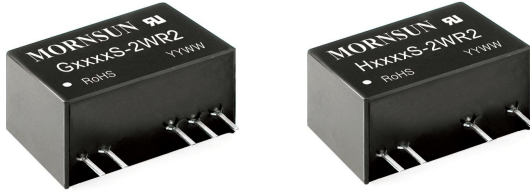


2W, Fixed input voltage, 4200VAC or 6000VDC isolated & unregulated positive-negative dual/single output

FEATURES

- SIP package
- High efficiency up to 84%
- Reinforced insulation
- The patient leakage current: Max 2μA
- Isolation voltage: 4200VAC or 6000VDC
- Operating temperature range:-40°C to +85°C
- Internal surface mounted design
- International standard pin-out
- EN60601-1, ANSI/AAMI ES60601-1 approval (1xMOPP/2xMOOP)



G\_S-2WR2 & H\_S-2WR2 series meet reinforced insulation requirements. They are specially designed for applications where require compact size, high isolation, low isolation capacitor and low leakage current power. They are widely used in medical, electricity, IGBT driver and so on. They are suitable for:

1. Where the voltage of the input power supply is stable (voltage variation:  $\pm 10\%V_{in}$ );
  2. Where isolation is necessary between input and output (isolation voltage  $\leq 4200VAC$  or  $6000VDC$ );
  3. Where do not has high requirement of line regulation and the ripple & noise of the output voltage;
- Such as: Medical collection and isolation, High voltage collection circuit, IGBT-driven circuits, etc.

Selection Guide

Certification	Part No.	Input Voltage (VDC)	Output		Efficiency (%Min./Typ.) @ Full Load	Max. Capacitive Load* (μF)	
		Nominal (Range)	Output Voltage(VDC)	Output Current (mA)(Max./Min.)			
UL/CE	G0505S-2WR2	5 (4.5-5.5)	±5	±200/±20	74/78	470	
	G0509S-2WR2		±9	±111/±12	74/78	470	
	G0512S-2WR2		±12	±83/±9	74/78	220	
	G0515S-2WR2		±15	±67/±7	76/80	220	
	H0505S-2WR2		5	400/40	73/77	1000	
	H0512S-2WR2		12	167/17	75/79	470	
	H0515S-2WR2		15	133/14	75/79	470	
	UL/CE	G1205S-2WR2	12 (10.8-13.2)	±5	±200/±20	74/78	470
		G1209S-2WR2		±9	±111/±12	78/82	470
		G1212S-2WR2		±12	±83/±9	78/82	220
		G1215S-2WR2		±15	±67/±7	76/80	220
		H1205S-2WR2		5	400/40	73/77	1000
		H1212S-2WR2		12	167/17	76/80	470
		H1215S-2WR2		15	133/14	78/82	470
UL	G1505S-2WR2	15 (13.5-16.5)	±5	±200/±20	73/77	470	
	G1515S-2WR2		±15	±67/±7	69/73	220	
	H1505S-2WR2		5	400/40	74/78	1000	
	H1515S-2WR2		15	133/14	78/82	470	
UL/CE	G2405S-2WR2	24 (21.6-26.4)	±5	±200/±20	75/79	470	
	G2409S-2WR2		±9	±111/±12	77/81	470	
	G2412S-2WR2		±12	±83/±9	78/82	220	
	G2415S-2WR2		±15	±67/±7	77/81	220	
	H2405S-2WR2		5	400/40	75/79	1000	
	H2412S-2WR2		12	167/17	78/82	470	
	H2415S-2WR2		15	133/14	80/84	470	

Note:\* The capacitive loads of positive and negative outputs are identical.

### Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (no-load/full load)	5V input	--	35/520	80/--	mA
	12V input	--	15/217	40/--	
	15V input	--	18/171	40/--	
	24V input	--	10/106	25/--	
Surge Voltage (1sec. max.)	5V input	-0.7	--	9	VDC
	12V input	-0.7	--	18	
	15V input	-0.7	--	21	
	24V input	-0.7	--	30	
Reflected Ripple Current		--	0.2	--	A
Input Filter		Capacitor filter			
Hot Plug		Unavailable			

Note: \*Reflected ripple current testing method please see DC-DC Converter Application Notes for specific operation.

### Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy		See tolerance envelope curve (Fig. 1)				
Line Regulation	Input voltage change: ±1%	--	--	±1.2	--	
Load Regulation	10%-100% load	5VDC output	--	--	20	%
		9VDC output	--	--	15	
		12VDC output	--	--	15	
		15VDC output	--	--	15	
Ripple & Noise*	20MHz bandwidth	--	100	150	mVp-p	
Temperature Drift Coefficient	100% full load	--	±0.02	--	%/°C	
Output Short Circuit Protection**		--	--	3	s	

Note: \*Output voltage accuracy with 10% load of G1515S-2WR2, Min.-5%.  
 \*\*Ripple and noise tested with "parallel cable" method, please see DC-DC Converter Application Notes for specific operation methods.  
 \*\*\*Supply voltage must be discontinued at the end of short circuit duration which less than 3s.

