

2:1 wide voltage 6W isolated regulated output series

Product Features

- ◇ Packaging form: DIP plastic plug-in
- ◇ Temperature range: -40°C to +105°C
- ◇ Conversion efficiency: up to 88%
- ◇ Isolation withstand voltage: 1500VDC
- ◇ Input range: 2:1 wide input voltage
- ◇ Output protection: output over-current, output short-circuit protection
- ◇ Application fields: industry, electric power, instrumentation, communications, rail transit



Selection table

Product number	Input nominal voltage (VDC)		output		Full load efficiency (%) Min./Typ	Maximum capacitive load (μF)
	nominal value (range value)	maximum value (overvoltage protection point)	The output voltage (VDC)	Output current(mA) Max./Min.		
HWQ6-12D05V3	12 (9-18)	20	±5	±600/0	79/81	#470
HWQ6-12D12V3			±12	±250/0	83/85	#100
HWQ6-12D15V3			±15	±200/0	81/83	#100
HWQ6-12S05V3			5	1200/0	79/81	1000
HWQ6-12S12V3			12	500/0	83/85	470
HWQ6-12S24V3			24	250/0	83/85	100
HWQ6-24D05V3	24 (18-36)	40	±5	±600/0	81/83	#470
HWQ6-24D12V3			±12	±250/0	85/87	#100
HWQ6-24D15V3			±15	±200/0	85/87	#100
HWQ6-24S03V3			3.3	1500/0	75/77	1800
HWQ6-24S05V3			5	1200/0	80/82	1000
HWQ6-24S09V3			9	667/0	83/85	470
HWQ6-24S12V3			12	500/0	83/85	470
HWQ6-24S15V3			15	400/0	84/86	220
HWQ6-24S24V3			24	250/0	83/85	100
HWQ6-48S03V3	48 (36-75)	80	3.3	1500/0	77/79	1800
HWQ6-48S05V3			5	1200/0	81/83	1000
HWQ6-48S12V3			12	500/0	85/87	470
HWQ6-48S15V3			15	400/0	86/88	220
HWQ6-48S24V3			24	250/0	86/88	100

*Remarks: “ # ” represents dual outputs for each channel

Input properties

item	working conditions		Min.	Typ.	Max.	unit
Input current (full load/no load)	12VDC nominal input series, nominal input current		--	603/10	633/22	mA
	24VDC nominal input series, nominal input voltage	3.3V output	--	268/5	275/15	
		other	--	296/5	313/15	
	48VDC nominal input series, nominal input voltage	3.3V output	--	130/4	134/8	
other		--	150/4	155/8		
Reflected ripple current			--	20	--	
Input surge voltage	12VDC nominal input series		-0.7	--	25	VDC
	24VDC nominal input series		-0.7	--	50	
	48VDC nominal input series		-0.7	--	100	
Starting voltage	12VDC nominal input series		--	--	9	
	24VDC nominal input series		--	--	18	
	48VDC nominal input series		--	--	36	
Input undervoltage protection	12VDC nominal input series		5.5	6.5	--	
	24VDC nominal input series		12	15.5	--	
	48VDC nominal input series		26	30	--	
Input filter type			PI type			
hot plug			not support			

Output characteristics

item	working conditions		Min.	Typ.	Max.	unit
Output voltage accuracy	0%-100% load		--	±1	±3	%
Linear regulation rate	Full load, input voltage from low voltage to high voltage	Vo1	--	±0.2	±0.5	
		Vo2	--	±0.5	±1	
Load regulation	5% - 100% load	Vo1	--	±0.5	±1	
		Vo2	--	±0.5	±1.5	
ripple noise	20MHz bandwidth , 100% load		--	60	85	mVp-p
cross regulation rate	Dual output, main channel 50% loaded, auxiliary channel 10%-100% loaded		--	--	±5	%
transient recovery time	25% load step change, nominal input voltage		--	300	500	μs
Transient response deviation			--	±3	±5	%
Temperature drift coefficient	Fully loaded		--	--	±0.03	%/ °C

Overvoltage protection	Input voltage range	110	--	160	%Vo.
Overcurrent protection		110	140	190	%Io
Short circuit protection		Sustainable, self-healing			

