

Features

- ◆ Wide 4:1 input voltage range
- ◆ High efficiency up to 90%
- ◆ No-load power consumption as low as 0.12W
- ◆ I/O isolation test voltage 1.5kV_{DC}
- ◆ Operating ambient temperature range: -40°C to +65°C
- ◆ Input under-voltage protection, output short-circuit, over-current, over-voltage protection
- ◆ Compliant with EN55032 standard
- ◆ Warranty period of three years

20W isolated DC-DC converter Wide input and regulated single output DIP encapsulation



Selection Guide

Certification	Part No.	Input Voltage(V _{DC})		Output		Full Load Efficiency (%)Min./Typ.	Capacitive Load (μF)Max.
		Nominal (Range)	Max.①	Voltage(V _{DC})	Current(mA) Max./Min.		
	CFDB20-24S03	24 (9~36)	40	3.3	5000/0	84/86	4700
	CFDB20-24S05			5	4000/0	86/88	3300
	CFDB20-24S12			12	1666/0	86/88	600
	CFDB20-24S15			15	1333/0	86/88	220
	CFDB20-24S24			24	833/0	88/90	220
	CFDB20-24S28			28	714/0	86/88	220

Notes:

- ①Exceeding the maximum input voltage may cause permanent damage;
 ②Efficiency is measured at nominal input voltage and rated output load;
 ③We suggest to connect an external electrolytic capacitor;

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (fullload)	Nominal temperature, Nominal input voltage	3.3V output	—	799	820	mA
		5V/12V/15V/28V output	—	947	968	
		24V output	—	926	947	
Reflected Ripple Current	Nominal temperature, Nominal input voltage		—	40	—	V _{DC}
Surge Voltage(Isec.max.)	Nominal temperature, Nominal input voltage		-0.7	—	50	
Start-up Voltage	Nominal temperature, Nominal input voltage		—	—	9	
Input under-voltage protection	Normal temperature, Nominal input voltage	Module undervoltage recovery point	—	—	9	
		Module undervoltage off breakpoint	5.5	6.5	—	
Input Filter			Pi typ			
Hot Plug			Unavailable			
CNT	Module on		CNT pin open or pulled high (3.0-12V _{DC})			
	Module off		CNT pin pulled low to -Vin(0-1.2V _{DC})			
	Input current when 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 Accuracy	0%-100%load	-	±1	±3	%
Linear Regulation	Input voltage variation from low to high at full load	-	±0.1	±0.2	
Load Regulation	0-100%load	-	±0.3	±1	
Transient Recovery Time	25%load step change,nominal input voltage	-	300	500	us
Transient Response Deviation	25%load step change,nominal input voltage	3.3V5V output	±5	±8	%
		Others	±3	±5	
Temperature Coefficient	Full load	-	—	±0.02	%/°C
Ripple/Noise	5%-100%load	-	60	150	mVp-p
Over-voltage Protection	Input voltage range	110	—	160	
Over-current Protection		110	140	190	%Io
Short circuit Protection		Hiccup,continuous,self-recovery			

Note:Under 0%-5% load conditions,Ripple/Noise does not exceed 5%Vo.

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	—	—	V _{DC}
Insulation Resistance	Input-output resistance at 500V _{DC}	1000	—	—	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	—	2200	—	pF
Operating Temperature	See Fig.1	-40	—	+65	°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
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(below50%)efficiency improvement.

