4:1 wide voltage 20W isolated regulated output series

Product Features

- ✧ Packaging form: DIP plastic plug-in
- ✧ Temperature range: -40℃ to +105℃
- ✧ Conversion efficiency: up to 91%
- ✧ Isolation withstand voltage: 1500VDC
- ✧ Input range: 4:1 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 (%,Typ)	Maximum Capacitive Load (μF)
	nominal value (range value)	maximum value	The output voltage (VDC)	Output current (mA) Max./Min . _ _		
HVR20-24S03	24 (9-36)	40	3.3	5000/0	84/86	10000
HVR20-24S05			5	4000/0	86/88	10000
HVR20-24S09			9	2222/0	87/89	4700
HVR20-24S12			12	1667/0	87/89	1600
HVR20-24S15			15	1333/0	88/90	1000
HVR20-24S24			24	834/0	88/90	500
HVR20-24S03	48 (18-75)	80	3.3	5000/0	84/86	10000
HVR20-24S05			5	4000/0	84/86	10000
HVR20-24S09			9	2222/0	8789	4700
HVR20-24S12			12	1667/0	85/87	1600
HVR20-24S15			15	1333/0	88/90	1000
HVR20-24S24			24	834/0	86/88	500

Input properties

item	working conditions		Min.	Typ.	Max.	unit
Input current (full load / no load)	24 VDC input	3.3 V output	--	779/40	818/45	mA
		5.0 V _ output	--	969/40	993/80	
		Other voltages	--	947/6	969/10	
	48 VDC input	3.3V output	--	400/20	409/25	
		5.0 V output _	--	485/20	497/60	
		Other voltages	--	475/5	485/9	
Reflected ripple current	24 VDC input		--	30	--	mA
	48 VDC input		--	30	--	
Input surge voltage	24VDC nominal input series		-0.7	--	50	VDC
	48 VDC nominal input series		-0.7	--	100	
Starting voltage	24VDC nominal input series		--	--	9	
	48 VDC nominal input series		--	--	18	
Input undervoltage protection	24VDC nominal input series		5.5	6.5 _	--	
	48 VDC nominal input series		12	15.5	--	
Start Time	Nominal input vs. constant resistance load		--	10	--	ms
Remote control foot (CTRL)	module on		CTRL 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		--	4	7	mA
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		--	±0.2	±0.5	
Load regulation rate	5% -100% load		--	±0.5	±1	
ripple noise	20MHz bandwidth, 5%-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	--	±5	±8	%
		Other outputs	--	±3	±5	
Temperature drift coefficient	Fully loaded		--	--	±0.03	%/ ℃
Output voltage regulation Trim	Input voltage range (24V, 48V input)		--	± 10	--	%Vo
Output overvoltage	Input voltage range		110	--	160	

protection					
Output overcurrent protection		110	150	190	% Io
Short circuit protection		Burp-like, sustainable, self-restoring			

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	HVR20-24S24	--	2050	--	pF
		Other models	--	1050	--	
Operating temperature	See Figure 1	--	-40	--	+85 _	C°
		--				
Storage temperature			-50	--	+125	C°
Storage humidity	No condensation		--	--	95	%RH
Pin resistance to soldering temperature	1.5mm away from the shell , 10 seconds		--	--	260	℃
On-off level	PWM mode		--	27 0	--	kHz
mean time between failures	MIL-HDBK-217F@25 ℃		1000	--	--	kHours

physical properties

Shell material	Aluminum alloy, black anodized coating
Package size	50.8 × 25.4 × 11.9 mm
weight	28 g (typ.)
cooling method	Natural air cooling

EMC characteristics

EMI	Conduction (CE)	CISPR32/EN55032 CLASS A (bare metal)/ CLASS B (see Figure 3-② for recommended circuit)	
	Radiation (RE)	CISPR32/EN55032 CLASS A (bare metal)/ CLASS B (see Figure 3-② for recommended circuit)	
EMS	Electrostatic discharge (ESD)	IEC/EN61000-4-2 Contact±4KV	perf. Criteria B

	Radiated Immunity (RS)	IEC/EN61000-4-3 10V/m	perf. Criteria A
	Burst Immunity (EFT)	IEC/EN61000-4-4 ±2KV (see Figure 3-① for recommended circuit)	perf. Criteria B
	Surge immunity (Surge)	IEC/EN61000-4-5 line to line±2KV (see Figure 3-① for recommended circuit)	perf. Criteria B
	Conducted disturbance immunity (CS)	IEC/EN61000-4-6 3Vr.ms	perf. Criteria A
	Voltage sags, dips and short interruption immunity	IEC/EN61000-4-29 0%, 70%	perf. Criteria B

