

FEATURES

6W isolated DC-DC converter

Ultra-wide input voltage and regulated dual/single output

- ◆ Wide range of input voltage (4:1)
- ◆ Efficiency up to 86%
- ◆ No-load power consumption as low as 0.12W
- ◆ Isolation voltage:2250V_{DC}
- ◆ Operating temperature range:-40℃ to +70℃
- ◆ Input under-voltage protection,output over-voltage,over-current,short circuit protection
- ◆ Meet CISPR22/EN55022 CLASSA
- ◆ International standard pin-out
- ◆ 3 years Warranty



Selectino Guide

certification	PartNo. ①	Input Voltage(V _{DC})		Output		Full Load Efficiency ③ (%) Min./Typ.	Max. Capacitive Load(μF)
		Nominal (Range)	Max. ②	Voltage(V _{DC})	Current(mA) Max./Min.		
	CFDR6-110D05	110 (40-160)	170	±5	±600/0	78/80	470
	CFDR6-110D12			±12	±250/0	82/84	100
	CFDR6-110D15			±15	±200/0	83/85	100
	CFDR6-110S05			5	1200/0	78/80	1000
	CFDR6-110S12			12	500/0	82/84	470
	CFDR6-110S15			15	400/0	83/85	220
	CFDR6-110S24			24	250/0	84/86	100

Note:

- ① Use "S" suffix for heat sink mounting, for chassis mounting and "Z" suffix for Din-Rail mounting. We recommend to choose modules with a heat sink for enhanced heat dissipation and applications with extreme temperature requirements;
- ② Exceeding the maximum input voltage may cause permanent damage;
- ③ Efficiency is measured at nominal input voltage and rated output load; efficiency for Z Model's is decreased by 2% due to the input reverse polarity protection circuit.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load/no-load)	Nominal input voltage	--	68/3	70/8	mA
Reflected Ripple Current	Nominal input voltage	--	25	--	
Surge Voltage(1sec.max.)		-0.7	--	180	V _{DC}
Start-up Voltage		--	--	40	
Shutdown Voltage		28	33	--	
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(3.5-12V _{DC})			
	Module off	CNT pin pulled low to -Vin(0-1.2V _{DC})			
	Input current when off	--	3	8	mA

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

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy ^①	0%-100% load		--	±1	±3	%
Linear Regulation	Input voltage variation from low to high at full load	Vo1	--	±0.2	±0.5	
		Vo2	--	±0.5	±1	
Load Regulation ^②	0%-100% load	Single	--	±0.5	±1	
	5%-100% load	Vo1of Dual		±0.5	±1	
		Vo2 of Dual		±0.5	±1.5	
Cross Regulation	Dual outputs,Vo1 load at 50%,Vo2 load at range of 25%-100%		--	--	±10	
Transient Recovery Time	25%load step change, nominal input voltage		--	300	500	μs
Transient Response Deviation		5V,±5V output	--	±3	±8	%
		Others	--	±3	±5	
Temperature Coefficient	Full load		--	±0.02	±0.03	%/℃
Ripple/Noise ^③	20MHz band width,5%-100% load		--	50	100	mVp-p
Over-voltage Protection	Input voltage range		110	--	160	%Vo
Over-current Protection			120	--	210	%Io
Short-circuit Protection			Continuous,self-recovery			
Note:①Vo2 output voltage accuracy of ±5VDC output converter for 0%-5%load is ±5%max; ②CFDR6-110D05 load 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,please refer						

