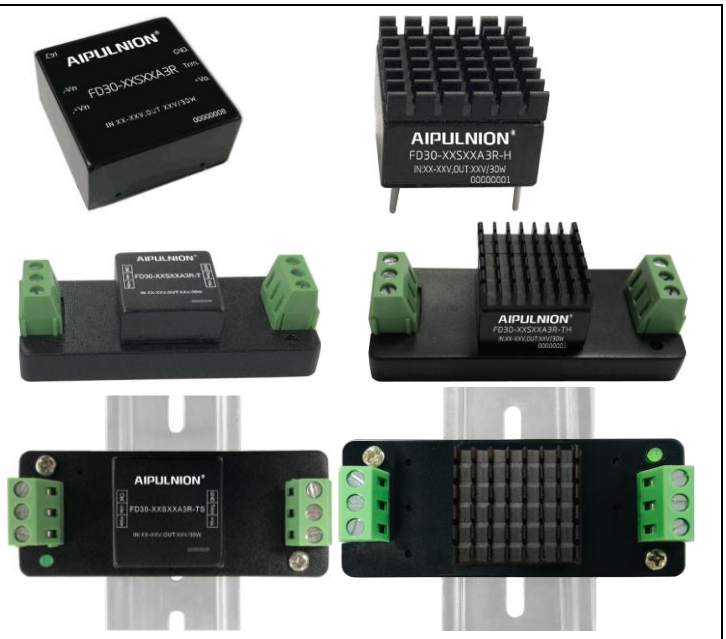
DC/DC Converter

FD30-XXSXXA3(R) (-T)(-TS) Series

Typical Features

- Wide input voltage range (4:1), Output Power 30W
- Transfer Efficiency up to 90%
- Stand-by Power Consumption as low as 0.08W
- Output super-fast start up
- Continuous Short Circuit protection, Self-recovery
- Input under voltage, output over voltage, short circuit, over current protection
- Isolation Voltage 1500VDC
- 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℃.

Application Field

FD30-XXSXXA3(R) *is a newly designed DIP 1X1 packed，30W 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. For harsh EMC environment, the application circuit in the datasheet is strongly recommended.*

Typical Product List

Certificate	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		
-	FD30-18S3V3A3(R)	24	9~36	3.3	6000/0	982	50	8000	50	100	82	84
-	FD30-18S05A3(R)	24	9~36	5	6000/0	1436	50	6000	50	100	86	88
-	FD30-18S09A3(R)	24	9~36	9	3333/0	1420	50	5000	50	100	86	88
-	FD30-18S12A3(R)	24	9~36	12	2500/0	1420	10	3000	50	100	87	89
-	FD30-18S15A3(R)	24	9~36	15	2000/0	1404	10	1000	50	100	87	89
-	FD30-18S24A3(R)	24	9~36	24	1250/0	1380	10	800	50	100	88	90
-	FD30-36S3V3A3(R)	48	18~75	3.3	6000/0	489	32	8000	50	100	81	83
-	FD30-36S05A3(R)	48	18~75	5	6000/0	706	40	6000	50	100	85	87
-	FD30-36S09A3(R)	48	18~75	9	3333/0	700	53	5000	50	100	85	87
-	FD30-36S12A3(R)	48	18~75	12	2500/0	707	2	3000	50	100	86	88
-	FD30-36S15A3(R)	48	18~75	15	2000/0	700	3	1000	50	100	86	88

-	FD30-36S24A3(R)	48	18~75	24	1250/0	698	4	800	50	100	87	89

Note 1: “R” is with control pin and output adjustment pin together, ”C” is for control function only, ”-T” for adjustment function, no suffix mean no extra functions;

Note 2: Suffix “-H” is with heatsink, “-TH” for chassis mounting with heatsink,”-T” for chassis mounting, ”-TS” for DIN-Rail mounting, ”-TSH” for DIN-Rail mounting with heatsink, DIN-Rail width is: 35mm;

Note 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;

