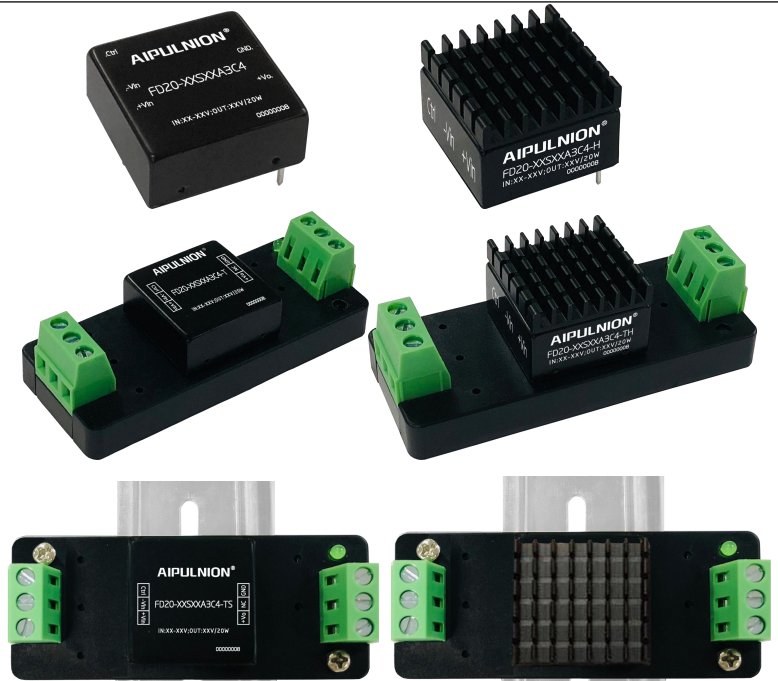




Product Typical Features

- ◆ Wide input voltage range (4:1), Output Power 20W
- ◆ Transfer Efficiency up to 90%
- ◆ Stand-by Power Consumption as low as 0.05W
- ◆ Output super-fast start up
- ◆ Continuous Short Circuit
- ◆ Input under voltage, output over voltage, short circuit, over current protection
- ◆ Switching Frequency 350KHz
- ◆ Isolation Voltage 3000VDC / 2150VAC
- ◆ Operating Temperature:-40°C~+85°C
- ◆ Good EMI performance
- ◆ ◆ International standard pin-out



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°C.

Application Field

FD20-XXSXXA3C4 is a newly designed DIP 1X1 packed, 20W output power, ultra wide input range 4:1, low stand-by power consumption, isolated regulated output DC-DC converter, could be widely used for industrial control, instrument, communication, power electricity, internet of things field.

Typical Product List

Part no.	Input Voltage Range (VDC)		Output Voltage/Current (Vo/Io)		Input Current (mA) (Nominal Voltage)		Max. Capacitive Load	Ripple & Noise		Efficiency (%)@output full load		
	Nominal	Range	Voltage (VDC)	Current (mA) MAX./Min.	Full load typ.	No Load typ.		uF	mVp-p		Min	Typ
									Typ.	Max.		
FD20-18S3V3A3C4	24	9-36	3.3	4000/0	626	30	10000	50	100	86	88	
FD20-18S05A3C4	24	9-36	5	4000/0	926	30	5000	50	100	88	90	
FD20-18S09A3C4	24	9-36	9	2222/0	926	30	3000	50	100	88	90	
FD20-18S12A3C4	24	9-36	12	1667/0	926	5	1000	50	100	88	90	
FD20-18S15A3C4	24	9-36	15	1333/0	926	5	800	50	100	88	90	
FD20-18S24A3C4	24	9-36	24	833/0	926	5	500	50	100	88	90	

FD20-36S3V3A3C4	48	18-75	3.3	4000/0	313	30	10000	50	100	86	88
FD20-36S05A3C4	48	18-75	5	4000/0	463	10	5000	50	100	86	88
FD20-36S09A3C4	48	18-75	9	2222/0	463	30	3000	50	100	88	90
FD20-36S12A3C4	48	18-75	12	1667/0	463	5	1000	50	100	88	90
FD20-36S15A3C4	48	18-75	15	1333/0	463	5	800	50	100	88	90
FD20-36S24A3C4	48	18-75	24	833/0	463	5	500	50	100	88	90

