



Product Typical Features

- ◆ Wide input voltage range (4:1), Output Power 6W
- ◆ Transfer Efficiency up to 85%
- ◆ Output super-fast start up
- ◆ Short Circuit protection, Self-recovery
- ◆ Protection: short circuit, over current
- ◆ Switching Frequency 300KHz
- ◆ Isolation Voltage: 1500VDC
- ◆ Operating Temperature: -40°C~+85°C
- ◆ 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

FD6-XXSXXA3 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 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, input nominal voltage	
	Nominal	Range	Voltage (VDC)	Current (mA) MAX./Min.	Full load typ.	No Load typ.		uF	mVp-p		Min.
							Typ.		Max.		
FD6-18S3V3A3	24	9-36	3.3	1818/0	320	1	4000	50	100	75	78
FD6-18S05A3	24	9-36	5	1200/0	312	1	2000	50	100	77	80
*FD6-18S09A3	24	9-36	9	667/0	301	1	1000	50	100	80	83
FD6-18S12A3	24	9-36	12	500/0	301	1	700	50	100	80	83
*FD6-18S15A3	24	9-36	15	400/0	297	1	500	50	100	81	84
*FD6-18S24A3	24	9-36	24	250/0	297	1	400	50	100	81	84
*FD6-36S3V3A3	48	18-75	3.3	1818/0	160	1	4000	50	100	75	78
*FD6-36S05A3	48	18-75	5	1200/0	156	1	2000	50	100	77	80
*FD6-36S09A3	48	18-75	9	667/0	150	1	1000	50	100	80	83
*FD6-36S12A3	48	18-75	12	500/0	150	1	700	50	100	80	83
*FD6-36S15A3	48	18-75	15	400/0	148	1	500	50	100	81	84
*FD6-36S24A3	48	18-75	24	250/0	148	1	400	50	100	81	84



1. “*” are models being developing;
2. “-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 10% load or above 470uF high frequency low resistance electrolytic capacitor, otherwise the output ripple will rise;

Input Specification

Stand-by Consumption	0.3W(TYP)
Input Filter	π filter

Output Specification

Main Circuit Output Voltage Accuracy	Full voltage full load	Vo	$\pm 2.0\%$ (max)
Voltage Regulation	Nominal load, full voltage	Vo	$\leq \pm 0.5\%$
Load Regulation	20% ~ 100% nominal load	Vo	$\leq \pm 1.0\%$
Ripple & Noise	Nominal load, nominal voltage Twisted Pair Method, 20M Hz bandwidth;	50mVp-p typ, 100mVp-p max	
Output Over-load Protection	110%~220%Io		
Output Short circuit Protection	Limit Power, Self-recovery, Continuous Time:4s		
Dynamic Response	25% nominal load step change	$\Delta Vo/\Delta t$	$\leq 5\%/500\mu s$
Output Voltage Adjustment	No Available		
Turn-on delay time	Typical	250ms	
Output Turn-on Overshoot Voltage			$\leq 10\%Vo$

General Specification

Switching Frequency	Typical	300KHz
Operating Temperature	Refer to Temperature Derating Curve	-40°C ~ +85°C
Storage Temperature		-55°C ~ +125°C
Max Case Temperature	Within Operating Curve	+105°C
Relative Humidity	No condensing	5%~95%
Case Material		Aluminum Metal Case
Cooling Method		Free air convection
Isolation Voltage	Input to Output	1500Vdc \leq 0.5mA / 1min
Meantime Between Failure	MIL-HDBK-217F@25°C	2X10 ⁵ Hrs
Product Weight	Average	18g