Note 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;

Note 5: 9~18VDC (FD30-18SXXA3R) input needs to be used under windy conditions;

Input Specification

Stand-by Consumption	0.08 W(TYP)	
Input Filter	π filter	
Input Under-Voltage Protection	7~8.5VDC FD30-18SXXA3 (R)Input	
	15~18VDC FD30-36SXXA3 (R)Input	
CTRL (The voltage of CTRL pin is relative to Input GND pin)	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)

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 bandwidth		50mVp-p typ., 100mVp-p max
Output Over-voltage Protection	120%~200%Vo		
Output Over-load Protection	110%~220%Io		
Output Short circuit Protection	Continuous, Self-recovery		
Dynamic Response	25% nominal load step change △Vo/△t	3.3V、5V Output	±5% typ , ±8% max /500us
		Other Output	±3% typ , ±5% max /500us
Output Voltage Adjustment	Available(choose)		
Turn-on delay time	Typical		100ms
Output Turn-on Overshoot Voltage	-		≤10%Vo

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

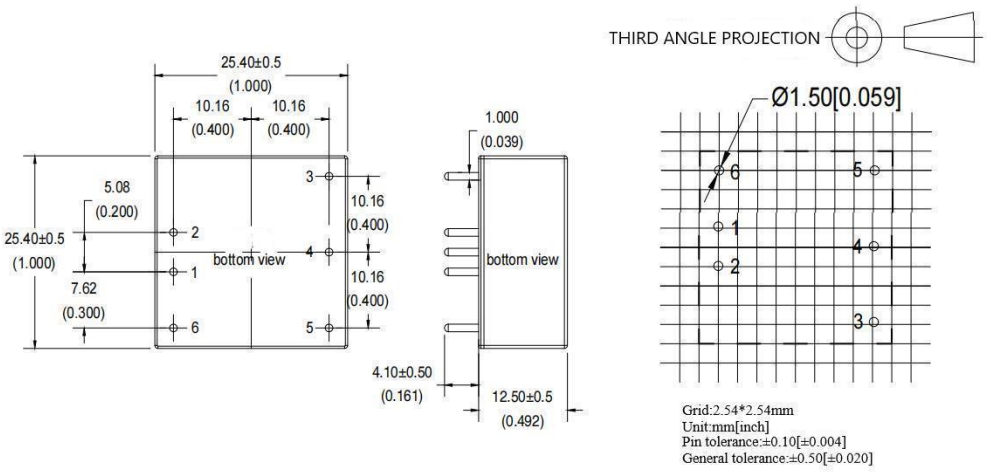
General Specification

Switching Frequency	Typical	18~75VDC:300KHz/9~36VDC:380KHz
Operating Temperature	Refer to Temperature Derating Curve	-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	1500Vdc ≤ 0.5mA / 1min
MTBF	MIL-HDBK-217F@25℃	$2X10^5$Hrs
Product Weight	Average	18g

