

## Product Features

- ◇ Packaging form: DIP plastic plug-in
- ◇ Temperature range: -40°C to +85°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

2:1 wide voltage 10W isolated regulated output series



## Selection table

Product number	Input voltage (VDC)	output		Full load efficiency (%) Min./Typ.	Maximum capacitive load (μF)
		The output voltage (VDC)	Output current (mA) Max./Min		
HWQ10-05S05V3	5 (4.5-9)	5	2000/0	83/85	470
HWQ10-05S12V3		12	834/0	81/83	470
HWQ10-05S15V3		15	667/0	82/84	330
HWQ10-05S24V3		24	417/0	81/83	100
HWQ10-05D05V3		±5	±1000/0	76/78	1000#
HWQ10-05D12V3		±12	±417/0	81/83	470#
HWQ10-05D15V3		±15	±334/0	82/84	330#
HWQ10-05D24V3		±24	±209/0	81/83	100#
HWQ10-12S05V3	12 (9-18)	5	2000/0	81/83	2200
HWQ10-12S12V3		12	833/0	85/87	470
HWQ10-12S15V3		15	667/0	86/88	330
HWQ10-12S24V3		24	416/0	86/88	100
HWQ10-12D05V3		±5	±1000/0	81/83	1000#
HWQ10-12D12V3		±12	±417/0	84/86	470#
HWQ10-12D15V3		±15	±334/0	85/87	330#
HWQ10-12D24V3		±24	±209/0	85/87	100#
HWQ10-24S03V3	24 (18-36)	3.3	2400/0	77/79	2200
HWQ10-24S05V3		5	2000/0	81/83	2200
HWQ10-24S12V3		12	833/0	85/87	470
HWQ10-24S15V3		15	667/0	86/88	330
HWQ10-24S24V3		24	416/0	86/88	100
HWQ10-24D05V3		±5	±1000/0	81/83	1000#
HWQ10-24D12V3		±12	±417/0	85/87	470#
HWQ10-24D15V3		±15	±334/0	86/88	330#
HWQ10-24D24V3	±24	±209/0	86/88	100#	

HWQ10-48S03V3	48 (36-75)	3.3	2400/0	77/79	2200
HWQ10-48S05V3		5	2000/0	81/83	2200
HWQ10-48S12V3		12	834/0	85/87	470
HWQ10-48S15V3		15	667/0	85/87	330
HWQ10-48 S24V3		twenty four	41 6 /0	86/88	100

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

### Input properties

item	working conditions	Min.	Typ.	Max.	unit
Input surge voltage	5VDC input	-0.7	--	16	VDC
	12VDC input	-0.7	--	25	
	24VDC input	-0.7	--	50	
	48VDC input	-0.7	--	100	
Starting voltage	5VDC input	--	--	4.5	
	12VDC input	--	--	9	
	24VDC input	--	--	18	
	48VDC input	--	--	36	
Input undervoltage protection	5VDC input	3	3.5	--	
	12VDC input	5.5	6.5	--	
	24VDC input	12	15.5	--	
	48VDC input	26	30	--	
Start Time	Nominal input and constant resistance load	--	10	--	ms
Ctrl foot function	module on	Floating or conducting at 2.7V-9V			
	Module shutdown	0V-1.2V shutdown			
Input filter type		PI type			
hot plug		not support			

### Output characteristics

item	working conditions	Min.	Typ.	Max.	unit
Output voltage accuracy	0%-100% load	--	±1.0	±3.0	%
Linear regulation rate	Full load, input voltage from low voltage to high voltage	--	--	±0.5	
Load regulation	0% to 100% load	single output	--	±1.0	
		Dual output	--	±1.5	
ripple noise	20MHz bandwidth , 5%-100% load	--	40	100	mVp-p
transient recovery time	25% load step change, nominal input voltage	--	300	500	µs
Transient response deviation		--	±3	±5	%
Temperature drift		--	--	±0.03	%/ °C

coefficient					
Overcurrent protection		110	140	190	% I <sub>o</sub>
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		-50	--	+125	
Storage humidity		5	--	95	%RH
Pin resistance to soldering temperature	Soldering point is 1.5mm away from the shell, 10 seconds	--	--	+300	°C
On-off level		--	312.5	--	kHz
mean time between failures		1000	--	--	K Hours