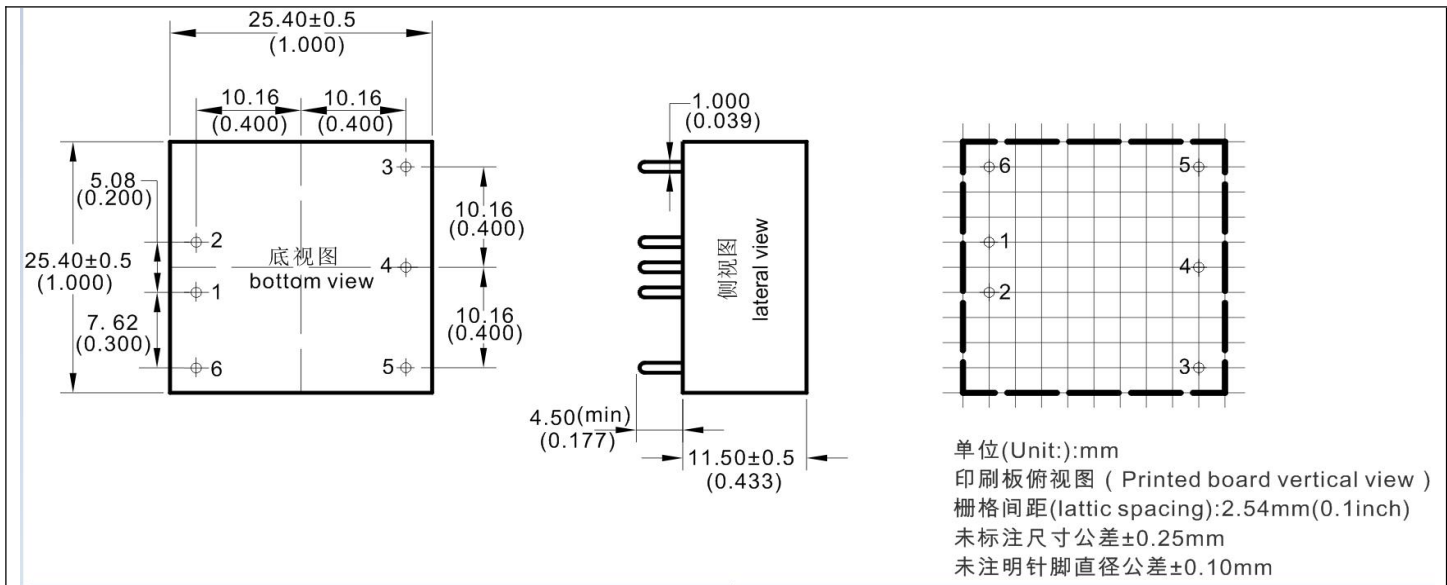
EMC Characteristics

Total Items		Sub Items	Test Standard	Class
EMC	EMI	CE	CISPR22/EN55032	CLASS B (see recommended circuit photo ②)