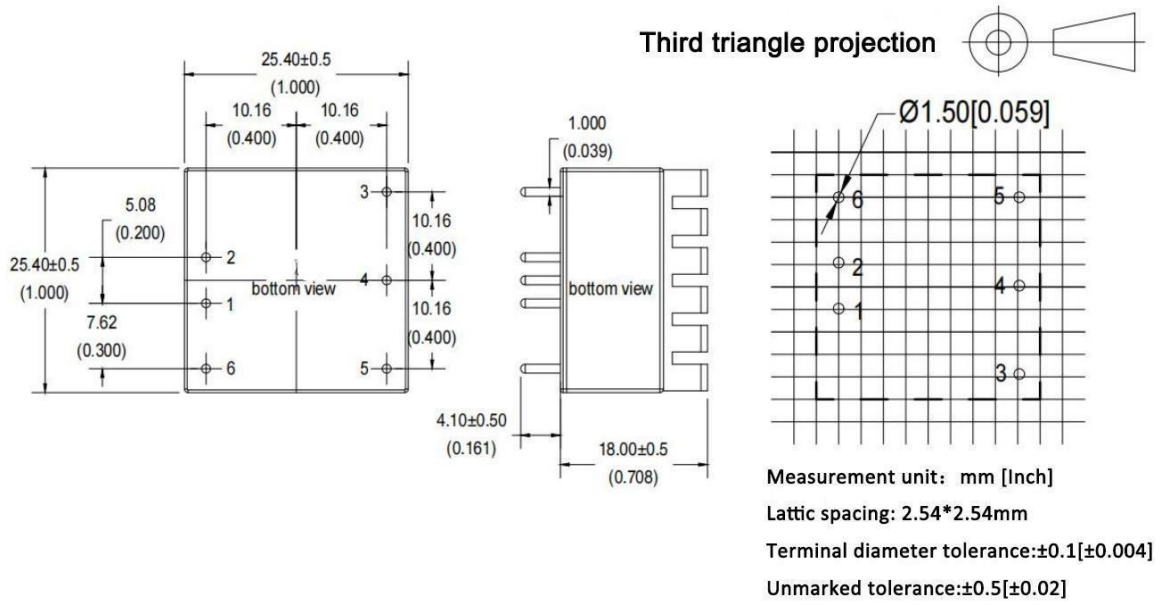
EMC Characteristics

Total Items		Sub Items	Test Standard	Class
EMC	EMI	CE	CISPR22/EN55032	CLASS B (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	±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

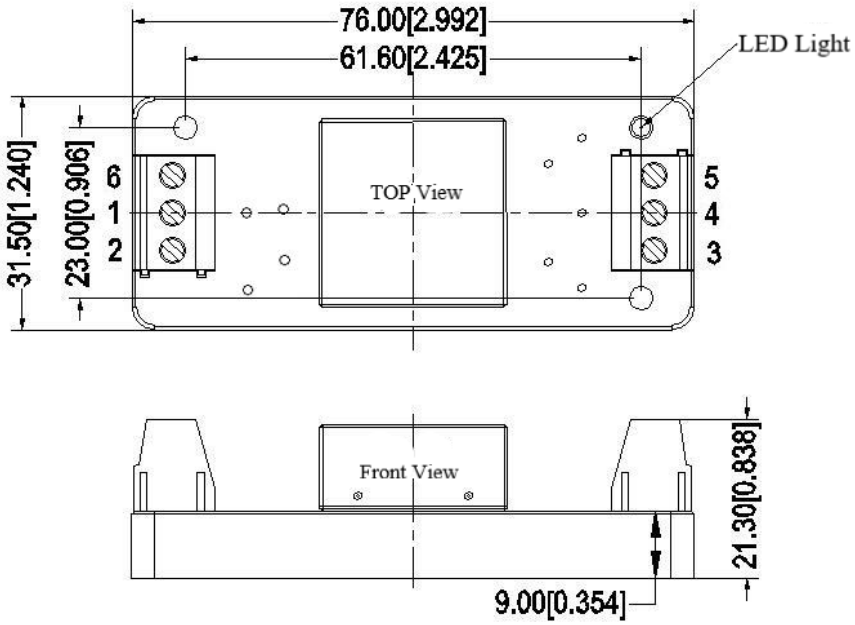
A3 Packing Dimension(Without Heat Sink)



