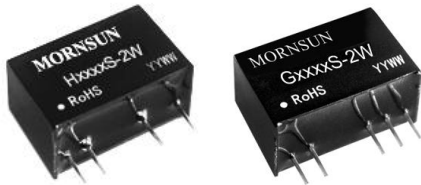


2W isolated DC-DC converter with 6000VDC  
Fixed input voltage, unregulated positive-negative dual/single output



Patent Protection RoHS

### FEATURES

- SIP package
- High efficiency up to 86%
- I/O isolation test voltage 6k VDC
- Operating ambient temperature range: -40°C ~ +105°C
- Continuous short-circuit protection
- Internal surface mounted design
- Industry standard pin-out

G\_S-2W & H\_S-2W series is specially designed for applications where an isolated voltage is required in a distributed power supply system. It is 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  $\leq 6000VDC$ );
  3. Where do not has high requirement of line regulation and the ripple & noise of the output voltage;
- Such as: pure digital circuits, low frequency analog circuits, IGBT-driven circuits, etc.

### Selection Guide

Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load*( $\mu F$ ) Max.
	Nominal(Range)	Voltage(VDC)	Current (mA) Max./Min.		
G0505S-2W	5 (4.5-5.5)	$\pm 5$	$\pm 200/\pm 20$	72/76	100
G0509S-2W		$\pm 9$	$\pm 111/\pm 12$	76/80	
G0512S-2W		$\pm 12$	$\pm 83/\pm 9$	73/77	
G0515S-2W		$\pm 15$	$\pm 67/\pm 7$	76/80	
G0524S-2W		$\pm 24$	$\pm 42/\pm 4$	76/80	
H0503S-2W		3.3	500/50	70/74	220
H0505S-2W		5	400/40	72/76	
H0509S-2W		9	222/23	75/79	
H0512S-2W		12	167/17	77/81	
H0515S-2W		15	133/14	78/82	
G1205S-2W	12 (10.8-13.2)	$\pm 5$	$\pm 200/\pm 20$	73/77	100
G1209S-2W		$\pm 9$	$\pm 111/\pm 12$	77/81	
G1212S-2W		$\pm 12$	$\pm 83/\pm 9$	75/79	
G1215S-2W		$\pm 15$	$\pm 67/\pm 7$	78/82	
H1205S-2W		5	400/40	76/80	220
H1209S-2W		9	222/23	77/81	
H1212S-2W		12	167/17	79/83	
H1215S-2W		15	133/14	80/84	
G2405S-2W	24 (21.6-26.4)	$\pm 5$	$\pm 200/\pm 20$	76/80	100
G2412S-2W		$\pm 12$	$\pm 83/\pm 9$	77/81	
G2415S-2W		$\pm 15$	$\pm 67/\pm 7$	78/82	
H2405S-2W		5	400/40	76/80	220
H2409S-2W		9	222/23	77/81	
H2412S-2W		12	167/17	80/84	
H2415S-2W		15	133/14	81/85	
H2424S-2W		24	83/9	76/80	

Note:\* The specified maximum capacitive load for positive and negative output is identical.

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (no-load/full load)	5V input	--	40/500	--	mA
	12V input	--	16/200	--	
	24V input	--	9/100	--	
Surge Voltage (1sec. max.)	5V input	-0.7	--	9	VDC
	12V input	-0.7	--	18	
	24V input	-0.7	--	30	
Input Filter		Capacitance filter			

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Voltage Accuracy	See output regulation curve(Fig.1)				
Linear Regulation	Input voltage change: $\pm 1\%$	--	--	$\pm 1.2$	--
Balance of Output Voltage*	Dual output, balanced load	--	$\pm 0.5$	$\pm 1$	%
Load Regulation	10%-100% load	3.3VDC output	--	20	
		5VDC output	--	15	
		9VDC output	--	15	
		12VDC output	--	15	
		15VDC output	--	15	
		24VDC output	--	15	
Ripple & Noise*	20MHz bandwidth	--	150	250	mVp-p
Temperature Coefficient	100% full load	--	--	$\pm 0.03$	%/°C
Short-circuit Protection	Continuous, self-recovery				

Notes: 1.\*Unbalanced load of positive-negative dual output module:  $\pm 5\%$ .