- Suffix "C" is with Control function; "-H" is with heat sink, "-T(H)" suffix for chassis mounting(with heat sink), "-TS(H)" suffix for DIN-Rail mounting(with heat sink), DIN-Rail width is: 35mm;
- 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;
- 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 10% load or above 470uF high frequency low resistance electrolytic capacitor, otherwise the output ripple will rise;

Input Specification

Stand-by Consumption	0.05 W(TYP)	
Input Filter	π filter	
Input Under-Voltage Protection	5~9VDC@FD20-18SXXA3 INPUT 11~18VDC@ FD20-36SXXA3 INPUT	
CTRL*	Module turn-on	CTRL suspended or TTL high level (2.5-12VDC)
	Module turn-off	CTRL connect to GND or low level (0-1.2VDC)
	Input current when switched off	5mA (TYP)

Note: *The voltage of CTRL pin is relative to GND pin.

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% nominal load	Vo	±1.0%
Ripple & Noise	Nominal load, nominal voltage, Parallel Line Test Method. 20M Hz	≤15% Load,	5%Vo mVp-p typ
		≥15% Load,	50mVp-p typ, 100mVp-p max
Output Over-voltage	120%~200%Vo		
Output Over-load	120%~220%Io		
Output Short circuit	Continuous, Self-recovery		
Dynamic Respons	25%nominal load step change ΔVo/Δt	3.3V、5V output	±5% typ , ±8% max /500us
		Others output	±3% typ , ±5% max /500us
Output Voltage Adjustment	Not Available		
Turn-on delay time	Typical	100ms	
Output Turn-on Overshoot	≤10%Vo		

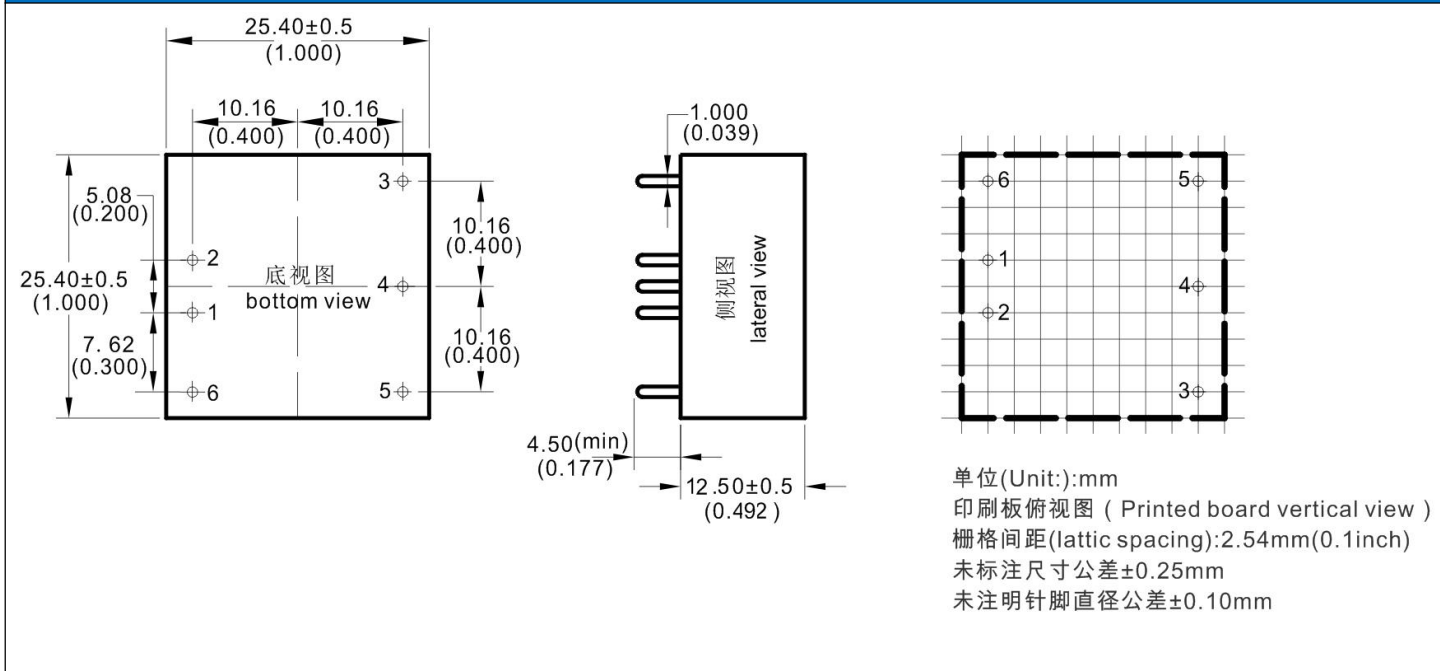
Note: * Ripple&Noise should be tested under the Parallel Line Test Method.

