FEATURES

- Ultra-wide 4:1 input voltage range
- Reinforced I/O isolation test voltage 2250V_{DC}
- Operating ambient temperature range -40℃ to +70℃
- Input under-voltage protection,output short circuit,over-current,over–voltage protection
- Low output ripple & noise
- EN50121-3-2/CISPR32/EN55032 CLASSA EMI
- compliant without external components
- EN50155/EN60950 Approval
- Designed to meet IEC60950/UL60950 safety standards
- Input Reverse Polarity Protection available with
- Chassis (Z2) or 35mm DIN-Rail mounting (Z4) version
- Industry standard pin-out
- Three year warranty

20W isolated DC-DC converter with Ultra-wide Input and Regulated Single Output

Selection Guide

Certification	Part No.[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.		
	CFDME20-110S03	110 (40-160)	170	3.3	5000/0	80/82	10000
	CFDME20-110S05			5	4000/0	83/85	10000
	CFDME20-110S12			12	1667/0	84/86	1600
	CFDME20-110S15			15	1333/0	84/86	1000
	CFDME20-110S24			24	833/0	85/87	470

Note:

①Use“S”suffix for heat sink mounting,“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 Absolute maximum stress rating without damage(not recommended);

③Efficiency 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.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current(fullload/no-load)	Nominal input voltage	3.3V output	--	183/10	188/20	mA
		5V output	--	214/10	219/20	
		Others	--	212/3	217/8	
Reflected Ripple Current	Nominal input voltage		--	25	--	
Surge Voltage(1sec.max.)			-0.7	--	180	VDC
Start-up Voltage	100%load		--	--	40	
Shut-down 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(3.5-12VDC)			
	Module off		CNT pin pulled low to GND(0-1.2VDC)			
	Input current when off		--	2	7	mA

Note:*The CNT pin voltage is referenced to input GND.

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy	0%-100% load		--	±1	±3	%
Linear Regulation	Input voltage variation from low to high at full load		--	±0.2	±0.5	
Load Regulation	0%-100% load		--	±0.5	±1	
Transient Recovery Time	25% load step change, nominal input voltage		--	300	500	μs
Transient Response Deviation		3.3V/5V output	--	±3	±8	%
		Others	--	±3	±5	
Temperature Coefficient	Full load		--	±0.02	±0.03	%/℃
Ripple/Noise *	20MHz bandwidth,5%-100% load		--	50	100	mVp-p
Trim	Input voltage range		90	--	110	%Vo
Over-voltage Protection			110	--	160	
Over-current Protection			120	--	210	%Io
Short-circuit Protection			Continuous,self-recovery			

Note:*Ripple/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.	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	--	2200	--	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	℃
Switching Frequency *	PWM mode	--	300	--	KHz
Vibration		IEC61373-Category 1,Grade B			
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	Without heat sink	Horizontal package	50.8×25.4×11.8mm
		S Din-rail mounting	76.0×31.5×25.8mm
	With heat sink	Horizontal package	51.4×26.2×16.5mm
		S Din-rail mounting	76.0×31.5×29.9mm
Weight	Without heat sink	Horizontal package/S Din-rail mounting	26.0g/68.0g(Typ.)
	With heat sink	Horizontal package/S Din-rail mounting	34.0g/76.0g(Typ.)
Cooling Method	Freeair convection		

Electromagnetic Compatibility (EMC) (EN50155)

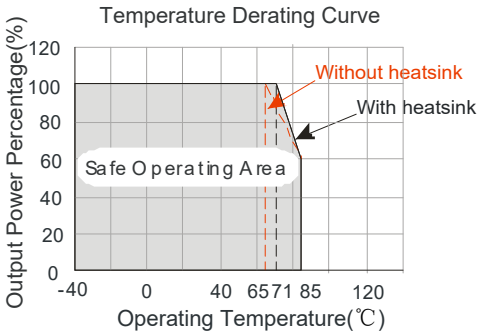
Emissions	CE	CISPR32/EN55032	CLASS A(without external components)/CLASS B(see Fig.4-② for recommended circuit)	
	RE	CISPR32/EN55032	CLASS A(without external components)/CLASS B(see Fig.4-② for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	perf.Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf.Criteria A
	EFT	IEC/EN61000-4-4	±4KV(see Fig.3 or Fig.4-① for recommended circuit)	perf.Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2KV (2Ω 0.5uF see Fig.3 for recommended circuit) line to ground ±4KV(12Ω 0.5uF see Fig.3 for recommended circuit)	perf.Criteria B
		EN50121-3-2	line to line ±1KV(42Ω 0.5uF see Fig.4-① for recommended circuit) line to ground ±2KV(42Ω 0.5uF see Fig.4-① for recommended circuit)	perf.Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s	perf.Criteria A

