CFDA20-D Series

DC/DC Power Supply Module

FEATURES

20W isolated DC-DC converter in DIP package
Ultra-wide input and regulated dual output

- Ultra-wide 4:1 input voltage range
- High efficiency up to 90%
- No-load power consumption as low as 0.24W
- I/O isolation test voltage 1500VDC
- Input under-voltage protection,output short circuit, over-current,over-voltage protection
- Operating ambient temperature range:-40℃to+105℃
- Input reverse polarity protection available with
- Chassis(Z2)or 35mm DIN-Rail mounting(Z4)version
- Industry standard pin-out

RoHS CE

Selection Guide

Certification	Part No.①	Input Voltage(VDC)		Output		Full Load Efficiency④(%) Min./Typ.	Max.Capacitive Load⑤(μF)
		Nominal② (Range)	Max.③	Voltage (VDC)	Current (mA) Max./Min.		
CE	CFDA20-24D05	24 (9-36)	40	±5	±2000	85/87	2000
	CFDA20-24D12			±12	±833	88/90	800
	CFDA20-24D15			±15	±667	88/90	600
	CFDA20-24D24			±24	±417	87/89	300
	CFDA20-48D05	48 (18-75)	80	±5	±2000	84/86	2000
	CFDA20-48D12			±12	±833	88/90	800
	CFDA20-48D15			±15	±667	88/90	600
	CFDA20-48D05			±24	±417	88/90	300

Notes:
① Use"Z2"suffix for chassis mounting and"Z4"suffix for DIN-Rail mounting;
② Minimum input voltage and start-up voltage are increased by 1VDC for all models with Z2 (wiring) and Z4 (rail) suffixes because of the input reverse polarity function;
③ Exceeding the maximum input voltage may cause permanent damage;
④ Efficiency is measured at nominal input voltage and rated output load;efficiencies for Z2 and Z4 Model's is decreased by 2% due to the input reverse polarity protection circuit;
⑤ The specified maximum capacitive load value for positive and negative output is identical.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load/no-load)	24VDC nominal input series,nominal input voltage	--	958/10	--/20	mA
	48VDC nominal input series,nominal input voltage	--	969/5	--/11	
Reflected Ripple Current		--	30	--	
Surge Voltage(1sec.max.)	24VDC nominal input series	-0.7	--	50	VDC
	48VDC nominal input series	-0.7	--	100	

Start-up Voltage	24VDC nominal input series	--	--	9	VDC
	48VDC nominal input series	--	--	18	
Under-voltage Protection	24VDC nominal input series	5.5	6.5	--	
	48VDC nominal input series	12	15.5	--	
Start-up Time	Nominal input voltage & constant resistance load	--	10	--	ms
Input Filter		Pi filter			
Hot Plug		Unavailable			
Cnt*	Module on	Cnt pin open or pulled high(3.5-12VDC)			
	Module off	Cnt pin pulled low to -Vin(0-1.2VDC)			
	Input currentwhen off	--	2	7	mA

Note:*The Cnt pin voltage is referenced to input -Vin.

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy①	5%-100% load		--	±1	±3	%
Linear Regulation	Input voltage variation from low to high at full load	Vo1	--	±0.2	±0.5	
		Vo2	--	±0.4	±1	
Load Regulation②	5%-100% load		--	±0.5	±1	
Cross Regulation	Vo1 load at 50%,Vo2 load at range of 10%-100%		--	--	±5	
Transient Recovery Time	25% load step change, nominal input voltage	All products	--	300	500	μs
Transient Response Deviation		5VDC output	--	±3	±8	%
		Others	--	±3	±5	
Temperature Coefficient	Full load		--	--	±0.03	%/℃
Ripple/Noise③	20MHz bandwidth,5%-100% load		--	100	200	mvp-p
Over-voltage Protection	Input voltage range		110	--	160	%Vo
Over-current Protection			110	150	200	%Io
Short-circuit Protection			Continuous,self-recovery			

Note:①Output voltage accuracy for 0%-5% load is ±4% max;
②Load regulation for 0%-100% load is ±5%;
③Ripple & Noise at≤5% load is 5%Vo max.The “parallel cable” method is used for Ripple and Noise test

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max	1500	--	--	VDC
	Input/output-case Electric Strength Test for 1 minute with a leakage current of 1mA max.	1000	--	--	
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100KHz/0.1V	--	2000	--	pF
Operating Temperature	See Fig. 1	-40	--	+105	℃
Storage Temperature		-55	--	+125	
Storage Humidity	Non-condensing	5	--	95	%RH
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	+300	℃
Vibration		10-150Hz,0.75mm,5G,90Min.along X, Y and Z			
Switching Frequency*	PWM mode	--	270	--	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours

Note:*Switching frequency is measured at full load.The module reduces the switching frequency for light load (below 50%) efficiency improvement.

