CFD20-XXDXXA3(C)Series

DC/DC Converter

Typical Features

- Wide input voltage range (4:1), Output Power 20W
- Transfer Efficiency up to 91%
- Stand-by Power Consumption as low as 0.20W
- 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 1500VDC
- Operating Temperature: -40°C~+85°C
- Good EMI performance
- International standard pin-out
- Conform to IEC62368/UL62368/EN62368 standard
- Comply to CE, RoHS standard

Application Field

CFD20-XXDXXA3(3) *is a newly designed DIP 1X1 packed,20W output power, ultra wide input range 4:1, low stand-by power consumption, isolated regulated dual 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

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			
								Typ.	Max.	Min	Typ
CFD20-18D3V3A3(C)	24	9-36	±3.3	±2000/0	625	40	3000	100	200	86	88
CFD20-18D05A3(C)	24	9-36	±5	±2000/0	916	40	2000	100	200	89	91
CFD20-18D09A3(C)	24	9-36	±9	±1111/0	926	60	1500	100	200	88	90
CFD20-18D12A3(C)	24	9-36	±12	±833/0	926	3	800	100	200	88	90
CFD20-18D15A3(C)	24	9-36	±15	±667/0	926	3	600	100	200	88	90
CFD20-18D24A3(C)	24	9-36	±24	±417/0	936	3	300	100	200	87	89
CFD20-36D3V3A3(C)	48	18-75	±3.3	±2000/0	313	30	3000	100	200	86	88
CFD20-36D05A3(C)	48	18-75	±5	±2000/0	463	40	2000	100	200	88	90
CFD20-36D09A3(C)	48	18-75	±9	±1111/0	458	40	1500	100	200	87	89

CFD20-36D12A3(C)	48	18-75	±12	±833/0	463	3	1000	100	200	88	90
CFD20-36D15A3(C)	48	18-75	±15	±667/0	463	3	800	100	200	88	90
CFD20-36D24A3(C)	48	18-75	±24	±417/0	473	3	600	100	200	86	88

Note 1: “R” is with control pin and 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 10% load or above 470uF high frequency low resistance electrolytic capacitor, otherwise the output ripple will rise;

Input Specification

Stand-by Consumption	0.20 W(TYP)	
Input Filter	π filter	
Input Under-Voltage Protection	5~9VDC@CFD20-18DXXA3C Input	
	11~18VDC@ CFD20 -36DXXA3C 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

Main Circuit Output Voltage Accuracy	Full voltage full load	Vo	±2.0%
Auxiliary Circuit Output Voltage Accuracy	Full voltage full load	Vo	±3.0%
Cross Regulation	Main road 50% load, Auxiliary road 10~100% load	Vo	±5.0%
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;	≤15% load	5%Vo mVp-p typ
		≥15% load	100mVp-p typ,200mVp-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	±3% typ , ±8% max /500us
		Other Output	±3% typ , ±5% max /500us
Output Voltage Adjustment	See Product List Note 1		

Turn-on delay time	Typical	150ms
Output Turn-on Overshoot Voltage	-	≤10%Vo

Note: * Ripple &Noise are tested under the Parallel Line Test Method. For a few models may have self-recovery phenomenon after short-circuit under high voltage input, it can recover to normal after restarting.

