



Typical Features	
Wide input voltage range ( 4:1), output power 6W	
◆	Transfer Efficiency up to 88%
◆	Stand-by Power Consumption as low as 0.02W
◆	Output super-fast start up
◆	Continuous Short Circuit protection, Self-recovery
◆	Input under voltage, output over voltage, short circuit, over current protection
◆	Switching Frequency 300KHz
◆	Isolation Voltage: 2150VAC
◆	Operating Temperature:-40°C~+85°C
◆	Good EMI performance
◆	International standard pin-out

**Application Field**

**FD6-XXSXXA3N4** is a newly designed DIP 1X1 packed, 6W output power, ultra wide input range 4:1, low stand-by power consumption, isolated regulated output DC-DC converter, could be widely used for railway, industrial control, instrument, communication, power electricity, internet of things field.

Typical Product List												
Certificate	Model no.	Input voltage/current (VDC)		Output Voltage/Current (Vo/Io)		Input current (mA) (Nominal Voltage)		Max. Ca capacitive Load uF	Ripple&Noise		Efficiency (%)@output full load,	
		Nominal	Range	Voltage (VDC)	Current (mA) MAX./Min	Full load typ	No load typ		mVp-p		Min	Typ
									Typ	Max		
-	*FD6-18S3V3A3N4	24	9-36	3.3	1818/0	305	2	4000	50	100	80	82
-	FD6-18S05A3N4	24	9-36	5	1200/0	297	2	3000	50	100	82	84
-	*FD6-18S09A3N4	24	9-36	9	667/0	294	2	2000	50	100	83	85
-	*FD6-18S12A3N4	24	9-36	12	500/0	290	2	1000	50	100	84	86
-	*FD6-18S15A3N4	24	9-36	15	400/0	287	2	700	50	100	85	87
-	*FD6-18S24A3N4	24	9-36	24	250/0	284	2	400	50	100	86	88
-	*FD6-36S3V3A3N4	48	18-75	3.3	1818/0	152	2	4000	50	100	80	82
-	*FD6-36S05A3N4	48	18-75	5	1200/0	148	2	3000	50	100	82	84
-	*FD6-36S09A3N4	48	18-75	9	667/0	147	2	2000	50	100	83	85
-	*FD6-36S12A3N4	48	18-75	12	500/0	145	2	1000	50	100	84	86
-	*FD6-36S15A3N4	48	18-75	15	400/0	143	2	700	50	100	85	87
-	*FD6-36S24A3N4	48	18-75	24	250/0	142	2	400	50	100	86	88

注 1: “\*”are models being developing;

注 2: Suffix“N” is the without Ctrl function. Suffix“C” is with Ctrl function; “-T” suffix for chassis mounting , “-TS” suffix for DIN-Rail mounting, DIN-Rail width is: 35mm; ;

3. Max capacitive load is, when the power supply is fully loaded, the max capacity could be connected to output, if exceed, the power supply cannot start-up;

4. To reduce no load power consumption and improve efficiency of light-load, IC will be flitter frequency under no-load and light-load operating, output cannot be no load, at least with 15% load or above 470uF high frequency low resistance electrolytic capacitor, otherwise the output ripple will rise;

### Input Specification

Stand-by Consumption	0.02 W(TYP)		
Input Filter	π filter		
Input Under-Voltage Protection	5~9VDC	FD6-18SXXA3N4 Input	
	11~18VDC	FD6-36SXXA3N4 Input	

### Output Specification

Output Voltage Accuracy	Full voltage full load	Vo	±2.0%
Voltage Regulation	Nominal load, full voltage range	Vo	≤±0.5%
Load Regulation	10% ~ 100%specified load	Vo	≤±1.0%
Ripple & Noise	Nominal load, nominal voltage Twisted Pair Method,20M Hz bandwidth;	When ≤10%load,	5%Vo mVp-p typ
		When ≥10%Load,	50mVp-p typ, 100mVp-p max
Output overvoltage protection	120%~200%Vo		
Output overload protection	110%~220%Io		
Output short circuit protection	Sustainable and self-healing		
Dynamic Response	25% of nominal load step $\Delta Vo/\Delta t$	3.3V、 5Voutput	±5% typ , ±8% max /500us
		Other output	±3% typ , ±5% max /500us
Output voltage regulation	No adjustment		
Start delay time	Typical value	100ms	
Output start overshoot voltage	-	≤10%Vo	



