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

Continuous Short Circuit Protection

3 years Warranty

Patent Protection

CE Report EN 60601-1

UKCA Report BS EN 60601-1

RoHS

FEATURES

- High efficiency up to 84%
- The leakage current < 2μA
- Isolation Capacitance as low as 4pF
- Creepage & Clearance Distance > 8mm
- Reinforced insulation, Isolation voltage: 5000VAC or 6000VDC
- Operating ambient temperature range: -40℃ to +105℃
- Continuous short circuit protection
- Meet IEC60601 standards

G_WS-2WR3 & H_WS-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.		
EN/BS EN	G1205WS-2WR3	12 (10.8-13.2)	±5	±200/±20	76/80	1000
	G1209WS-2WR3		±9	±111/±11	78/82	470
	G1212WS-2WR3		±12	±83/±9	79/83	220
	G1215WS-2WR3		±15	±67/±7	80/84	220
	H1205WS-2WR3		5	400/40	76/80	1000
	H1209WS-2WR3		9	222/22	78/82	680
	H1212WS-2WR3		12	167/17	80/84	470
	H1215WS-2WR3		15	133/14	80/84	470
	G1505WS-2WR3	15 (13.5-16.5)	±5	±200/±20	74/78	1000
	G1509WS-2WR3		±9	±111/±11	76/80	470
	G1515WS-2WR3		±15	±67/±7	76/80	220
	H1505WS-2WR3		5	400/40	76/80	1000
	H1515WS-2WR3		15	133/14	79/83	470
	G2405WS-2WR3	24 (21.6-26.4)	±5	±200/±20	75/79	1000
	G2409WS-2WR3		±9	±111/±11	77/81	470
	G2412WS-2WR3		±12	±83/±9	78/82	220
	G2415WS-2WR3		±15	±67/±7	77/81	220
	H2405WS-2WR3		5	400/40	75/79	2200
	H2409WS-2WR3		9	222/22	77/81	680
	H2412WS-2WR3		12	167/17	78/82	470
	H2415WS-2WR3		15	133/14	80/84	470
	H2424WS-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
Output 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	--	%/℃
Output 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, with the test time of 1 minute, the leakage current < 1mA	5000	--	--	VAC
		6000	--	--	VDC
Leakage Current*	250VAC, 50/60Hz	--	--	2	μA
Insulation Resistance	Input-output, isolation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 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	Welding spot is 1.5mm away from the casing, 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		8	--	--	mm
Operating altitude		--	--	5000	m
Note: * Leakage current and reinforced insulation is based on 250 VAC, 50/60 Hz system input voltage.					

Mechanical Specifications

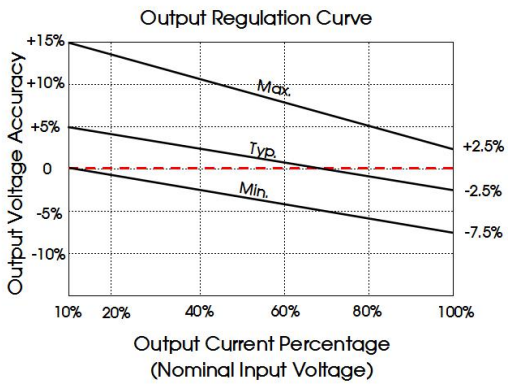
Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	19.50 x 9.80 x 12.50 mm
Weight	4.0g(Typ.)
Cooling Method	Free air convection

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_WS-2WR3, G24_WS-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_WS-2WR3, G24_WS-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

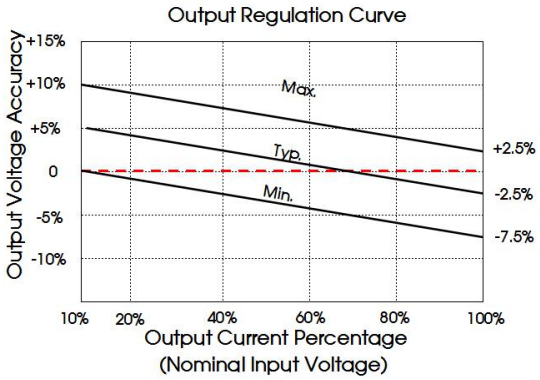


Fig. 1

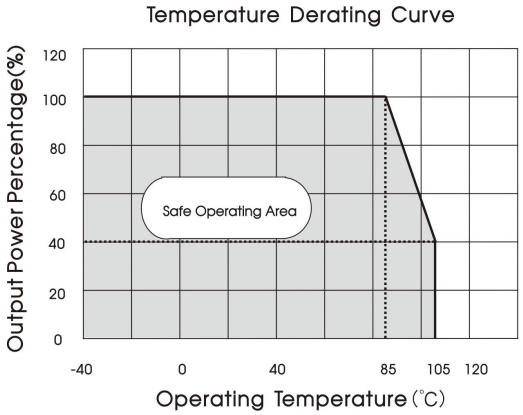


Fig. 2

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 ensured the modules running well, the recommended capacitive load values as shown in Table 1.

