

Product Features

- ◇ Packaging form: DIP plastic plug-in
- ◇ Temperature range: -40°C to +105°C
- ◇ Conversion efficiency: up to 91%
- ◇ Isolation withstand voltage: 1500VDC
- ◇ Input range: 2:1 wide input voltage
- ◇ Output protection: output over-current, output short-circuit protection

2:1 wide voltage 15W isolated regulated output series



Selection table

Product number	Input nominal voltage (VDC)		output		Full load efficiency (% ,Typ)	Maximum Capacitive Load (μF)
	nominal value (range value)	maximum value	The output voltage (VDC)	Output current (mA) Max./Min.		
HWQ15-12S03V3	12 (9-18)	20	3.3	4000/0	86/88	4700
HWQ15-12S05V3			5	3000/0	88/90	4700
HWQ15-12S12V3			12	1250/0	88/90	1000
HWQ15-12S15V3			15	1000/0	89/91	820
HWQ15-12S48V3			48	313/0	88/89	100
HWQ15-24S03V3	24 (18-36)	40	3.3	4000/0	86/88	4700
HWQ15-24S05V3			5	3000/0	88/89	4700
HWQ15-24S12V3			12	1250/0	88/89	1000
HWQ15-24S15V3			15	1000/0	89/91	820
HWQ15-24D05V3			± 5	±1500/0	88/89	#1500
HWQ15-24D12V3			± 12	±625/0	88/89	#470
HWQ15-24D15V3	± 15	±500/0	89/91	#330		
HWQ15-48S03V3	48 (36-75)	80	3.3	4000/0	86/88	4700
HWQ15-48S05V3			5	3000/0	88/90	4700
HWQ15-48S12V3			12	1250/0	89/91	1000
HWQ15-48S15V3			15	1000/0	89/91	820
HWQ15-48S24V3			24	625/0	89/91	820

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

Input properties

project	working conditions		Min.	Typ.	Max.	unit
Input current (full load / no load)	12VDC nominal input series, nominal input voltage	3.3V output	--	1250/40	1280/65	mA
		5V output	--	1389/40	1421/65	
		12V output	--	1389/7	1421/22	
		15V output	--	1374/7	1405/22	
		24V output	--	1374/12	1405/22	
	24VDC nominal input	3.3V output	--	625/30	647/50	

	series, nominal input voltage	5V output	--	695/30	711/50	
		12V output	--	695/6	711/15	
		15V output	--	687/6	703/15	
		24V output	--	687/10	703/20	
	48VDC nominal input series, nominal input voltage	3.3V output	--	313/15	320/30	
		5V output	--	348/15	356/30	
		12V output	--	344/3	352/11	
		15V output	--	344/3	352/11	
		24V output	--	344/4	352/11	
Reflected ripple current	Nominal input voltage		--	30	--	
Input surge voltage	12VDC nominal input series		-0.7	--	25	VDC
	24VDC nominal input series		-0.7	--	--	
	48VDC nominal input series		-0.7	--	100	
Starting voltage	12VDC nominal input series		--	--	9	
	24VDC nominal input series		--	--	--	
	48VDC nominal input series		--	--	18	
Input undervoltage protection	12VDC nominal input series		5.5	6.5	--	
	24VDC nominal input series		12	15.5	--	
	48VDC nominal input series		26	30	--	
Start Time	Nominal input vs. constant resistance load		--	10	--	ms
Remote shutdown function	module on		C TRL is left floating or connected to TTL high level (3.5-12VDC)			
	Module shutdown		CTRL connected to GND or low level (0 -1 . 2VDC)			
	Input current during shutdown		--	2	7	mA
Input filter type			PI type			
hot plug			not support			

Output characteristics

project	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	--	±0.2	±0.5	
Load regulation	5% to 100% load	--	±0.5	±1.0	
cross adjustment rate	Dual output, main channel 50% loaded, auxiliary channel 10%-100%	--	--	± 5	%
ripple noise	20MHz bandwidth , 5% to 100% load	--	50	100	mVp-p

transient recovery time	25% load step change, nominal input voltage		--	300	500	μs
Transient response deviation		3.3V , 5V output	--	±3.0	±7.0	%
		Other outputs	--	±3.0	±5.0	
Temperature drift coefficient	Fully loaded		--	--	±0.03	%/ °C
Output voltage is adjustable	Input voltage range		90	--	110	%
Overvoltage protection			110	--	160	
Overcurrent protection			110	150	190	
Short circuit protection			Burp-like, sustainable, self-restoring			