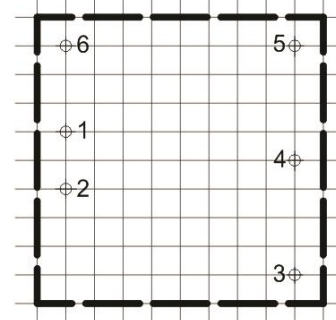
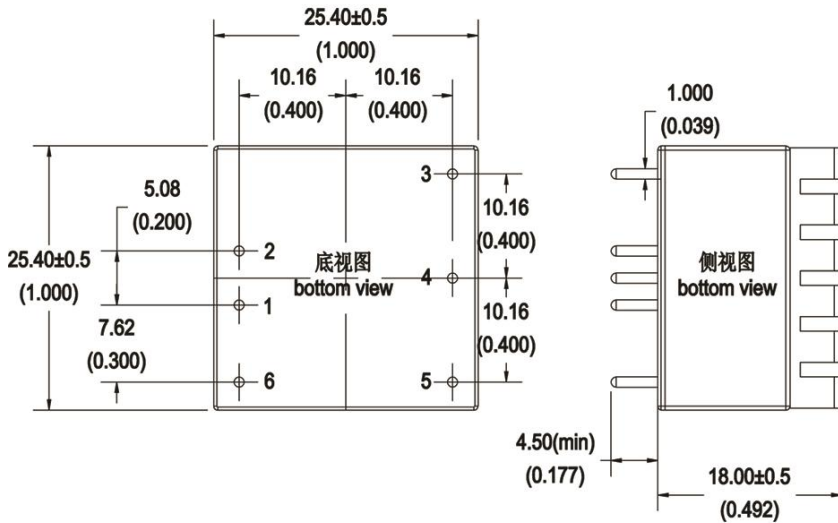
General Specification

Switching Frequency	Typical	350KHz
Operating Temperature	Refer to Temperature Derating	-40℃ ~ +85℃
Storage Temperature		-55℃ ~ +125℃
Max Case Temperature	Within Operating Curve	+105℃
Relative Humidity	No condensing	5%~95%
Case Material		Aluminum Metal Case
Cooling Method		Free air convection
Isolation Voltage	Input to Output	3000Vdc ≤ 0.5mA / 1min
		2150Vac ≤ 5mA / 1min
Meantime Between Failure	MIL-HDBK-217F@25℃	2X10 ⁵ Hrs
Product Weight	Average	18g

EMC Characteristics

Total Items		Sub Items	Test Standard	Class
EMC	EMI	CE	CISPR22/EN55032	CLASS B (The recommended circuit is shown in Figure 2)
		RE	CISPR22/EN55032	CLASS B (The recommended circuit is shown in Figure 2)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B (The recommended circuit is shown in Figure 2)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (The recommended circuit is shown in Figure 2)
		ESD	IEC/EN61000-4-2	Contact ±4KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	±2KV Perf.Criteria B (The recommended circuit is shown in Figure 1)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B (The recommended circuit is shown in Figure 1)
		Voltage dips, short interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B

A3(C) Packing Dimension(Without Heat Sink)


A3-H Packing Dimension(With Heat Sink)


