FEATURES

- Ultra-wide 4:1 input voltage range
- High efficiency up to 93%
- I/O isolation test voltage:2250VDC
- Input under-voltage protec tion,output short circuit,over-current,over–voltage,
- over-temperature protection
- Operating ambient temperature range: -40℃~+100℃
- Five-sided metal shielded package
- EN62368 approved
- Meet UL62368,IEC62368,EN50155 standards
- Industry standard ¼-Brick package and pin-out
- Three year warranty

75W isolated DC-DC converter
Wide input voltage and regulated single output

Selection Guide

Certification	Part No.①	Input Voltage(VDC)		Output		Full Load Efficiency(%) Min./Typ.	Capacitive Load(μF) Max.
		Nominal (Range)	Max.②	Voltage (VDC)	Current(A) Max.		
	CFDQR75-48S05	48 (18-75)	80	5	15	89/91	6000
	CFDQR75-48S12			12	6.25	90/92	2000
	CFDQR75-48S15			15	5	91/93	2000
	CFDQR75-48S24			24	3.13	90/92	1000
	CFDQR75-48S48			48	1.56	90/92	470

Note:
①The suffix "S" indicates radiator installation; we recommend selecting modules with radiators to enhance heat, heat dissipation and applications with extreme temperature requirements;
②Exceeding the maximum input voltage may cause permanent damage.

Input Spec ifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current(full load/no-load)	Nominal input voltage	--	1698/50	1756/80	mA
Reflected Ripple Current	Nominal input voltage	--	30	--	
Surge Voltage(1sec.max.)		-0.7	--	90	VDC
Start-up Voltage		--	--	18	
Input Under-voltage Protection	5VDC,15VDC output	16	16.5	--	
	Others	15	15.5	--	
Input Filter		Pi filter			
CNT*	Module on	CNT pin open or pulled high (3.5-12VDC)			
	Module off	CNT pin pulled low to GND (0-1.2VDC)			

CNT*	Input current when off	--	2	10	mA
Hot Plug		Unavailable			
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	±0.75	
Transient Recovery Time	25% load step change		--	200	500	μs
Transient Response Deviation	25% load step change	5VDC output	--	±3	±7.5	%
		Others	--	±3	±5	
Temperature Coefficient	Full load		--	--	±0.03	%/℃
Ripple/Noise*	20MHz bandwidth	12VDC,15VDC output	--	100	200	mVp-p
		Others	--	150	250	
Over-voltage Protection	Input voltage range		110	130	160	%Vo
Over-current Protection			110	140	190	%Io
Short-circuit Protection			Hiccup, continuous, self-recovery			
Note: * 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 5mA max.	2250	--	--	VDC
	Input-case		1500	--	--	
	Output-case		500	--	--	
Insulation Resistance	Input-output resistance at 500VDC		100	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100KHz/0.1V		--	2200	--	pF
Trim Range*			95	--	110	%Vo
Remote Sense Compensation			--	--	105	
Operating Temperature			-40	--	+100	℃
Storage Temperature			-55	--	+125	
Over-temperature Protection	Max.case temperature		--	115	120	
Pin Soldering Resistance Temperature	Wave-soldering, 10 seconds		--	--	260	
	Soldering spot is 1.5mm away from case for 10 seconds		--	--	300	
Storage Humidity	Non-condensing		5	--	95	%RH
Vibration			IEC/EN61373 - Category 1, Grade B			
Switching Frequency	PWM mode		--	250	--	KHz
MTBF	MIL-HDBK-217F@25℃		500	--	--	K hours
Note:*For CFDQR75-48S05 and CFDQR75-48S15, the Trim function satisfies the output up to 10% or the Sense function satisfies the output up to 5%, Vin needs to be higher than 20VDC.						

Mechanical Specifications

Case Material	AAluminum alloy case; Black plastic bottom, flame-retardant and heat-resistant (UL94 V-0)	
Dimensions	CFDQR75-48S05	61.8×40.2×12.7mm
	CFDQR75-48S05S	61.8×40.2×27.7mm
Weight	CFDQR75-48S05	90.0g(Typ.)
	CFDQR75-48S05S	121.0g(Typ.)