General features

project	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, isolation voltage 500VDC	1000	--	--	MΩ
isolation capacitor	Input - output, 100KHz , 0.1V	--	2000	--	pF
Operating temperature	See Figure 1	-40	--	+105 _	C°
Storage temperature		-55	--	+125	
Storage humidity	No condensation	5	--	95	%RH
Pin resistance to soldering temperature	1.5mm away from the shell , 10 seconds	--	--	+300	°C
On-off level	PWM mode	--	3 0 0	--	kHz
mean time between failures	MIL-HDBK-217F@25 °C	1000	--	--	kHours

physical properties

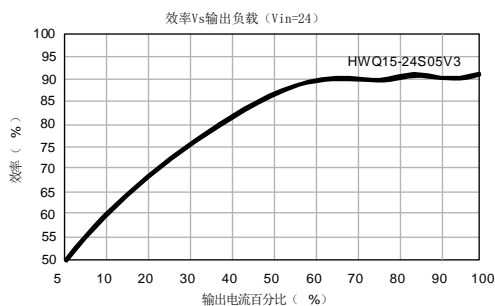
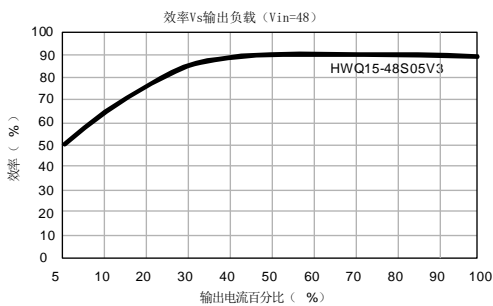
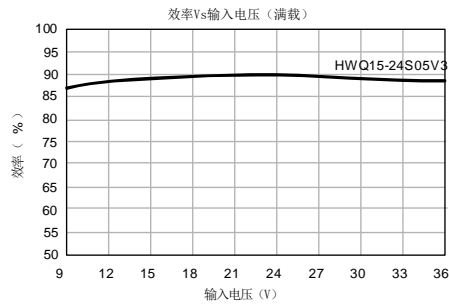
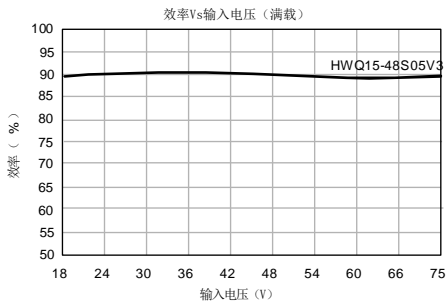
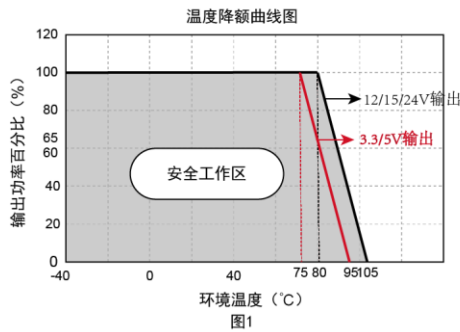
Shell material	Aluminum alloy, black anodized coating
Package size	25.40 × 25.40 × 12.00 mm
weight	15g

cooling method	Natural air cooling
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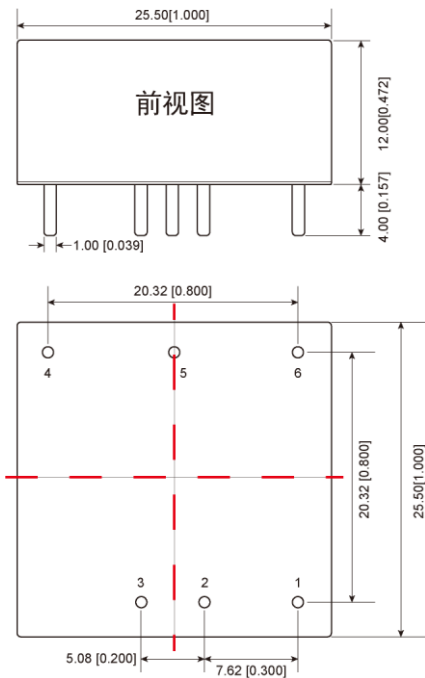
EMC characteristics

EMI	conducted disturbance	CISPR32/EN55032 CLASS A (bare metal) , CLASS B (see Figure 3-2 for recommended circuit)	
	Radiation harassment		
EMS	electrostatic discharge	IEC/EN61000-4-2	perf. Criteria B
	Radiated immunity	IEC/EN61000-4-3	perf. Criteria A
	Burst Immunity	IEC/EN61000-4-4	perf. Criteria B
	Surge Immunity	IEC/EN61000-4-5	perf. Criteria B
	Conducted disturbance immunity	IEC/EN61000-4-6	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]