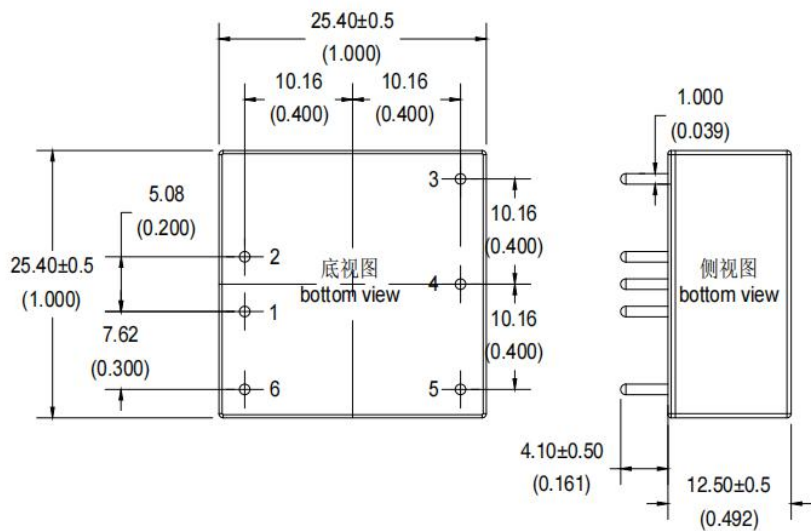
**General characteristics**

operating frequency	Typical value	300KHz
Operating temperature	Use reference temperature derating curve	-40℃ ~ +85℃
Storage temperature	-	-55℃ ~ +125℃
Maximum shell temperature	Within the working curve	+105℃
Relative humidity	No condensation	5%~95%
Housing material	-	Aluminum metal housing
cooling method	-	Natural cooling
Isolation voltage	Input to output	2150Vac ≤ 5mA / 1min
Minimum time between failures	MIL-HDBK-217F 25℃	2X10 <sup>5</sup> Hrs
weight	average value	15g

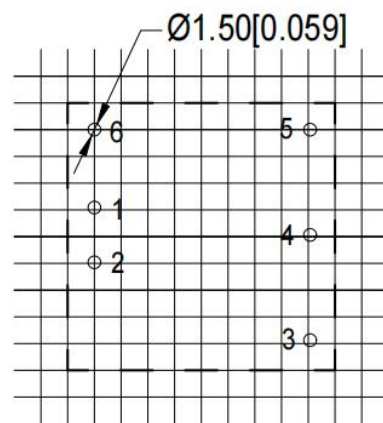
**EMC characteristics**

Total project		Subproject	Testing standard	Judgment level
EMC	EMI	Conduction harassment	CISPR22/EN55032	CLASS B (The recommended circuit is shown in the picture②)
		Radiation harassment	CISPR22/EN55032	CLASS B (The recommended circuit is shown in the picture②)
	EMS	Radiation immunity	IEC/EN61000-4-3	10V/m Perf.Criteria B (The recommended circuit is shown in the picture2)
		Conducted disturbance immunity	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (The recommended circuit is shown in the picture2)
		Electrostatic discharge	IEC/EN61000-4-2	±4KV Perf.Criteria B
		Surge immunity	IEC/EN61000-4-5	±2KV Perf.Criteria B (The recommended circuit is shown in the picture1)
		Pulse group immunity	IEC/EN61000-4-4	±2KV Perf.Criteria B (The recommended circuit is shown in the picture1)
Voltage sag, drop and short-term interruption immunity	IEC/EN61000-4-11	0%~70% Perf.Criteria B		