### physical properties

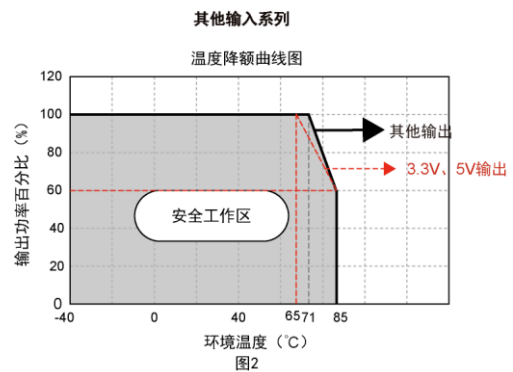
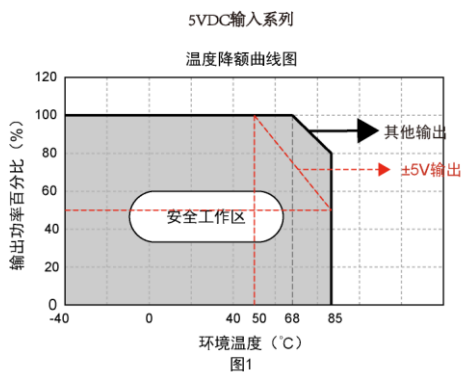
Shell material	Aluminum alloy, black anodized coating
Package size	25.50×25.50×12.00mm
weight	15g
cooling method	Natural air cooling

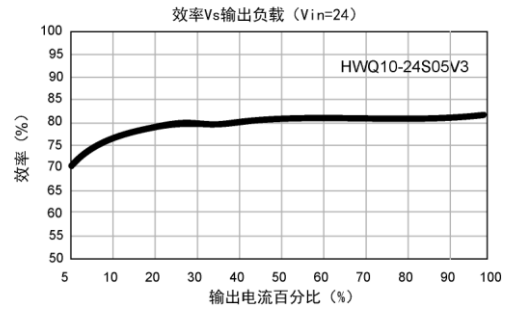
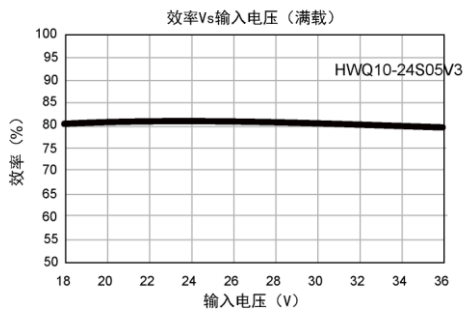
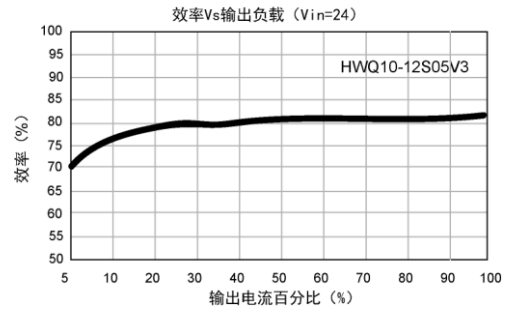
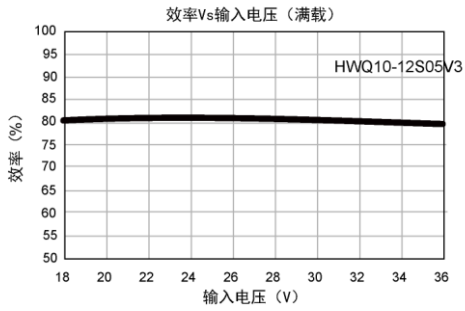
### EMC characteristics