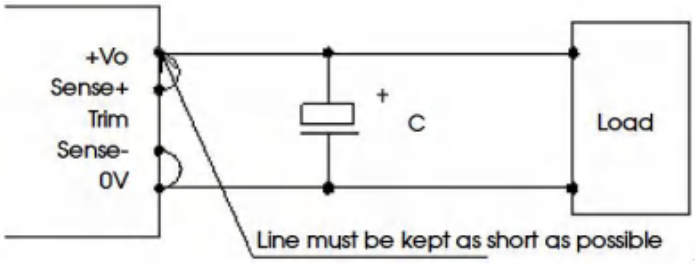
Cooling method	Natural convection (20FLM)	

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS A and CLASS B (see Fig.3 for recommended circuit)	
	RE	CISPR32/EN55032	CLASS A and CLASS B (see Fig.3 for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2,EN50121-3-2	Contact ±6KV Air ±8KV	perf.Criteria B
	RS	IEC/EN61000-4-3,EN50121-3-2	10V/m	perf.Criteria A
	EFT	IEC/EN61000-4-4,EN50121-3-2	±2KV(see Fig.2 for recommended circuit)	perf.Criteria A
	Surge	EN50121-3-2	differential mode ±1KV,1.2/50us,source impedance 42Ω (see Fig.2 for recommended circuit)	perf.Criteria B
	CS	IEC/EN61000-4-6,EN50121-3-2	10Vr.m.s	perf.Criteria A

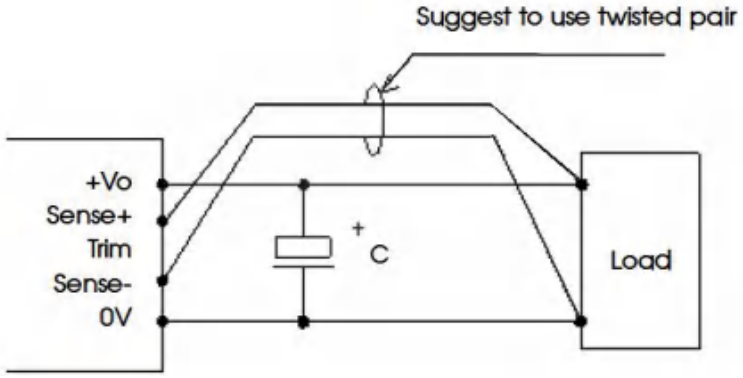
Remote Sense Application

1.Remote Sense Connection if not used



(1) If the sense function is not used for remote regulation the user must connect the +Sense to +Vo and -Sense to -Vo at the DC-DC converter pins and will compensate for voltage drop across pins only.
(2) The connections between Sense lines and their respective power lines must be kept as short as possible, otherwise they may be picking up noise, interference and/or causing unstable operation of the power module.

2.Remote Sense Connection used for Compensation



(1) Using remote sense with long wires may cause unstable output, please contact technical support if long wires must be used.
(2) PCB-tracks or cables/wires for Remote Sense must be kept as short as possible. Twisted pair or shielded wairs are suggested for remote compensation and must be kept as short as possible.
(3) We recommend using adequate cross section for PCB-track layout and/or cables to connect the power supply module to the load in order to keep the voltage drop below 0.3V and to make sure the power supply's output voltage remains within the specified range.
(4) Note that large wire impedance may cause oscillation of the output voltage and/or increased ripple. Consult technical support or factory for further advice of sense operation.

Design Reference

1.Typical application

(1)We recommended using the recommended circuit shown in Fig.1 during product testing and application, otherwise please ensure that at least a 220μF electrolytic capacitors is connected at the input in order to ensure adequate voltage surge suppression and protection.
(2)We recommended increasing the value of Cin and pay attention to the unstable input voltage if the product input side is paralleled with mmotor drive circuit and/or larger energy transient circuits, to ensure the stablity of input terminal and avoid repeatedly start-up problems due to input voltage lower than under-voltage protection point.
(3)We recommended increasing the output capacitance with limited to the capactive load specification and/or increasing the voltage clamping circuit(such as TVS) if the output terminal is inductive device such as relay or a motor, to ensure adequate voltage surge suppression and protection.
(4)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 specified max. capacitive load value of the product.

