

Small Size&Isolation Type DC-DC High voltage Power Supply Module

6KV isolated DC boost power supply module: GRS series

Product Features:

- Low cost and small volume SIP 7Pin flame retardant package which meets UL94V-0 standard
- 6000VDC high isolation between DC boost module power input and output
- 2: 1 DC wide voltage input range, isolated regulated DC high voltage output
- Output voltage: 48VDC ~ 400VDC for optional
- Output power: 1W ~ 3W for optional
- High-voltage output&circuit output with self-recovery short-circuit protection
- Efficiency up to 60% ~ 78%
- Industrial temperature range: -40 ~ + 85 °C



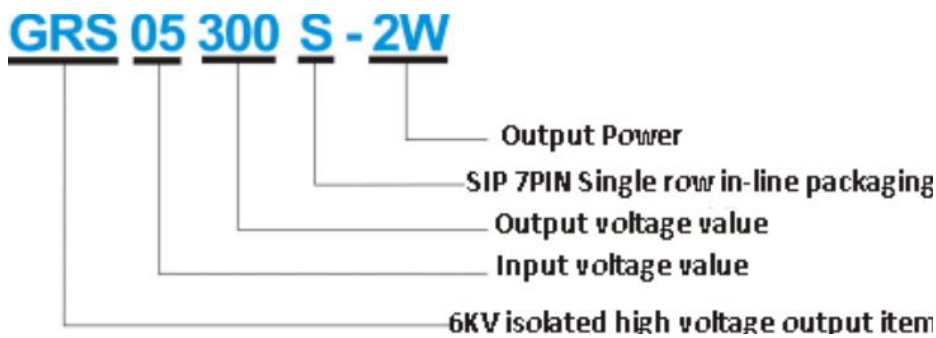
Product Description:

Sunyuan the newest developed GRF series isolated high voltage module dc-dc converter with low cost ,small volume & wide voltage input. it is a high isolated regulated DC-DC high voltage converter in the industry and can be operates in a wide range of unstable voltage input environments. Also can generate isolated and stabilized DC high voltage output through the internal adjustment circuit of the module.The new GRS series item adopt SIP 7Pin (single row 7 pin) small volume modular design, makes the product have higher DC / DC conversion efficiency with low cost integrated technology solution,The wide creepage distance and the design of new isolation material technology solutions of this product's internal make this high-voltage module power supply have 6000VDC high isolation characteristics of input and output and self-recovery overload short-circuit protection regulated output function.The design of high isolation technology used in the module power supply can effectively isolate the influence of common mode interference from the primary terminal equipment on the control system and can also effectively isolate the ground loop current of the primary terminal and the secondary terminal or the high voltage potential difference between the ground terminal in the system The safety impact of equipment and personnel. The products are widely used in blood analysis of medical equipment, petrochemical industry, laboratory instruments, ultrasonic instruments, power meters, communication facilities and other fields. With good DC high voltage output characteristics and high withstand voltage isolation design technology can solve most of the user's application problems.

The latest developed GRF series item by SunYuan with low cost, small size, wide voltage input isolation high voltage module dc dc converter can be used in the following instrumentation equipments: Accelerator, 3D printing, X-ray tube, X-ray analysis, energy dispersion, wavelength dispersion, X-ray fluorescence analyzer, chemical analysis electronic spectrometer, Automatic test equipment, capacitor charge and discharge, chromatograph, mass spectrometer, carbon dioxide laser, cathode ray tube, display, flight simulation experiment, detector, ray, microchannel plate, photomultiplier tube, insulation breakdown test, electron beam exposure, capillary Gel electrophoresis, protein extraction, DNA sequencing, electrostatic suction cups, copiers, coatings, electrostatic flocking, electrostatic precipitators, fume purification, air purification, electrostatic spraying (plastic spraying, paint spraying), image intensifiers, industrial color printing, luggage Inspection, food inspection, radiology, PCB

inspection, nondestructive testing, thickness gauge, test tube, focused ion beam microscope for photomask repair, ion implantation, lithotripsy, medical imaging PET, MRI, medical oncology, X-ray medical CT, bone density Tests, chest radiography, magnetrons, klystrons, neutron generators, nuclear testing instruments, instruments, marine power supply equipment, electron microscopes, medical blood analysis, PM2.5 environmental monitoring, spectrometers, agricultural defogging and dew production, Pressure testing, surface analysis, water purification equipment ...Now Sunyuan Technology is stepping up efforts to improve the isolated high-voltage power supply product line to meet the growing needs of medical, industrial and scientific research industries.