General features

item	working conditions	Min.	Typ.	Max.	unit
Insulation voltage	Input-output, test time 1 minute, leakage current less than 1mA	1500	--	--	VDC
Insulation resistance	Input-output, insulation voltage 500VDC/1 minute, normal temperature, 75%RH	1000	--	--	MΩ
isolation capacitor	Input-output, 100KHZ, 0.1V	--	1000	--	pF
Operating temperature		-40	--	+85	C°
Storage temperature		-55	--	+125	
Storage humidity		5	--	95	%RH
Pin soldering temperature	Soldering point is 1.5mm away from the shell, 10 seconds	--	--	+300	°C
On-off level	HWQ6-24S05V3	--	208.3	--	kHz
	Other models	--	312.5	--	
mean time between failures		1000			Hours

physical properties

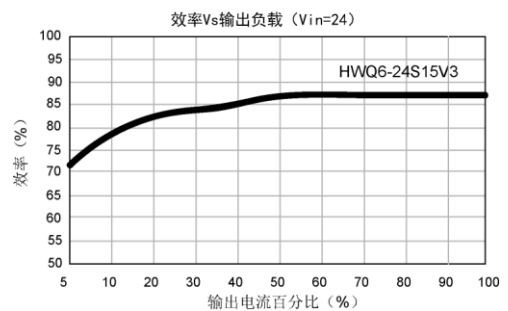
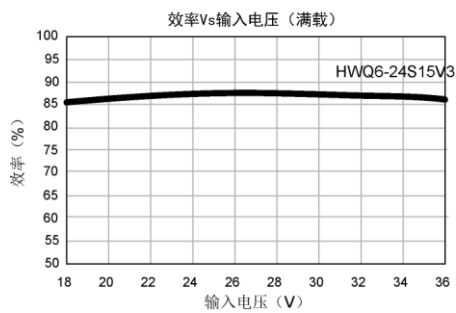
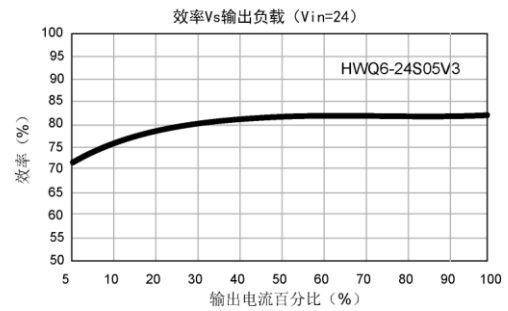
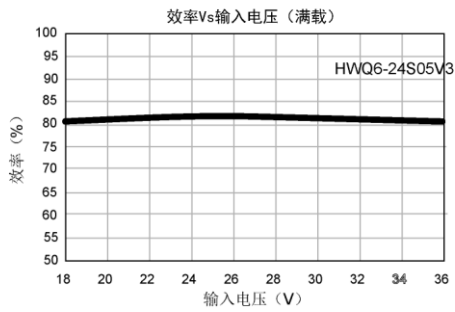
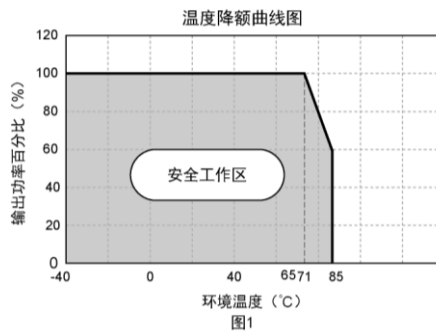
Shell material	Aluminum alloy, black anodized coating
Package size	25.50×25.50× 12.00mm
weight	15g
cooling method	Natural air cooling

EMC characteristics

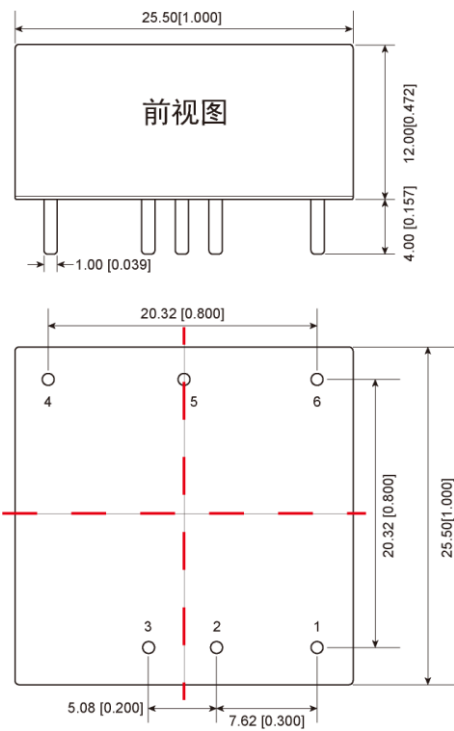
EMI	conducted disturbance	CISPR32/EN55032 CLASS A (bare board)/CLASS B (recommended circuit shown in Figure 3-(2))
	Radiation harassment	CISPR32/EN55032 CLASS A (bare board)/CLASS B (recommended circuit shown in Figure 3-(2))
EMS	electrostatic discharge	IEC/EN61000-4-2 Contact±4KV Perf.Criteria B

