

FEATURES

- ◆ 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+71℃
- ◆ Input reverse polarity protection available with
- ◆ Chassis(Z2)or 35mm DIN-Rail mounting(Z4)version
- ◆ Industry standard pin-out

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



Selection Guide

Certification	Part No. ^①	Input Voltage(Vdc)		Output		Full Load Efficiency ^④ (%) Min./Typ.	Max.Capacitive Load ^⑤ (μF)
		Nominal ^② (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
	CFDA20-48D24			±24	±417	88/90	300

Notes:

- ① "Z"suffix for DIN-Rail mounting;
- ② Minimum input voltage and start-up voltage are increased by 1Vdc for all models with Z (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 Z 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 current when off	--	2	7	mA

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

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Voltage Accuracy ^①	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 Regulation ^②	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	%/°C
Ripple/Noise ^③	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	--	+71	°C
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	°C
Vibration		10-150Hz,0.75mm,5G,90Min.along X, Y and Z			
Switching Frequency*	PWM mode	--	270	--	KHz
MTBF	MIL-HDBK-217F@25°C	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
	Z DIN-rail mounting	76.0×31.5×25.8mm
Weight	Horizontal package/Z DIN-rail mounting	15.0g/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.3-① for recommended circuit) perf.Criteria B
	CS	IEC/EN61000-4-6	3Vr.m.s perf.Criteria A