Model and Definition:



GRS Series and model examples:

(The bellow data is the detection value of the product after 8 hours of continuous full load aging)

Model Number	Input voltage Vin(VDC)		Output voltage/Current		No-load power consumption (mW)	Full load efficiency(%)
	Nominal value Vin(VDC)	Range Vin(VDC)	Output current Full load (mA)	Output voltage Vout(VDC)		
GRS05048S-1W	5	4.5~9	21	48	300	62
GRS05100S-1W			10	100		65
GRS05150S-1W			6.7	150		63
GRS05200S-1W			5	200		62
GRS05250S-1W			4	250		63
GRS05300S-1W			3.4	300		62
GRS05400S-1W			2.5	400		61
GRS12048S-1W	12	9~18	21	48	300	68
GRS12100S-1W			10	100		71
GRS12150S-1W			6.7	150		72
GRS12200S-1W			5	200		70
GRS12250S-1W			4	250		71
GRS12300S-1W			3.4	300		69
GRS12400S-1W			2.5	400		68
GRS12048S-2W	12	9~18	41.7	48	300	70

GRS12100S-2W			20	100		76
GRS12150S-2W			13.4	150		78
GRS12200S-2W			10	200		75
GRS12250S-2W			8	250		73
GRS12300S-2W			6.7	300		72
GRS12400S-2W			5	400		70
GRS12048S-3W			62.5	48		73
GRS12100S-3W			30	100		78
GRS12150S-3W			20	150		77
GRS12200S-3W	12	9~18	15	200	300	75
GRS12250S-3W			12	250		74
GRS12300S-3W			10	300		72
GRS12400S-3W			7.5	400		73
GRS24048S-2W			41.7	48		71
GRS24100S-2W			20	100		76
GRS24150S-2W			13.4	150		72
GRS24200S-2W	24	18~32	10	200	300	69
GRS24250S-2W			8	250		68
GRS24300S-2W			6.7	300		67
GRS24400S-2W			5	400		68
GRS24048S-3W			62.5	48		73
GRS24100S-3W			30	100		75
GRS24150S-3W			20	150		74
GRS24200S-3W	24	18~32	15	200	300	72
GRS24250S-3W			12	250		70
GRS24300S-3W			10	300		68
GRS24400S-3W			7.5	400		65

Remarks: If you need other non-standard output voltage signal, please contact and confirm with sales

Technical Parameters and characteristics:

Project	Working condition	Min	Typic value	Max value	Unit
Output regulated-voltage accuracy	1%-100% Load range		±2		%
Load adjustment rate	Nominal voltage input, load from 10% to 100%		±1		%
Linear adjustment rate	Input voltage range, full load		±1		%
Ripple & Noise	20MHz bandwidth, parallel line test method		±1		%
switch frequency	Nominal voltage input, full load		200	400	KHz
Temperature Coefficient	Nominal voltage input, full load		0.02		%/°C
stability	After half an hour of booting, the hourly rate of change		0.001		%/Hr

Output short circuit protection	Output short circuit	Sustainable and Self-recoverable			
Isolated withstand voltage	Leakage current 1mA, time 60s	6000			VDC
Pin soldering temperature	Welding point from the shell \geq 1mm, 10s	+300			°C
Insulation resistance	Input/Output, 500VDC, 25°C, 70%RH	500			MΩ
Working Temperature		-40		+85	°C
storage temperature		-55		+105	°C
Storage humidity	No condensation			95	%RH
cooling method		Natural air cooling			
Hot swap		Not support			
MTBF	MIL-HDBK-217F@25°C	1000			KHours
Shell material		Plastic shell-PVC flame retardant material			
Package size	Length * width * height	19.6 x 9.8 x 12.0			mm
Weight		5			g