Radiated immunity	IEC/EN61000-4-3 10V/m Perf.Criteria A
Burst Immunity	IEC/EN61000-4-4 ±2KV (see Figure 3-① for recommended circuit) Perf.Criteria B
Surge Immunity	IEC/EN61000-4-5 line to line±2KV (recommended circuit shown in Figure 3-①) Perf.Criteria B
Conducted disturbance immunity	IEC/EN61000-4-6 3 Vr.ms Perf.Criteria A

Product Characteristics Curve



Appearance dimensions/recommended printing layout



Size unit: mm [inch]
 Terminal diameter tolerance: ± 0.10 [± 0.004]
 Unmarked tolerances: ± 0.50 [± 0.020]

Pin no.	Function (single channel)	Function (dual channel)
1	No Pin	No Pin
2	GND	GND
3	Vin	Vin
4	+Vo	+Vo
5	No Pin	COM
6	-Vo	-Vo

circuit design

1. Typical application circuit

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 cannot be greater than the maximum capacitive load of the product.

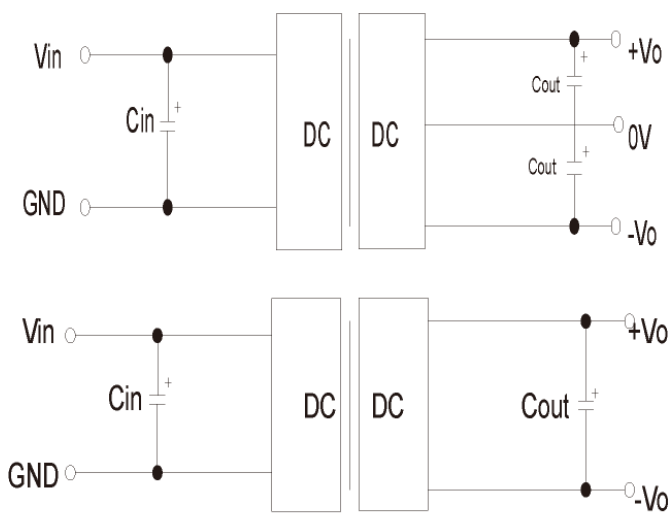


图2

Vin	Cin	Cout
12V	100uF	10uF
24V	10-47uF	
48V	100uF	

2.EMC solution----recommended circuit

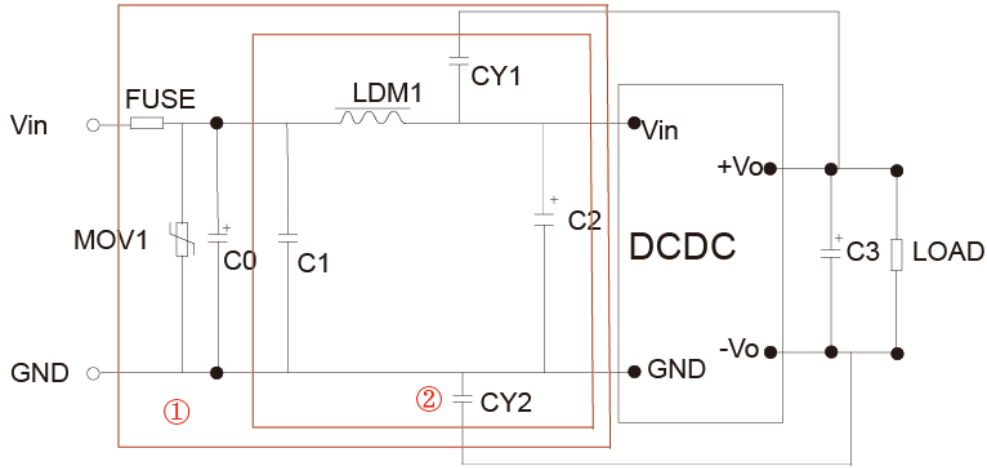


图3

Model	Vin: 12V	Vin: 24V	Vin: 48V
FUSE	Select according to customer's actual input current		
MOV	14D330K	20D470K	14D101K
C0	1000uF/35V	1000uF/50V	680uF/100V
C1	1uF/50V		4.7uF/100V
C2	330uF/35V	330uF/50V	330uF/100V
C3	Refer to the Cout parameter in Figure 2		
LDM1	4.7uH		
CY1、CY2	1nF/2KV		

Note:

The first part in Figure 3 is used for EMC testing;

Part 2 is used for EMI filtering and can be selected according to needs.

Note:

1. If the product operates below the minimum required load, there is no guarantee that the product performance will comply with all performance indicators in this manual;
2. The maximum capacitive load is tested under input voltage range and full load conditions;
3. Unless otherwise specified, all indicators in this manual are measured at Ta=25°C, temperature <75%RH, nominal input voltage and output rated load;
4. All index testing methods in this manual are based on the company's corporate standards;
5. Our company can provide product customization, please contact our sales engineer directly for specific needs;

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