

Typical product characteristics

- Constant voltage input, isolated non-regulated output, output power 1W
- Conversion efficiency up to 78%
- Small SIP package
- No external components required
- Isolation voltage 1500VDC
- Working environment temperature: -40℃~+85℃
- Plastic housing, meeting UL94-V0 requirements



Test conditions: Unless otherwise specified, all parameters are tested at nominal input voltage, pure resistive rated load and 25℃ room temperature.

Application Areas

Widely used in instrumentation, communications, pure digital circuits, general low-frequency analog circuits, relay drive circuits, data exchange circuits and other fields

Product Selection List

Product Model	Input voltage range (VDC)		Output voltage/current (Vo/Io)		Input current (mA) Nominal voltage		maximum Capacitance load	Ripple & noise Max	Efficiency(%)@Output Full load, input nominal power	
	Nominal value	range	Voltage (VDC)	Current (mA) MAX./MIN.	Fully loaded type.	No load type.	uF mVpp Min.			Type.
FN1-3V3S3V3AN	3.3	3.0	3.3	300	433	40	47	100	68	70
FN1-3V3S05AN			5	200	421	40	47	100	70	72
FN1-3V3S09AN		3.6	9	110	410	40	22	100	72	74
FN1-3V3S12AN			12	83	410	40	22	100	72	74
FN1-3V3S15AN			15	67	410	40	22	100	72	74
FN1-05S3V3AN	5	4.5	3.3	300	278	25	47	100	70	72
FN1-05S05AN			5	200	263	25	47	100	74	76
FN1-05S09AN		5.5	9	110	263	25	22	100	74	76
FN1-05S12AN			12	83	260	25	22	100	75	77
FN1-05S15AN			15	67	260	25	22	100	75	77
FN1-09S3V3AN	9	8.1	3.3	300	154	20	47	100	70	72
FN1-09S05AN			5	200	146	20	47	100	74	76
FN1-09S09AN		9.9	9	110	146	20	22	100	74	76
FN1-09S12AN			12	83	144	20	22	100	75	77
FN1-09S15AN			15	67	144	20	22	100	75	77
FN1-12S3V3AN	12	10.8	3.3	300	116	15	47	100	70	72
FN1-12S05AN			5	200	108	15	47	100	75	77
FN1-12S09AN		13.2	9	110	108	15	22	100	75	77
FN1-12S12AN			12	83	108	15	22	100	75	77
FN1-12S15AN			15	67	107	15	22	100	76	78
FN1-15S3V3AN	15	13.5	3.3	300	93	10	47	100	70	72
FN1-15S05AN			5	200	89	10	47	100	73	75

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FN1-15S09AN		16.5	9	110	89	10	22	100	73	75
FN1-15S12AN			12	83	88	10	22	100	74	76
FN1-15S15AN			15	67	88	10	22	100	74	76
FN1-24S3V3AN	24	21.6	3.3	300	59	7	47	100	69	71
FN1-24S05AN			5	200	55	7	47	100	74	76
FN1-24S09AN		26.4	9	110	54	7	22	100	75	77
FN1-24S12AN			12	83	54	7	22	100	75	77
FN1-24S15AN			15	67	53	7	22	100	76	78

1. In order to ensure that the module can work efficiently and reliably, its minimum output load should not be less than 10% of the rated load when in use. If the power you need is indeed small, please connect

Connect a resistor with a recommended resistance value equivalent to 10% of the rated power.

Input characteristics

project	Working conditions	Min.	Type.	Max.	unit
Input surge 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 filtering				

Output Characteristics

project	Working conditions	Min.	Type.	Max.	unit
Output Power		0.1	-	1	IN
Output voltage accuracy	Nominal input, full load	-	±2	±5	%
Load Regulation	10% to 100% load	3.3Vdc output--	-	20	
		Other outputs --	-	15	
Linear voltage regulation	Input voltage change ±1%	3.3Vdc output--	-	±1.5	
		Other outputs --	-	±1.2	
Ripple & Noise	Nominal input, full load, 20MHZ bandwidth	-	75	100	mVp-p
Temperature drift coefficient	100% load	-	-	±0.03	%/°C
Output short circuit protection	Sustainable short circuit protection, self-recovery				

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

General Features

Switching frequency	Typical Value	100KHz (Typ.)
Operating temperature	Use the reference temperature derating curve	-40℃ ~ +85℃
Storage temperature		-55℃ ~ +125℃
Shell temperature rise during operation	Within the temperature derating curve	25℃(Typ.)