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output, with the test time of 1 minute and the leak current lower than 1mA.	2250	--	--	Vdc
	Input/output-case Electric Strength Test for 1 minute with a leakage current of 1mA max.	1600	--	--	
Insulation Resistance	Input-output resistance at 500Vdc	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100KHz/0.1V	--	1000	--	pF
Operating Temperature	See Fig.1	-40	--	+70	°C
Storage Temperature		-55	--	+125	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	+300	
Storage Humidity	Non-condensing	5	--	95	%RH
Vibration		IEC61373-Category1, Grade B			
Switching Frequency*	PWM Mode	--	300	--	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 package(without heatsink)		25.4×25.4×11.7mm
	Horizontal package(with heatsink)		25.4×25.4×16.2mm
	Z2wiring package(without heat sink)		76.0×31.5×21.2mm
	Z2wiring package(with heat sink)		76.0×31.5×25.2mm
	Z4rail package(without heat sink)		76.0×31.5×25.8mm
	Z4rail package(with heat sink)		76.0×31.5×29.8mm
Weight	without heat sink	Horizontal package/Z2wiring package/Z4rail package	12.5g/36.0g/56.0g(Typ.)
	with heat sink	Horizontal package/Z2wiring package/Z4rail package	17.0g/40.0g/59.0g(Typ.)
Cooling Methods	Free air convection		

Electromagnetic Compatibility(EMC)

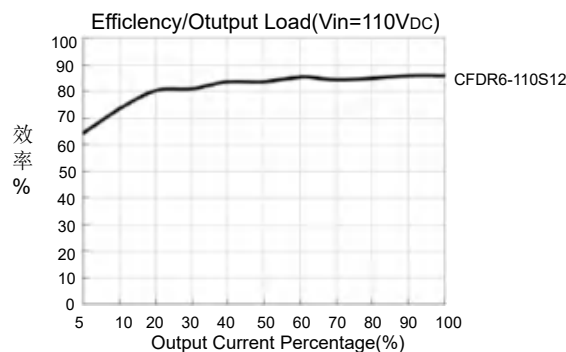
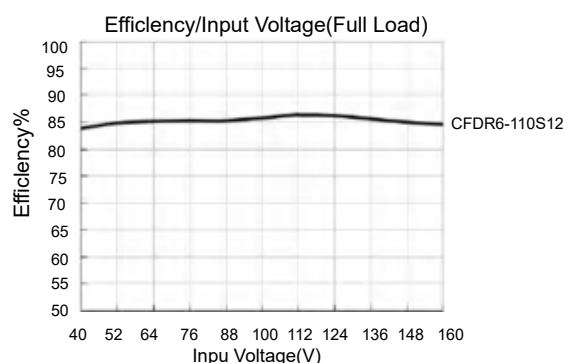
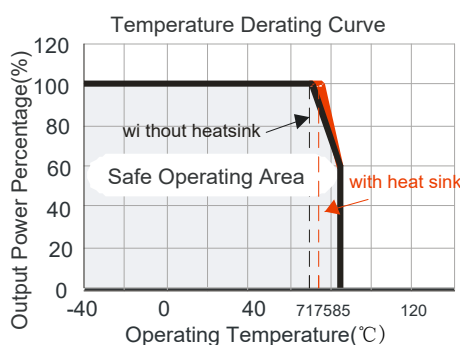
Emissions	CE	CISPR32/EN55032	CLASS B(see Fig.3 or Fig.4-② for recommended circuit)	
	RE	CISPR32/EN55032	CLASS B(see Fig.3 or Fig.4-② for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2	Contact $\pm 6\text{KV}$ /Air $\pm 8\text{KV}$	perf.Criteria B
	RS	IEC/EN61000-4-3	20V/m	perf.Criteria A
	EFT	IEC/EN61000-4-4	$\pm 4\text{KV}$ (see Fig.3 or Fig.4-① for recommended circuit)	perf.Criteria B
	Surge	IEC/EN61000-4-5	line to line $\pm 2\text{KV}$ (2Ω 18 μF see Fig.3 for recommended circuit) line to ground $\pm 4\text{KV}$ (12 Ω 9 μF see Fig.3 for recommended circuit)	perf.Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s	perf.Criteria A