**A3Packing Dimension**



第三角投影



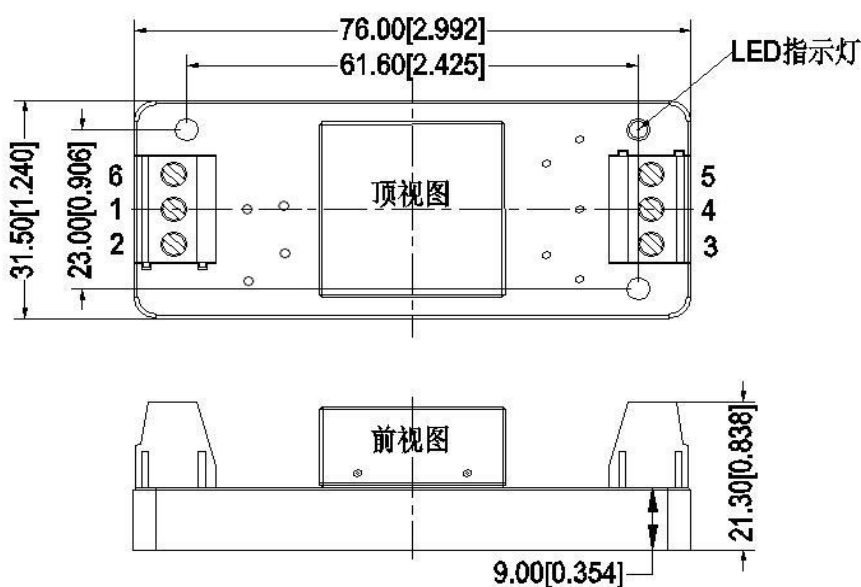
注：栅格距离2.54\*2.54mm

尺寸单位:mm[inch]

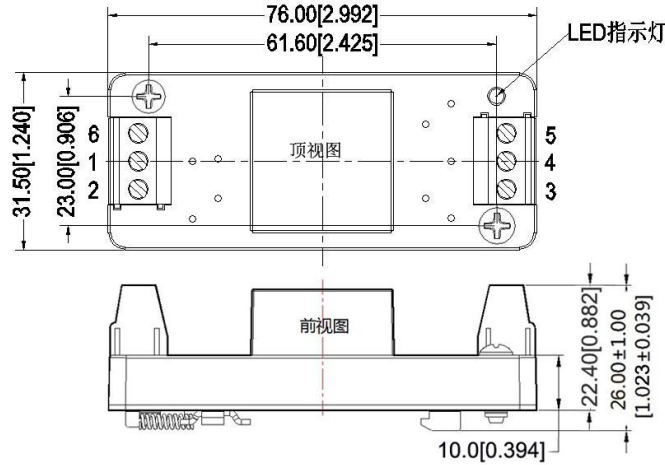
端子直径公差 $\pm 0.10$  [ $\pm 0.004$ ]

未标注公差 $\pm 0.50$  [ $\pm 0.020$ ]

**A3-T Packing Dimension**



**A3-TS Paking Dimension**



Packing Code	L x W x H
A3	25.4X 25.4X12.5 mm
A3-T	76X31.5X21.3mm
A3-TS	76X31.5X26mm

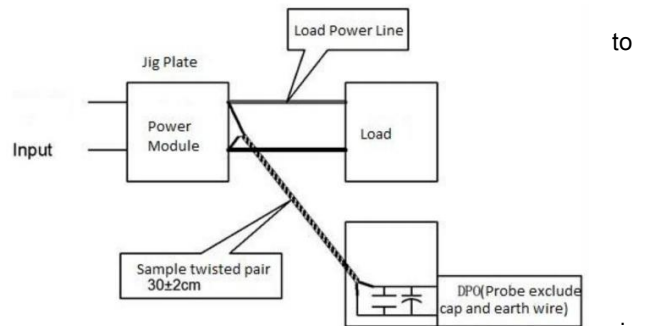
**Pin definition**

	1	2	3	4	5	6
FD6-XXSXXA3C4	-Vin	+Vin	+Vout	NP	GND	CTRL
FD6-XXSXXA3N4	-Vin	+Vin	+Vout	NP	GND	NP

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

**Test Method:**

- 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.
- Input terminal connect to power supply, output terminal connect 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.