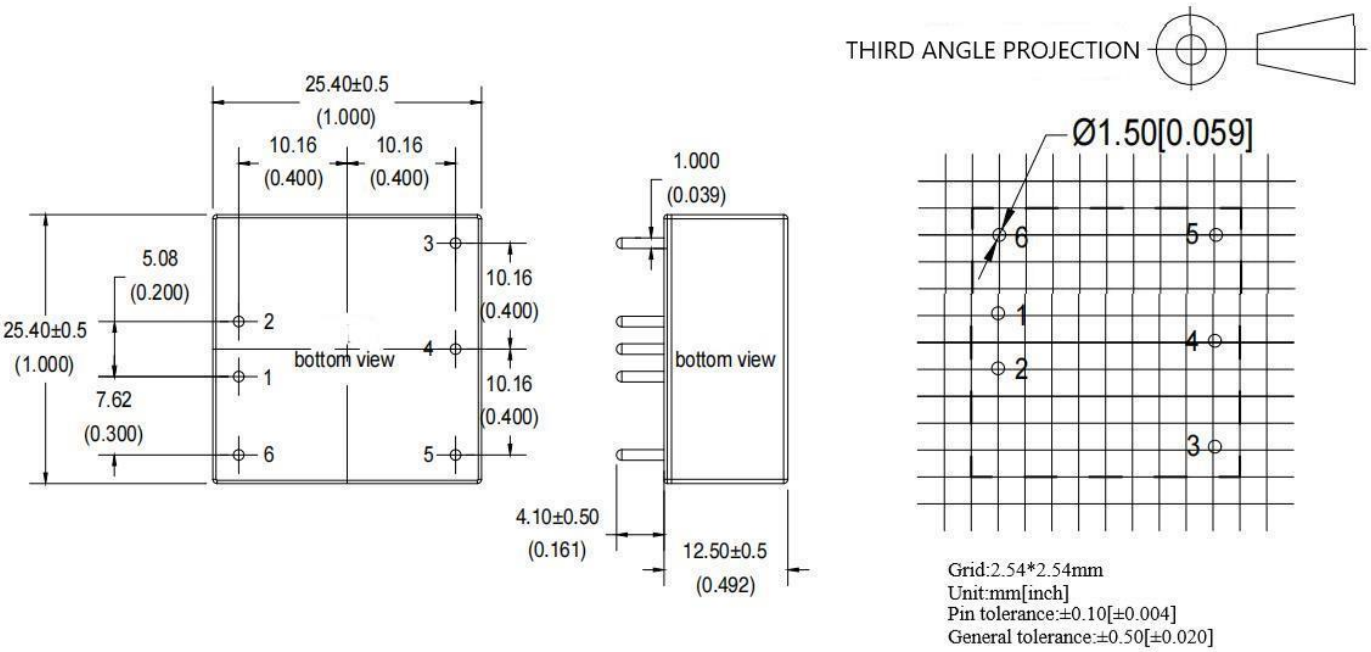
General Specification

Switching Frequency	Typical	300KHz
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
Meantime Between Failure	MIL-HDBK-217F@25℃	$2X10^5$Hrs
Product Weight	Average	18g

