FEATURES

- Ultra-wide 4:1 input voltage range
- High efficiency up to 88%
- No-load power consumption as low as 0.12W
- I/O isolation test voltage:1.5kVDC
- Operating ambient temperature range:-40℃to+85℃
- Input under-voltage protection,output short-circuit, over-current and over voltage protection
- Meet CISPR32/EN55032 CLASS A,without extra components
- Industry standard pin-out

10W isolated DC-DC converter in DIP package
Ultra-wide input,regulated single or dual output

RoHS

Selection Guide

Certification	Part No.	Input Voltage(VDC)		Output		Full Load Efficiency②(%) Min./Typ.	Capacitive Load③(μF) Max.
		Nominal (Range)	Max.①	Voltage (VDC)	Current(mA) Max./Min.		
CE	CFDB10-24D05	24 (9-36)	40	±5	±1000/0	81/83	1000
	CFDB10-24D12			±12	±416/0	85/87	470
	CFDB10-24D15			±15	±333/0	85/87	330
	CFDB10-24S03			3.3	2400/0	85/87	1200
	CFDB10-24S05			5	2000/0	86/88	1000
	CFDB10-24S12			12	833/0	85/87	470
	CFDB10-24S15			15	667/0	85/87	330
	CFDB10-24S24			24	416/0	86/88	100
	CFDB10-48D05	48 (18-75)	80	±5	±1000/0	81/83	1000
	CFDB10-48D12			±12	±416/0	85/87	470
	CFDB10-48D15			±15	±333/0	85/87	330
	CFDB10-48S03			3.3	2400/0	84/86	1200
	CFDB10-48S05			5	2000/0	85/87	1000
	CFDB10-48S12			12	833/0	85/87	470
	CFDB10-48S15			15	667/0	85/87	330
	CFDB10-48S24			24	416/0	86/88	100

Notes:
①Exceeding the maximum input voltage may cause permanent damage;
②Efficiency is measured at nominal input voltage and rated output load;
③The specified maximum capacitive load value for Vo1 and Vo2 output is identical;
④We suggest to connect an external electrolytic capacitor if there is a spike voltage at the input,details please refer to application circuit.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current(full load/no-load)	24VDC nominal input series, nominal input voltage	3.3VDC single output	--	379/12	388/25	mA
		5VDC single output	--	473/6	484/15	
		others	--	502/5	515/12	
	48VDC nominal input series, nominal input voltage	3.3VDC single output	--	192/5	197/20	
		5VDC single output	--	239/6	245/15	
		others	--	251/4	258/8	

Reflected Ripple Current	24VDC nominal input series,nominal input voltage	--	40	--	mA
	48VDC nominal input series,nominal input voltage	--	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	
	48VDC nominal input series	--	--	18	
Under-voltage Protection	24VDC nominal input series	5.5	6.5	--	
	48VDC nominal input series	12	15.5	--	
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	--	6	10	mA

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

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy①	0%-100%load	3.3VDC/5VDC single output	--	± 0.5	± 2	%
		Others	--	±1	±3	
Linear Regulation	Input voltage variation from low to high at full load	Vo1	--	±0.2	±0.5	
		Vo2	--	±0.5	±1	
Load Regulation②	5%-100% load	Vo1	--	±0.5	±1	
		Vo2	--	±0.5	±1.5	
Cross Regulation	Dual outputs,Vo1 load at 50%,Vo2 load at range of 25%-100%		--	--	±5	
Transient Recovery Time	25% load step change, nominal input voltage		--	300	500	μs
Transient Response Deviation		3.3VDC/5VDC single output	--	±5	±8	%
		Others	--	±3	±5	
Temperature Coefficient	Full load		--	--	±0.03	%/℃
Ripple/Noise③	20MHz bandwidth		--	40	80	mVp-p
Over-voltage Protection	Input voltage range		110	--	160	%Vo
Over-current Protection	Input voltage range	3.3VDC/5VDC single output	110	160	230	%Io
		Others	110	140	190	
Short-circuit Protection	Input voltage range		Continuous,self-recovery			