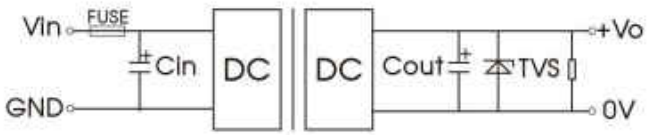


Fig.1

Vout(VDC)	Fuse	Cin*	Cout	TVS
5	10A, slow blow	220μF	470μF	SMDJ6.0A
12			220μF	SMDJ14A
15				SMDJ17A
24			100μF	SMDJ28A
48				SMDJ54A

Note:
*Please pay attention to the ambient temperature of the product when using an external capacitor, increase the electrolytic capacitor values to at least 1.5 times the original parameter if the ambient temperature is low(such as -25℃).

2.EMC solution-recommended circuit

We suggest to use the recommended circuit shown in Fig.2 during product EMC testing and application.

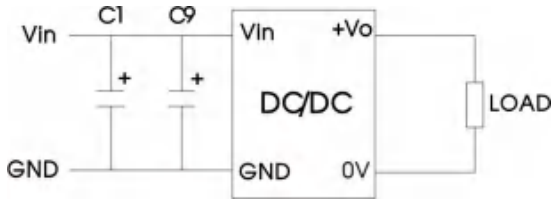


Fig.2

Capacitor	Recommended value	Function
C1	150μF electrolytic	Meets EFT and surge
C9	47μF electrolytic	

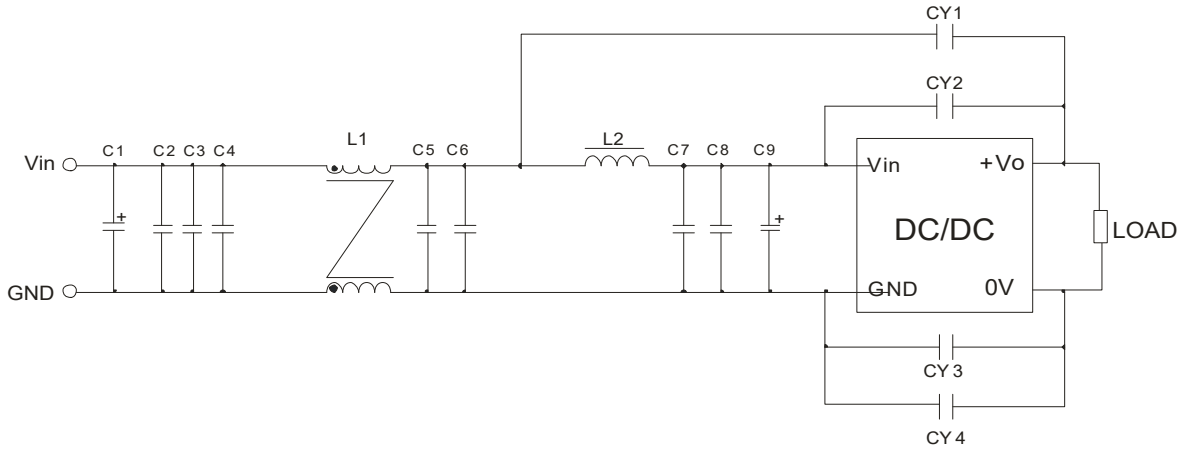
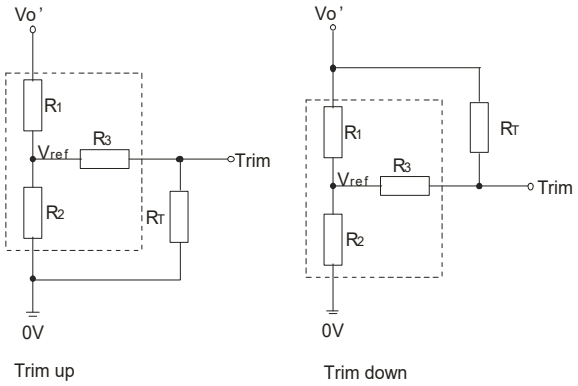


Fig.3

Class A components	Class B components	Recommended component value	function
C1		150μF electrolytic capacitor	Meets conducted emissionand radiated emission
C9		47μF electrolytic capacitor	
C1		150μF electrolytic capacitor	
C9		47μF electrolytic capacitor	
C2,C3,C4,C5,C6,C7,C8		2.2μF ceramic capacitor	
L1		1.0mH common mode inductor	
L2		1.5μH inductance	
CY3	CY1,CY2,CY3,CY4	1nF Y1 safety capacitor	

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



Calculation formula of Trim resistance:

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

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

RT=Trim Resistor value; a=self-defined parameter

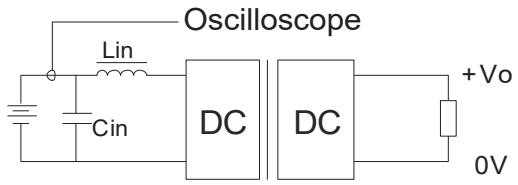
Vo'= desired output voltage(±10% max.)