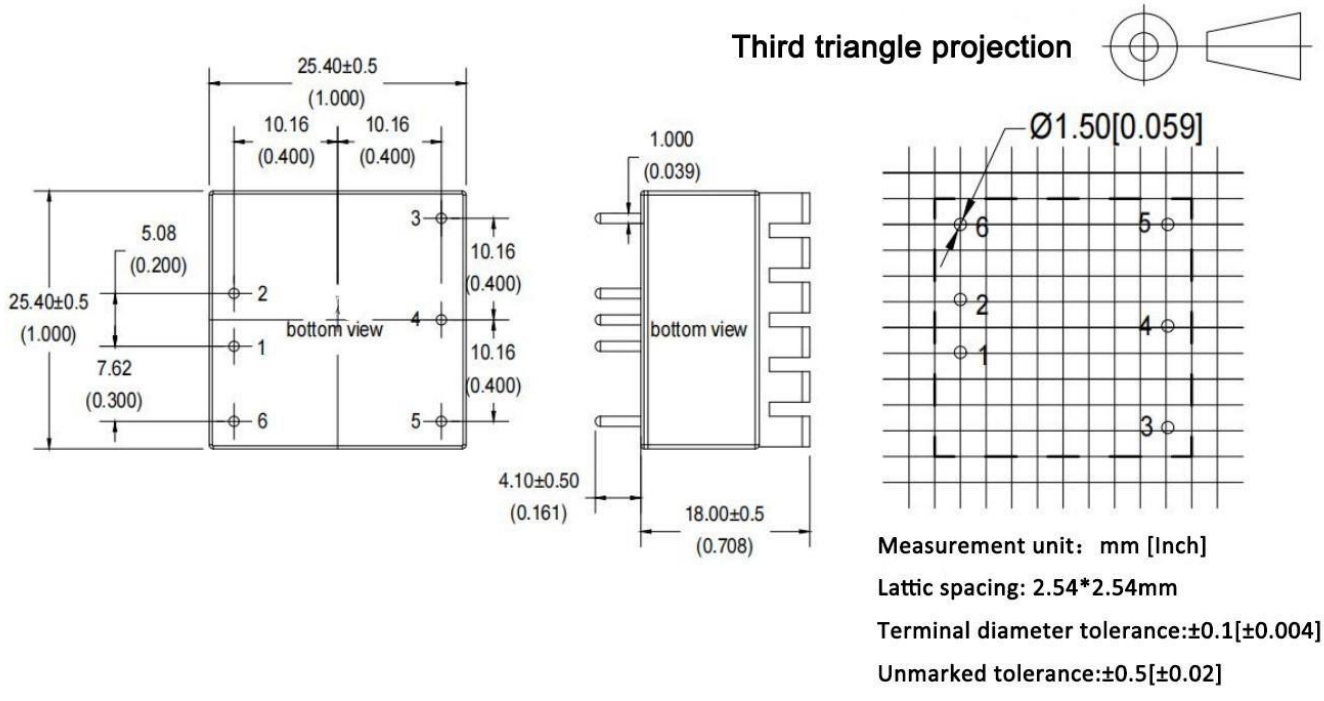
EMC Characteristics

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

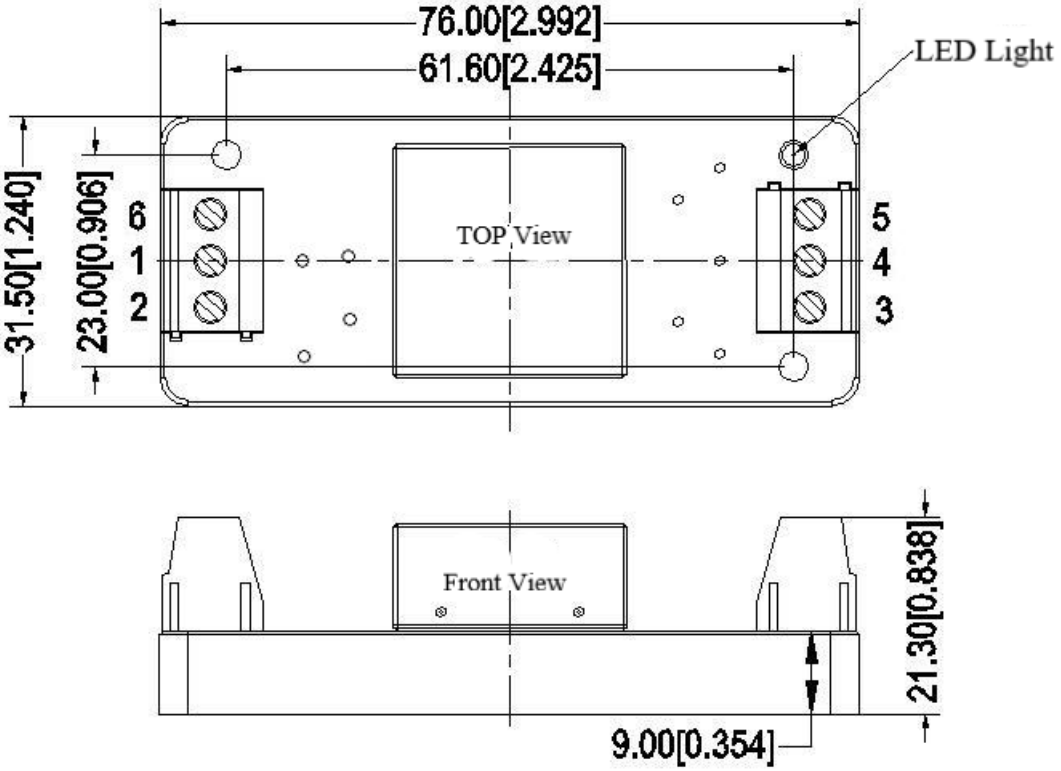
A3 Packing Dimension (Without Heat Sink)