Note:
①At 0%-5% load,the Max.output voltage accuracy of ±5VDC output converter is ±5%,the Max.output voltage accuracy of 3.3VDC/5VDC output converter is ±3%;
②Load regulation for 0%-100% load increases to ±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
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	--	+85	℃
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,5G,0.75mm.along X, Y and Z			
Switching Frequency *	PWM mode	--	350	--	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	32.0x20.0x10.8mm
Weight	12.0g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS A(without extra recommended)/ CLASS B(see Fig.3-②for recommended circuit)	
	RE	CISPR32/EN55032	CLASS A(without extra recommended)/ CLASS B(see Fig.3-②for 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.3-①for recommended circuit)	perf.Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2KV(seeFig.3-①for recommended circuit)	perf.Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s	perf.Criteria A
	Immunities of voltage dip,drop and short interruption	IEC/EN61000-4-29	0%,70%	perf.Criteria B

Typical Characteristic Curves

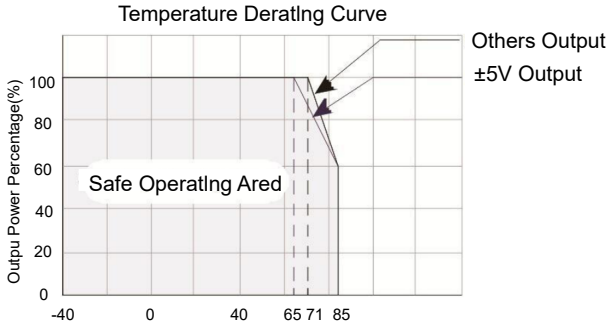
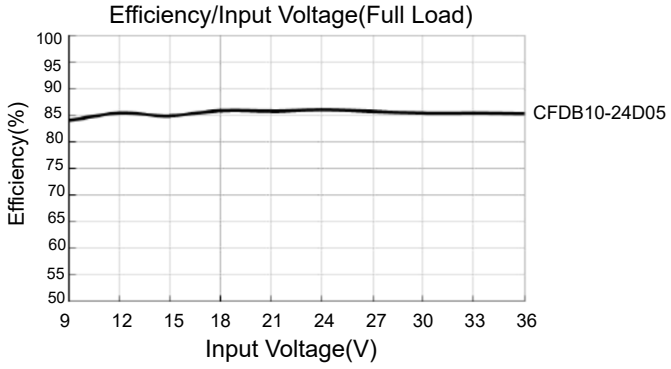
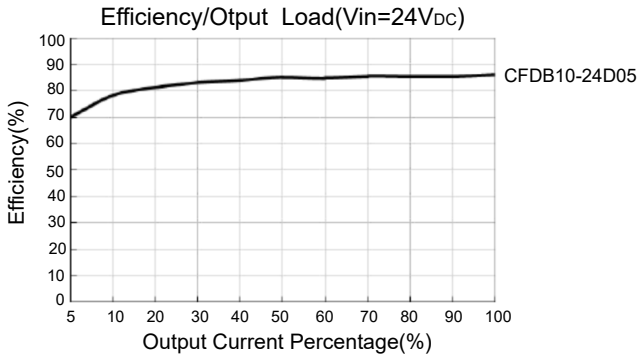
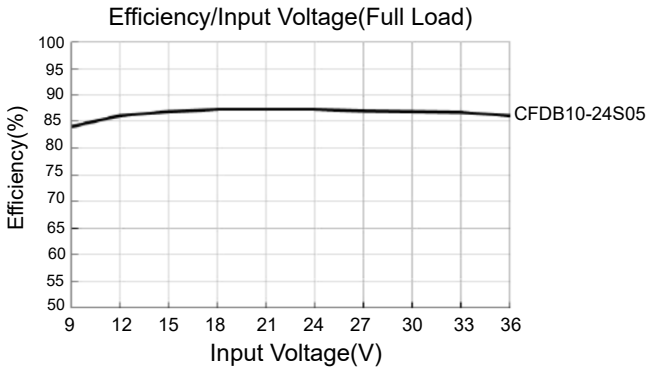
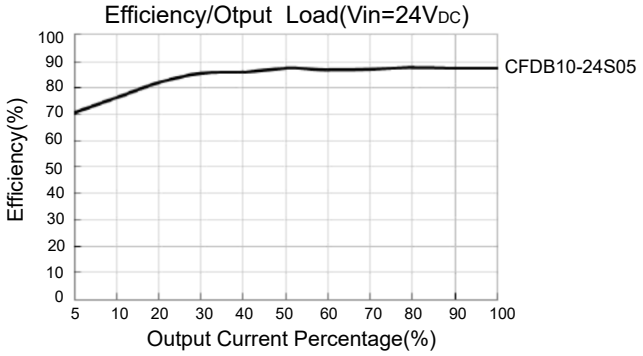