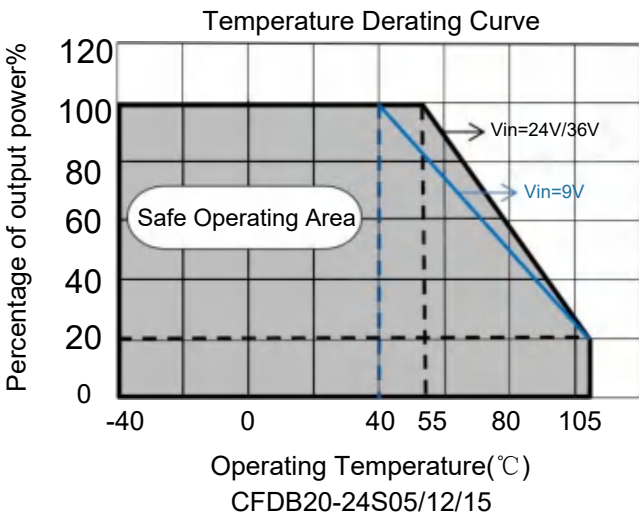
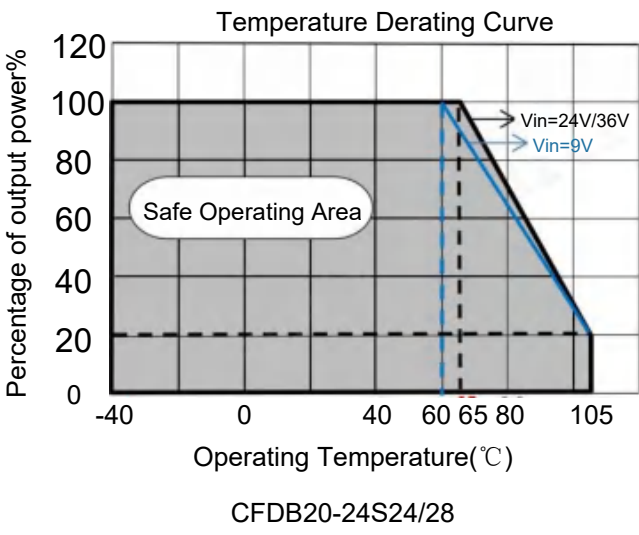
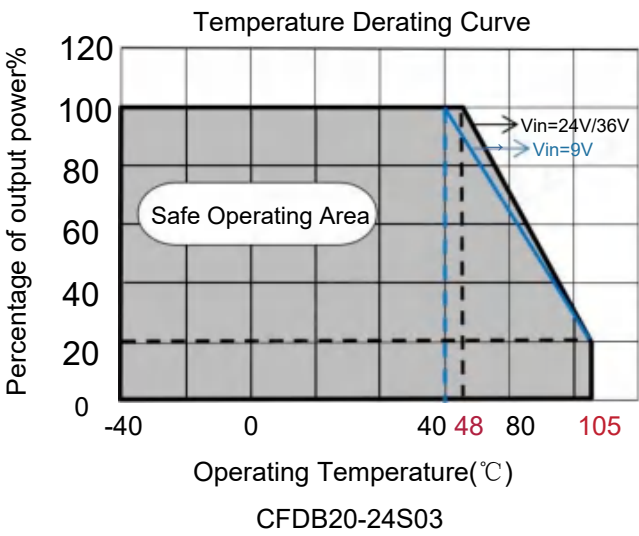
Mechanical Specifications

Case Material	Aluminum alloy
Size	32.0×20.0×10.8mm
Weight	14.4g(Typ.)
Cooling method	Free air convection

Electromagnetic Compatibility(EMC)

Emissions	CE	CISPR32/EN55032 CLASS A(with external 60uF/50V MLCC capacitor at the input) /CLASS B(see Fig.3-②for recommended circuit)
	RE	CISPR32/EN55032 CLASS A(without extra components) /CLASS B(see Fig.3-②for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2 Contact±6kV/Air±8kV perf.Criteria A
	RS	EC/EN61000-4-3 10V/m(see Fig.3-①for recommended circuit) perf.Criteria A
	EFT	EC/EN61000-4-4 100KHz±2KV(see Fig.3-①for recommended circuit) perf.Criteria A
	Surge	IEC/EN61000-4-5 line to line±2KV(see Fig.3-①for recommended circuit) perf.Criteria A
	CS	EC/EN61000-4-6 10 Vrm.s(see Fig.3-①for recommended circuit) perf.Criteria A