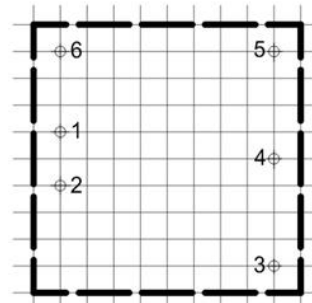
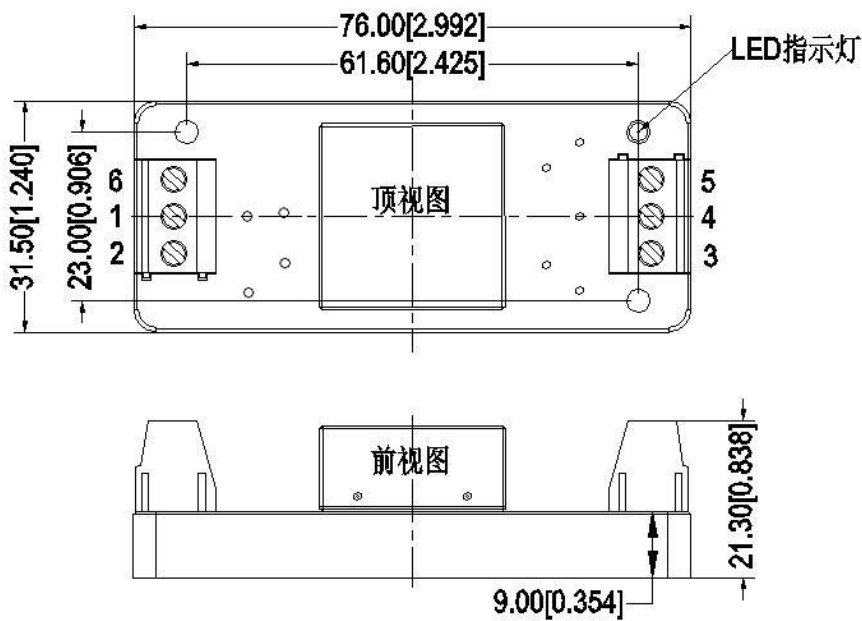
单位(Unit):mm

印刷板俯视图 (Printed board vertical view)

栅格间距(latic spacing):2.54mm(0.1inch)

未标注尺寸公差±0.25mm

未注明引脚直径公差±0.10mm

A3-T Packing Dimension(Without Heat Sink)


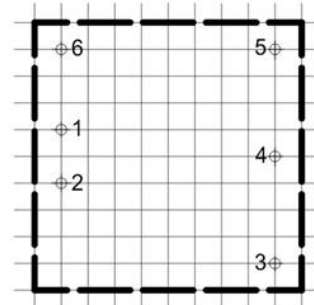
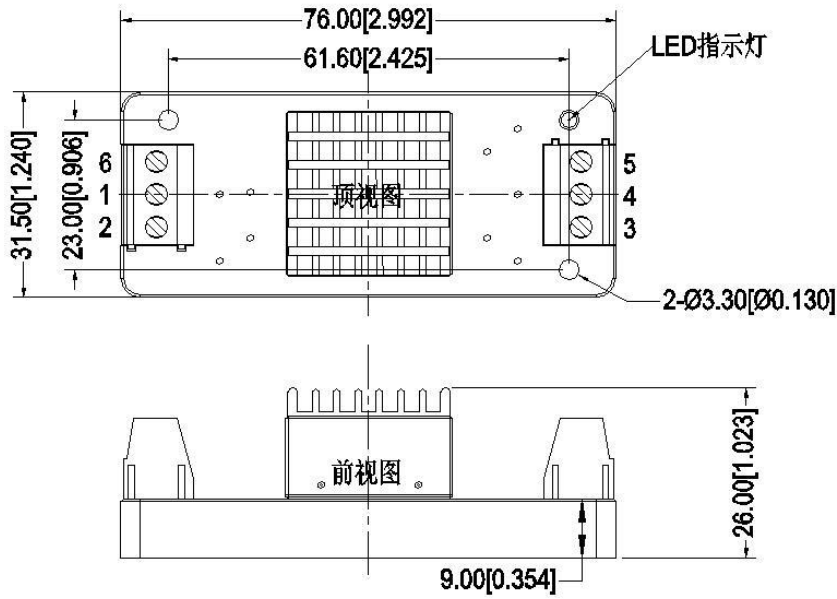
单位(Unit):mm

印刷板俯视图 (Printed board vertical view)

栅格间距(latic spacing):2.54mm(0.1inch)