Typical Characteristic Curves

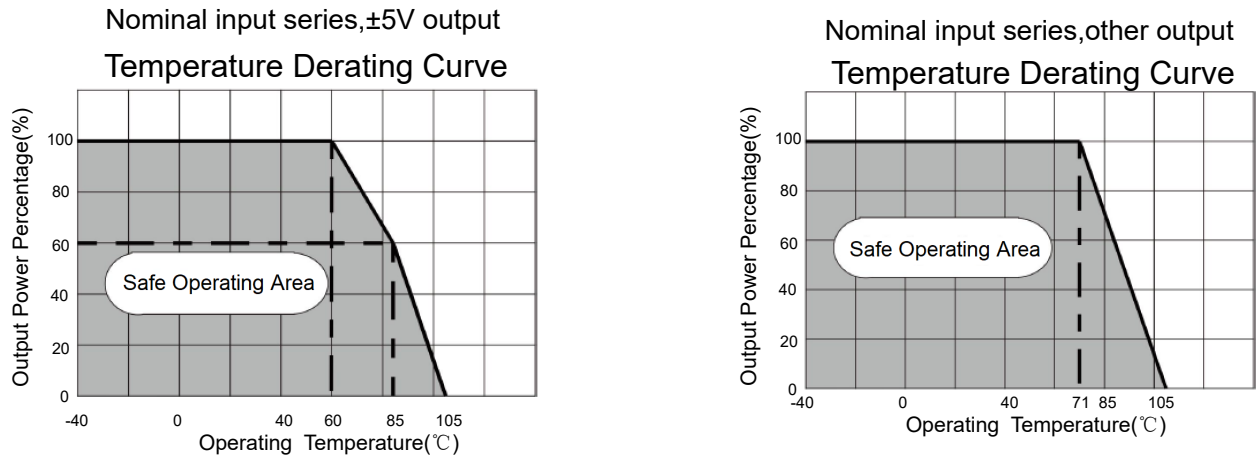
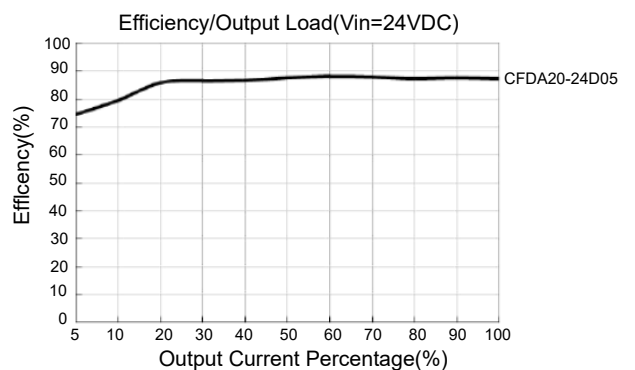
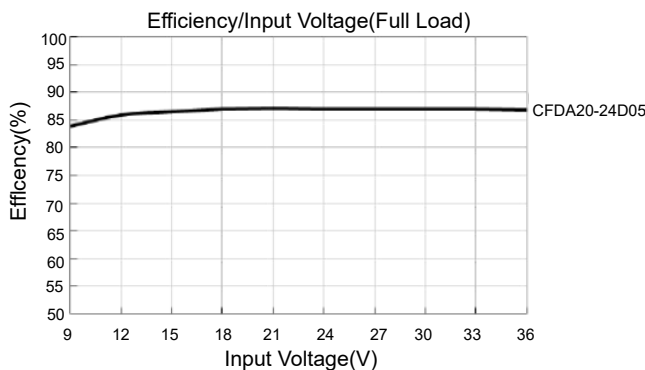
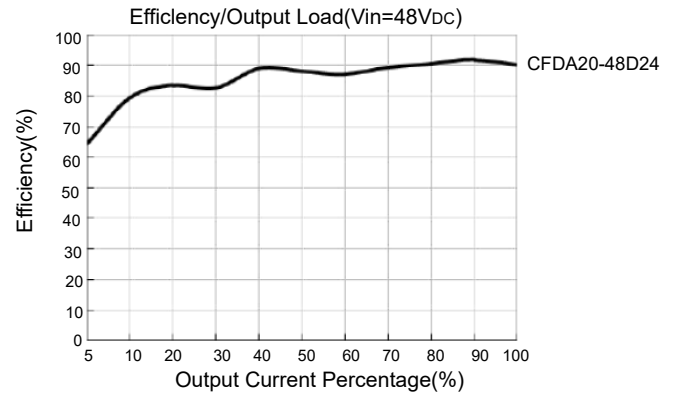
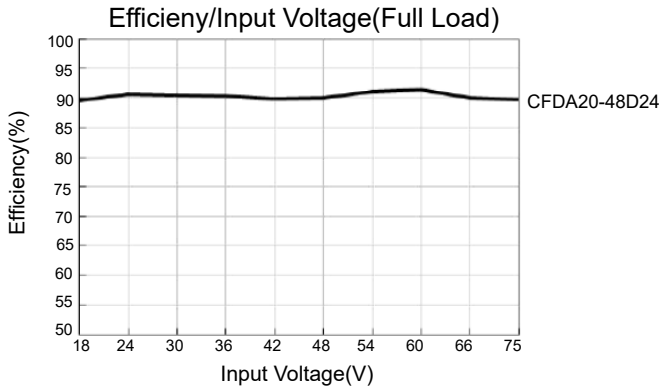


Fig.1





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 C_{in} and C_{out} 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