Typical Characteristic Curves



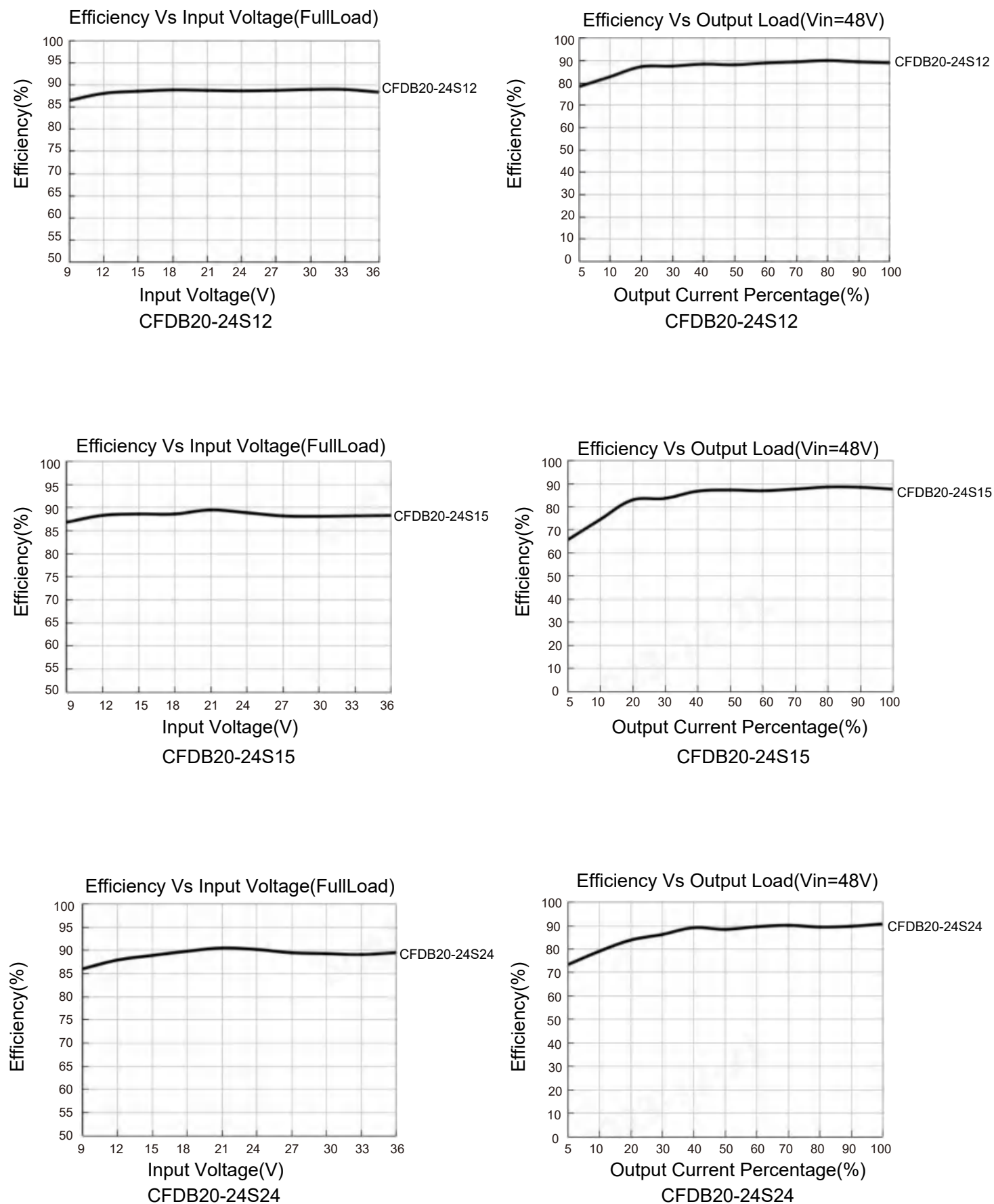


Fig.1

Design Reference

1. Typical application

All DC/DC converters of this series are tested according to the recommended test circuit (Figure 2) before leaving the factory. If it is required to further reduce the input and output ripple, the input and output external capacitors C_{in} and C_{out} can be increased or a capacitor with a small series equivalent impedance value can be selected, but the capacitance value cannot be greater than the maximum capacitive load of the product



Fig.2

Parameter description:

Vin(V _{DC})	Vout(V _{DC})	Cin	C1	Cout
24	3.3/5/12/15/24/28	100μF/100V	1μF	10μF

2. EMC compliance circuit

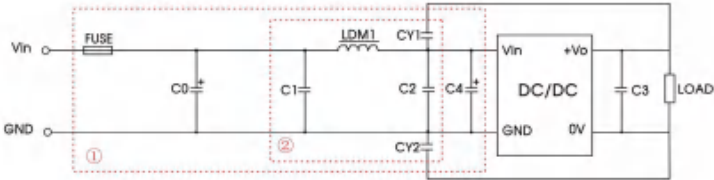


Fig.3

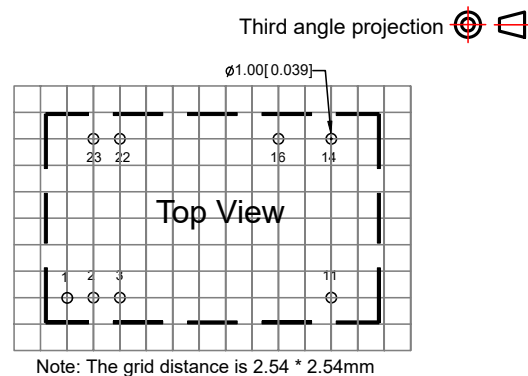
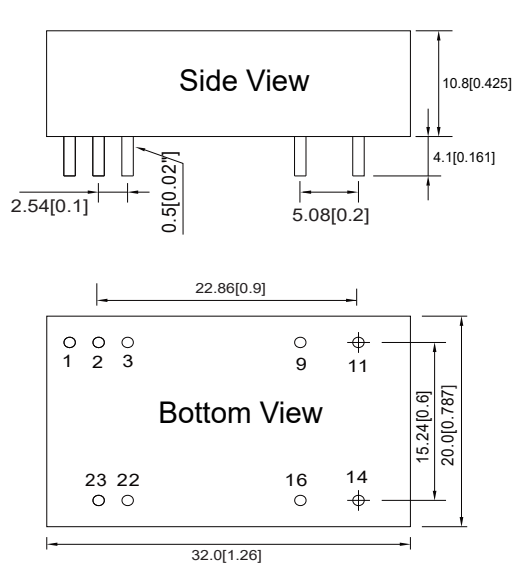
Note: Part 1 of Figure 3 is for EMS testing; The second part is used for EMI filtering, which can be selected according to demand.

Parameter description:

Components	Vin: 24VDC
FUSE	Choose according to actual input current
C0	680μF/50V
C4	330μF/50V
C1, C2	4.7μF/50V
C3	10μF
LDM1	2.2μH/4A
CY1, CY2	1nF/2KV

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

Packaging size and printing layout:



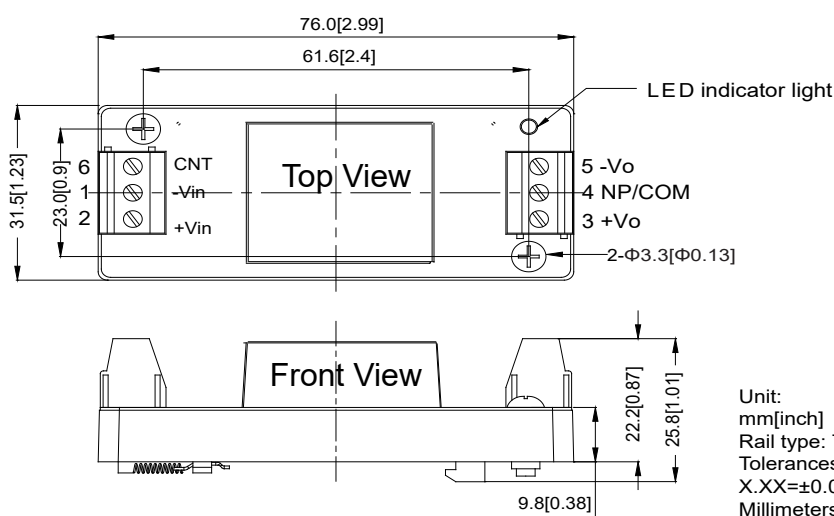
Note:

Size unit: mm[inch]

Terminal diameter tolerance: $\pm 0.1[\pm 0.004]$ Unmarked tolerance: $\pm 0.5[\pm 0.02]$

Pin definition	1	2,3	9	11	14	16	22,23
Single	CNT	-Vin	NP	NC	+Vo	-Vo	+Vin

Dimensional diagram for installing adapter base:



Note: The suffix (Z) is for installing an adapter base

Unit:

mm[inch]

Rail type: TS35

Tolerances Inches:

X.XX= ± 0.02 , X.XXX= ± 0.01 Millimeters: X.X= ± 0.5 , X.XX= ± 0.25

Tightening torque for installation hole: Max 0.4N · m



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