Electromagnetic Compatibility (EMC) (EN50155)

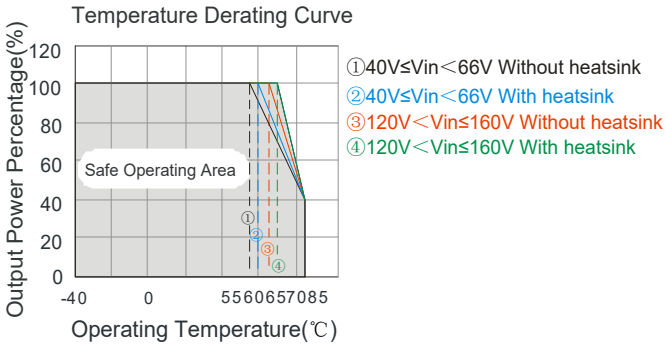
Emissions	CE	EN50121-3-2 EN55016-2-1	150kHz-500kHz 99dBuV 500kHz-30MHz 93dBuV	
	RE	EN50121-3-2 EN55016-2-1	30MHz-230MHz 40dBuV/m at 10m 230MHz-1GHz 47dBuV/m at 10m	
Immunity	ESD	EN50121-3-2	Contact ±6KV/Air ±8KV	perf. Criteria B
	RS	EN50121-3-2	20V/m	perf. Criteria A
	EFT	EN50121-3-2	±2kV 5/50ns 5kHz	perf. Criteria A
	Surge	EN50121-3-2	line to line ±1KV(42Ω,0.5μF) line to ground ±2KV(42Ω,0.5μF)	perf. Criteria B
	CS	EN50121-3-2	0.15MHz-80MHz 10Vr.m.s	perf. Criteria A

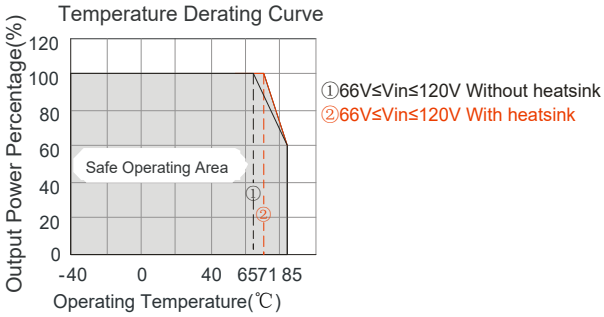
Note:All the tests are measured under the conditions of inputs capacitor 100uF/200V

Typical Characteristic Curves



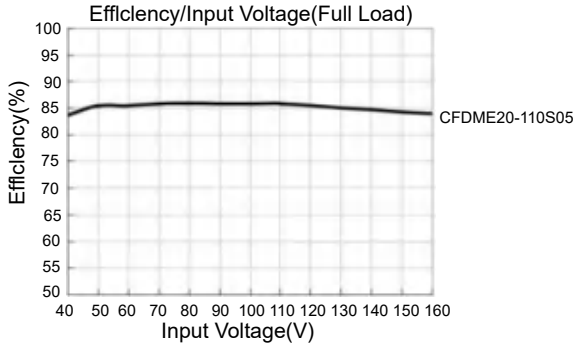
OperatingTemperature,Except CFDME20-110S03/05(S)