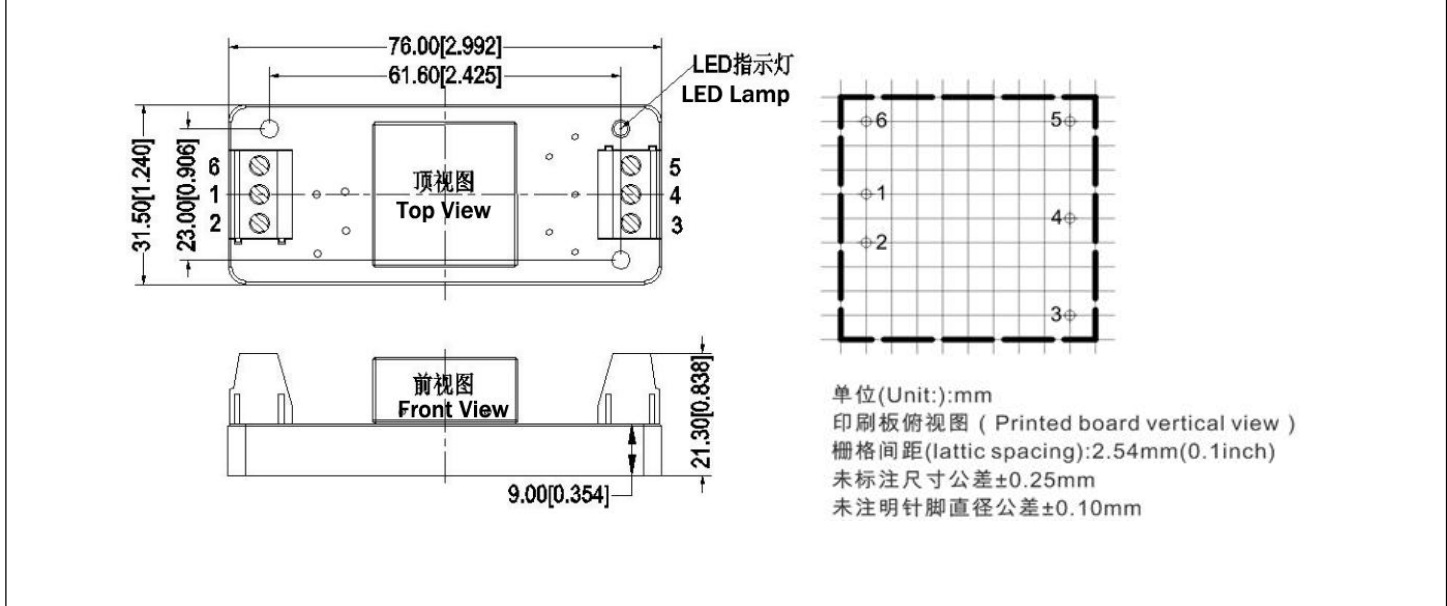


		RE	CISPR22/EN55032	CLASS B (see recommended circuit photo ②)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B (see recommended circuit photo 2)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (see recommended circuit photo 2)
		ESD	IEC/EN61000-4-2	Contact ±4KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	±2KV Perf.Criteria B (see recommended circuit photo 1)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B (see recommended circuit photo 1)
		Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%~70% Perf.Criteria B

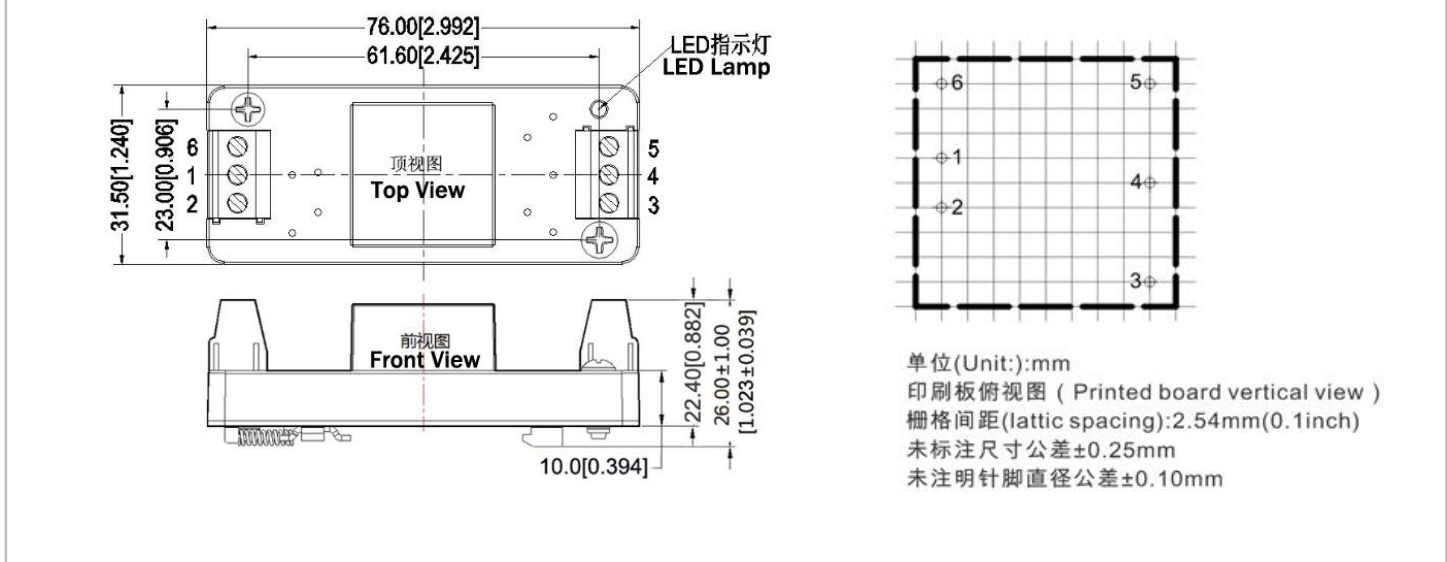
A3 Packing Dimension



A3-T Packing Dimension



A3-TS Packing Dimension





Packing Code	L x W x H	
A3	25.4X 25.4X11.5 mm	1X1 X0.433inch
A3-T	76X31.5X21.3mm	2.99X1.24X0.838inch
A3-TS	76X31.5X26mm	2.99X1.24X1.023inch