Mechanical Specifications

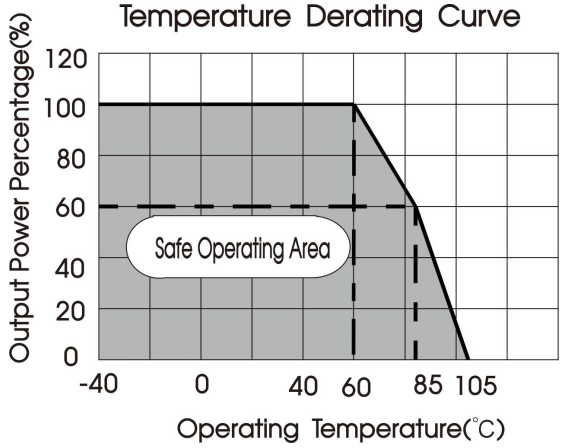
Case Material	Aluminum alloy	
Dimensions	Horizontal pac kage	25.4×25.4×11.7mm
	Z2 chassis mounting	76.0×31.5×21.2mm
	Z4 DIN-rail mounting	76.0×31.5×25.8mm
Weight	Horizontal package/Z2 chassis mounting/Z4 DIN-rail mounting	15.0g/35.0g/58.0g(Typ)
Cooling method	Free air convection	

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B(see Fig.3-② for recommended circuit)	
	RE	CISPR32/EN55032	CLASS B(see Fig.3-② for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV(see Fig.3-① for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2KV(see Fig.3-①for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A

Typical Characteristic Curves

Nominal input series, ±5V output



Nominal input series, other output

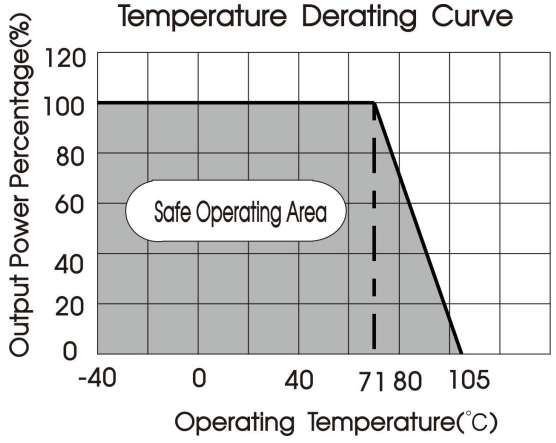
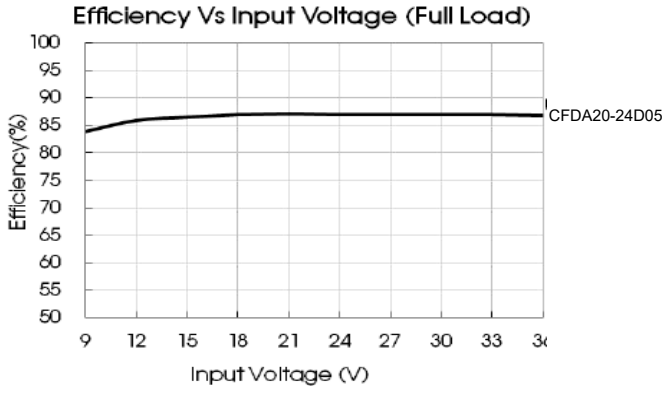
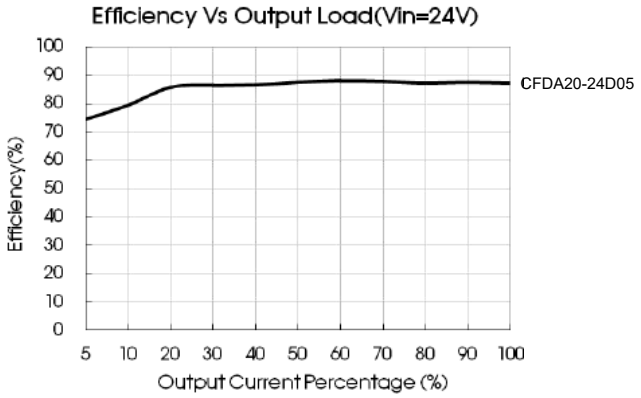
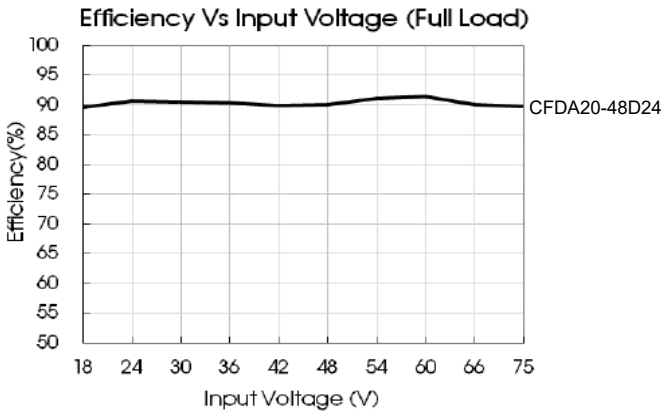
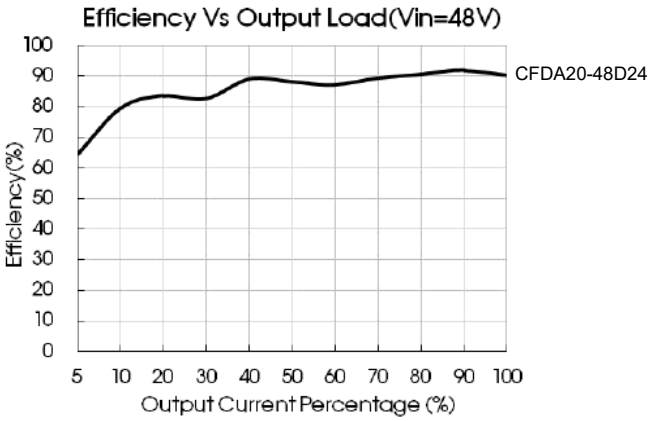