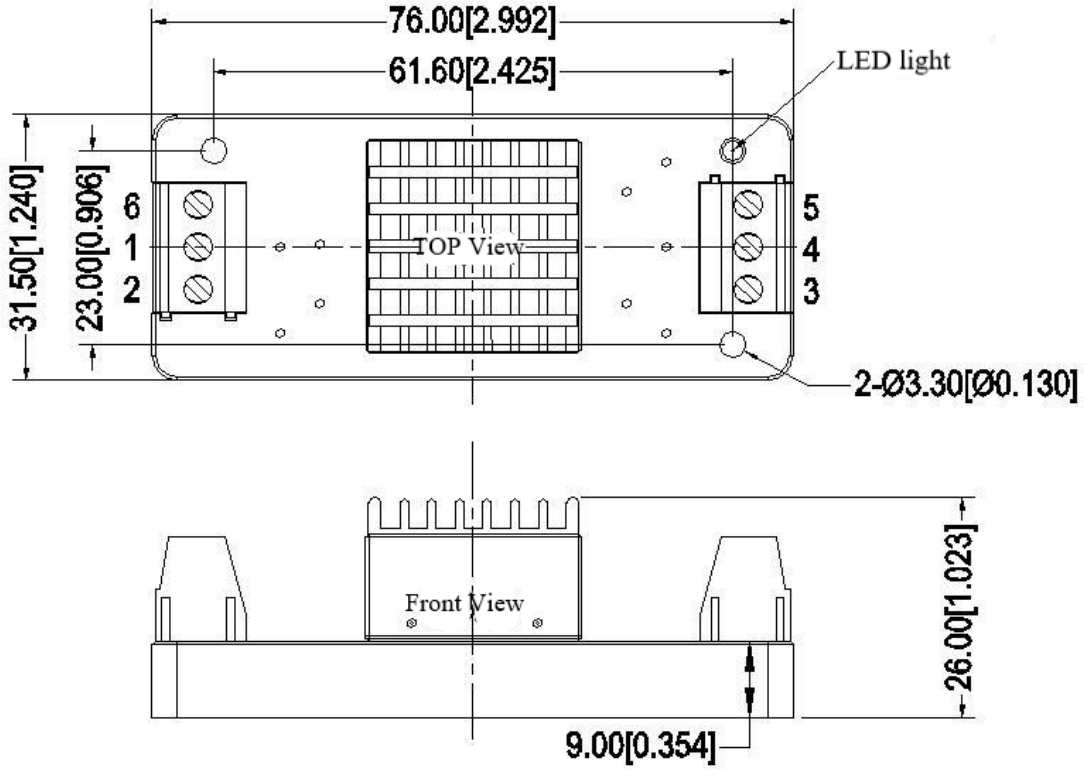
A3-H Packing Dimension(With Heat Sink)



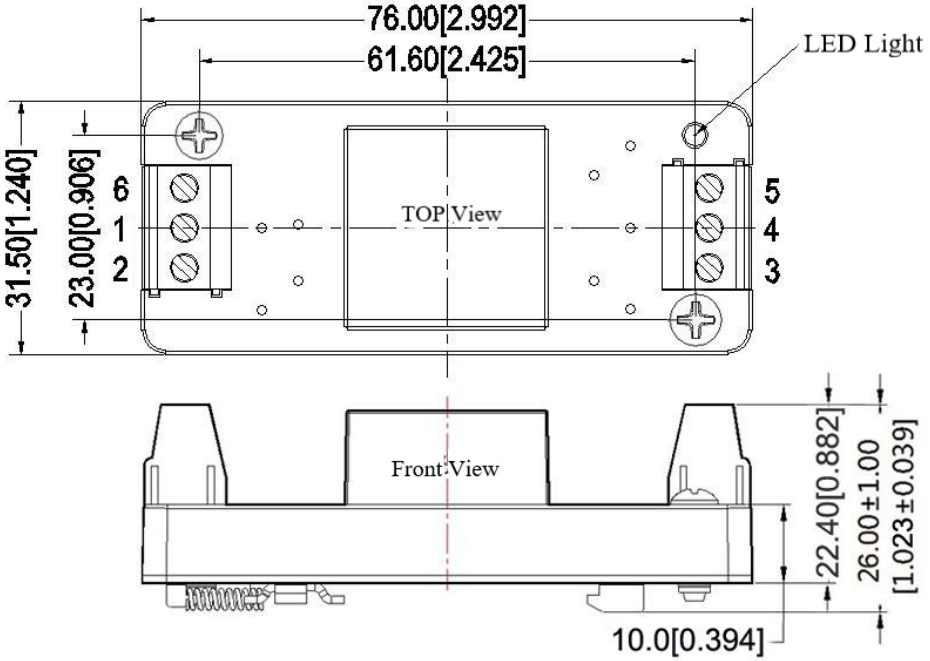
A3-T Packing Dimension(Without Heat Sink)