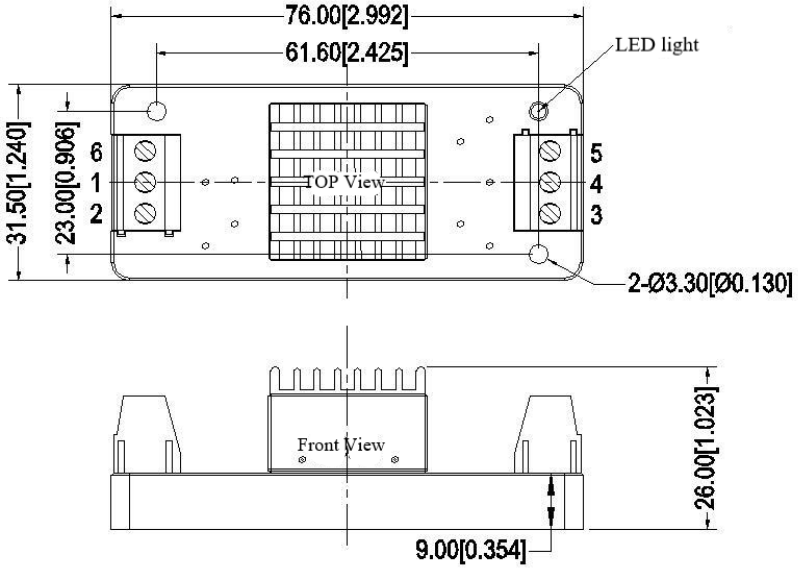
A3-H Packing Dimension (With Heat Sink)



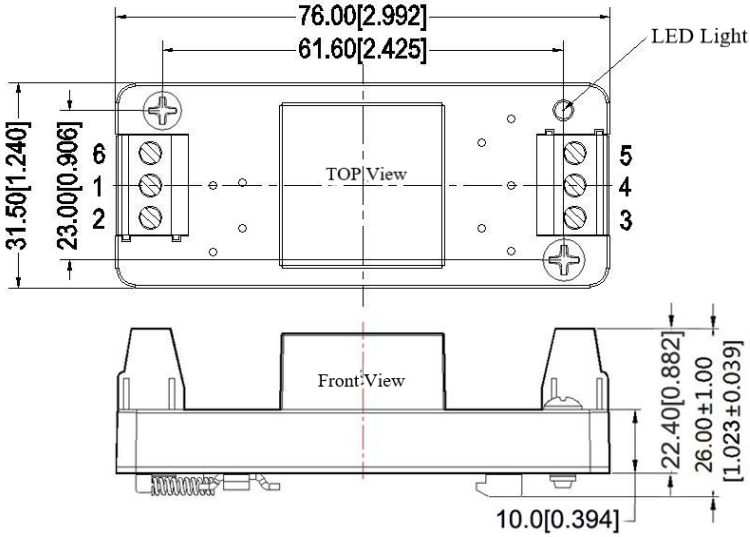
A3-T Packing Dimension (Without Heat Sink)



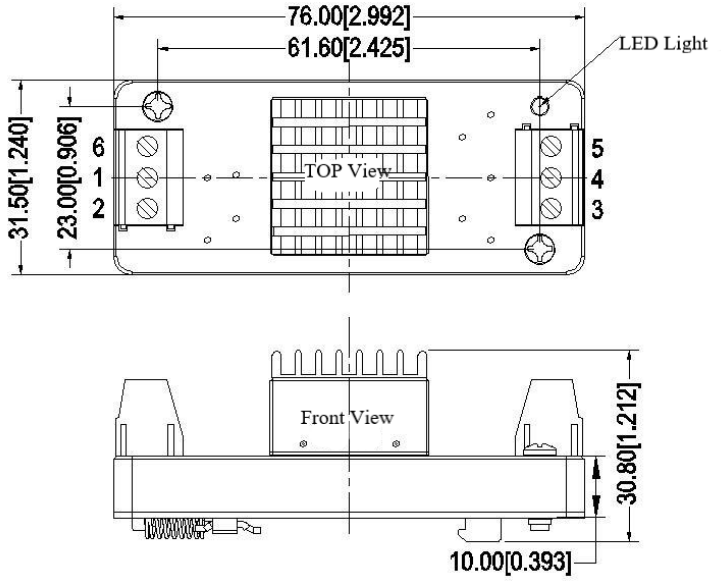
A3-TH Packing Dimension(With Heat Sink)



A3-TS Packing Dimension(Without Heat Sink)



A3-TSH Packing Dimension(With Heat Sink)