2.\*The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information.

## General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max.	6000	--	--	VDC
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	M $\Omega$
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	5	--	pF
Operating Temperature	Derating when operating temperature up to 85°C (see Fig. 2)	-40	--	105	°C
Storage Temperature		-55	--	125	
Case Temperature Rise	Ta=25°C	--	25	--	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	
Storage Humidity	Non-condensing	--	--	95	%
Switching Frequency	100% load, nominal input voltage	5V input	--	60	KHz
		12V/24V input	--	80	
MTBF	MIL-HDBK-217F@25°C	3500	--	--	K hours

## Mechanical Specifications

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

## Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B (see Fig. 5 for recommended circuit)
	RE	CISPR32/EN55032	CLASS B (see Fig. 5 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2	Contact $\pm 6$ KV perf. Criteria B

## Typical Characteristic Curves

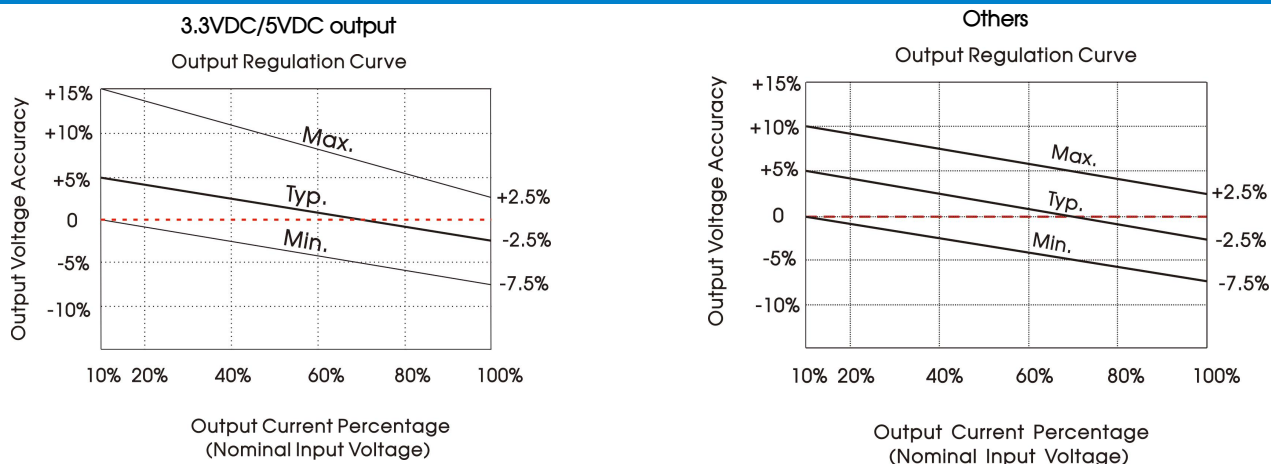


Fig. 1

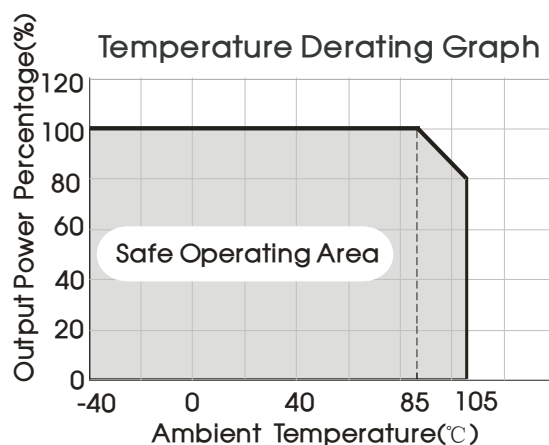
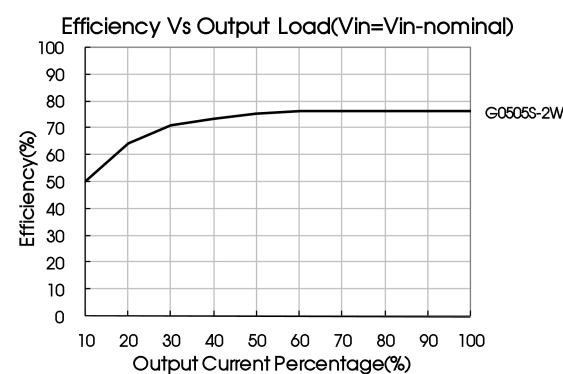
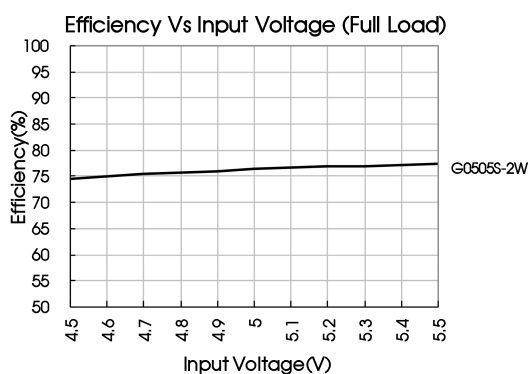
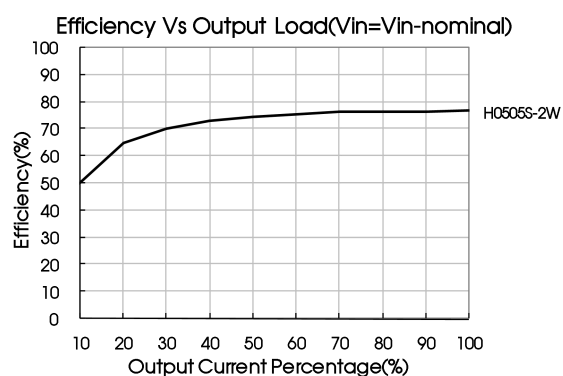
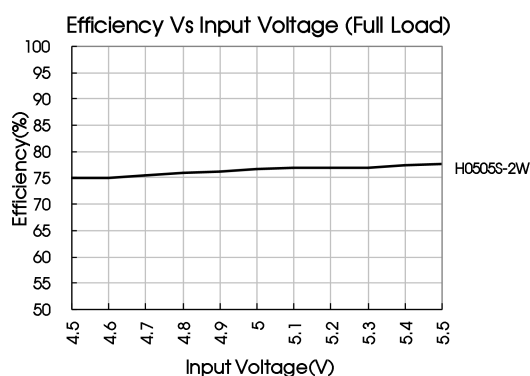


Fig. 2



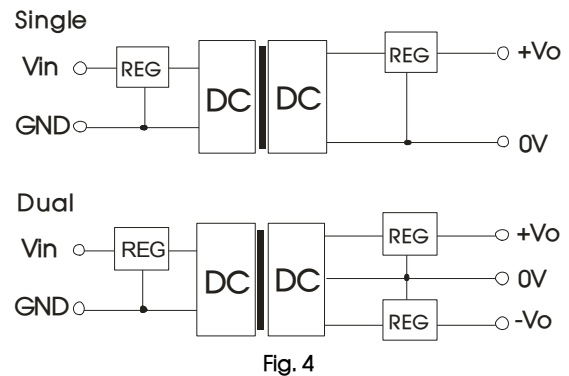
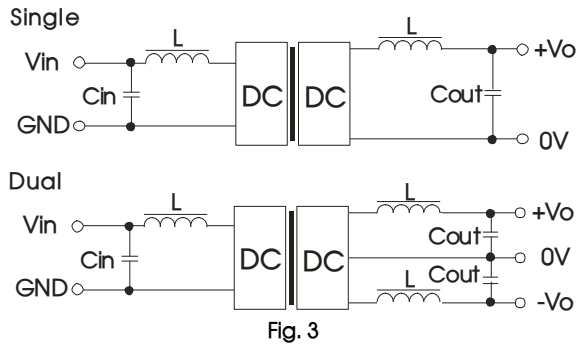
## Design Reference

### 1. Typical application

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig.2.

Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to 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).

