characteristic Curve (2)". As can be seen from the figure, when the input voltage is stable, the output voltage changes with the change of the output current. In the design and selection stage of the power system, it is necessary to consider the load variation of the module power supply comprehensively, and evaluate whether the output voltage meets the design requirements according to the load variation range in the actual circuit. This product is suitable for applications where the load is constant or the range of variation is relatively small.

3, output ripple and noise suppression/output filter capacitor selection:

When the product is in use, the output end can be used normally without additional capacitance. To further reduce the output ripple and noise of the product, a filter capacitor can be applied to the output end of the product. However, it must be noted that the output can not increase the capacity of the electrolytic capacitor, too large capacity of the electrolytic capacitor may cause the output voltage of the module can not be established or even lead to product damage; Different types of output terminals have the requirements of "maximum capacitive load", in order to ensure the safe and reliable work of the product, in the output ripple and noise to meet the requirements of the premise, as far as possible to reduce the capacity of the output capacitance. See the Design Reference section for typical application circuits.

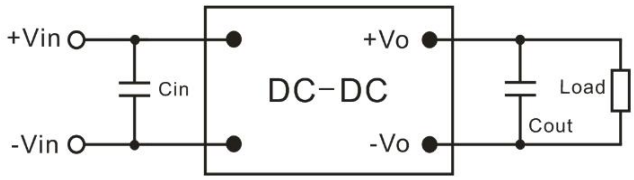
4, prevent product hot swap test or use:

Hot swap usually refers to plugging a product into or out of a circuit without the power supply being disconnected. The product does not support hot swap during use or testing. Because in the hot swap process, due to the current mutation will produce high voltage spikes, it is possible to cause product damage. Another case is to insert a mechanical switch between the power supply and the product input to control the power supply through the mechanical switch. Mechanical switches can also produce high pressure spikes during on-off operation, which may also lead to product damage. During the testing or use of the product, any operation that will produce high pressure spikes should not be ignored, and measures should be taken to prevent high pressure spikes from being directly added to the input end of the product, please refer to the Design reference section.

Design reference

1, typical application circuit:

In the actual application circuit, due to the existence of a variety of interference noise, in order to make the product work stably and reliably, it is usually necessary to add a suitable absorption capacitance at the input end of the product; To further reduce the output ripple, a filter capacitor can be applied to the output, but the capacity should not be too large, see the "Product use Precautions" section. We recommend the use of MLCC capacitors, in order to ensure the safe and reliable operation of the product, its capacity can be referred to the following table.

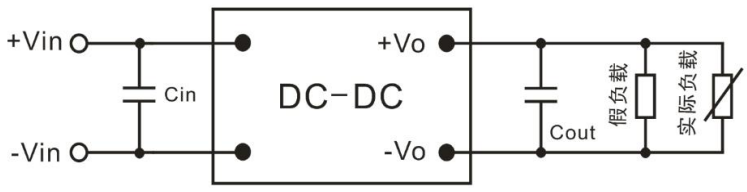


Vin	Cin (MLCC)	Vo	Cout (MLCC)
3.3V	10uF/10V	3.3V	10uF/10V
5.0V	10uF/16V	5.0V	10uF/10V
12V	4.7uF/50V	12V/15V	4.7uF/25V
24V	4.7uF/50V	24V	2.2uF/50V

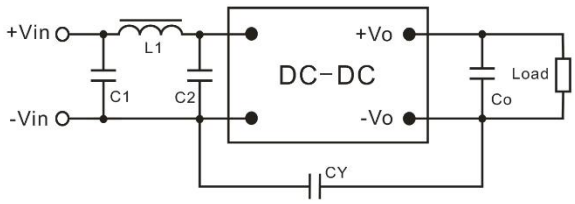
Note: In the application circuit, the input and output filter capacitors are as close as possible to the product pin; A 33uF/35V high frequency and low resistance electrolytic capacitor can be added to the input side to absorb surge voltage spikes from the supply side.