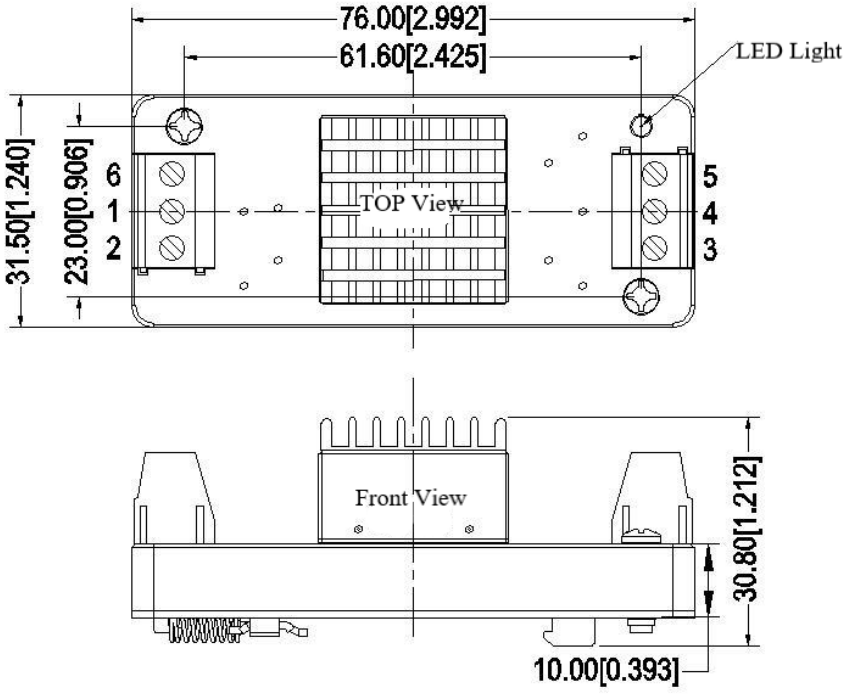
A3-TH Packing Dimension(With Heat Sink)