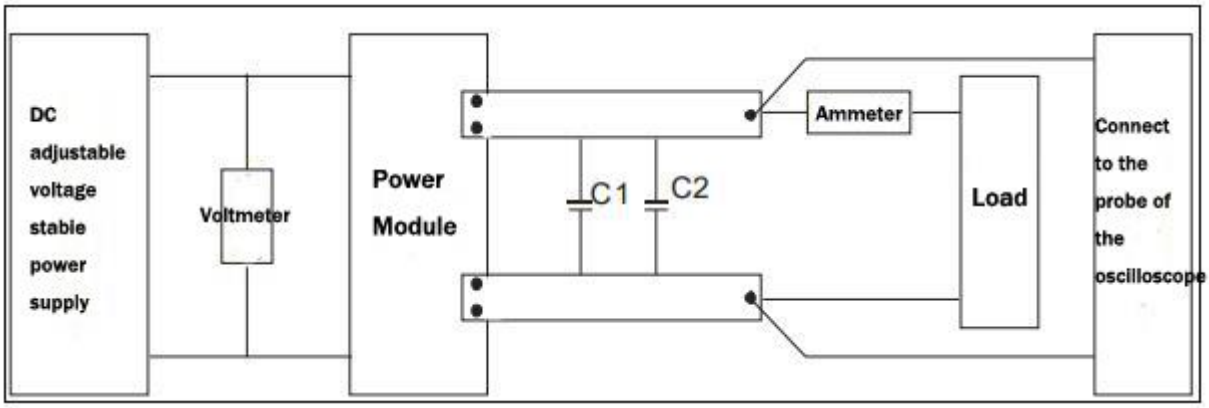
Packing Code	L x W x H
A3 (Without Heat Sink)	25.4X 25.4X12.5 mm
A3-H (With Heat Sink)	25.4X25.4X18.0mm
A3-T(Without Heat Sink)	76X31.5X21.3mm
A3-TH(With Heat Sink)	76X31.5X26.0mm
A3-TS (Without Heat Sink)	76X31.5X26mm
A3-TSH (With Heat Sink)	76X31.5X30.8mm

Pin Definition

Item	1	2	3	4	5	6
FD30-XXSXXA3	-Vin	+ Vin	+ Vout	NP	GND	NP
FD30-XXSXXA3C	-Vin	+ Vin	+ Vout	NP	GND	Ctrl
FD30-XXSXXA3T	-Vin	+ Vin	+ Vout	Trim	GND	NP
FD30-XXSXXA3R	-Vin	+ Vin	+ Vout	Trim	GND	Ctrl

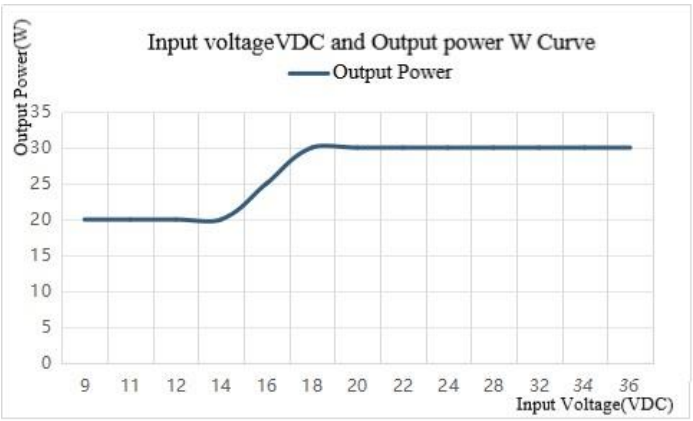
Ripple& Noise Test: (Parallel Line Test Method 20MHz bandwidth)