2. Applications with large dynamic load changes:

The output voltage of the product will change with the change of the output current (see the "Product Use Precautions" section), in the use of large dynamic load changes, in order to maintain the output voltage changes within a reasonable range, you can add a suitable resistance at the output end as a fixed load (commonly known as false load). However, it should be noted that the total load added to the output of the product (false load + actual maximum load) cannot exceed the rated load of the product. Its circuit is shown below:

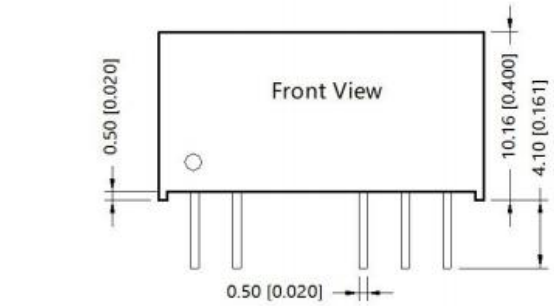


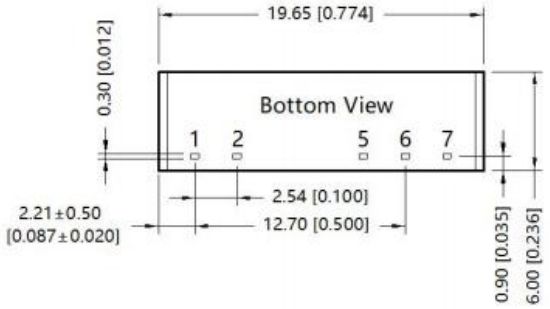
3、EMC recommended circuit（CLASS B）：



Vin	C1(MLCC)	L1	C2(MLCC)	Co(MLCC)	CY
3.3V	10uF/10V	33uH	10uF/10V	10uF/10V	470pF/2KV
5.0V	10uF/16V	33uH	10uF/16V	10uF/16V	
12V	4.7uF/50V	33uH	4.7uF/50V	4.7uF/50V	
24V	4.7uF/50V	33uH	4.7uF/50V	4.7uF/50V	1nF/2KV

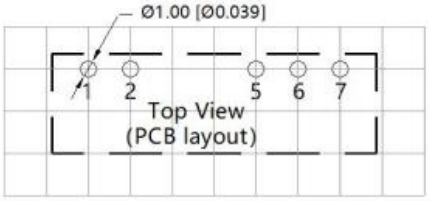
Appearance size and pin function



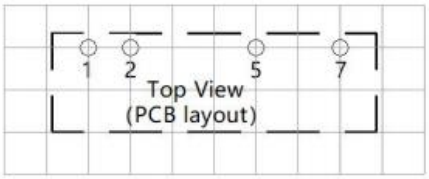


Note:
Unit: mm[inch]
Pin section tolerances: ±0.10[±0.004]
General tolerances: ±0.25[±0.010]

Duals Output



Singles Output



Note: Grid 2.54*2.54mm

Pin	Single	Dual
1	Vin	Vin
2	GND	GND
5	0V	-Vo
6	No Pin	0V
7	+Vo	+Vo

Note:

1. For our specific packaging information, please refer to "Dexu Product Shipping Packaging Instructions";
2. If the working load of the product is lower than the minimum load requirements, we cannot guarantee that the product performance can meet all performance indicators;
3. The maximum capacitive load is tested in the input voltage range and under full load conditions;
4. Unless otherwise specified, all indicators in this manual are measured at Ta=25℃, humidity <75%RH, nominal input voltage and rated output load;
5. All index test methods in this manual are based on the company's enterprise standards;
6. Our company can provide product customization, specific circumstances can directly contact our technical personnel;
7. Products related to laws and regulations: see "Product Characteristics", "EMC characteristics";
8. Our products shall be classified and stored in accordance with ISO14001 and relevant environmental laws and regulations after scrapping, and handed over to qualified units.