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

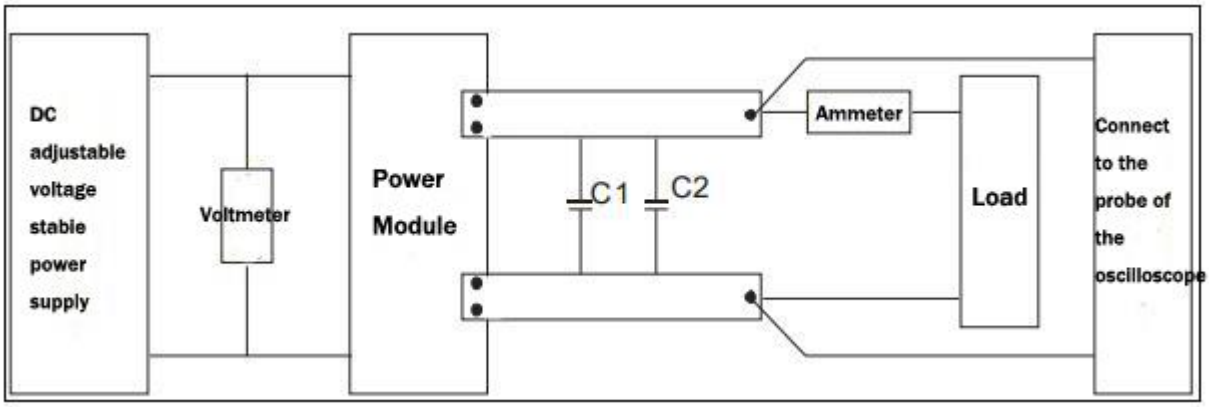
Pin out Specifications

Pin-Out	1	2	3	4	5	6
CFD20-XXDXXA3	-Vin	+Vin	+Vout	COM	-Vout	NP
CFD20-XXDXXA3C	-Vin	+Vin	+Vout	COM	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:

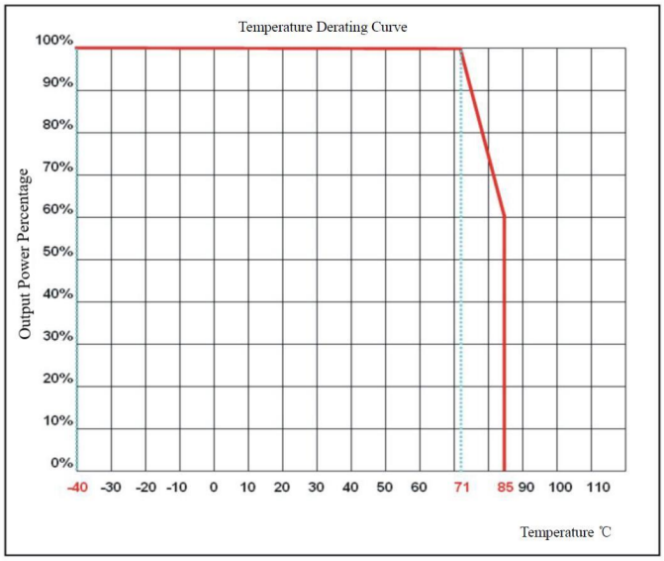
1.The recommended minimum load is 15% or above 470uF high frequency low resistance electrolytic capacitor, or output ripple will rise;

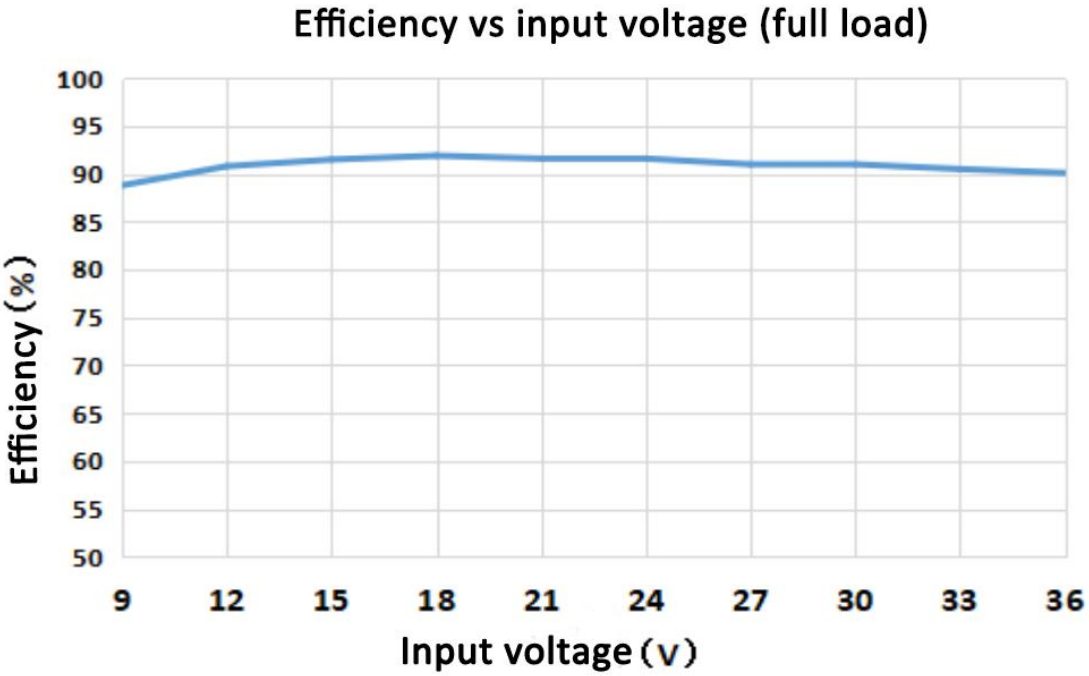
2.Recommend the unbalance loads of dual output to be ≤±5%;