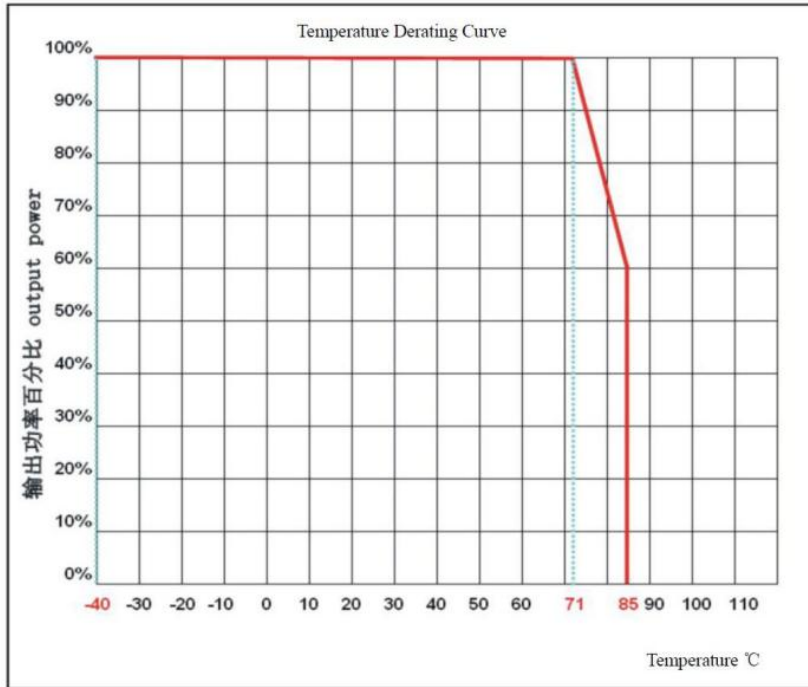


**Application Reference:**

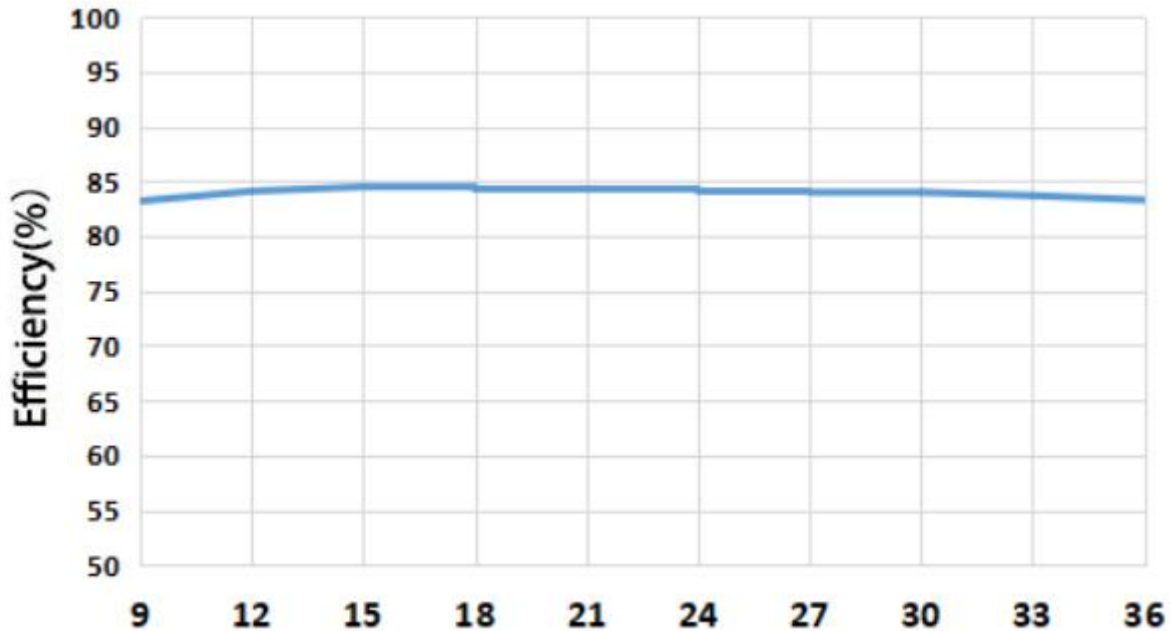
- 1.The recommended minimum load is 10% or above 3300uF high frequency low resistance electrolytic capacitor, or output ripple will rise;
- 2.Recommend the unbalance loads of dual output to be ≤±5%;
- 3.The maximum capacitive load is tested under pure resistance and full load condition;
- 4.Our company could provide whole power supply solution, or customized made items; Due to space limitation, please contact our team for more information.