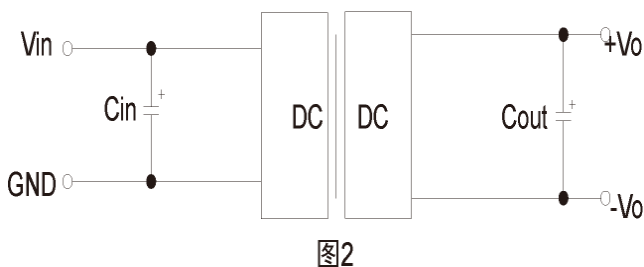
pin	Function (single channel)	Function (dual channel)
1	CTRL	CTRL
2	GND	GND
3	Vin	Vin
4	+Vo	+Vo
5	Trim	COM
6	-Vo	-Vo

circuit design

1.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 Cin and Cout 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.

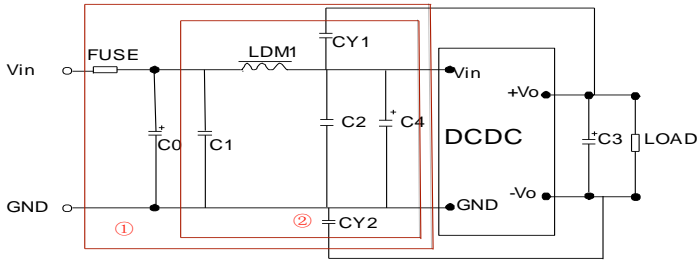
Figure 2



Vout(VDC)	Cin(uF)	Cout(uF)
3.3/5/12/15	100	100
24		47

2. EMC Solution – Recommended Circuit

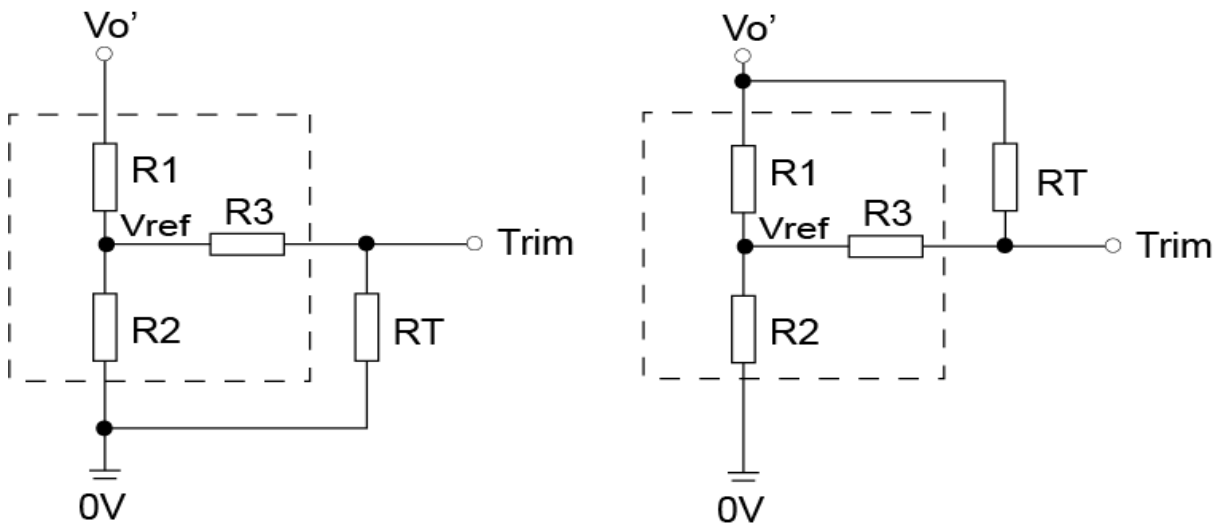
Parameter Description:



model	Vin : 24V	Vin:48V
FUSE	Select according to customer's actual input current	
C0 , C4	330uF /50V	330uF /50V
C1 , C2	330uF /50V	330uF /50V
C3	Cout parameter in Figure 2	
LDM1	2.2uF /4A	
CY1 , CY2	1nF/2KV	

Figure 3

3. The use of Trim and the calculation of Trim resistance



Vout(V)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
3.3	10	6.064	13.622	1.24
5	2.4	2.344	13.622	2.5
12	8.2	2.153	17.346	2.5
15	12	2.388	21.016	2.5
24	10	1.158	10.714	2.5

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;

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3. Unless otherwise specified, all indicators in this manual are measured at $T_a=25\text{ }^\circ\text{C}$, temperature $<75\%\text{RH}$, 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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