### General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Insulation Voltage	Input-output, with the test time of 1 minute	4200	--	--	VAC
		6000	--	--	VDC
Patient Leakage Current	250VAC, 50/60Hz	--	--	2	μA
Insulation Resistance	Input-output, isolation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	5	--	pF
Operating Temperature		-40	--	85	°C
Storage Temperature		-55	--	125	
Casing Temperature Rise	Ta=25°C	--	25	--	
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	
Storage Humidity	Non-condensing	--	--	95	%RH
Switching Frequency	100% load, nominal input voltage	--	100	--	KHz
MTBF	MIL-HDBK-217F@25°C	3500	--	--	K hours
Transformer Creepage		5	--	--	mm
Transformer Clearance		5	--	--	
PCB Creepage & Clearance		5.5	--	--	

Note: 1. Patient leakage current and reinforced insulation is based on a 250 VAC, 50/60 Hz system input voltage.  
 2. The UL certification (ANSI/AAMI ES60601-1, File No. E347375) of G\_S-2WR2 & H\_S-2WR2 series is approved, G\_S-2WR2 & H\_S-2WR2 series meets 1xMOPP/2xMOOP when system input voltage is with 250VAC, 50/60Hz.

Physical Specifications

Casing Material	Black flame-retardant and heat-resistant plastic (UL94 V-0)
Package Dimensions	19.50*9.80*12.50 mm
Weight	4.2g(Typ.)
Cooling Method	Free air convection

EMC Specifications

EMI	CE	CISPR32/EN55032 CLASS B (see Fig. 5 for recommended circuit)
	RE	CISPR32/EN55032 CLASS B (see Fig. 5 for recommended circuit)
EMS	ESD	IEC/EN61000-4-2 Contact ±8KV <span style="float: right;">perf. Criteria B</span>