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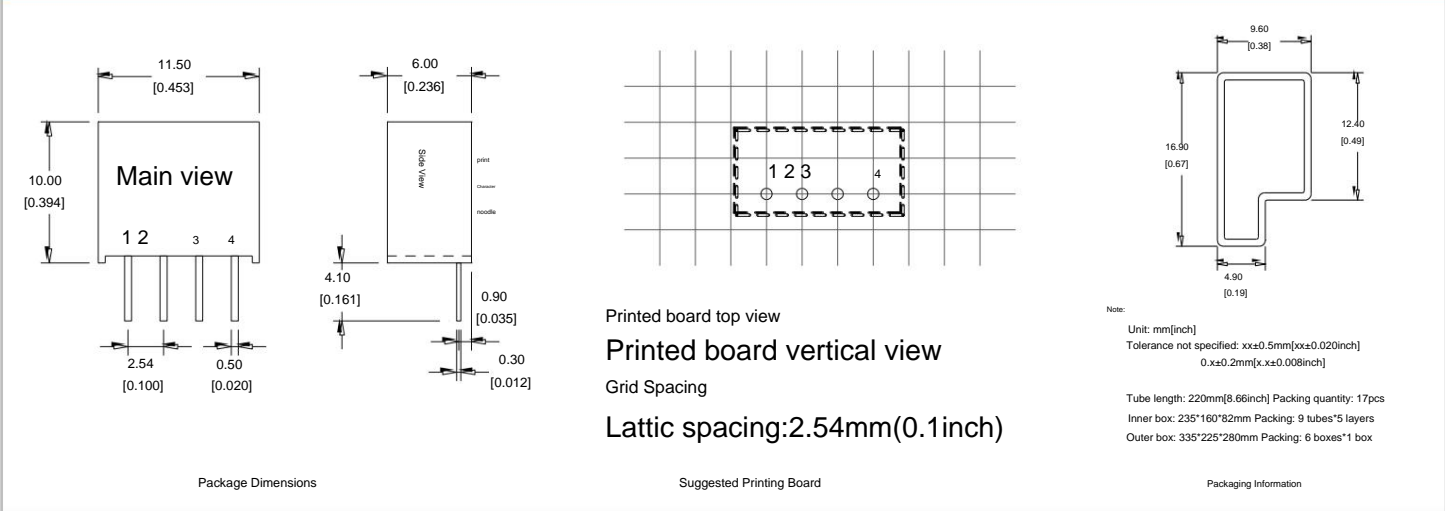
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Relative humidity	No condensation	5%~95%
Housing Material		Black flame retardant and heat resistant plastic (UL94-V0)
Product Weight		2.4g (Typ.)
Isolation voltage	Test time: 1 minute, leakage current less than 0.5mA	1500Vdc
Isolation capacitor	0.5mA Input/output, 100KHz/0.1V	20 pF (Typ.)
Mean time between failures	MIL-HDBK-217F@25y	35X105Hrs

Package size



Package code	L x W x H	
A	11.50× 6.00 × 10.00mm	0.453 × 0.236 × 0.394inch

Pin Definition

Pin Definition	1	2	3	4
Single channel (S)	GND	+Win	-In	+In
	Input	Input positive	Output negative	Output positive

Note: If the pin definitions of the power module are inconsistent with those in the selection manual, the markings on the actual label shall prevail.

Ripple & Noise Test Description (Twisted Pair Method 20MHz Bandwidth)

Test Method:

1. Ripple noise is connected by 12# twisted pair cable, oscilloscope

The bandwidth is set to 20MHz, 100M bandwidth probe, and

Connect a 0.1uF polypropylene capacitor and a 10uF high frequency

Low resistance electrolytic capacitor, oscilloscope sampling using Sample sampling

model.