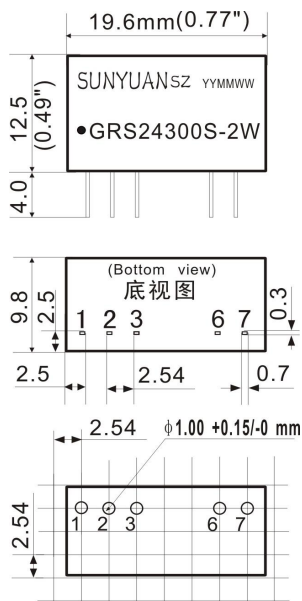
Temperature characteristic curve

OutPut (1W/3W)

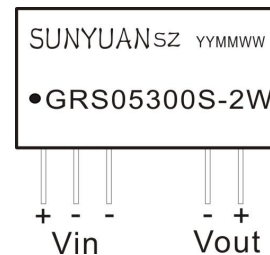
Output temperature characteristic curve (Environment temperature 25 degrees)



Shape dimension and pin function description

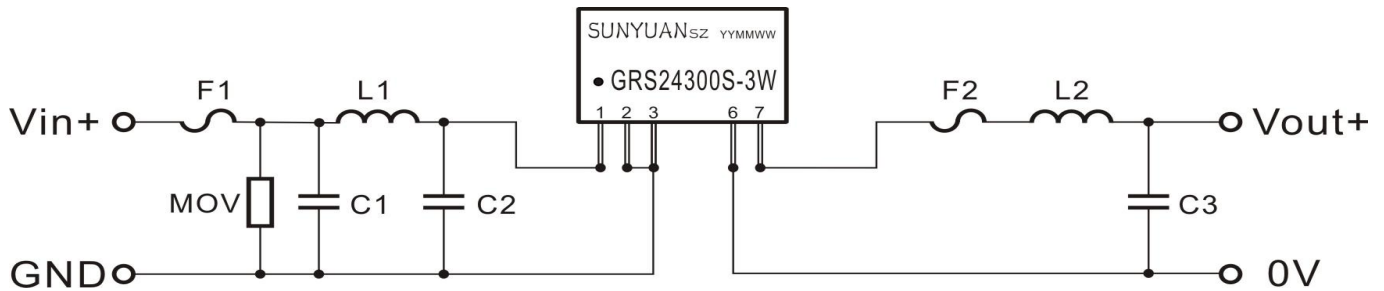


IC封装 SIP 7PIN
PCB布板尺寸参考



Pin	Pin function description	
1	Vin+	input positive
2~3	GND	input ground
4~5	NC	empty
6	0V	output ground
7	Vout+	output positive

External filter and protection circuit reference

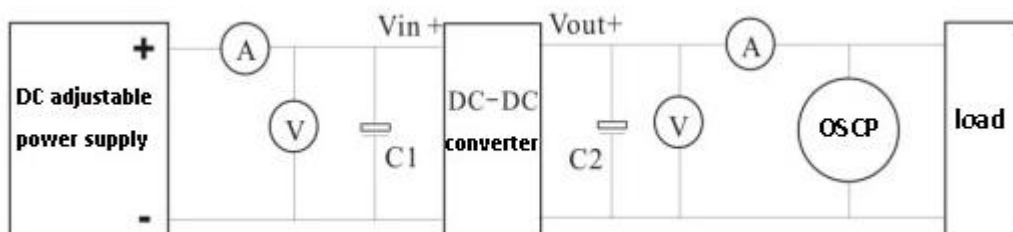


F1	Input fuse, slow blow type	
MOV	14D220K	Nominal 5V input voltage
	14D390K	Nominal 12V input voltage
	14D560K	Nominal 24V input voltage
F2	Output fuse, slow blow or optional (PTC) self-recovery fuse	
C1 , C2	47uF/25V	Nominal 5V, 12V input voltage
	22uF/50V	Nominal 24V input voltage
L1 , L2	2.2uH~10uH	
C3	1uF~10uF	

Remarks: If it is required to further reduce the input and output ripple, the parameters of the LC filter can be increased appropriately, but it should be noted that the external capacitor at the output cannot be selected too large and should be lower than the maximum capacitive load of the product.