Fig . 1









Design Reference

1.Typical application

All the DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig.2.

Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout and/or by selecting capacitors with a low ESR (equivalent series resistance).Also make sure that the capacitance is not exceeding the max. capacitive load value of the product.

Fig. 2

Vin	24V	48V
Cin	100μF	10μF-47μF
Cout	10μF	

2. EMC compliance circuit

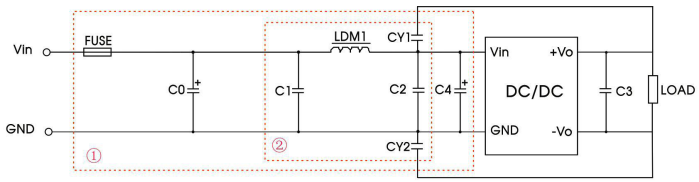


Fig. 3

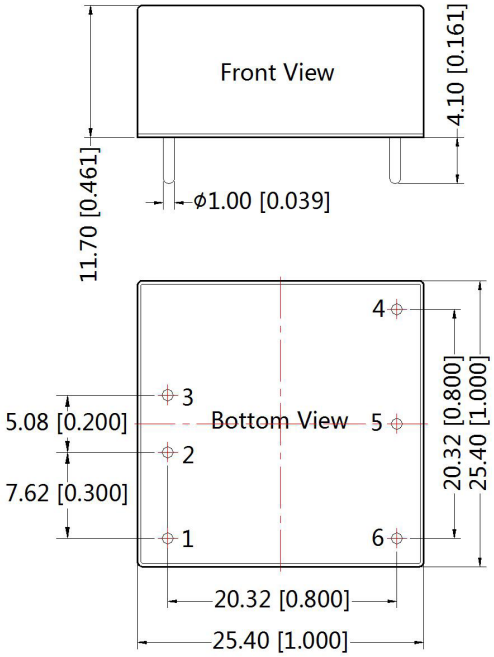
Notes:For EMC tests we use Part ① in Fig.3 for immunity and part ② for emissions test.Selecting based on needs.