Product Characteristics Curve

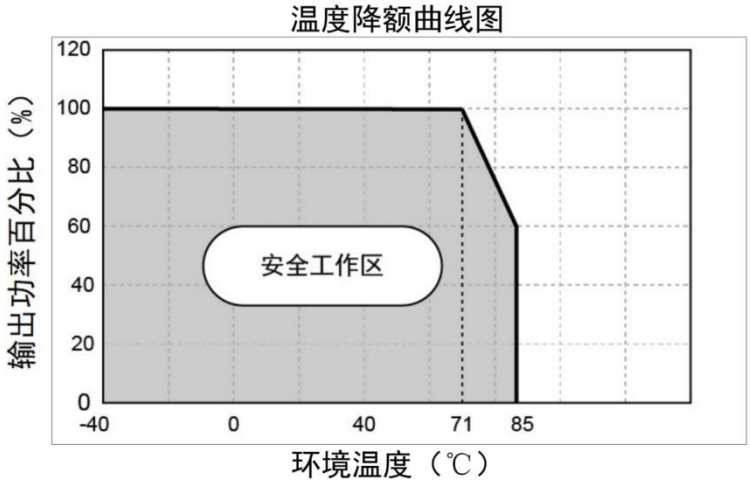
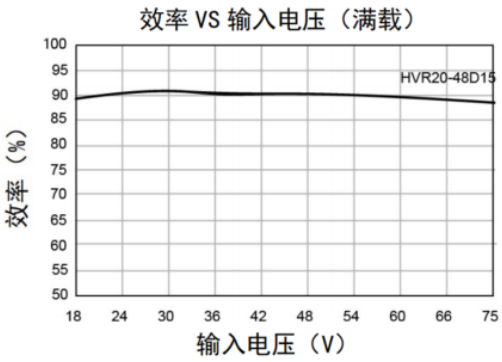
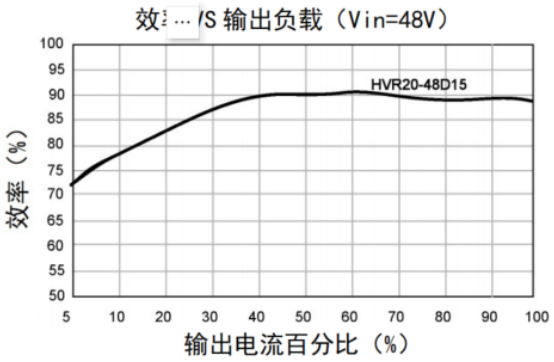
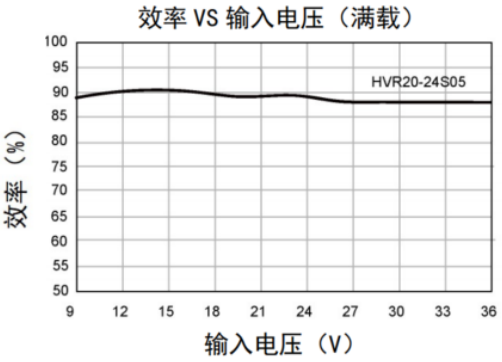
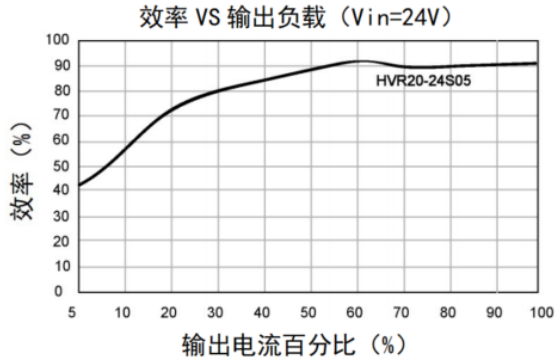


图 1









Typical circuit design and applications

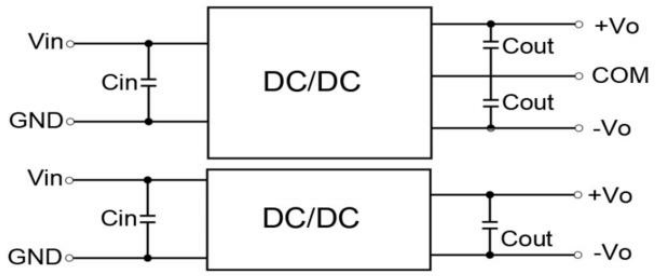
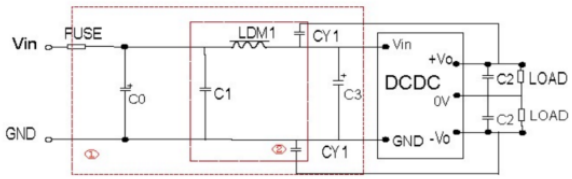


图 2

推荐容性负载值表					
单路 Vout (VDC)	Cout (μF)	Cin (uF)	双路 Vout (VDC)	Cout (μF)	Cin (uF)
3.3/5	470	100	±5	220	100
9/ 12/ 15	220		±9/ ±12/ ±15	100	
24	100		--	--	

