2W Fixed input voltage, 5000VAC or 6000VDC isolated & unregulated dual/single output

Patent Protection RoHS

3 years Warranty

Continuous Short Circuit Protection

FEATURES

- High efficiency up to 84%
- The leakage current < 2μA
- Isolation Capacitance as low as 4pF
- Creepage & Clearance Distance > 5mm
- Reinforced insulation, Isolation voltage: 5000VAC or 6000VDC
- Operating ambient temperature range: -40℃ to +105℃
- Continuous short circuit protection
- Meet EN60601-1, ANSI/AAMI ES60601-1 standard (1xMOPP & 2xMOOP)
- Meet IEC62368 standard

G_S-2WR3 & H_S-2WR3 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: ±10%Vin);
2.Where isolation is necessary between input and output (isolation voltage ≤5000VAC or 6000VDC);
3.Where do not has high requirement of line regulation and the ripple & noise of the output voltage;
Such as, medical collection isolation, high voltage collection circuit and IGBT drive circuit.

Selection Guide

Certification	Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load(μF)* Max.
		Nominal (Range)	Voltage (VDC)	Current (mA) Max./Min.		
--	G1205S-2WR3	12 (10.8-13.2)	±5	±200/±20	76/80	1000
	G1209S-2WR3		±9	±111/±11	78/82	470
	G1212S-2WR3		±12	±83/±9	79/83	220
	G1215S-2WR3		±15	±67/±7	80/84	220
	H1205S-2WR3		5	400/40	76/80	1000
	H1209S-2WR3		9	222/22	78/82	680
	H1212S-2WR3		12	167/17	80/84	470
	H1215S-2WR3		15	133/14	80/84	470
	G1505S-2WR3	15 (13.5-16.5)	±5	±200/±20	74/78	1000
	G1509S-2WR3		±9	±111/±11	76/80	470
	G1515S-2WR3		±15	±67/±7	76/80	220
	H1505S-2WR3		5	400/40	76/80	1000
	H1515S-2WR3		15	133/14	79/83	470
	G2405S-2WR3	24 (21.6-26.4)	±5	±200/±20	75/79	1000
	G2409S-2WR3		±9	±111/±11	77/81	470
	G2412S-2WR3		±12	±83/±9	78/82	220
	G2415S-2WR3		±15	±67/±7	77/81	220
	H2405S-2WR3		5	400/40	75/79	2200
	H2409S-2WR3		9	222/22	77/81	680
	H2412S-2WR3		12	167/17	78/82	470
	H2415S-2WR3		15	133/14	80/84	470
	H2424S-2WR3		24	83/9	80/84	220

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

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load/no-load)	12V input	--	210/15	220/--	mA
	15V input	--	167/15	176/--	
	24V input	--	106/15	111/--	
Surge Voltage (1sec. max.)	12V input	-0.7	--	18	VDC
	15V input	-0.7	--	21	
	24V input	-0.7	--	30	
Reflected Ripple Current*		--	200	--	mA
Input Filter		Capacitance filter			
Hot Plug		Unavailable			
Note: * Refer to DC-DC Converter Application notes for detailed description of reflected ripple current test method.					

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy			See output regulation curve(Fig. 1)			
Linear Regulation	Input voltage change: ±1%		--	--	1.2	--
Load Regulation	10%-100% load	5V output	--	--	20	%
		Other output	--	--	15	
Ripple & Noise*	20MHz bandwidth	5V output	--	100	150	mVp-p
		Other output	--	80	120	
Temperature Coefficient	100% full load		--	±0.02	--	%/℃
Short Circuit Protection			Continuous, self-recovery			
Note: *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, Test for 1 minute, the leakage current < 1mA	5000	--	--	VAC
		6000	--	--	VDC
Patient Leakage Current*	250VAC, 50/60Hz	--	--	2	μA
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	4	--	pF
Operating Temperature	Derating when operating temperature≥85℃ (see Fig. 2)	-40	--	+105	℃
Storage Temperature		-55	--	+125	
Case Temperature Rise	Ta=25℃	--	25	--	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	
Storage Humidity	Non-condensing	5	--	95	%RH
Switching Frequency	100% load, nominal input voltage	--	200	--	kHz
MTBF	MIL-HDBK-217F@25℃	19360	--	--	k hours
Creepage & Clearance Distance		5	--	--	mm
Note: * Leakage current and reinforced insulation is based on 250 VAC, 50/60 Hz system input voltage.					