Pin out Specifications

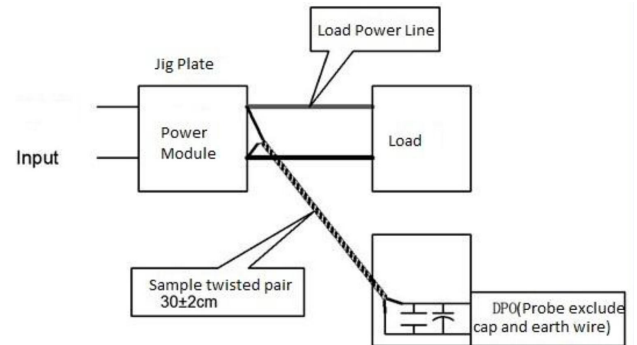
Single (S)	1	2	3	4	5	6
	-Vin	+Vin	+Vout	NP	GND	NP
Dual Output(D)	1	2	3	4	5	6
	-Vin	+Vin	+Vout	COM	-Vout	NP

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:

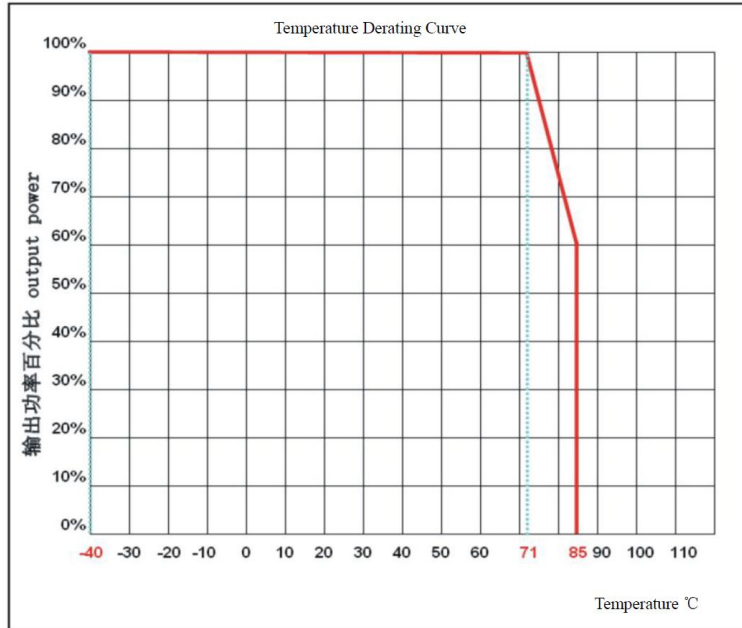
- 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.
- Input terminal connect to power supply, output terminal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



Application Reference:

- The recommended minimum load is 10% or above 470uF high frequency low resistance electrolytic capacitor, or output ripple will rise;
- Recommend the unbalance loads of dual output to be $\leq \pm 5\%$;
- The maximum capacitive load is tested under pure resistance and full load condition;
- 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