V_{in}	24V	48V
C_{in}	100 μ F	10 μ F-47 μ F
C_{out}	10 μ F	

2. EMC compliance circuit

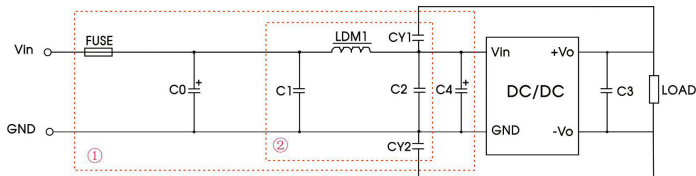


Fig. 3

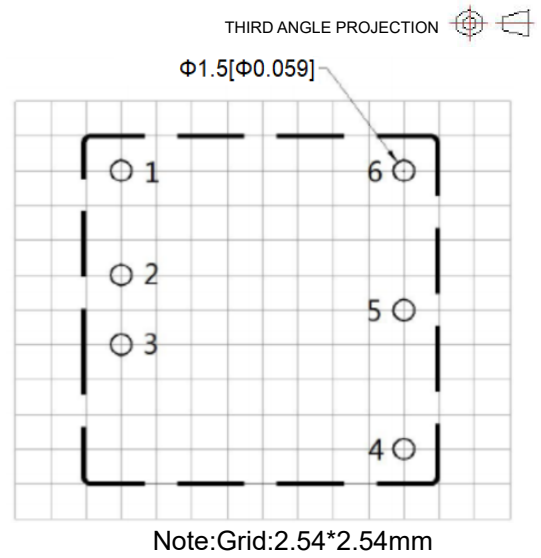
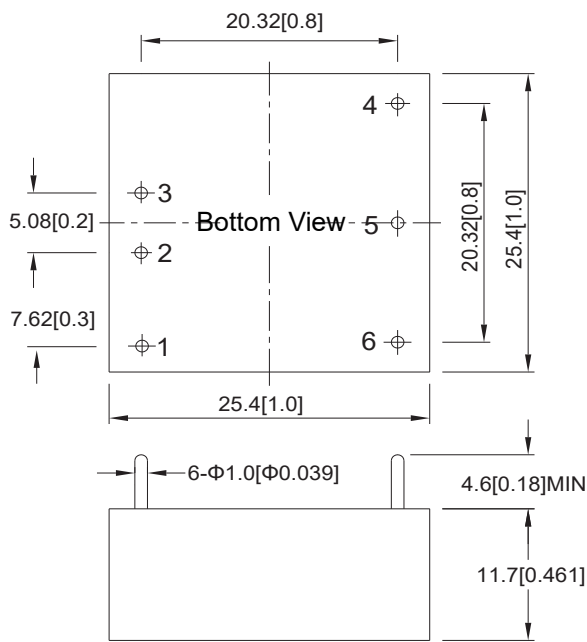
Notes: For EMC tests we use Part ① in Fig.3 for immunity and part ② for emissions test. Selecting based on needs.

List of components:

Model	V_{in} :24V	V_{in} :48V
FUSE	Choose according to actual input current	
C0,C4	330 μ F/50V	330 μ F/100V
C1,C2	4.7 μ F/50V	4.7 μ F/100V
C3	Refer to the C_{out} in Fig.2	
LDM1	4.7 μ H	
CY1,CY2	1nF/2KV	

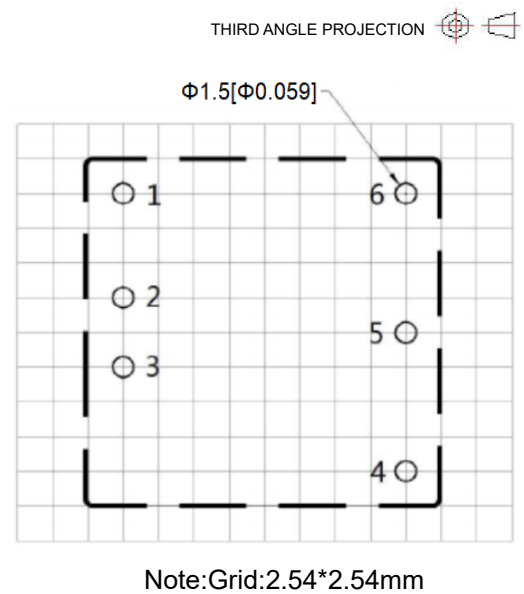
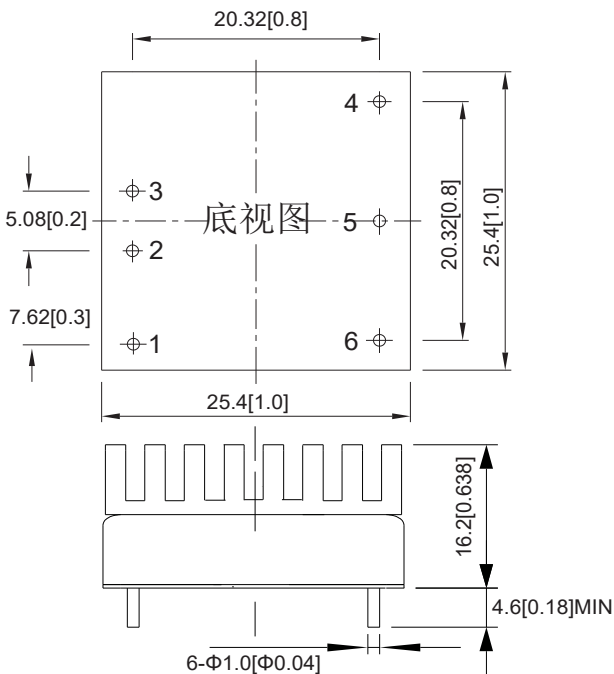
3. The products do not support parallel connection of their output