3.The maximum capacitive load is tested under pure resistance and full load condition;

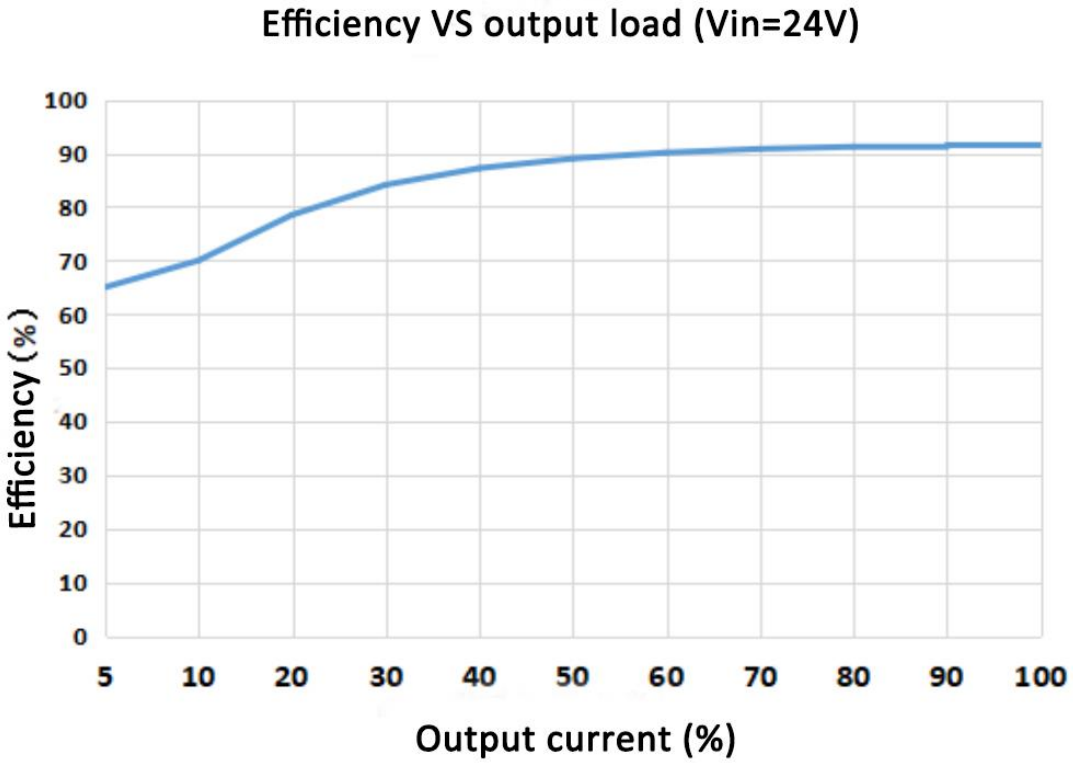
4.Our company could provide whole power supply solution, or customized made items; Due to space limitation, please contact our team for more information.