TRIM resistor connection (dashed line shows internal resistor network)

Vout(VDC)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
5	3.036	3	10	2.5
12	11.00	2.87	15	2.5
15	14.03	2.8	15	2.5
24	24.872	2.87	15	2.5
48	53.017	2.913	15	2.5

NNote:If the Trim pin is shorted with “+Vo”, or its value is too low, then the output voltage Vo’ would be lower than 0.95Vo, which may cause permanent damage.

4. Reflected ripple current--test circuit

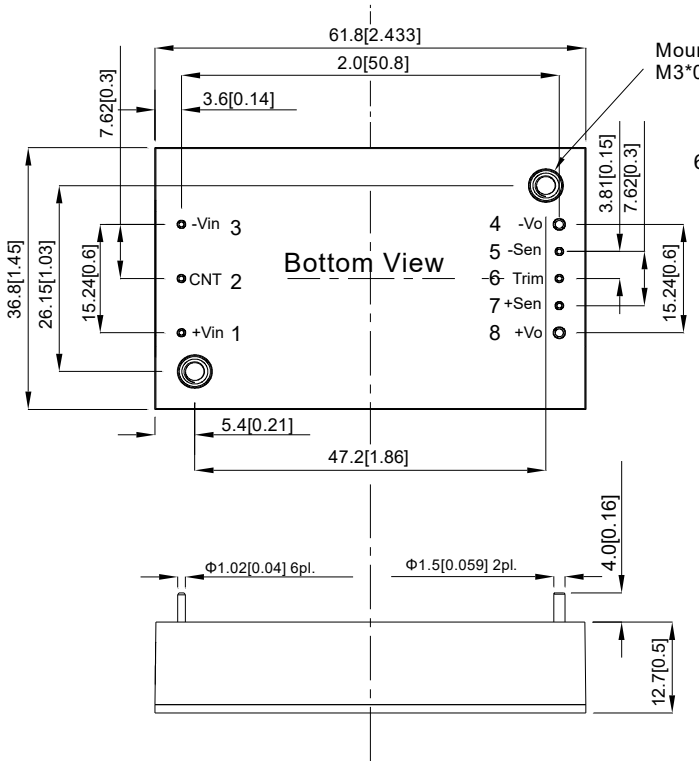


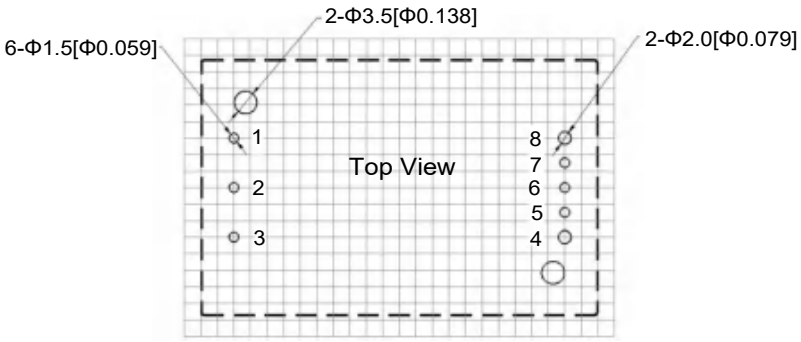
Note:Lin(4.7μH), Cin (220μF, ESR<1.0Ω at 100 KHz)

5. The products do not support parallel connection of their output
6. Ensure input current meet start-up current of the products, ensuring that the product is not underpower
7. For additional information please refer to application notes on www.chewins.net