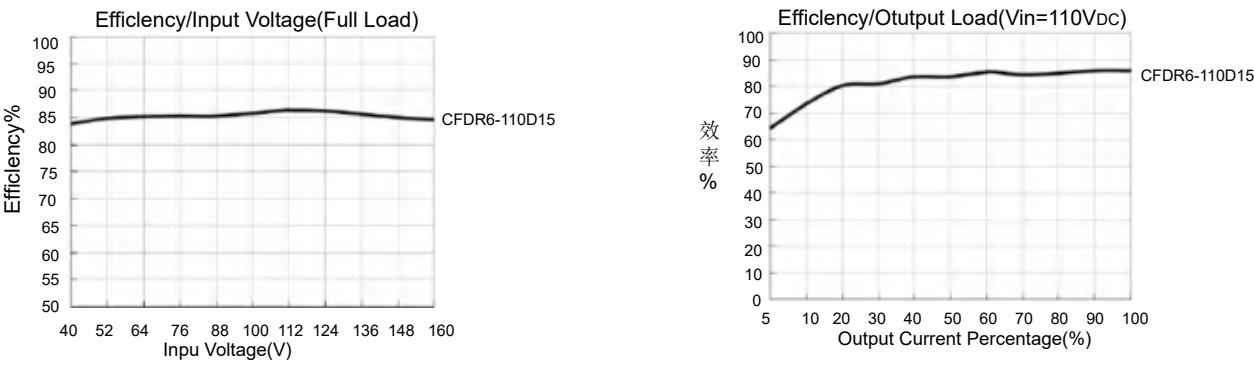
Electromagnetic Compatibility(EMC)(EN50155)

Emissions	CE	EN50121-3-2	150kHz-500kHz 99dBuV 500kHz-30MHz 93dBuV	
	RE	EN50121-3-2	30MHz-230MHz 40dBuV/m at 10m 230MHz-1GHz 47dBuV/m at 10m	
Immunity	ESD	EN50121-3-2	Contact $\pm 6\text{KV}$ /Air $\pm 8\text{KV}$	perf.Criteria B
	RS	EN50121-3-2	20V/m	perf.Criteria A
	EFT	EN50121-3-2	$\pm 2\text{kV}$ 5/50ns 5kHz	perf.Criteria A
	Surge	EN50121-3-2	line to line $\pm 1\text{KV}$ (42 Ω ,0.5 μF) line to ground $\pm 2\text{KV}$ (42 Ω ,0.5 μF)	perf.Criteria B
	CS	EN50121-3-2	0.15MHz-80MHz 10Vr.m.s	perf.Criteria A

Note:All the tests are measured under the conditions of input capacitor 100 μF /200V

Product Characteristic Curves





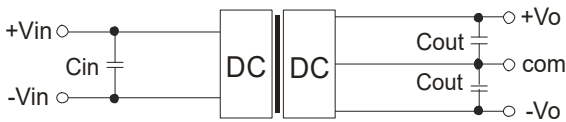
Design Reference

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 specified max. capacitive load value of the product.

Dual Output



Single Output

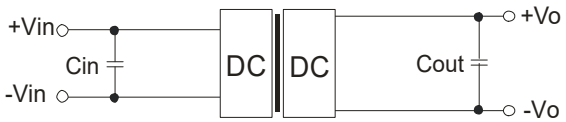


Fig.2

C_{in}	C_{out}
10 μ F-47 μ F	10 μ F

2. EMC compliance circuit

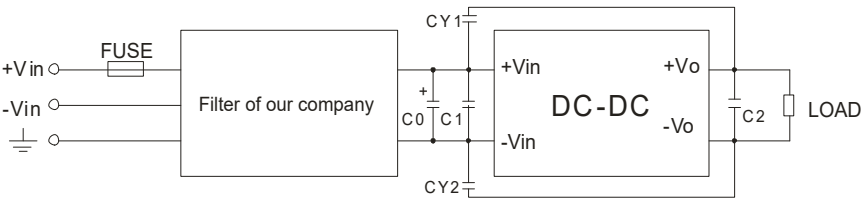


Fig. 3

Fig.3 Parameter description:

FUSE	Choose according to actual input current
Filter of our company	EMC auxiliary component of our company. Input voltage range: 40V-160V
C0	100 μ F/200V
C1	Refer to the C_{in} in Fig.2
C2	Refer to the C_{in} in Fig.2
CY1,CY2	1nF/3KV

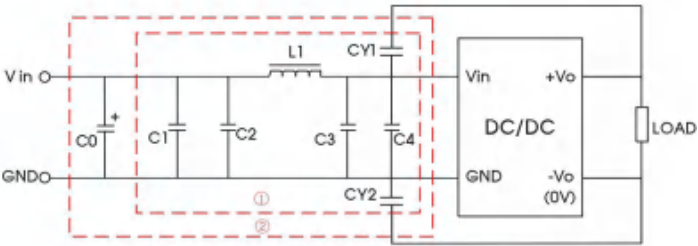


Fig.4

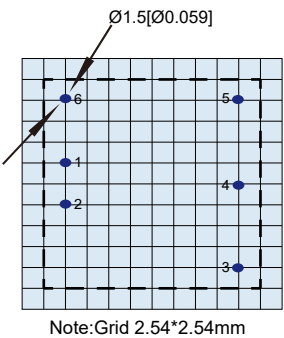
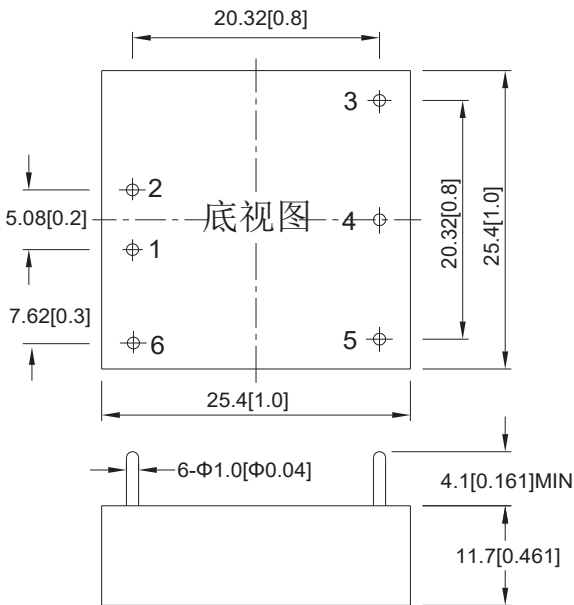
Fig.4 Parameter description:

C0	100uF/200V
C1,C2,C3,C4	0.22uF/250V
L1	68μH
CY1,CY2	1nF/3KV

3.The products do not support parallel connec tion of their output

Horizontal Package (without heat sink) Dinmensionsand Recommended Layout

THIRD ANGLE PROJECTION

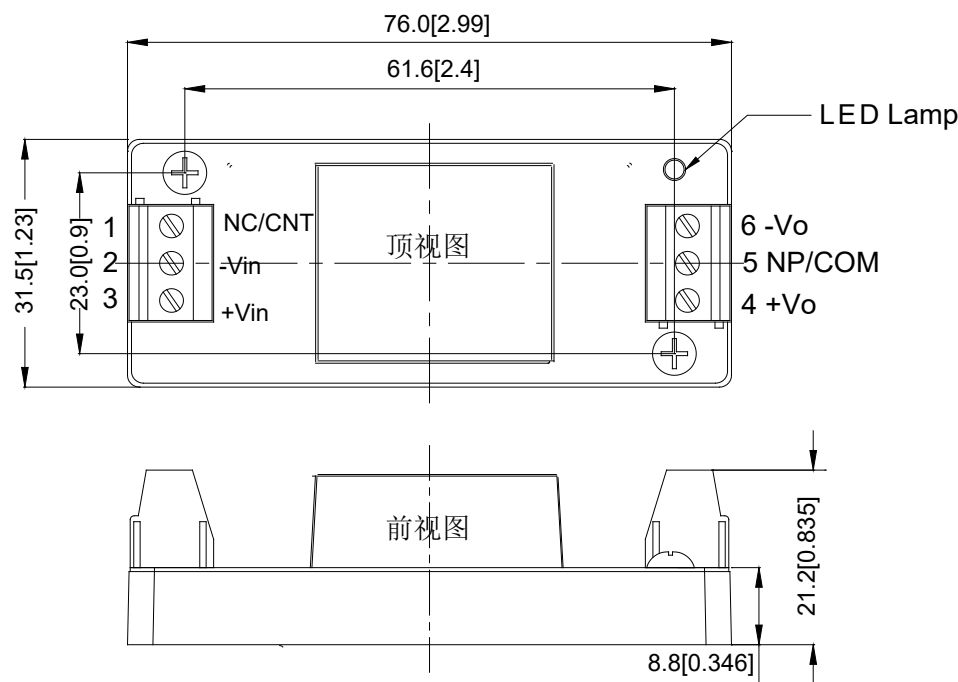


Note:
Unit:mm[inch]
Pin diameter tolerances:±0.1[±0.004]
General tolerances:±0.5[±0.02]

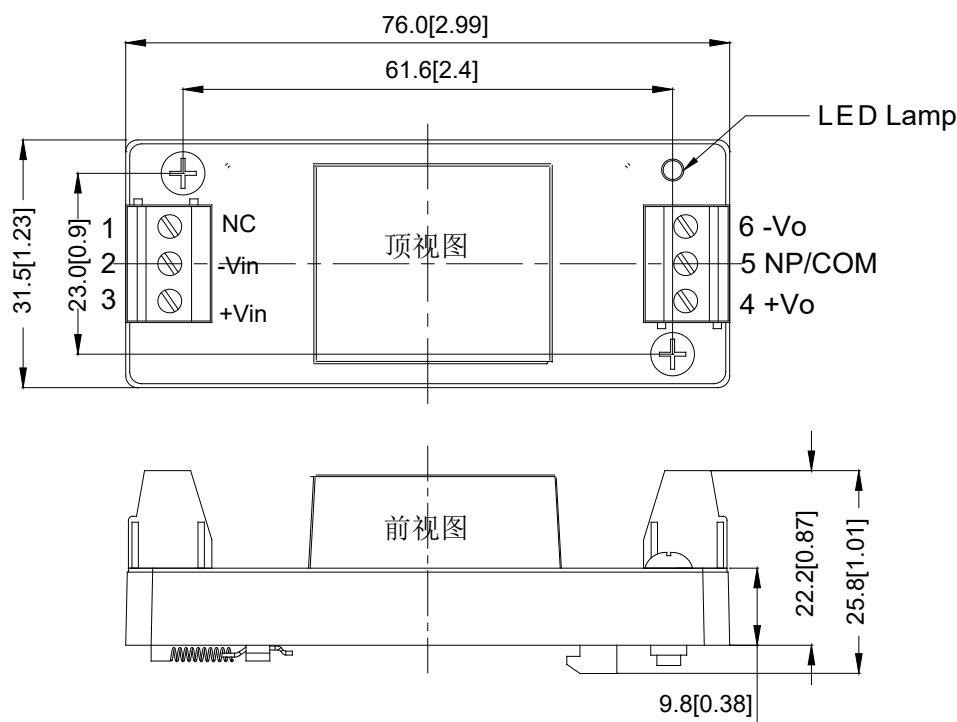
管脚	Pin	1	2	3	4	5	6
单路	Single	-Vin	+Vin	+Vo	NP	-Vo	NP
双路	Dual	-Vin	+Vin	+Vo1	COM	-Vo2	CNT

CFDR6-24S05Z1(without heat sink)Dimensions

Trigonometric projection 



CFDR6-110S05Z(without heat sink) Dimensions



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;
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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