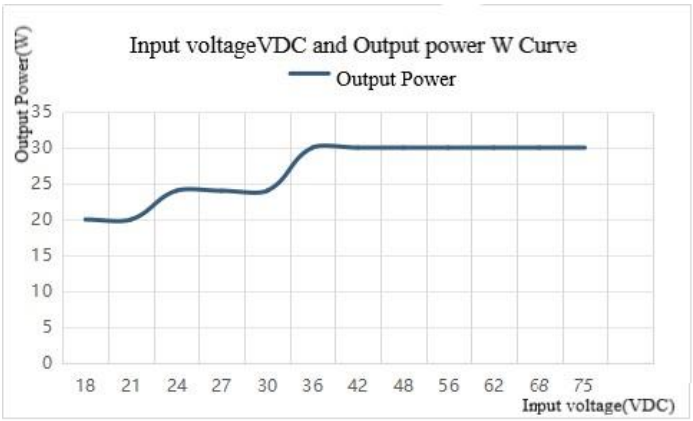
Test Method:



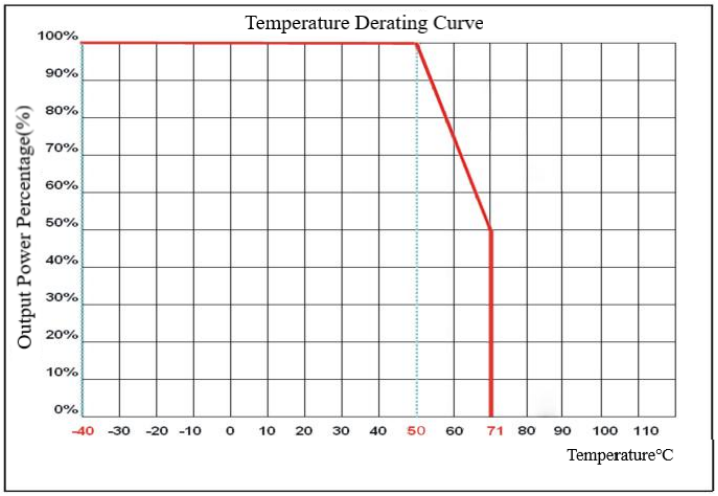
Note：C1=1uF;C2=10uF; the withstand value of the capacitor should be bigger the output voltage of the module.

Product Characteristic Curve

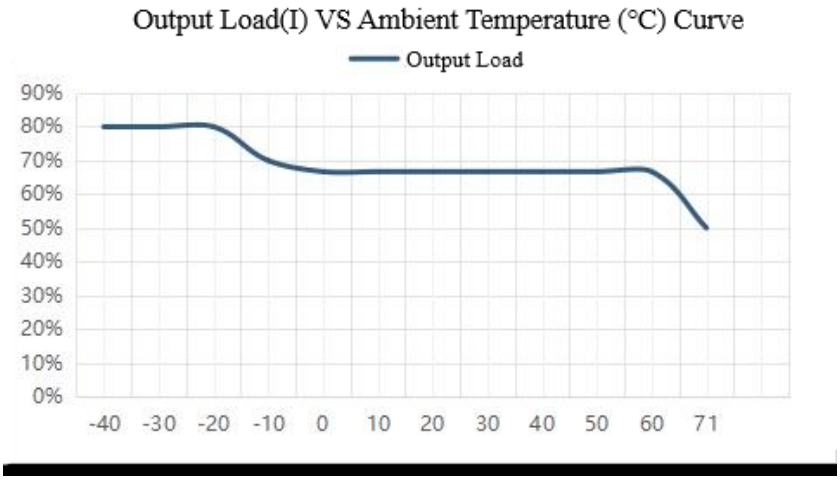




Derating curve measured under normal temperature conditions with input voltage 9~36VDC (FD30-18SXXA3R) and input voltage (18~75VDC) (FD30-36SXXA3R) with wind.



Note: The above temperature derating curve is tested under the conditions of wind, 18V-36VDC input and with heatsink, for reference only.