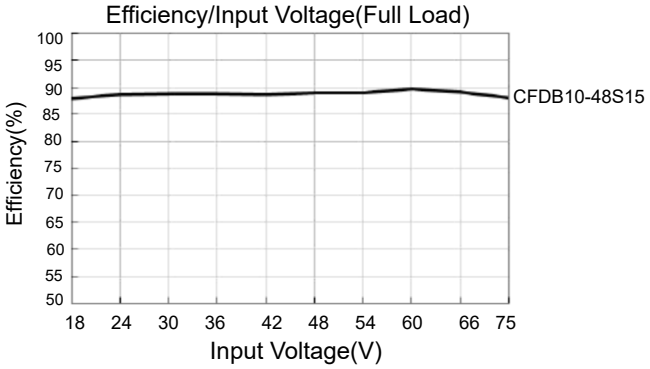
Fig. 1

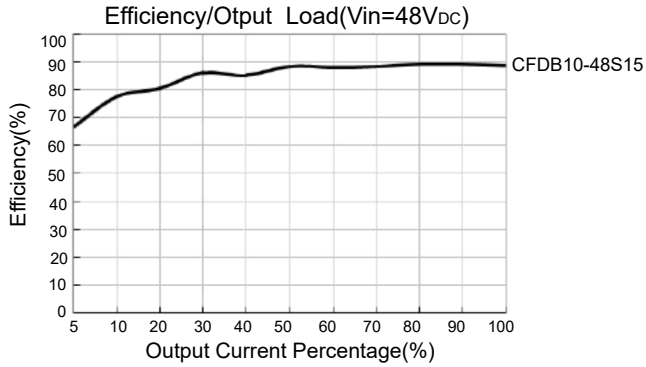












Design Reference

1.Typical application

All 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.

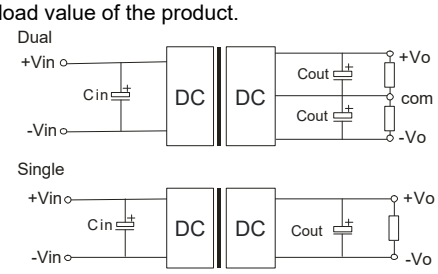
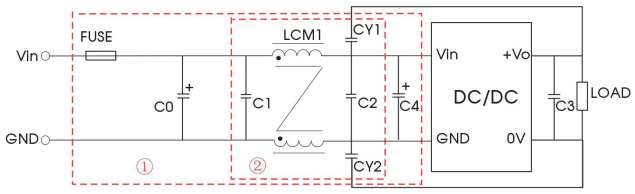


Fig. 2

Vin(VDC)	Cin	Cout
24	100μF	10μF
48	10μF-47μF	10μF

2.EMC compliance circuit

3.3VDC/5VDC single output:



Others:

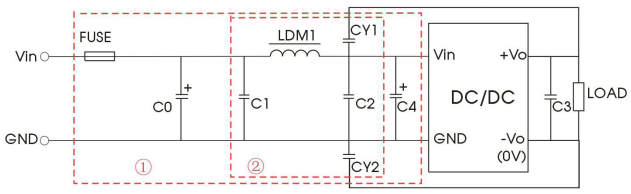


Fig.3

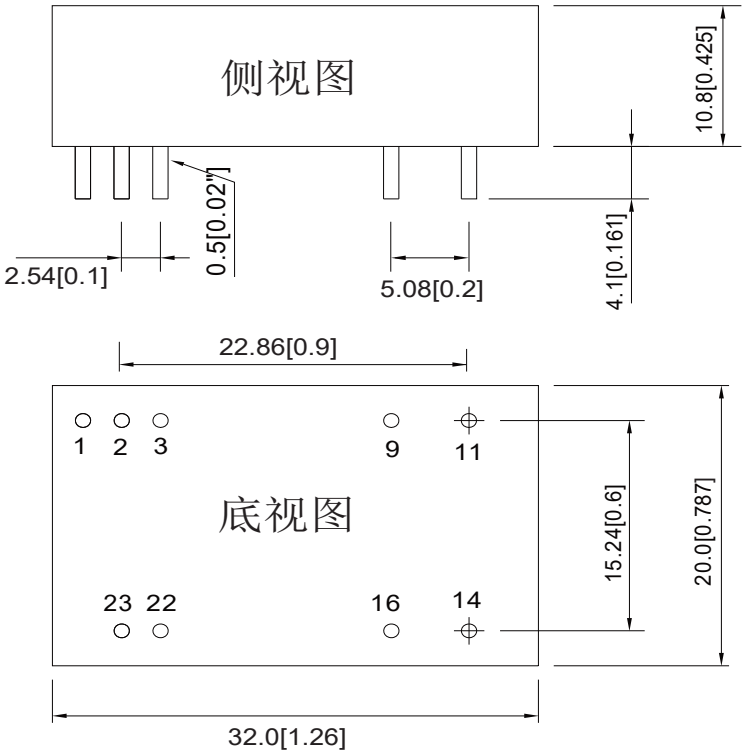
Notes:For EMC tests we use Part ① in Fig.3 for immunity and part ② for emissions test,chose according to the demand.