Dimensions and Recommended Layout

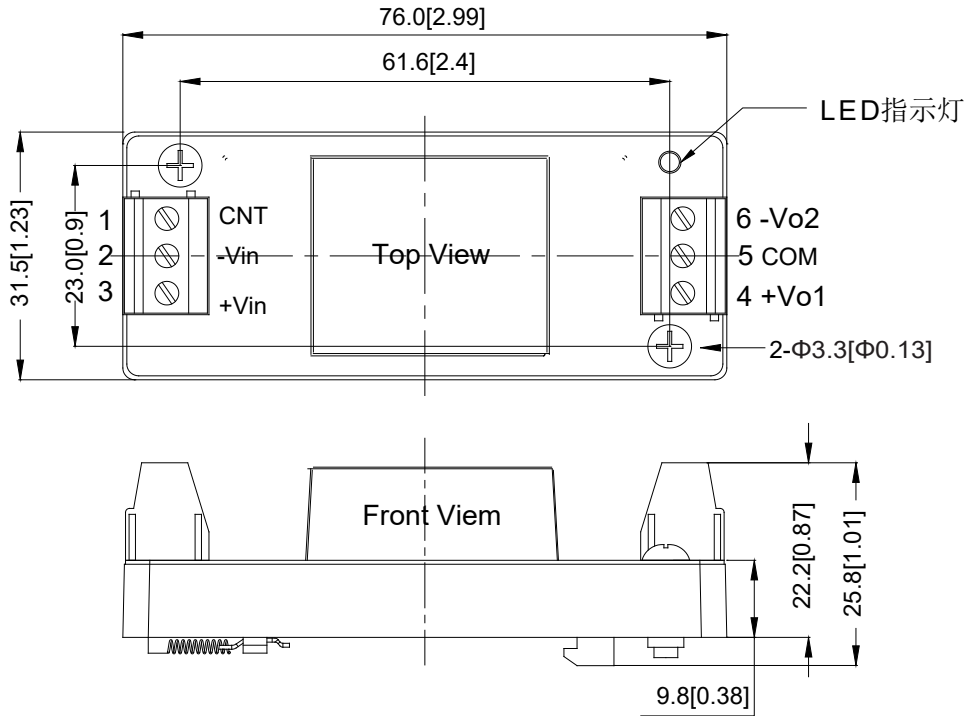


Pin	1	2	3	4	5	6
Two-way	CNT	-Vin	+Vin	+Vo1	COM	-Vo2

Horizontal Package(with heat sink) Dimensions



CFDA20-24D05Z Dimensions



Note:
 Unit:mm[inch]
 Mounting rail:TS35
 Wire range:24-12AWG
 Tightening torque:Max 0.4N•m
 General tolerances:±1.0[±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 $T_a=25^{\circ}\text{C}$, 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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