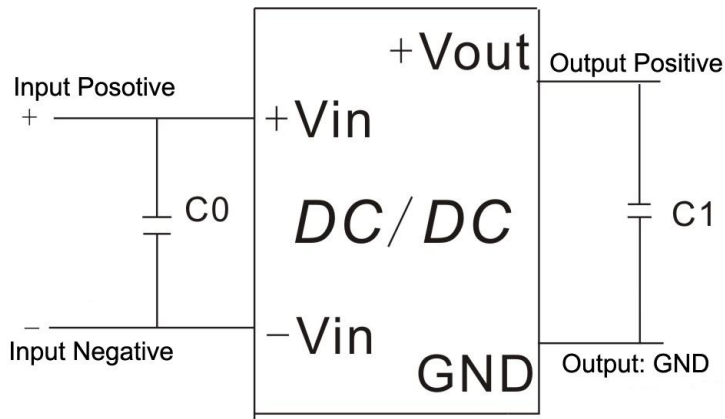
Design Application



Recommended circuit

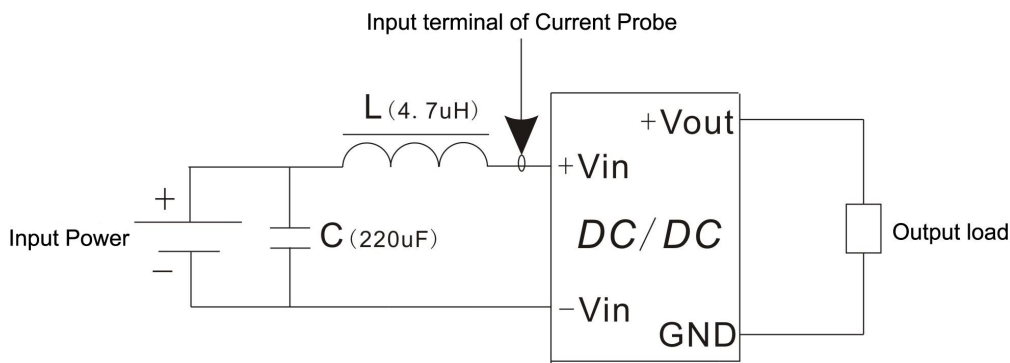
1. DC/DC test circuit:

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

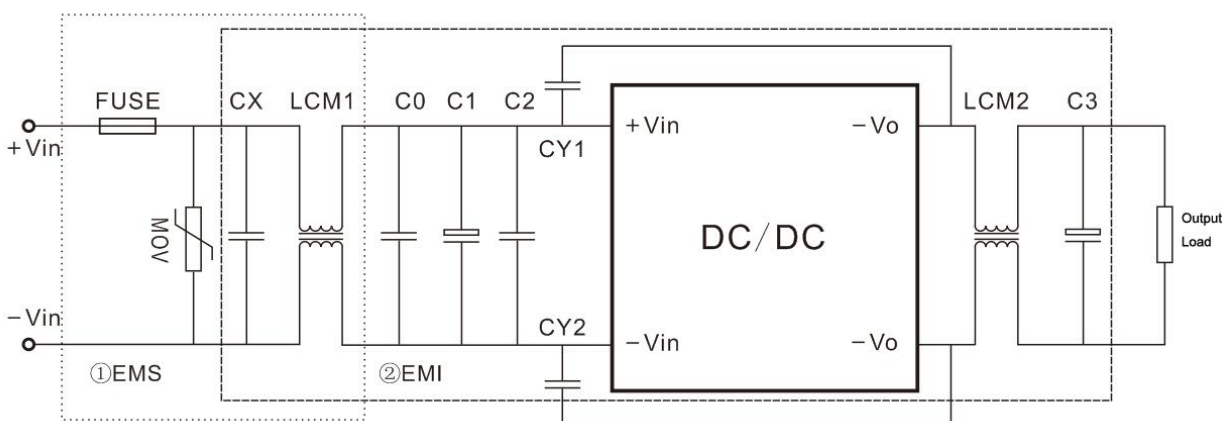


2. Input reflecting ripple current test circuit:

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



3. EMC external recommended circuit:




Recommended Spec:

Component	FD6-18SXXA3 Input	FD6-36SXXA3 Input
FUSE	According to customer's request	
MOV	14D560K	14D101K
CX	4.7uF/100V	4.7uF/100V
LCM1	10mH	10mH
C0	4.7uF/50V	1uF/100V
C1	220uF/100V	220uF/100V
C2	4.7uF/50V	1uF/100V
LCM2	30uH	30uH
C3	47uF/50V	47uF/50V
CY1,CY2	1nF/2000V	

Note:

1. The product should be used under the specification range, otherwise it will cause permanent damage to it.
2. If the product worked beyond the load range or below the minimum load, we cannot ensure that the performance of product is in accordance with all the indexes in this manual;
3. Unless otherwise specified, data in this datasheet should be tested under conditions of Ta=25°C, humidity<75% when inputting nominal voltage and outputting rated load(pure resistance load);
4. All index testing methods in this datasheet are based on our Company' s corporate standards
5. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technician for specific information;
6. We can provide customized product service;
7. The product specification may be changed at any time without prior notice.

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