未标注尺寸公差±0.25mm

未注明引脚直径公差±0.10mm


A3-TH Packing Dimension(With Heat Sink)


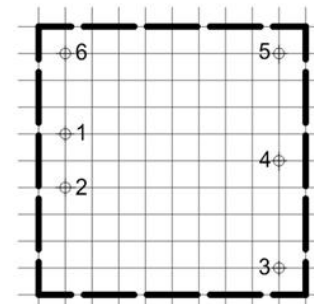
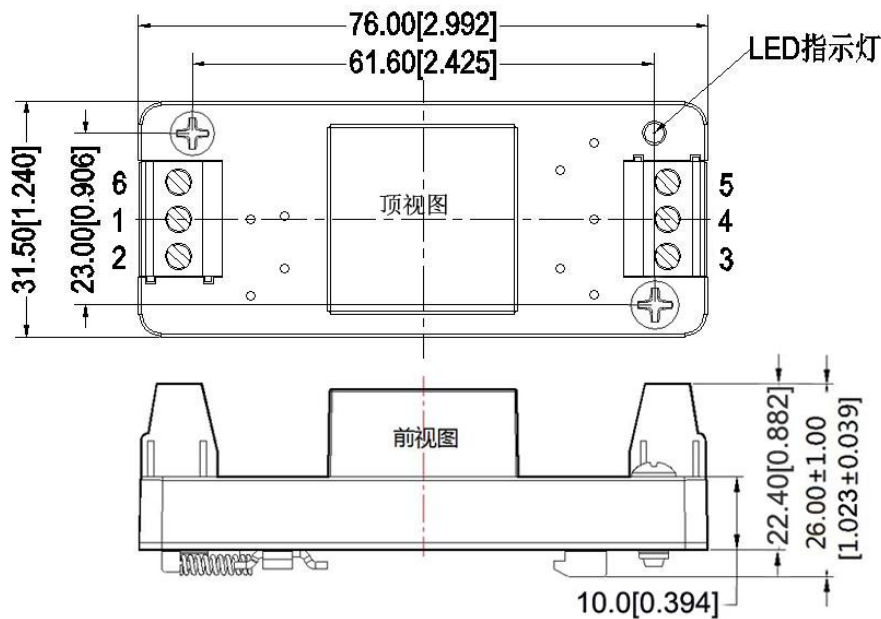
单位(Unit):mm

印刷板俯视图 (Printed board vertical view)

栅格间距(latic spacing):2.54mm(0.1inch)

未标注尺寸公差±0.25mm

未注明引脚直径公差±0.10mm

A3-TS Packing Dimension(Without Heat Sink)