Mechanical Specifications

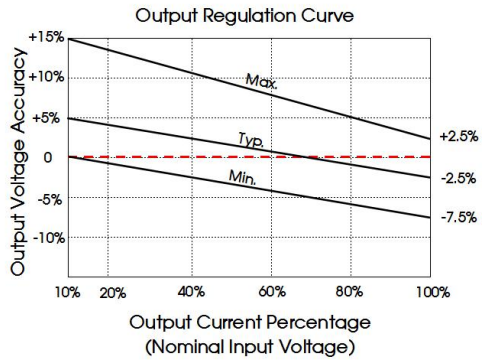
Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	19.50 x 9.80 x 12.50 mm
Weight	4.0g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	Others	CISPR32/EN55032 CLASS B (see Fig. 4 for recommended circuit) EN60601-1-2/CISPR 11 GROUP1 CLASS B (see Fig. 4 for recommended circuit)
		G15_S-2WR3, G24_S-2WR3	CISPR32/EN55032 CLASS A (see Fig. 4 for recommended circuit) EN60601-1-2/CISPR 11 GROUP1 CLASS A (see Fig. 4 for recommended circuit)
	RE	Others	CISPR32/EN55032 CLASS B (see Fig. 4 for recommended circuit) EN60601-1-2/CISPR 11 GROUP1 CLASS B (see Fig. 4 for recommended circuit)
		G15_S-2WR3, G24_S-2WR3	CISPR32/EN55032 CLASS A (see Fig. 4 for recommended circuit) EN60601-1-2/CISPR 11 GROUP1 CLASS A (see Fig. 4 for recommended circuit)
Immunity	ESD		EN60601-1-2 (IEC/EN61000-4-2) Air ±15kV, Contact ±8kV perf. Criteria B

Typical Characteristic Curves

5VDC output



Other output

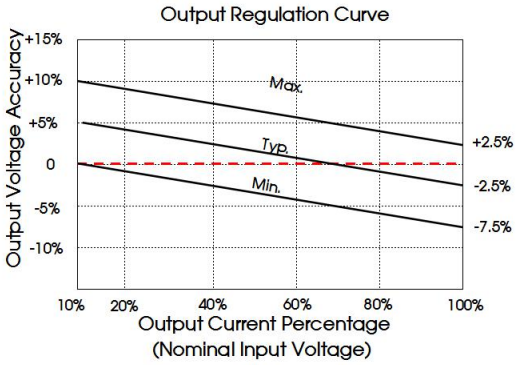


Fig. 1

Temperature Derating Curve

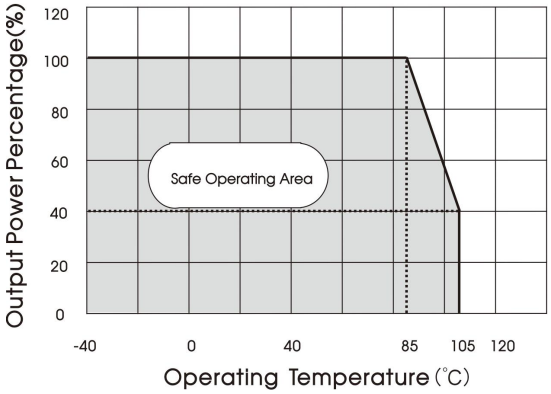


Fig. 2

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. 3.