Product Characteristic Curve

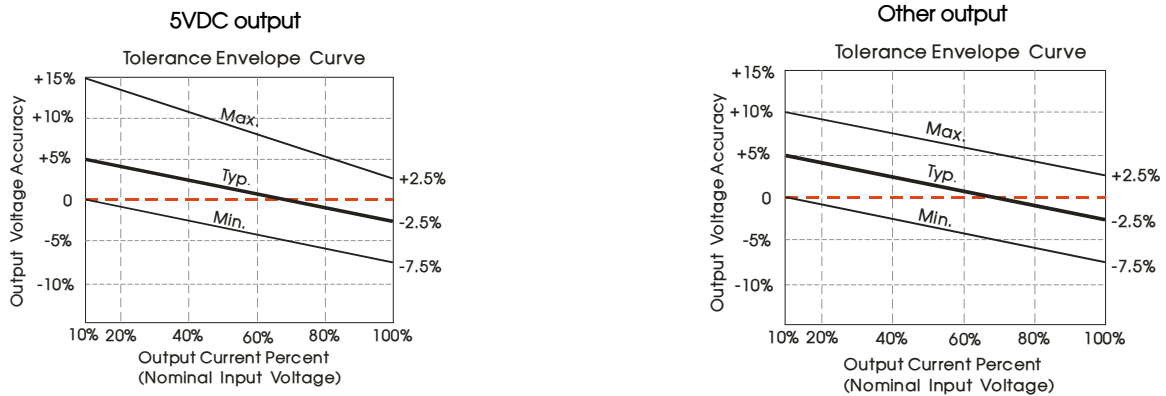


Fig. 1

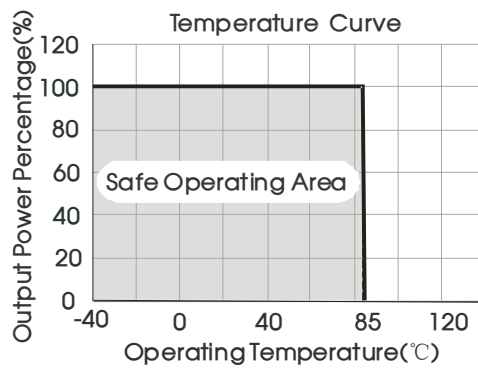
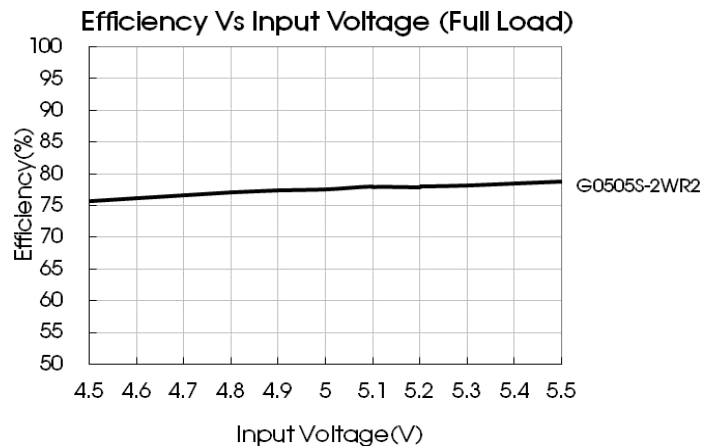
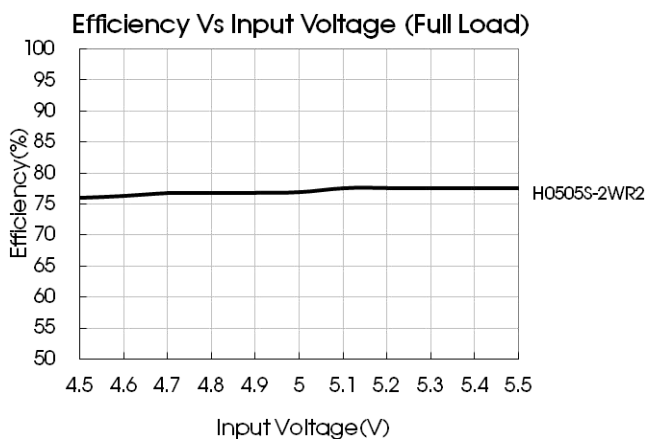
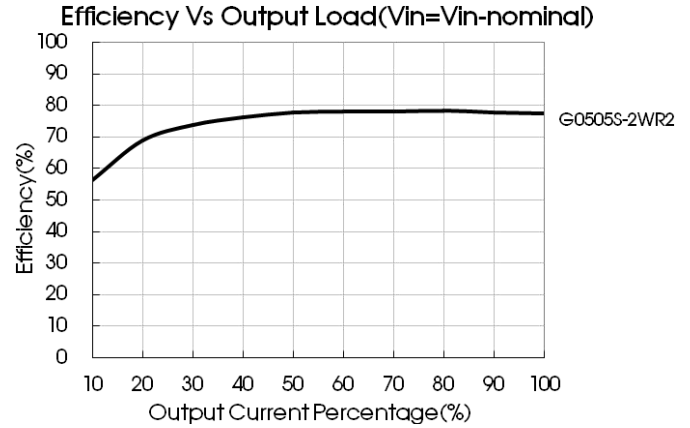
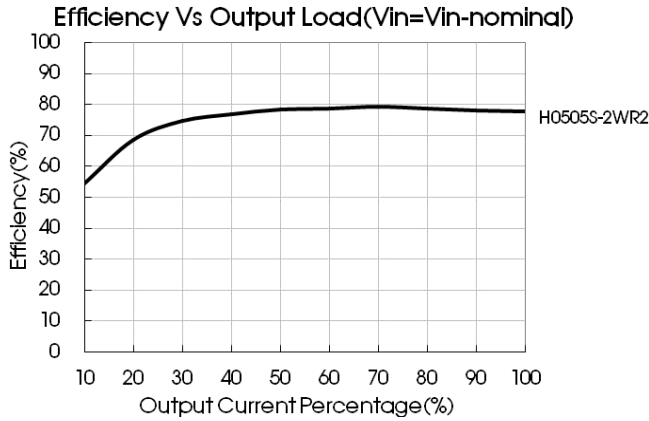


Fig. 2





## Design Reference

### 1. Typical application

If it is required to further reduce input and output ripple, a filter capacitor can be connected to the input and output terminals, see Fig.3. Moreover, choosing suitable filter capacitor is very important, start-up problems may be caused by too large capacitance. To ensure the modules running well, the recommended capacitive load values as shown in Table 1.

The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (see Fig. 4).