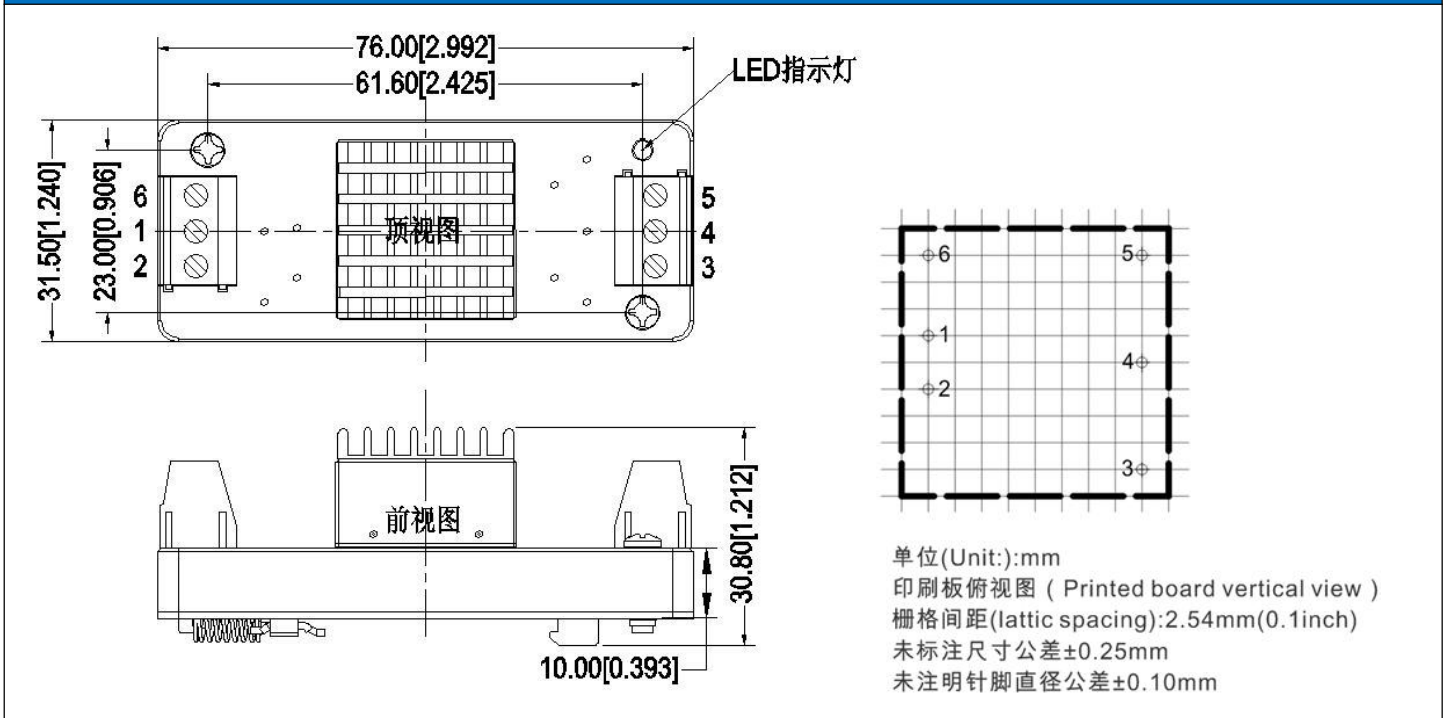
单位(Unit):mm

印刷板俯视图 (Printed board vertical view)

栅格间距(latic spacing):2.54mm(0.1inch)

未标注尺寸公差±0.25mm

未注明引脚直径公差±0.10mm

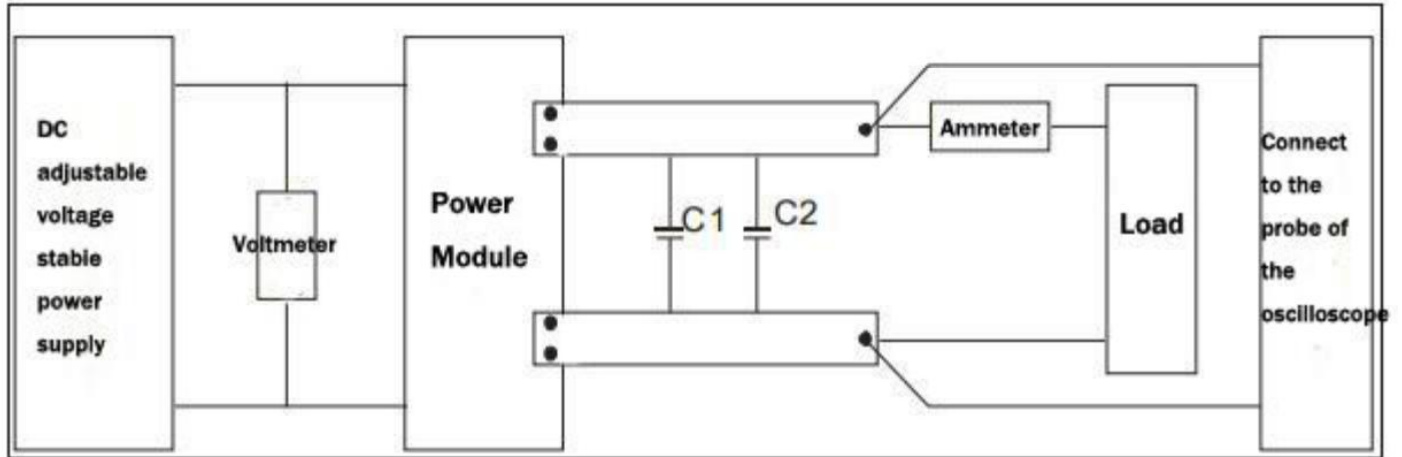
A3-TSH Packing Dimension(With Heat Sink)