List of components:

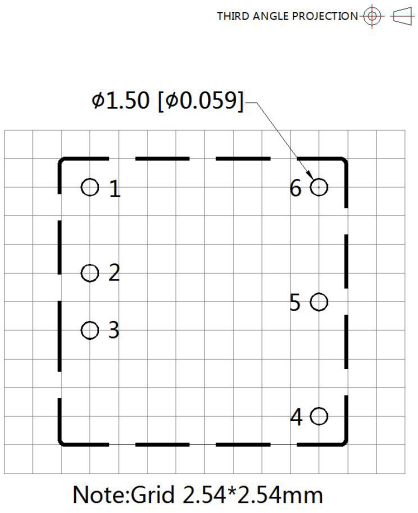
Model	Vin:24V	Vin:48V
FUSE	Choose according to actual input current	
C0,C4	330μF/50V	330μF/100V
C1,C2	4.7μF/50V	4.7μF/100V
C3	Refer to the Cout in Fig.2	
LDM1	4.7μH	
CY1,CY2	1nF/2KV	

3.The products do not support parallel connection of their output

Dimensions and Recommended Layout



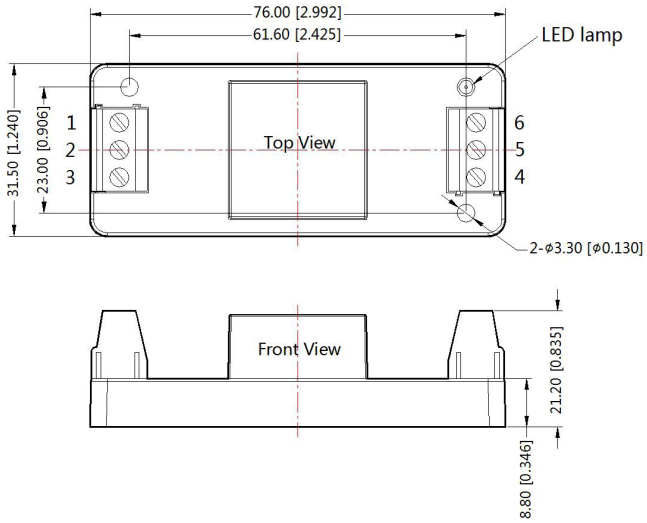
Note:
Unit: mm[inch]
Pin diameter tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]



Note:Grid 2.54*2.54mm

Pin-Out	
Pin	Dual
1	Ctrl
2	GND
3	Vin
4	+Vo
5	0V
6	-Vo

CFDA20-24D05Z2 Dimensions

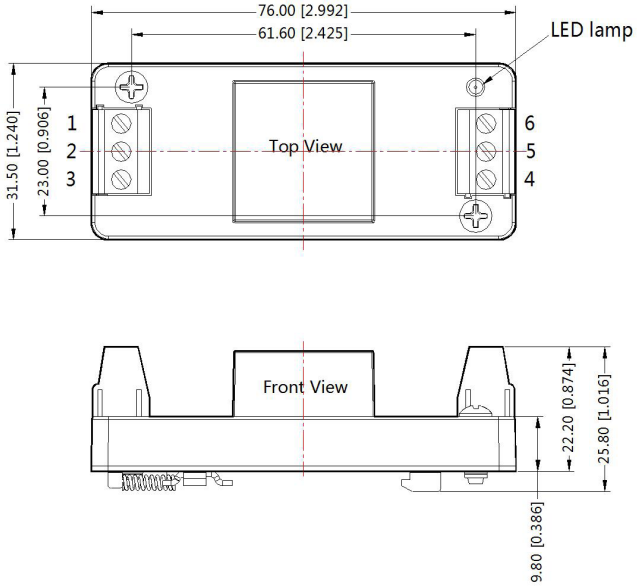


Pin-Out						
Pin	1	2	3	4	5	6
Function	Ctrl	GND	Vin	+Vo	0V	-Vo

Note:
Unit: mm[inch]
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±1.00[±0.039]

CFDA20-24D05Z4 Dimensions

THIRD ANGLE PROJECTION



Pin-Out						
Pin	1	2	3	4	5	6
Function	Ctrl	GND	Vin	+Vo	0V	-Vo

Note:
Unit: mm[inch]
Mounting rail: TS35
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±1.00[±0.039]

Note:

1: The maximum capacitive load offered were tested at input voltage range and full load;
2: Unless otherwise specified,parameters in this datasheet were measured under the conditions of Ta=25℃,humidity<75%RH with nominal input voltage and rated output load;
3: All index testing methods in this datasheet are based on company corporate standards;
5: We can provide product customization service,please contact our technicians directly for specific information;
6:Products are related to laws and regulations: see"Features"and"EMC";
7: Our products shall be classified according to ISO14001 and related environmental laws and regulations,and shall be handled by qualified units.

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