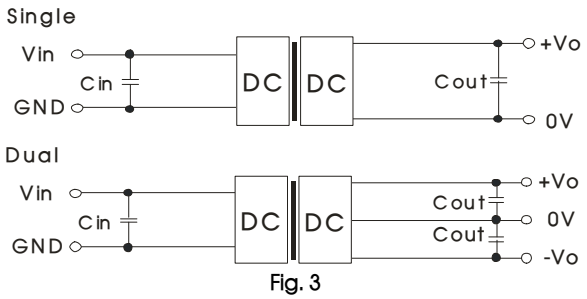


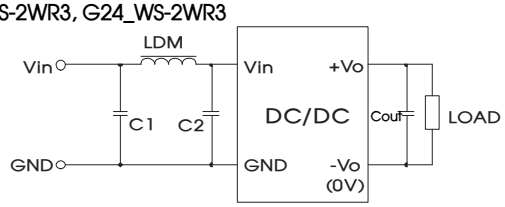
Fig. 3

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_WS-2WR3, G24_WS-2WR3



12/15/24V input

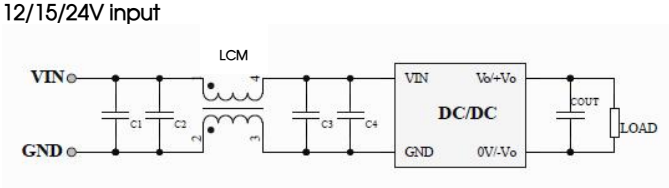


Fig. 4

EMC recommended circuit value table (Table 2)

Input voltage		G15_WS-2WR3, G24_WS-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	H2424WS-2WR3	100μF /50V
		Other output	4.7μF /50V
	C4	H2424WS-2WR3	--
		Other output	4.7μF /50V
	COUT		Refer to the Cout in table 1
	LCM		22μH(Nickel zinc inductance)

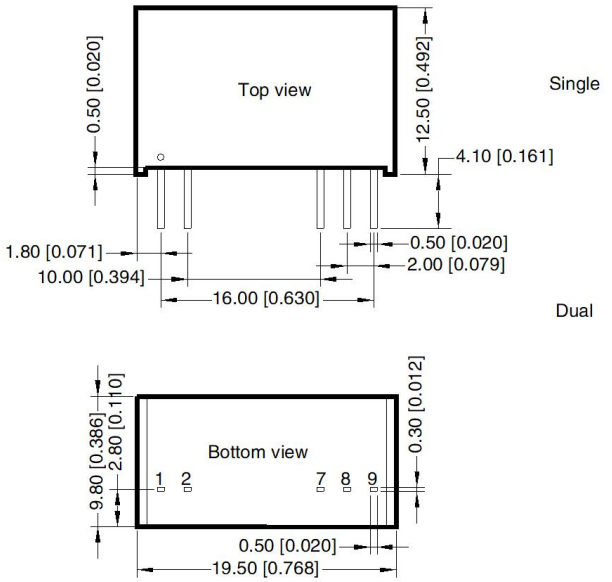
3. Minimum Output Load Requirement

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.

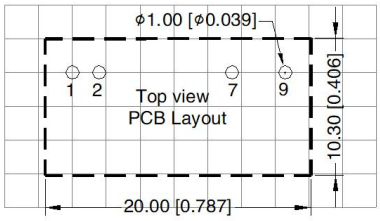
4. For additional information, please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout

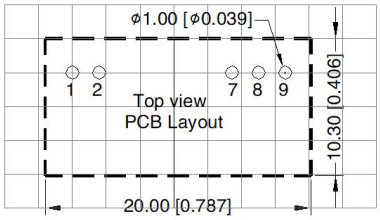
THIRD ANGLE PROJECTION



Single



Dual



Note: Grid 2.54*2.54mm

Pin-Out		
Pin	Single	Dual
1	Vin	Vin
2	GND	GND
7	0V	–Vo
8	No Pin	0V
9	+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, operating altitude within 2000m, 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.

MORNSUN Guangzhou Science & Technology Co., Ltd.
Address: No. 8, Nanyun 4th Road, Huangpu District, Guangzhou, China
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com