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



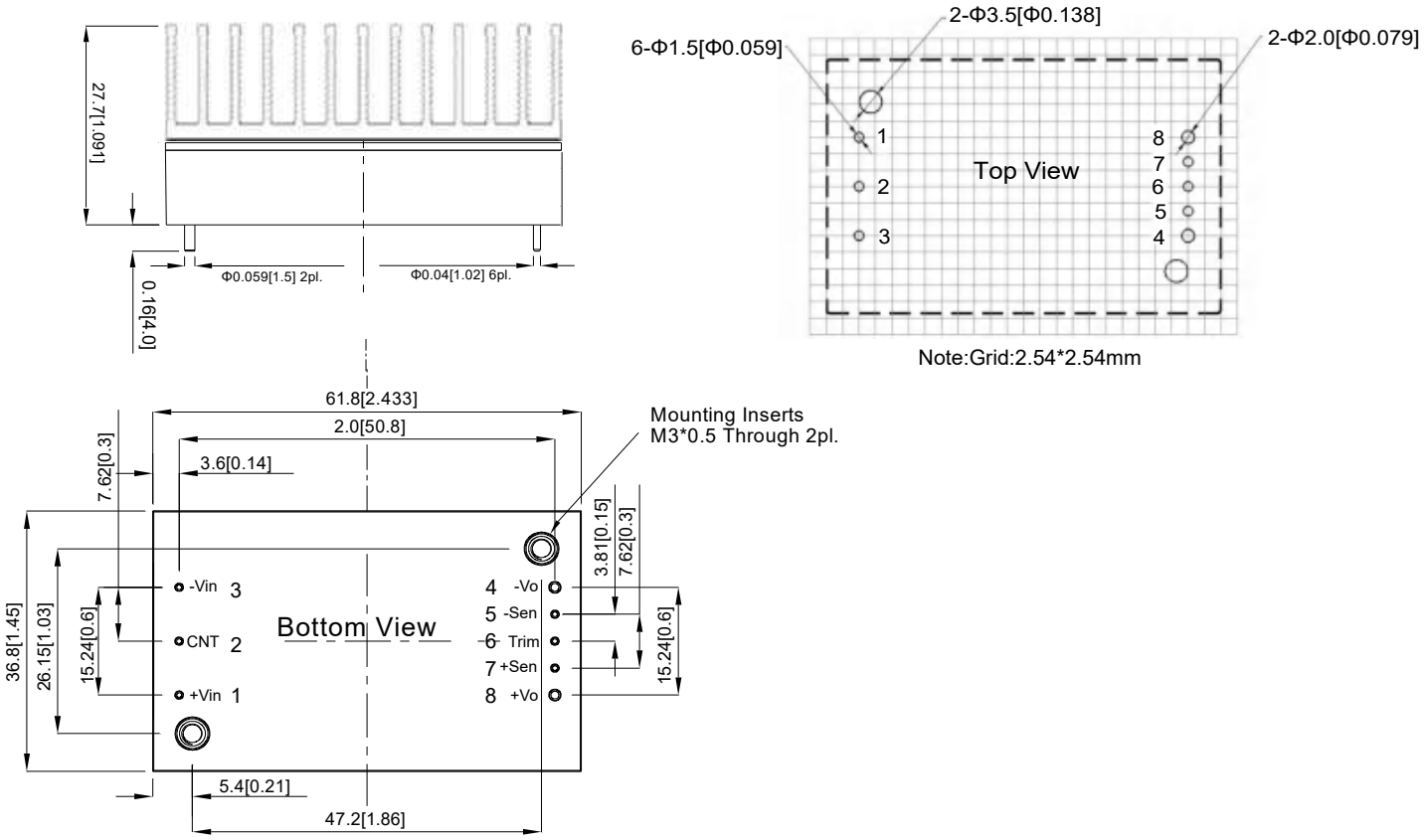


Note:Grid:2.54*2.54mm

All Dimensions In mm[inch]
Tolerances Inches:X.XX= ±0.02,X.XXX=±0.01
Millimeters:X.X= ±0.5,X.XX=±0.25

CFDQR75-48S05S Dimensions and Recommended Layout

Third angle projection



1.The recommended unbalance degree of the dual output module load is ≤±5%; if the degree exceeds ±5%, than the product performance cannot be guaranteed to comply with all parameters in the datasheet. Please contact our technicians directly for specific information;
2. The maximum capacitive load offered were tested at nominal input voltage and full load;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75% with nominal input voltage and rated output load;
The maximum capacitive load offered were tested at nominal input voltage and full load;
4.All index testing methods in this datasheet are based on our Company's corporate standards;
5.The performance parameters of the product models listed in this manual are as above, but some parameters of non-standard model products may exceed the requirements mentioned above. Please contact our technicians directly for specific information;
6.Specifications are subject to change without prior notice.

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