双路



单路

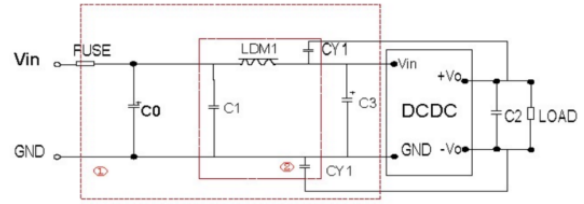
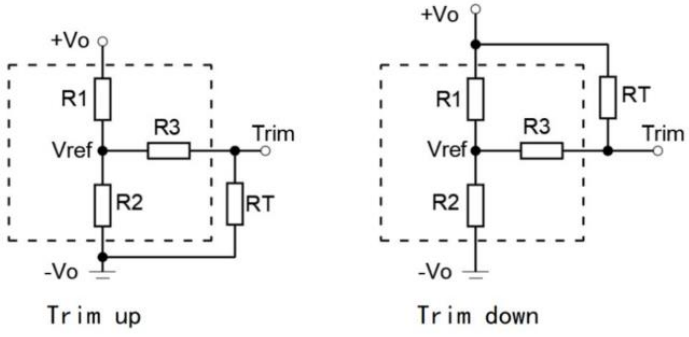


图 3

EMI 推荐参数表		
型号	Vin：24V	Vin：48V
FUSE	依照客户实际输入电流选择	
C0、C3	330μF/50V	330μF/100V
C1	1μF/50V	1μF/100V
C2	参照图 2 中 Cout 参数	
LDM1	4.7μH/3.1A	
CY1、CY2	1nF/2KV	



Trim 的使用电路（虚线为产品内部）

图 4

Trim 电阻的计算				
Vout	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
3.3	4.801	2.87	12.4	1.24
5	2.883	2.87	10	2.5
9	7.500	2.87	15	2.5
12	11.000	2.87	15	2.5
15	14.949	2.87	15	2.5
24	24.872	2.87	17.8	2.5

Application circuit

1. All DC/DC converters of this series are tested according to the recommended test circuit (Figure 2) before leaving the factory.

2. 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. For each output, under the condition of ensuring safe and reliable working conditions, its filter capacitor The maximum capacitance value cannot be greater than the maximum capacitive load of the product.

Note:

1. If the product operates below the minimum required load, there is no guarantee that the product performance will meet all the performance indicators in this manual;

2. The maximum capacitive load is tested under input voltage range and full load conditions;

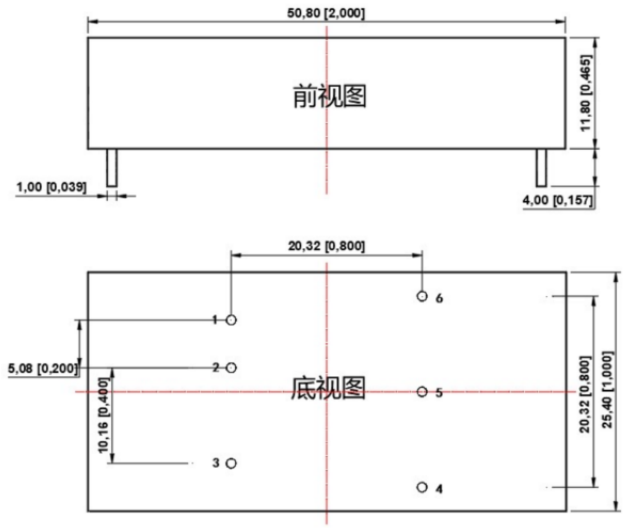
3. Unless otherwise specified, all indicators in this manual are measured at Ta=25℃, humidity <75%RH, nominal input voltage and output rated load;

4. All index test methods in this manual are based on the company's corporate standards;

5. Our company can provide product customization. For specific needs, please contact our sales engineers directly.

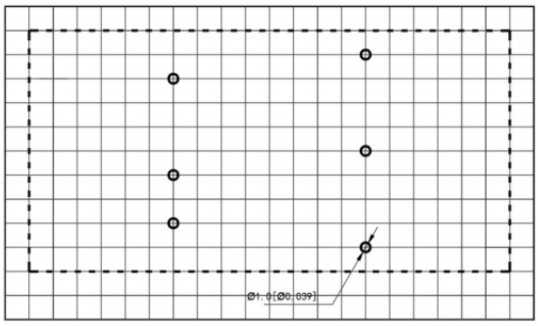
Appearance dimensions/recommended printing layout

外观尺寸图



注:
尺寸单位：mm[inch]
端子直径公差：±0.10[±0.004]
未标注之公差：±0.50[±0.020]

PCB 印刷版图 & 引脚定义表



引脚	功能（单路）	功能（双路）
1	Vin	Vin
2	GND	GND
3	CTRL	CTRL
4	Trim	-Vo
5	-Vo	COM
6	+Vo	+Vo

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