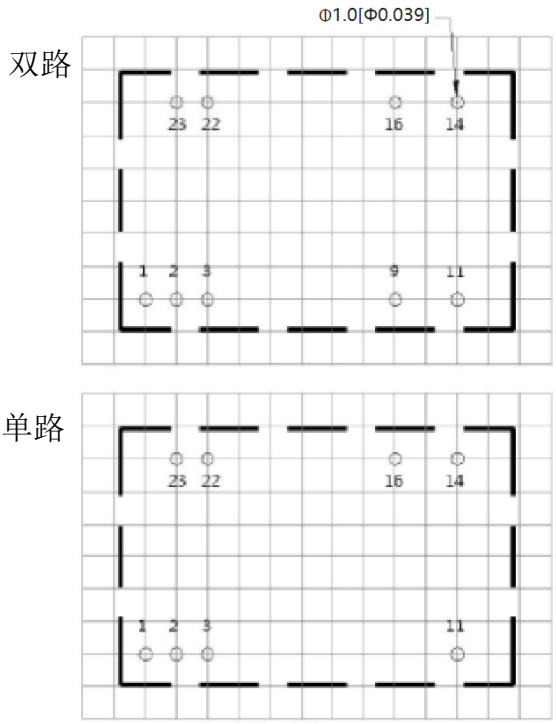
Parameter description:

Model	Vin:24VDC	Vin:48VDC
FUSE	Select FUSE value according to actual input current	
C0,C4	330μF/50V	330μF/100V
C1,C2	10μF/50V	10μF/100V
LDM1	10μH	
LCM1	1.4-1.7mH	
C3	Refer to the Cout in Fig.2	
CY1,CY2	1nF/2KV	

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

Dimensions and Recommended Layout

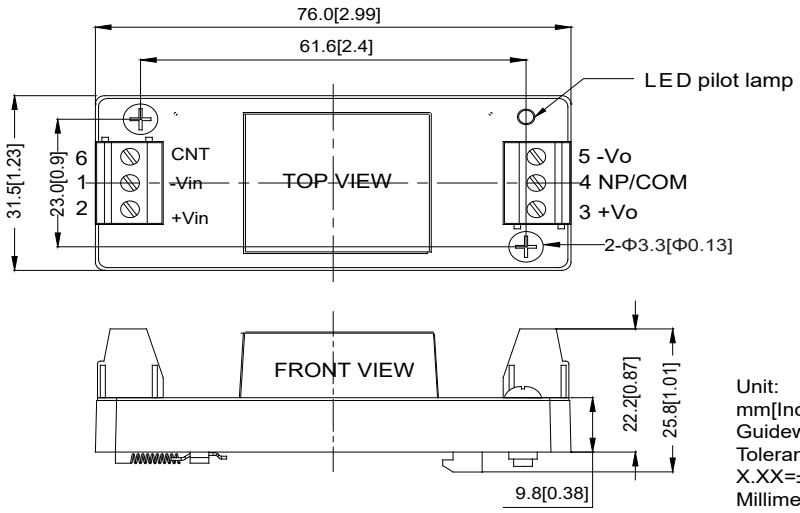




栅格距离:2.54*2.54mm

单位:mm[inch]

管脚定义	1	2,3	9	11	14	16	22,23
单路 Single	CNT	-Vin	NP	NC	+Vo	-Vo	+Vin
双路 Dual output	CNT	-Vin	com	-Vo2	+Vo1	com	+Vin



Z Dimensions

Unit:
mm[Inches]
Guideway type:TS35
Tolerances Inches:
X.XX=±0.02,X.XXX=±0.01
Millimeters:X.X=±0.5,X.XX=±0.25
General tolerances:Max 0.4N·m

Notes:
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;
4. We can provide product customization service,please contact our technicians directly for specific information;
5. Products are related to laws and regulations:see "Features"and"EMC";
6. 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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