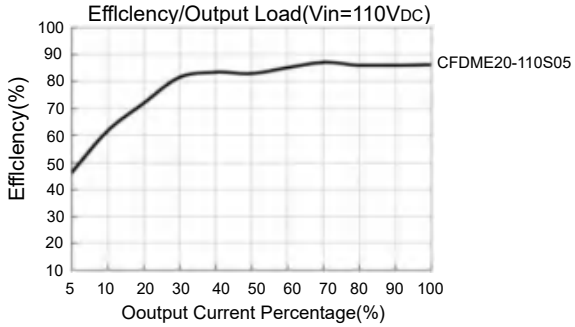


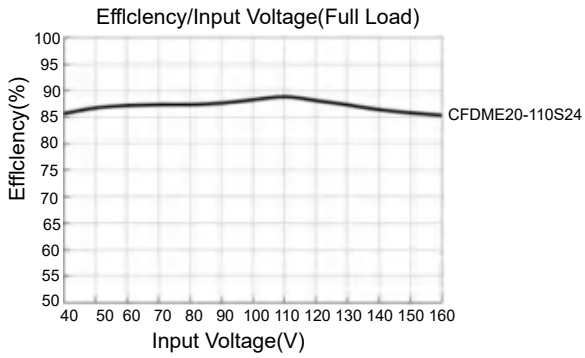


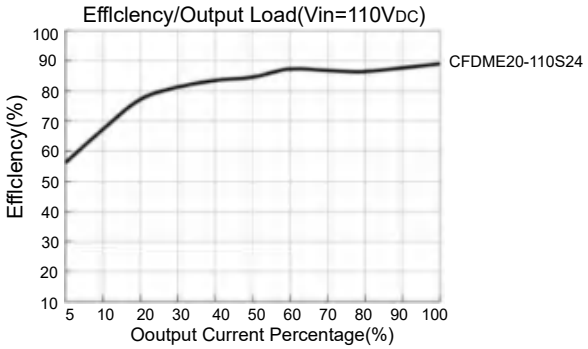
CFDME20-110S05OperatingTemperature

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

Vout(VDC)	Fuse	Cin	Cout
3.3/5	2A,slow blow	10μF-47μF	470μF
12/15			220μF
24			100μF

2.EMC compliance circuit

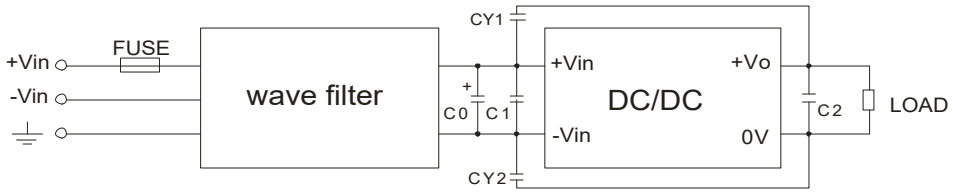


Fig.3

Fig.3 Listof components:

Output voltage	3.3V	5V	12V	15V	24V
FUSE	Choose according to actual input current				
wave filter	EMC auxiliary component of our company. Input voltage range:40V-160V				
C0	100μF/200V				
C1	47μF/200V				
C2	470μF/16V		220μF/25V		100μF/35V
CY1, CY2	1000pF/400VAC				

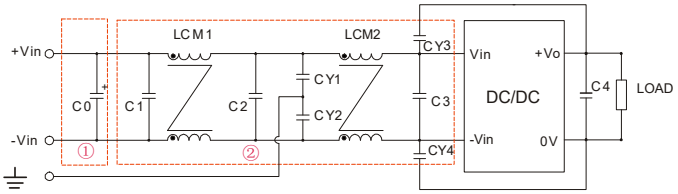


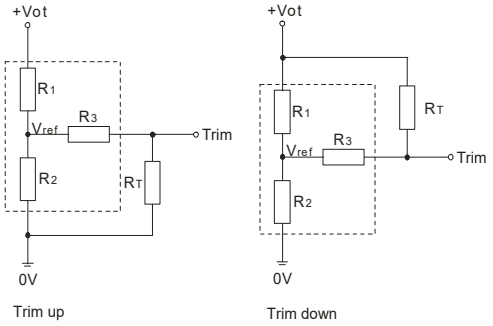
Fig.4

Notes:Part ① in the Fig.4 is used for EMS test and part ② for EMI test

Fig.4 List of components:

Output voltage	3.3V	5V	12V	15V	24V
C0	100μF/200V				
C1, C2	0.22μF/250V				
C3	47μF/200V				
LCM1, LCM2	15mH (UU common mode inductance)				
CY1, CY2, CY3, CY4	1000pF/400VAC				
C4	470μF/16V		220μF/25V		100μF/35V

3.Trim Function for Output Voltage Adjustment (open if unused)



Calculating Trim resistor values:

$$up{:}R_T=\frac{aR_2}{R_2-a}-R_3 \qquad a=\frac{Vref}{Vo'-Vref}\cdot R_1$$

$$down{:}R_T=\frac{aR_1}{R_1-a}-R_3 \qquad a=\frac{Vo'-Vref}{Vref}\cdot R_2$$

TRIM resistor connection (dashed line shows internal resistor network)