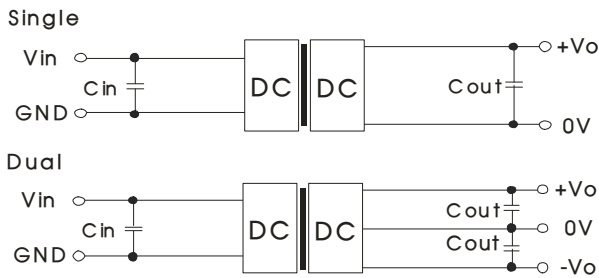


Fig. 3

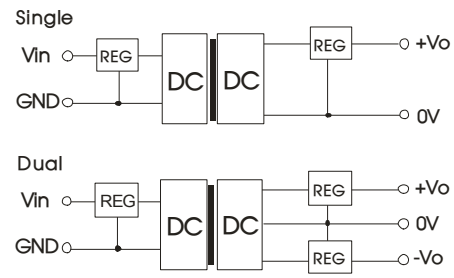


Fig. 4

Recommended capacitive load value table (Table 1)

Vin (VDC)	Cin (μF)	Single Vout (VDC)	Cout (μF)	Dual Vout (VDC)	Cout (μF)
5	10	5	10	±5	4.7
12/15	4.7	12	2.2	±9	2.2
24	2.2	15	1	±12/±15	1

### 2. EMC typical recommended circuit (CLASS B)

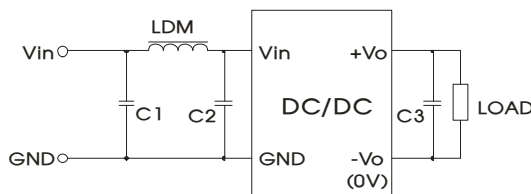


Fig. 5

Recommended typical circuit parameters:

Input voltage (V)		5/12/15	24
EMI	C1,C2	4.7μF /50V	
	C3	Refer to the Cout in Fig.3	
	LDM	6.8μH	15μH

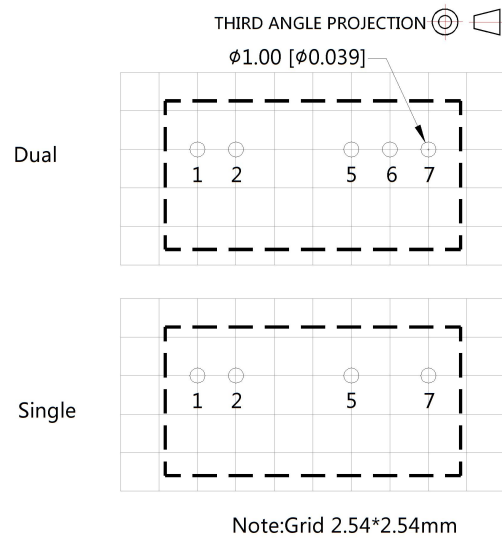
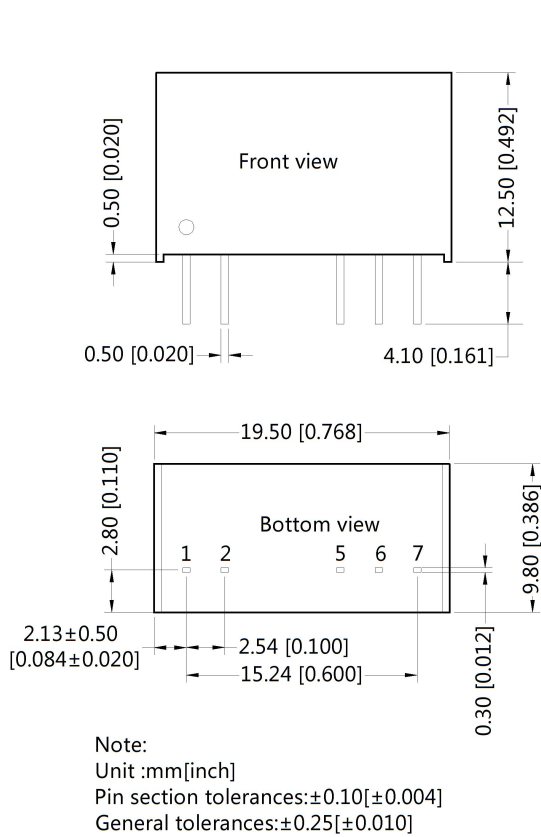
Note: C1 and C2 of G1515S-2WR2 is 10μF/25V, LDM of G1515S-2WR2 is 22μH.

### 3. Output load requirements

In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor on the output side (The sum of the efficient power and resistor consumer power is not less than 10%).

4. For more information please find the application notes on [www.mornsun-power.com](http://www.mornsun-power.com)

Dimensions and Recommended Layout



Pin-Out		
Pin	Single	Dual
1	Vin	Vin
2	GND	GND
5	0V	-Vo
6	No Pin	0V
7	+Vo	+Vo

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from [www.mornsun-power.com](http://www.mornsun-power.com). Packing bag number: 58200013;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. The maximum capacitive load offered were tested at input voltage range and full load;
4. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75%RH with nominal input voltage and rated output load;
5. All index testing methods in this datasheet are based on our Company's corporate standards;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Specifications are subject to change without prior notice.

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