EMI	conducted disturbance	5VDC nominal input series	CISPR32/EN55032 CLASS B (recommended circuit shown in Figure 6-②)
		12VDC nominal input series	CISPR32/EN55032 CLASS A (bare board)/CLASS B (recommended circuit shown in Figure 5-②)
		24VDC nominal input series	CISPR32/EN55032 CLASS A (bare board)/CLASS B (recommended circuit shown in Figure 4-②)
		48VDC nominal input series	CISPR32/EN55032 CLASS B (recommended circuit shown in Figure 4-②)

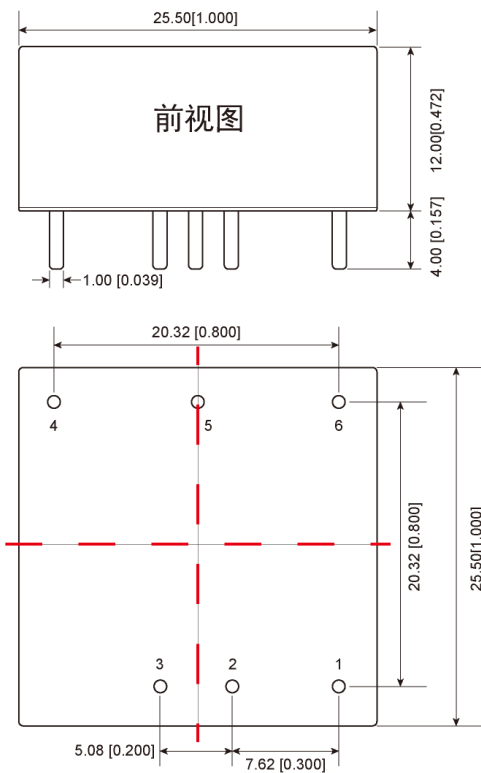
	radiation	5VDC nominal input series	CISPR32/EN55032 CLASS B (recommended circuit shown in Figure 6-②)	
		12VDC nominal input series	CISPR32/EN55032 CLASS A (bare board)/CLASS B (recommended circuit shown in Figure 5-②)	
		24VDC nominal input series	CISPR32/EN55032 CLASS A (bare board)/CLASS B (recommended circuit shown in Figure 4-②)	
		48VDC nominal input series	CISPR32/EN55032 CLASS B (recommended circuit shown in Figure 4-②)	
EMS	electrostatic discharge	5VDC nominal input series	IEC/EN61000-4-2 Contact±6KV	Perf.Criteria B
		Other nominal input series	IEC/EN61000-4-2 Contact±4KV	Perf.Criteria B
	Radiated immunity		IEC/EN61000-4-3 10V/m	Perf.Criteria A
	Burst Immunity	Other nominal input series	IEC/EN61000-4-4 ±2KV (recommended circuit shown in Figure 4-①)	Perf.Criteria B
		5VDC nominal input series	IEC/EN61000-4-4 ±2KV (recommended circuit shown in Figure 6-①)	Perf.Criteria B
		12VDC nominal input series	IEC/EN61000-4-4 ±2KV (recommended circuit shown in Figure 5-①)	Perf.Criteria B
	Surge Immunity	Other nominal input series	IEC/EN61000-4-5 line to line±2KV (see Figure 4-① for recommended circuit)	Perf.Criteria B
		5VDC nominal input series	IEC/EN61000-4-5 line to line±2KV (see Figure 6-① for recommended circuit)	Perf.Criteria B
		12VDC nominal input series	IEC/EN61000-4-5 line to line±2KV (recommended circuit shown in Figure 5-①)	Perf.Criteria B
	Conducted disturbance immunity		IEC/EN61000-4-6 3Vr.ms	Perf.Criteria A

Product Characteristics Curve





Appearance dimensions/recommended printing layout



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

Pin no.	Function (single channel)	Function (dual channel)
1	CTRL	
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 3) 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