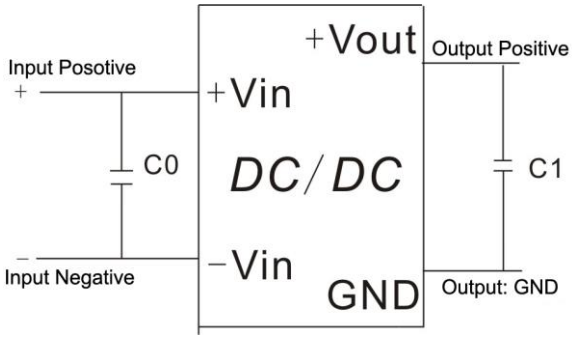


Note: The above curve is measured when inputting 9V-18V (FD30-18SXXA3R) and 18-36V (FD30-36SXXA3R) under windy conditions.

Recommended circuit

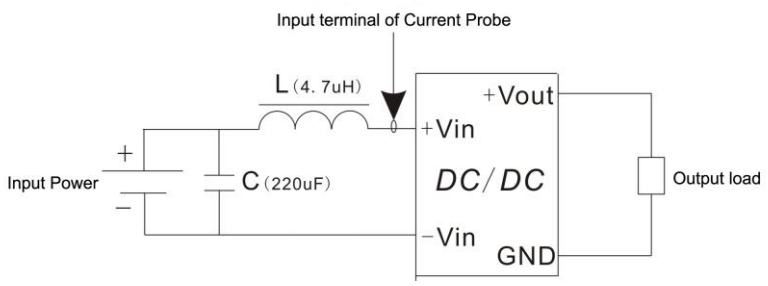
1. DC/DC test circuit:

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

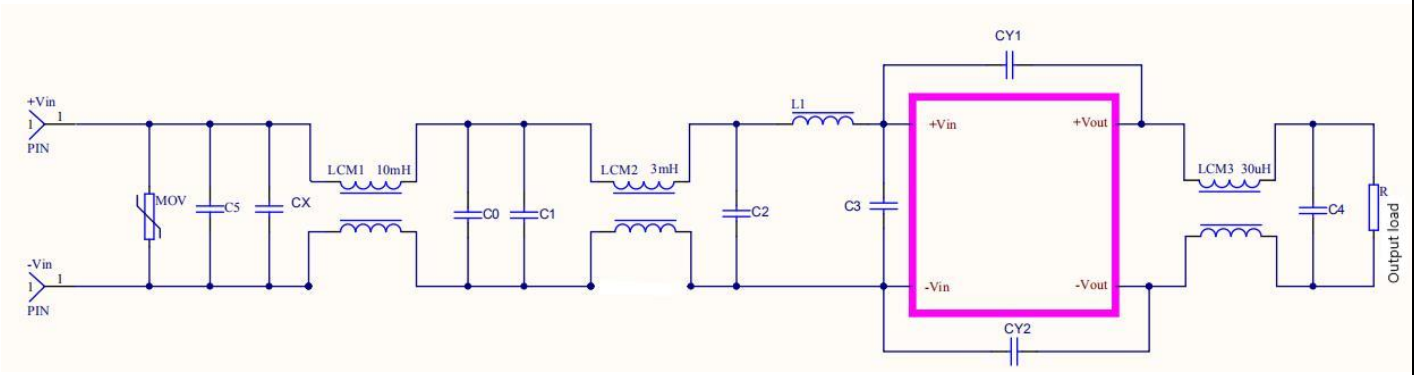


2. Input reflecting ripple current test circuit:

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



3. EMC external recommended circuit:



Recommended Spec:

Component	FD30-18SXXA3R Input	FD30-36SXXA3R Input
FUSE	According to customer's request	
MOV	14D560K	14D101K
CX	0.47uF	
LCM1	10~15mH	
C0	1uF/50V	1uF/100V
C1,C5	220uF/50V	220uF/100V
C2,C3	1uF/50V	1uF/100V
LCM2	1-3mH	
C4	47uF /50V	
CY1,CY2	2.2nF/2000V	
L1	47uH	
LCM3	50uH	

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℃, 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.