Packing Code	L x W x H					
A3 (Without Heat Sink)	25.4X 25.4X12.5 mm					
A3 (With Heat Sink)	25.4X25.4X18.0mm					
A3-T(Without Heat Sink)	76X31.5X21.3mm					
A3-T(With Heat Sink)	76X31.5X26.0mm					
A3-TS (Without Heat Sink)	76X31.5X26mm					
A3-TS (With Heat Sink)	76X31.5X30.8mm					
Single (S)	1	2	3	4	5	6
	-Vin	+Vin	+Vout	NP	GND	CTRL

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: (Parallel Line Test Method 20MHz bandwidth)

Test Method:



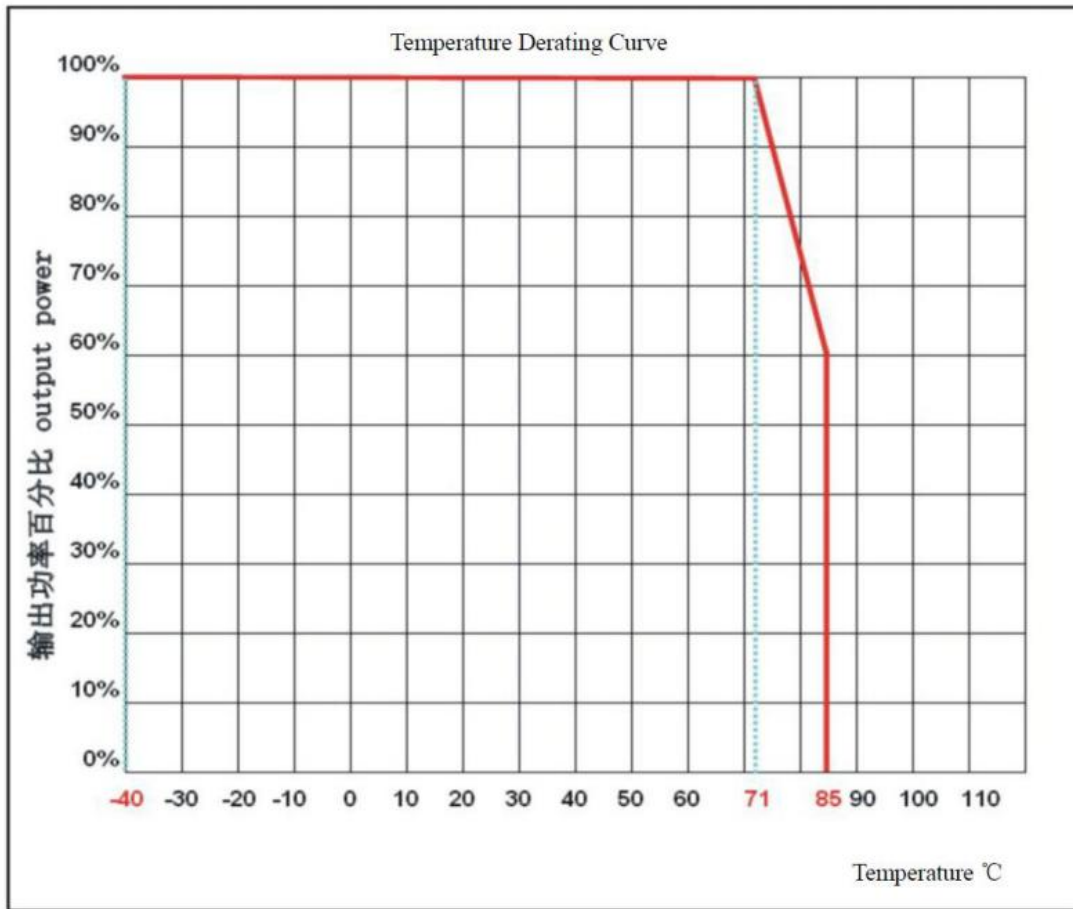
Note: C1=1uF;C2=10uF; the withstand value of the capacitor should be bigger the output voltage of the module.