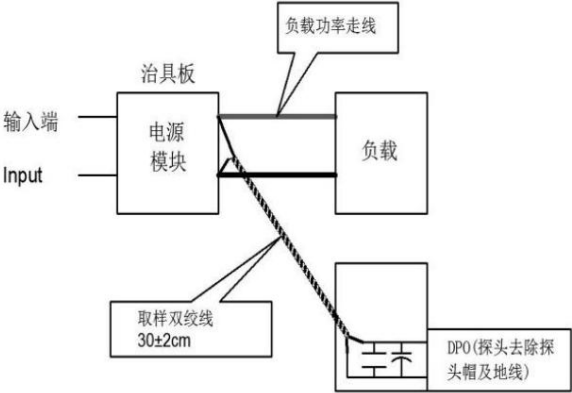
2. Output ripple noise test diagram:

Connect the power input to the input power supply, and the power output to the

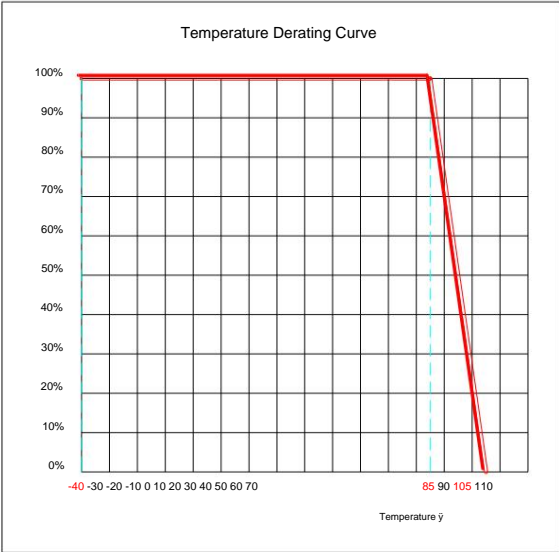
The fixture board is connected to the electronic load and the test is performed separately with 30cm±2 cm

The sampling line samples directly from the power output port.

Select an insulated wire with corresponding wire diameter according to the output current.



Product characteristic curve



Design Reference Applications

Output load requirements

a. To ensure that the power module can work efficiently and reliably, it is recommended that its minimum load should not be less than 10% of the rated load; if the power you need is indeed small, please connect a

A resistor equivalent to 10% of the rated load.

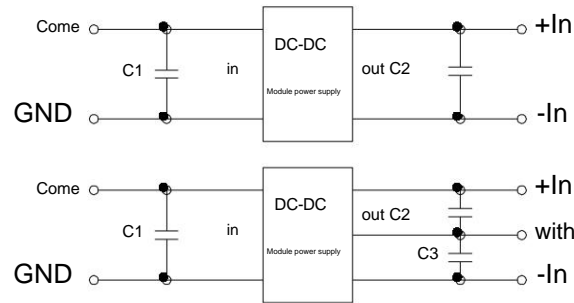
b. The maximum capacitive load of the product is obtained from the nominal full load test. It should not exceed the maximum capacitive load of the output terminal during use, otherwise it may cause startup difficulties and damage the product.

Recommended circuit

a. 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 Figure 1 below; however, appropriate filter capacitors should be selected.

If the capacitance is too large, it may affect the startup of the product. To ensure that each output works safely and reliably, the recommended capacitive load value is shown in Table 1 below. (However, for actual output power is small

For 0.5W application circuit, it is recommended not to connect external capacitors)



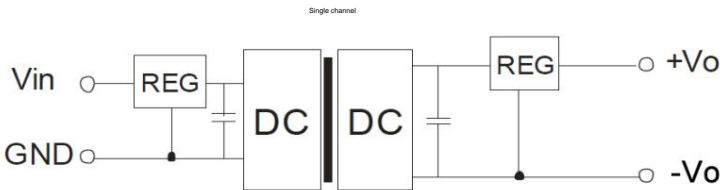
Recommended capacitive load value table (Table 1)

Come (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

Output voltage regulation and overvoltage protection circuit

The simplest device for output voltage regulation, overvoltage and overcurrent protection is to connect a linear regulator with overheat protection in series at its input or output and connect a capacitor filter network (see

The recommended filter capacitor values are shown in Table 1. The linear regulator should be selected based on the voltage and current required for actual work; or our NW series products can be selected.



Note: 1. This product cannot be used in parallel and does not support hot swap;

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

3. All index test methods in this article are based on the company's corporate standards;

4. Product specifications are subject to change without prior notice.