**Product Characteristic Curve**



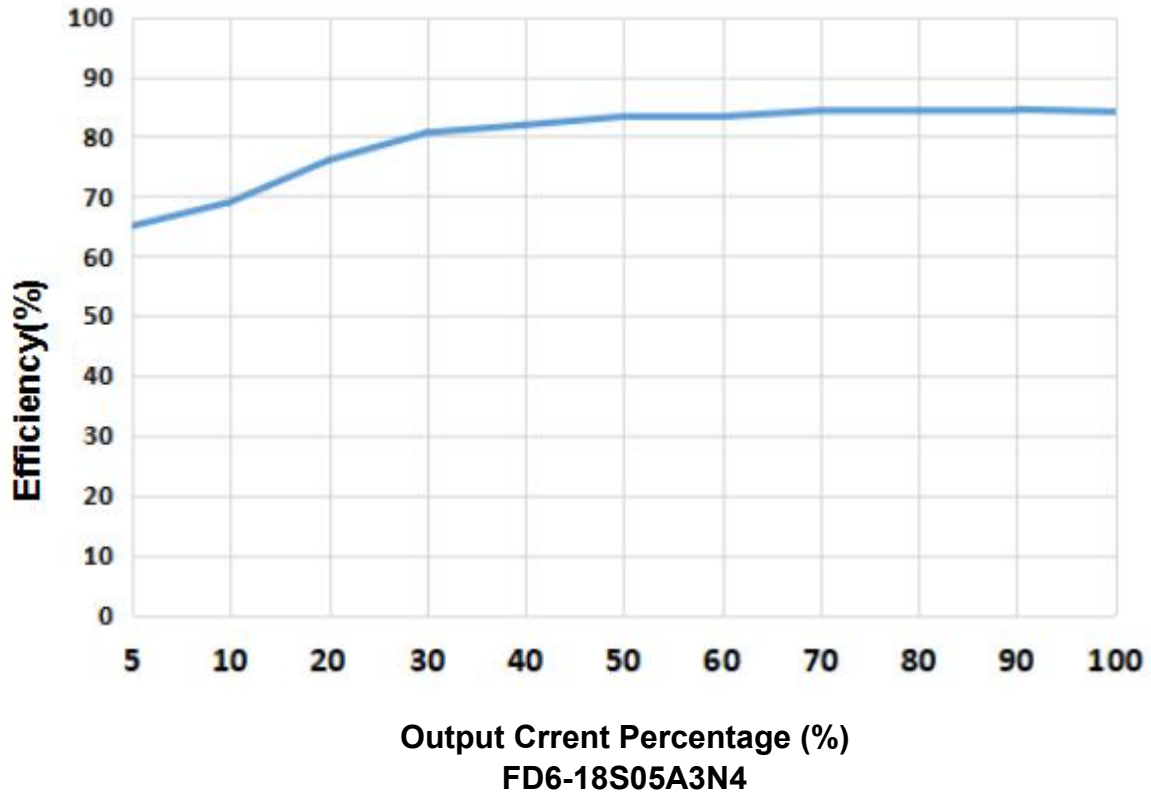
**Efficiency VS Input Voltage (Full Load)**