一. The main parameter detection method of DC-DC module power supply products
Adopt standard Kelvin four-terminal input and rated load test (as picture)

Test conditions: room temperature $T_A = 25$ degrees Celsius, temperature: less than 75% of nominal input and rated load.

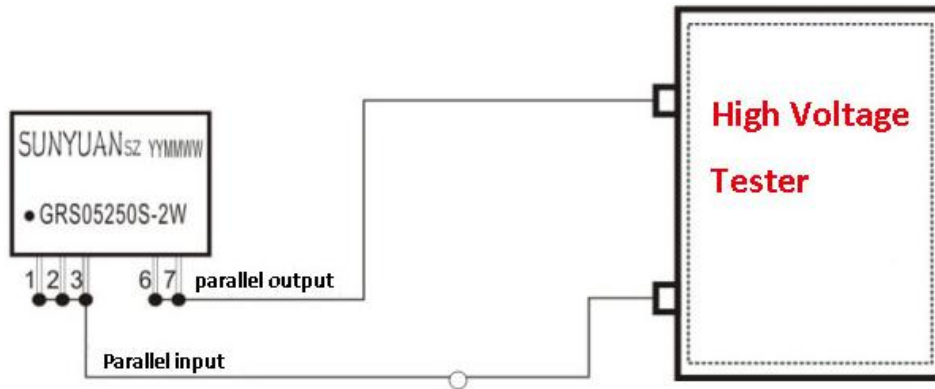


二. Reference method for reducing noise common mode interference in the use of DC-DC module converter.

The module power supply will generate common mode and differential mode noise at the switching frequency. The way to reduce the text wave and noise is to add a passive LC or RC

(large loss) filter network at the input and output ends. The self-resonant frequency of L is much higher than the switching frequency of the module. The current value allowed to pass is preferably selected to be more than twice the maximum input current of the module. The internal resistance should be small to reduce DC loss.

三. DC-DC module converter isolation withstand voltage test method



Safety precautions and conventional methods of product high voltage isolation test:

1、As show above picture 1: Set the rated high voltage value according to the product isolation voltage specifications. Please pay attention to personal safety when testing and beware of electric shock!

Test condition: room temperature $T_A = 25\text{ }^\circ\text{C}$, humidity $<75\%$

2、The operator of the withstand voltage test must wear rubber insulation (insulation voltage $> 10\text{KV}$) gloves, and place insulation pads on the workbench and seat floor to prevent high voltage electric shock.

3、The pressure tester instrument must be reliably grounded and cannot be detected in a high temperature, humid and dusty environment.

4、When the withstand voltage tester is connected to the test object, it cannot be operated with power on, and the output voltage value of the high voltage tester must be zero.

5、When the instrument is in the startup state or the high voltage is not released, it must not touch the measured object, test line or high voltage test line and test fixture.

6、The product test method like above picture 1: all pins of the input and output terminals are connected in parallel, and the test is performed for 1 minute according to the isolation voltage value given by the product.

7、According to the test standard for withstand voltage, the withstand voltage value is gradually adjusted upward from 0. When the withstand voltage value is adjusted to the set maximum withstand voltage and maintained at the highest withstand value for one minute.

8、The pressure test itself is a destructive test. The fewer times the product should be done, the better. If the customer needs multiple tests, the general requirements are: the first measurement is based on the voltage value of the specification, and the voltage value should be reduced accordingly for each subsequent test, otherwise the product performance will be reduced or directly damaged.