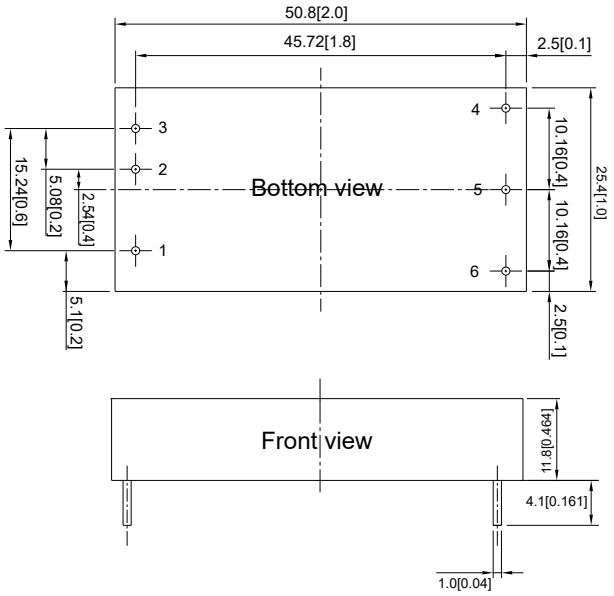
R_T=Trim Resistor value; a=self-defined parameter; Vo'=desired output voltage

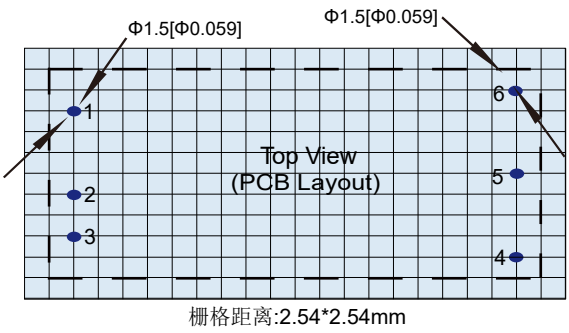
Vout(V)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
3.3	4.801	2.87	10	1.24
5	2.883	2.87	10	2.5
12	11.000	2.87	15	2.5
15	14.384	2.87	15	2.5
24	24.872	2.87	17.8	2.5

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

Horizontal Package(without heat sink)Dimensions and Recommended Layout

第三角投影



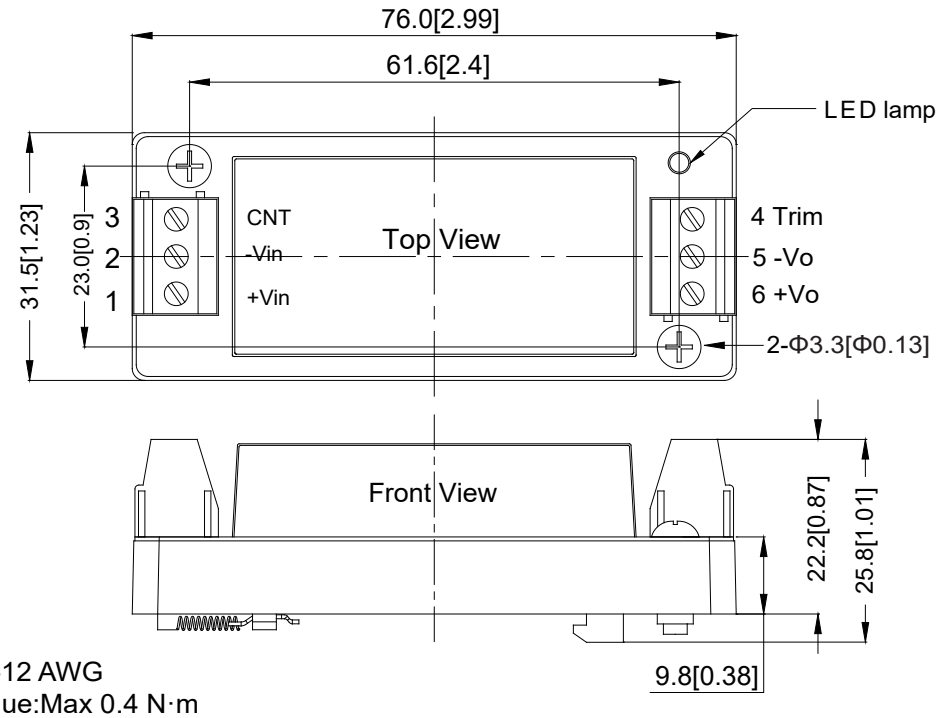


Note:
Unit mm[inch]
Pin diameter tolerances0.1mm[0.004inch
General tolerances±0.25mm[±0.01inch]

管脚 Pin	1	2	3	4	5	6
单路 Single	CNT	-Vin	+Vin	+Vo	-Vo	TRIM

CFDME20-110S05Z(without heatsink)Dimensions

THIRD ANGLE PROJECTION



Note:
Unit:mm[inch]
Wire range:24-12 AWG
Tightening torque:Max 0.4 N·m
General tolerances: ±0.5[±0.02]

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