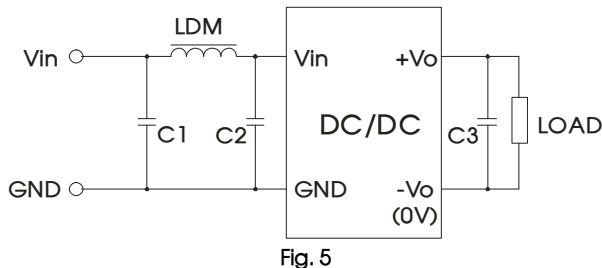


Recommended capacitive load value table (Table 1)

Vin (VDC)	Cin (μF)	Single Vout (VDC)	Cout (μF)	Dual Vout (VDC)	Cout (μF)
5	10	3.3/5	10	±5	4.7
12	4.7	9	4.7	±9	2.2
24	2.2	12	2.2	±12	1
—	—	15	1	±15/±24	0.47

It is not recommended to connect any external capacitor when output power is less than 0.5W.

### 2. EMC (CLASS B) compliance circuit



Recommended typical circuit parameters:

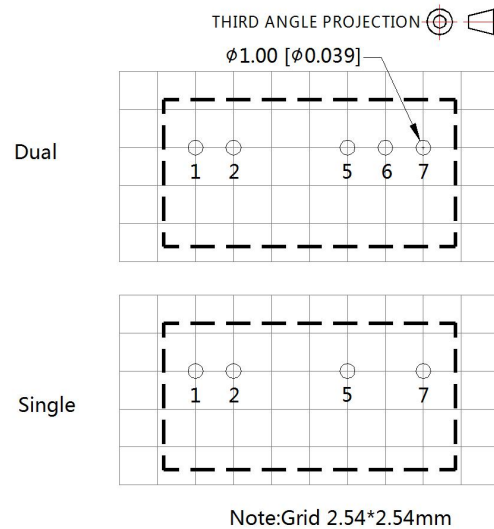
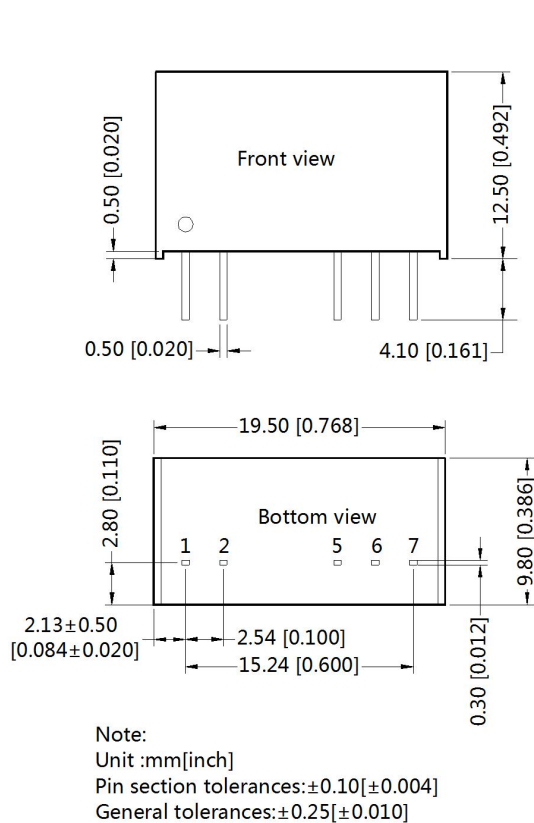
Input voltage (V)		5/12/24
EMI	C1,C2	4.7μF /50V
	C3	Refer to the Cout in Fig.3
	LDM	6.8μH

### 3. Output load requirements

For a reliable and efficient operation of the converter, the minimum load should never be less than 10% of the rated output load. If the total required output power is below 10%, a parallel bleeding resistor is required on the output, ensuring that the sum of the power consumption is always maintained at 10% minimum.

### 4. For additional information please refer to DC-DC converter 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:

- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58200013;
- If the product is operated under the min. required load, the product performance cannot be guaranteed to comply with all performance indexes in this datasheet;
- The max. capacitive load should be tested within the input voltage range and under full load conditions;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on our company corporate standards;
- The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technicians for specific information;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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