Application Reference:

- 1.The recommended minimum load is 10% or above 470uF high frequency low resistance electrolytic capacitor, or output ripple will rise;
- 2.Recommend the unbalance loads of dual output to be $\leq \pm 5\%$;
- 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

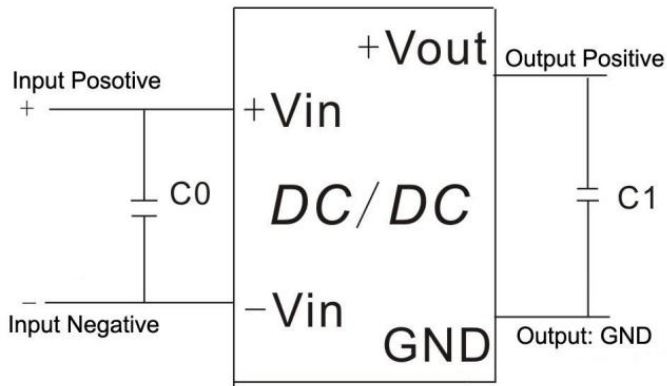




Recommended circuit

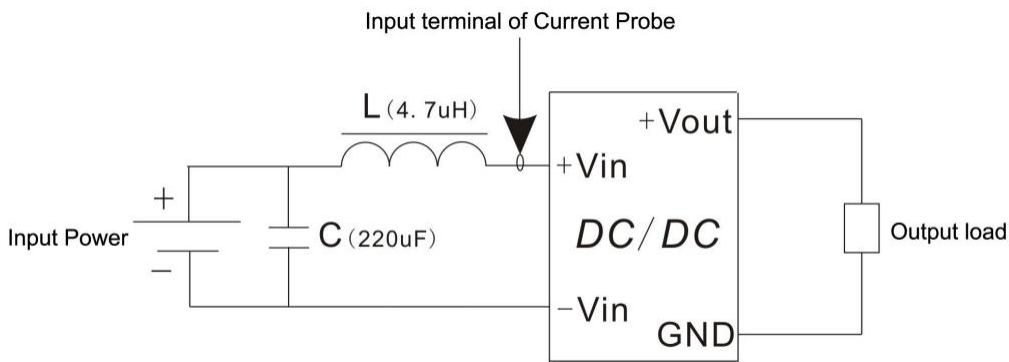
1、 DC/DC test circuit:

Normal recommended capacitors: C0: 47-100uF; C1: 470uF.

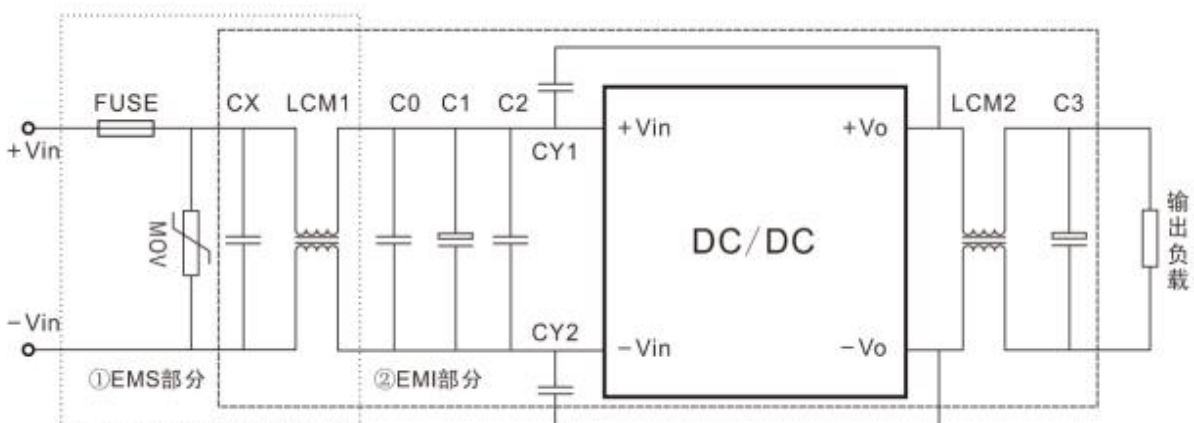


2、 Input reflecting ripple current test circuit:

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



3、 EMC external recommended circuit:




Recommended Spec:

Component	FD20-18SXXA3 Input	FD20-36SXXA3 Input
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	2.2nF/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 at 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.