**FD6-18S05A3N4**



**Efficiency VS Output Load (Vin=24v)**

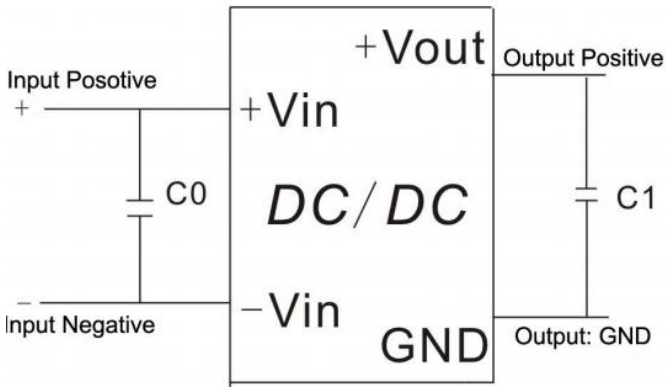


**Design Application**

**Recommended circuit:**

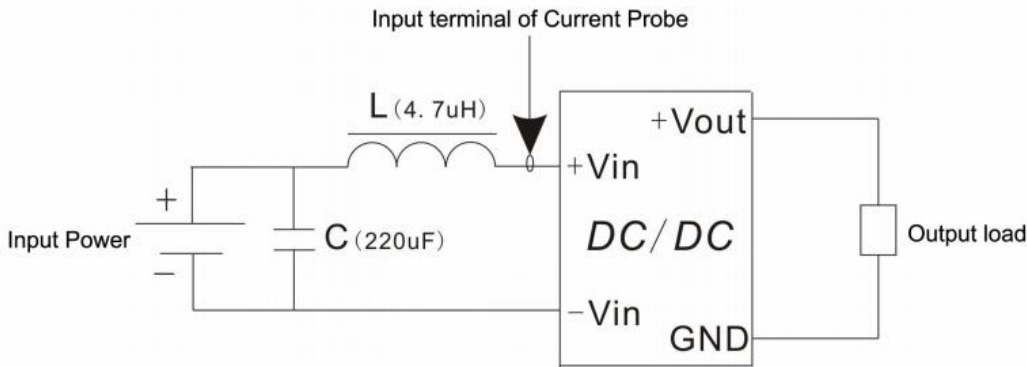
1、DC/DC Test Circuit:

Normal recommended capacitors: C0: 47-100uF; C1; 330uF.

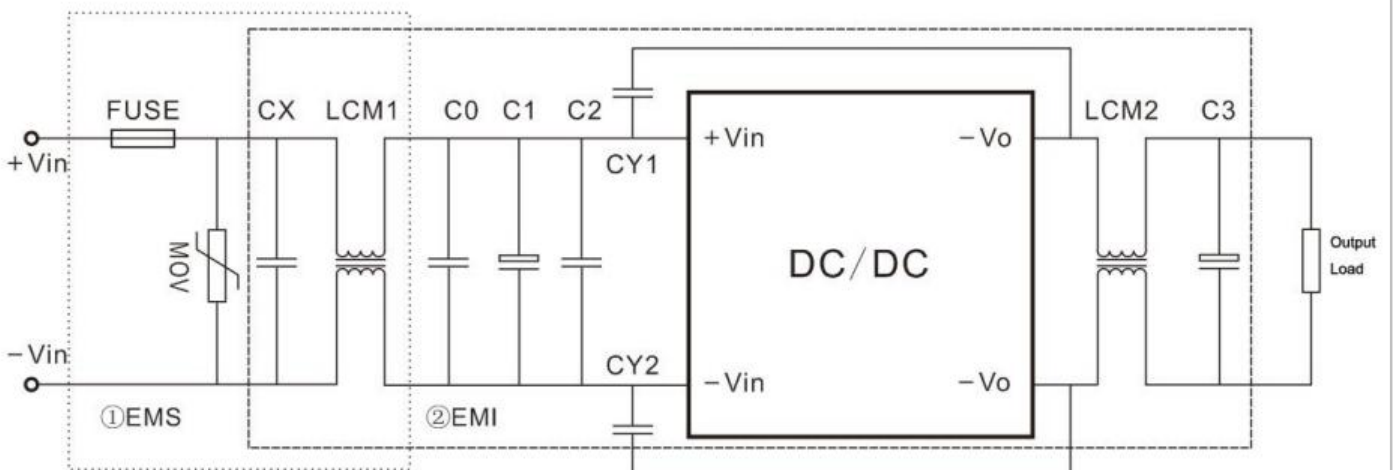


2、Input reflecting ripple current test circuit:

Capacitor C choose low ESR ones, withstand voltage value should be bigger than max input voltage;



3、EMC external recommended circuit:





Device code	FD6-18SXXA3N4 Input product	FD6-36SXXA3N4 Input product
FUSE	Connect the corresponding fuse according to customer needs	
MOV	14D560K	14D101K
CX	0.47uF	0.47uF
LCM1	10mH	10mH
C0	1uF/100V	1uF/100V
C1	220uF/100V	220uF/100V
C2	1uF/100V	1uF/100V
LCM2	30uH	30uH
C3	47uF/50V	47uF/50V
CY1,CY2	1nF/2000V	

**Note 1:**

1. The product should be used within the specification range, otherwise it will cause permanent damage to the product;
2. If the product works below the minimum required load, it cannot be guaranteed that the product performance meets all the performance indicators in this manual;
3. If the product works beyond the product load range, it cannot be guaranteed that the product performance meets all the performance indicators in this manual;
4. Unless otherwise specified, the above data is measured when Ta=25°C, humidity <75%, input nominal voltage and output rated load (pure resistance load);
5. All the above index test methods are based on the company's standards;
6. The above are the performance indicators of the product models listed in this manual. Some indicators of non-standard products will exceed the above requirements. For specific information, please contact our technical staff directly;
7. Our company can provide product customization;
8. Product specifications are subject to change without notice. Please pay attention to the latest manual published on our official website.