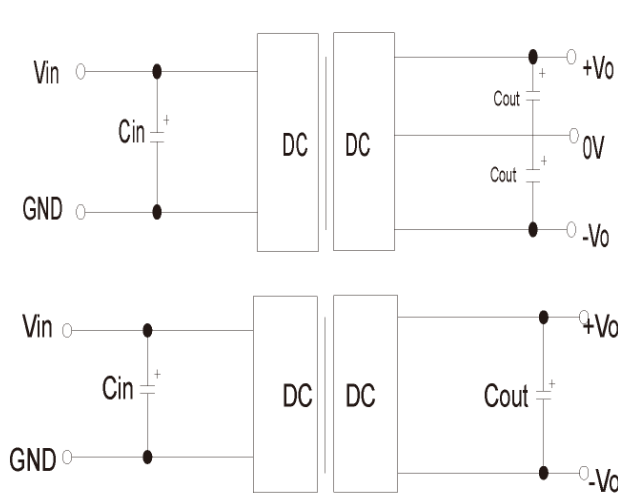


图3

图

Vin	5V/12V/24V/48V
Cin	100uF
Cout	10uF

2. EMC solution----recommended circuit

24VDC/48VDC Nominal input series

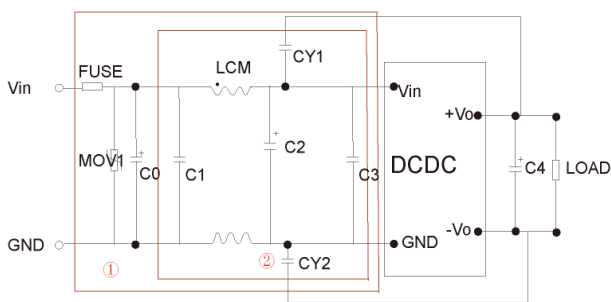


图4

Model	Vin: 24V	Vin: 48V
FUSE	Select according to customer's actual input current	
MOV	20D470K	14D101K
C0	680uF/50V	680uF/100V
C1	1uF/50V	1uF/100V
C2	330uF/50V	330uF/100V
C3	4.7uF/50V	4.7uF/100V
C4	Refer to the Cout parameter in Figure 3	
LCM	4.7mH	
CY1、CY2	1nF/2KV	

12VDC Nominal

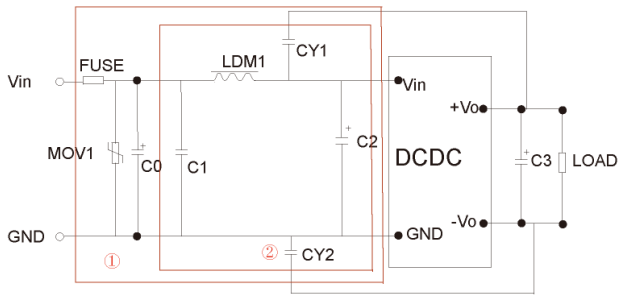


图5

Model	Vin: 12V
FUSE	Select according to customer's actual input current
MOV	20D470K
C0、C2	330uF/50V
C1	1uF/50V
C3	Refer to the Cout parameter in Figure 3
LDM1	4.7uH
CY1、CY2	1nF/2KV

5VDC Nominal

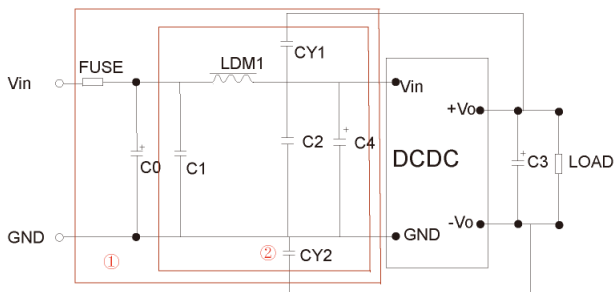


图6

Model	Vin: 5V
FUSE	Select according to customer's actual input current
C0	2200uF/35V
C1、C2	4.7uF/50V
C4	1000uF/35V
C3	Refer to the Cout parameter in Figure 3
LDM1	4.7uH
CY1、CY2	1nF/2KV

Note:

In Figure 4, 5, 6, the first part is used for EMC testing;

The second part 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;

## About us

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