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

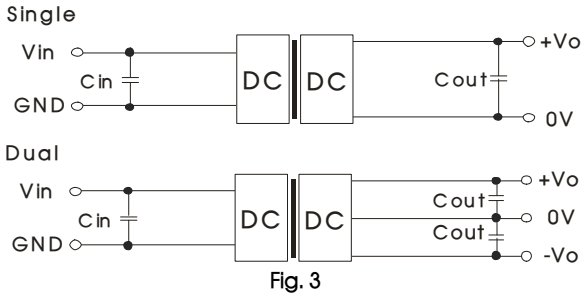


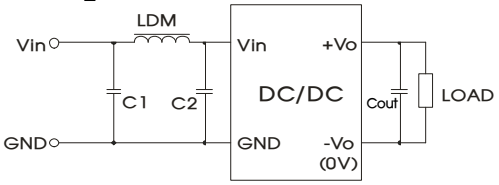
Fig. 3

Table 1: Recommended input and output capacitor values

Vin	Cin	Single Vout	Cout	Dual Vout	Cout
12VDC	10μF/25V	5VDC	10μF/16V	--	--
15VDC	4.7μF/25V	9VDC	10μF/16V	±5/±9VDC	4.7μF/16V
24VDC	2.2μF/50V	12VDC	2.2μF/25V	±12/±15VDC	1μF/25V
--	--	15VDC	1μF/25V	--	--
--	--	24VDC	0.47μF/50V	--	--

2. EMC compliance circuit

G15_S-2WR3, G24_S-2WR3



12/15/24V input

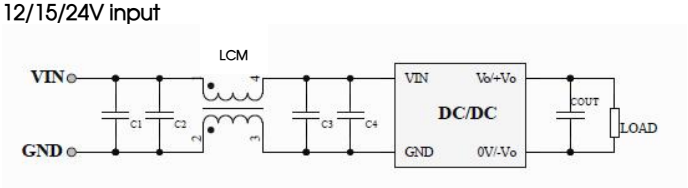


Fig. 4

EMC recommended circuit value table (Table 2)

Input voltage		G15_S-2WR3, G24_S-2WR3
Emissions	C1/C2	4.7μF /50V
	Cout	Refer to the Cout in table 1
	LDM	22μH

Input voltage			12/15/24VDC
Emissions	C1/C2		4.7μF /50V
	C3	H2424S-2WR3	100μF /50V
		Other output	4.7μF /50V
	C4	H2424S-2WR3	--
		Other output	4.7μF /50V
	COUT		Refer to the Cout in table 1
	LCM		22μH(Nickel zinc inductance)

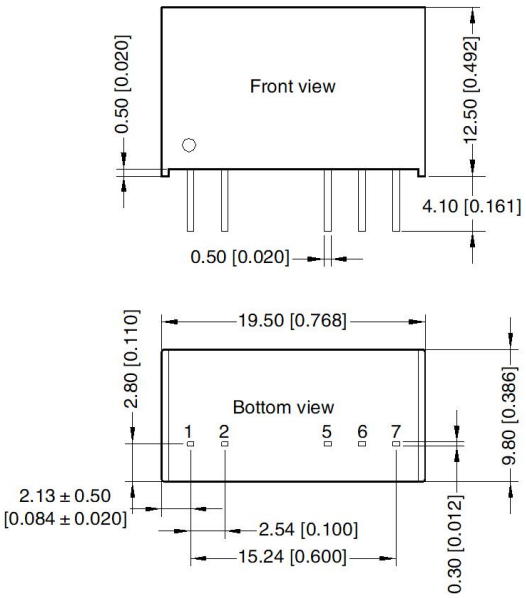
3. Minimum Output Load Requirement

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.

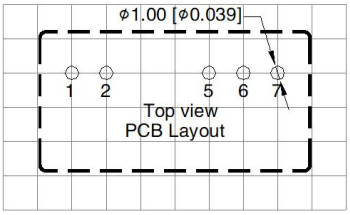
4. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout

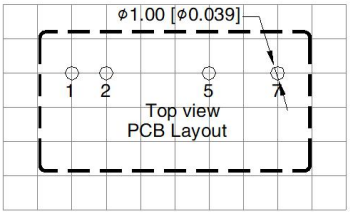
THIRD ANGLE PROJECTION



Dual



Single



Note: Grid 2.54*2.54mm

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

Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.50[± 0.020]

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging 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℃, humidity<75%RH with nominal input voltage and rated output load;
5. All index testing methods in this datasheet are based on our company corporate standards;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. 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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