Product Characteristic Curve





CFD20-18D05A3C

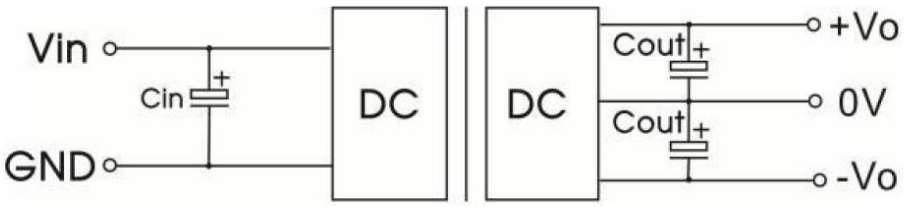


CFD20-18D05A3C

Recommended circuit

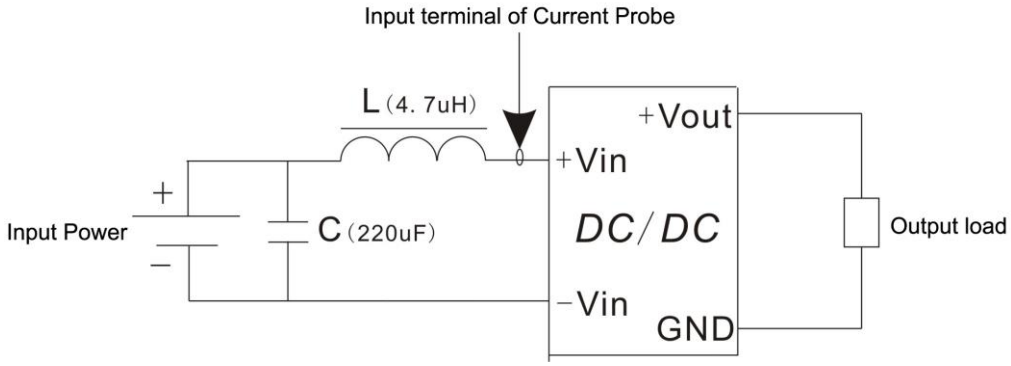
1. DC/DC test circuit:

Normal recommended capacitors: Cin:47-100uF; Cout:470uF.

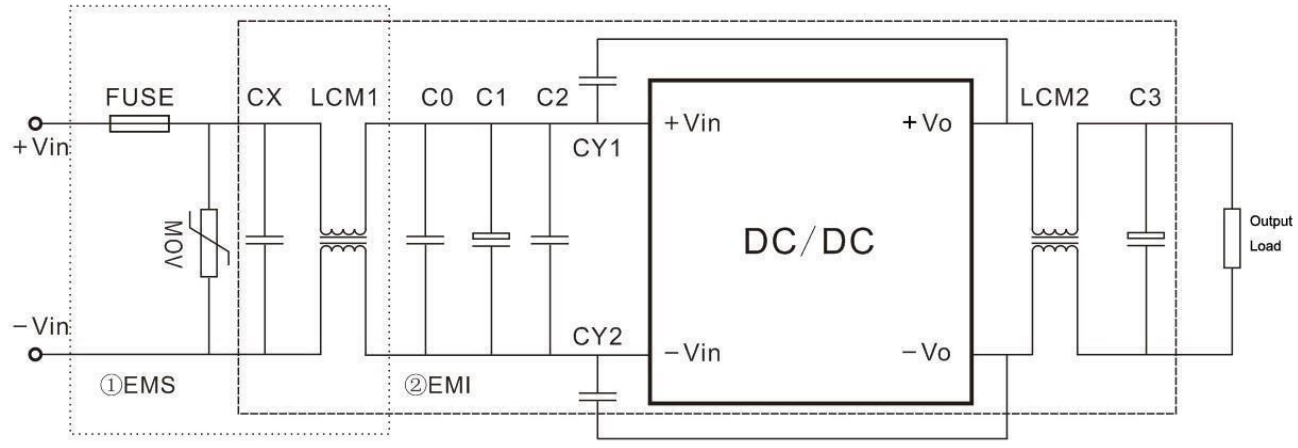


2. Input reflecting ripple current test circuit:

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



3. EMC external recommended circuit:



Recommended Spec:

Component	CFD20-18DXXA3 Input	CFD20-36DXXA3 Input
FUSE	According to customer's request	
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. 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.