

3W isolated DC/DC converter
Wide input and regulated dual output



Patent Protection **RoHS**

WRE2418S-3WR2 of isolated 3W DC-DC converter productions with a wide 2:1 input voltage range and input isolation is tested with 3000VDC. The product has a relatively compact SIP-8 plastic package, and features high efficiency, operating temperature of -40℃ to +85℃, remote control, and continuous short-circuit protection. The smaller size and cost-effective design make the converter an ideal solution in communication, instruments, and industrial electronics applications.

FEATURES

- Ultra compact SIP package
- Wide input voltage range (2:1)
- Operating temperature range: -40℃ to +85℃
- I/O Isolation test voltage 3k VDC
- High power density
- Short-circuit protection (self-recovery)
- Remote On/Off
- Meet EN62368 standard

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency (%)Min./Typ.	Capacitive Load ^② (μF)Max.
		Nominal (Range)	Max. ^①	Voltage(VDC)	Current(mA) Max./Min.		
--	WRE2418S-3WR2	24 (18-36)	40	±18	±83/±4	76/78	147

Notes:①Exceeding the maximum input voltage may cause permanent damage;

②For the dual output modules, the capacitive loads of positive and negative outputs are the same.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load/no-load)	Nominal input voltage	--	160/16	165/30	mA
Reflected Ripple Current		--	55	--	
Surge Voltage (1sec. max.)	24VDC input	-0.7	--	50	VDC
Starting Voltage	24VDC input	--	--	18	
Input Filter		Filter capacitor			
Hot Plug		Unavailable			
Ctrl*	Module on	Ctrl pin open (high resistance)			
	Module off	Ctrl pin pulled high			

Note: * For use of Ctrl, please refer to the "design reference" in this manual.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Voltage Accuracy	5%-100% load	--	±1	±3	%
Voltage Accuracy(no-load)	Input voltage range	--	±2	±5	
Linear Regulation	Input voltage variation from low to high at full load	--	±0.2	±0.5	
Load Regulation	5%-100% load	Main road	±0.3	±0.75	
		Side road	±1.5	±3	
Transient Recovery Time	25% load step change	--	1	3	ms
Transient Response Deviation		--	--	±5	%
Temperature Coefficient	Full load	--	--	±0.03	%/℃
Ripple & Noise*	20MHz bandwidth	--	50	75	mVp-p
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 and the leak current lower than 1mA	3000	--	--	VDC
Insulation Resistance	Input-output, isolation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100kHz/0.1V	--	30	50	pF
Operating Temperature	see Fig. 1	-40	--	+85	℃
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 (PFM Mode)	Full load, nominal input voltage	--	250	--	kHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	k hours

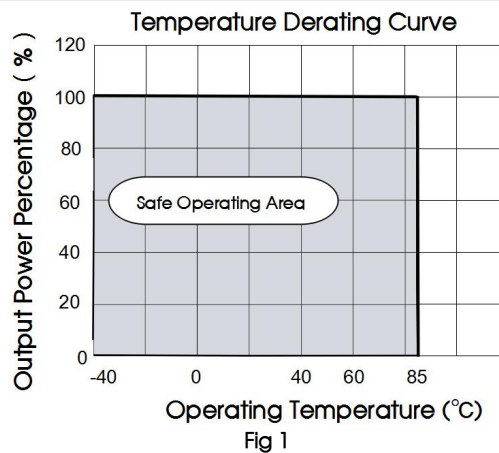
Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94-V0)
Dimension	22.00 x 9.50 x 12.00 mm
Weight	4.48g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B (see Fig. 3-② for recommended circuit)
	RE	CISPR32/EN55032	CLASS B (see Fig. 3-② for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2	Contact ±4kV perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m perf. Criteria A
	EFT	IEC/EN61000-4-4	±2kV (see Fig. 3-① for recommended circuit) perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2kV (see Fig. 3-① for recommended circuit) perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-29	0%, 70% perf. Criteria B

Typical Characteristic Curves



Design Reference

1. Typical application

All DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2.

Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values C_{in} and C_{out} and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the specified max. capacitive load value of the product.

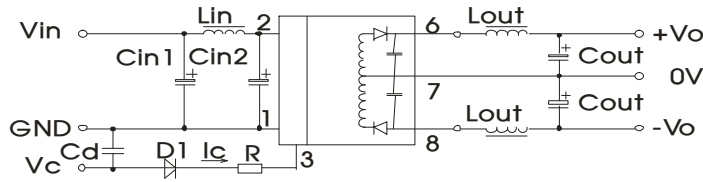


Fig. 2

Vin	24VDC
Cin1	10μF
Cin2	1μF
Lin	4.7μH-12μH
Cout	100μF(Typ.)
Cd	47nF/100V

2. EMC compliance circuit

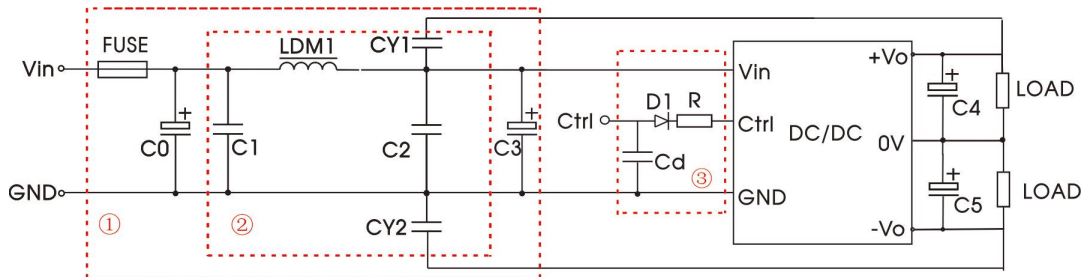


Fig. 3

Parameter description:

FUSE	Slow-blow, selecting based on needs
C0	680μF/50V
C1	10μF/50V
LDM1	10μH
C2	10μF/50V
C3	330μF/50V
CY1	1nF/2000V
CY2	1nF/2000V
C4、C5	Refer to the Cout in Fig.2
D1	RB160M-60V/1A
R	In accordance with the formula: $R = \frac{V_C - V_D - 1.0}{I_C} - 300$
Cd	47nF/100V

注:

① For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs;

② V_C is the voltage of the Ctrl end relative to the GND of the input grounding; V_D is the positive-going conduction pressure drop of D1; I_C is the current flows into the Ctrl end and its value is generally 5-10mA, see Fig. 3-③ for the peripheral circuit of Ctrl end.

3. Ctrl end

The modules are of normal output when the Ctrl end is suspended or of high resistance; the modules turn off when connecting with high level (relative to the input grounding); notice that the current flows into the pin shall be 5 - 10mA, the modules will be permanently damaged if the current exceeds its max. value (20mA in general).

The value of R can be derived as follows:

$$R = \frac{V_C - V_D - 1.0}{I_C} - 300$$

For Detailed parameter, please refer to EMC solution-recommended circuit in this manual.

4. Input current

When the electricity is provided by the unstable power supply, please make sure that the range of the output voltage fluctuation and the ripple voltage of the power supply do not exceed the indicators of the modules. Input current of power supply should afford the flash startup current of this kind of DC/DC module(see Fig. 5).

Generally: $V_{in}=24V$ series $I_{ave}=104mA$

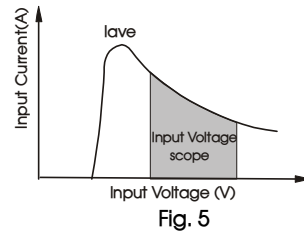


Fig. 5

5. Output load requirements

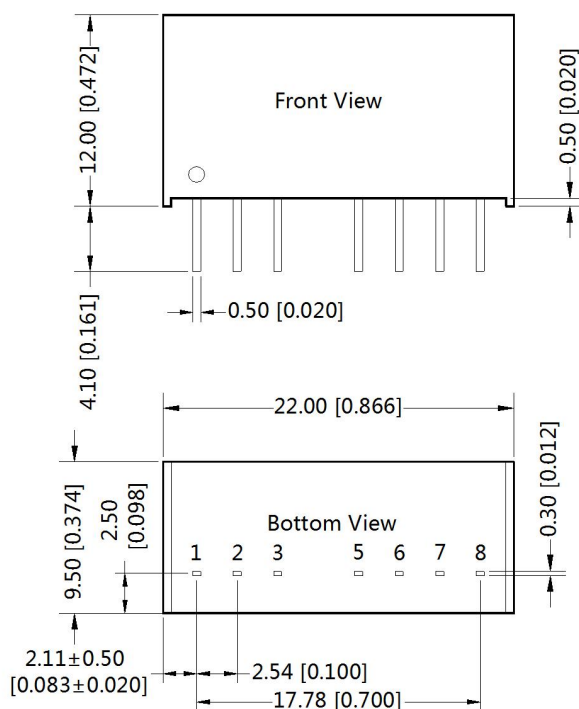
When using, the minimum load of the module output should not be less than 5% of the nominal load. In order to meet the performance parameters of this datasheet, please connect a 5% dummy load in parallel at the output end, the dummy load is generally a resistor, please note that the resistor needs to be used in derating.

6. For additional information please refer to DC-DC converter application notes on

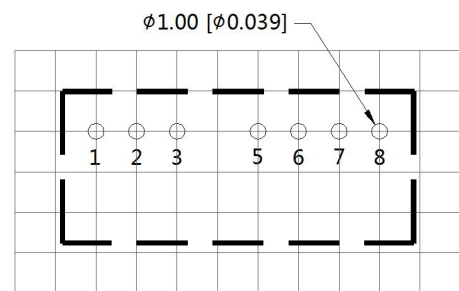
www.mornsun-power.com

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Note:
Unit: mm[inch]
Pin section tolerances: $\pm 0.10[\pm 0.004]$
General tolerances: $\pm 0.25[\pm 0.010]$



Note : Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	GND
2	Vin
3	Ctrl
5	NC
6	+Vo
7	0V
8	-Vo

NC: Not available for electrical connection

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging number: 58210004;
2. Recommend to use module with more than 5% load, if not, the ripple of the product may exceeds the specification, but does not affect the reliability of the product;
3. The recommended unbalance degree of the dual output module load is $\leq \pm 5\%$; if the degree exceeds $\pm 5\%$, then the product performance cannot be guaranteed to comply with all parameters in the datasheet. Please contact our technicians directly for specific information;
4. The maximum capacitive load offered were tested at input voltage range and full load;
5. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75%RH with nominal input voltage and rated output load;
6. All index testing methods in this datasheet are based on company corporate standards;
7. We can provide product customization service, please contact our technicians directly for specific information;
8. Specifications are subject to change without prior notice.

Mornsun Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Huangpu District, Guangzhou, P. R. China
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com