

3W,wide input isolated & regulated
DC-DC converter



Patent Protection RoHS

FEATURES

- Production process in accordance with IATF16949 system control, components meet AEC-Q100 standards, applied to automobile industry
- High isolation voltage : 4.3K VDC
- Operating temperature range:-40°C to +105°C
- International standard pin-out
- Wide input voltage range (2:1)
- High efficiency up to 82%

CWRF1215S-3W product is 3W output power, extremely wide range of voltage input of 7-18VDC, isolation voltage of 4300VDC; Production process in accordance with IATF16949 system control, components meet AEC-Q100 standards. The product is special designed for automobile application.

Selection Guide

Part No.	Input Voltage (VDC)		Output		Efficiency (%Min./Typ.) @ Full Load	Max. Capacitive Load(μF)
	Nominal (Range)	Max.*	Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
CWRF1215S-3W	12 (7-18)	20	15	200/10	80/82	680

Note: *Absolute maximum rating without damage on the converter, but it isn't recommended.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load/ no-load)		--	305/30	313/50	mA
Reflected Ripple Current		--	30	--	
Input impulse Voltage (1 minute. max.)		-0.7	--	30	VDC
Starting Voltage		--	6.5	7	
No-load power consumption		--	0.36	--	W
Input Filter		Capacitor filter			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Power		0.15	--	3	W
Output Voltage Accuracy	5%-100% load	--	±5	±10	%
Line Regulation	Full load, the input voltage is from low voltage to high voltage	--	±5	±10	
Load Regulation	5%-100% load	--	±5	±10	
Temperature Coefficient	Full load	--	--	±0.03	%/°C
Ripple & Noise*	20MHz bandwidth (5%-100% load)	--	100	200	mV
Short circuit Protection	Input voltage range	None			

Note: * Ripple and noise are measured by "parallel cable" method, please see DC-DC Converter Application Notes for specific operation.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	4300	--	--	VDC
insulation Resistance	Input-output, isolation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	30	--	pF

Operating Temperature	see Fig. 1	-40	--	105	°C
Storage Temperature		-55	--	125	
Storage Humidity	Non-condensing	5	--	95	%RH
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	°C
Vibration		10-1000Hz, 10G, 300 Min. along X, Y and Z			
Switching Frequency	PWM Mode	--	380	--	KHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	K hours

Physical Specifications

Casing Material	Black flame-retardant and heat-resistant plastic (UL94-V0)
Dimensions	22.00*9.5*12.00mm
Weight	5.00g (Typ.)
Cooling	Free convection

EMC Specifications

EMI	Conducted emission	EN55025 / CISPR25	CLASS 3 (see Fig.3-② and Fig.3-③ for recommended circuit)
	Radiated emission	EN55025 / CISPR25	CLASS 3 (see Fig.3-② and Fig.3-③ for recommended circuit)
EMS	Electrostatic discharge	IEC/EN61000-4-2	Contact ±4KV perf. Criteria B
	Radiation immunity	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 immunity	IEC/EN61000-4-5	±2KV (see Fig.3-① for recommended circuit) perf. Criteria B
	Conducted disturbance immunity	IEC/EN61000-4-6	3 Vr.m.s perf. Criteria A

Product Characteristic Curve

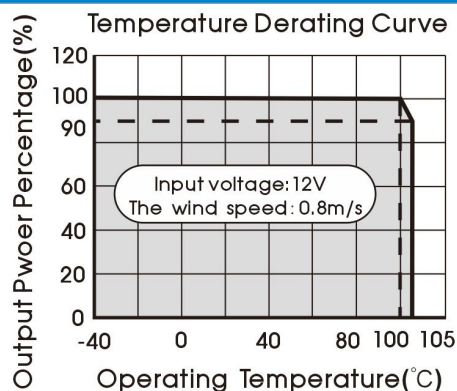
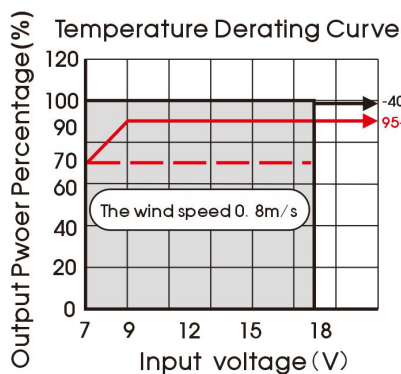
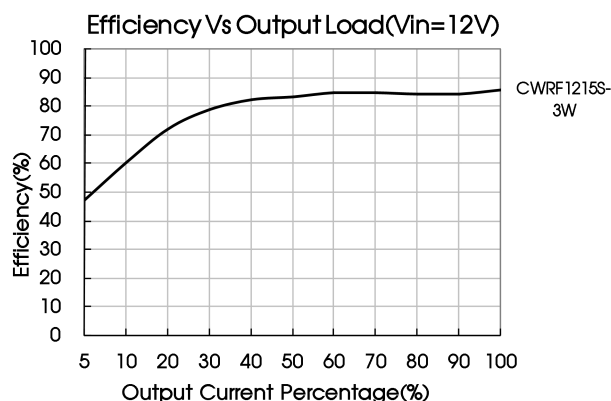
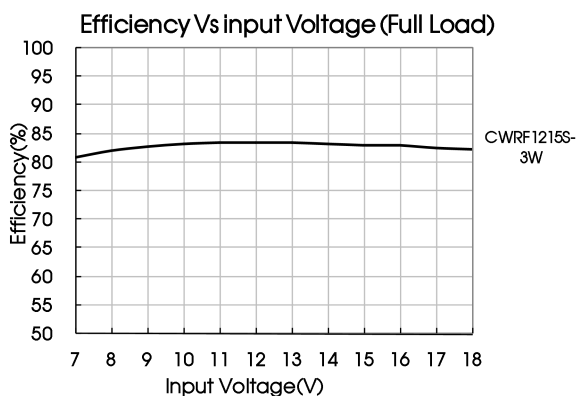


Fig. 1

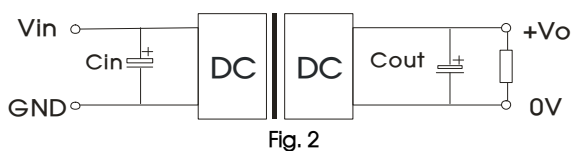


Design Reference

1. Typical application

All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 2) before delivery.

If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors C_{in} and C_{out} or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.



V_{in}	12V
C_{in}	100 μ F
C_{out}	100 μ F

2. EMC solution-recommended circuit

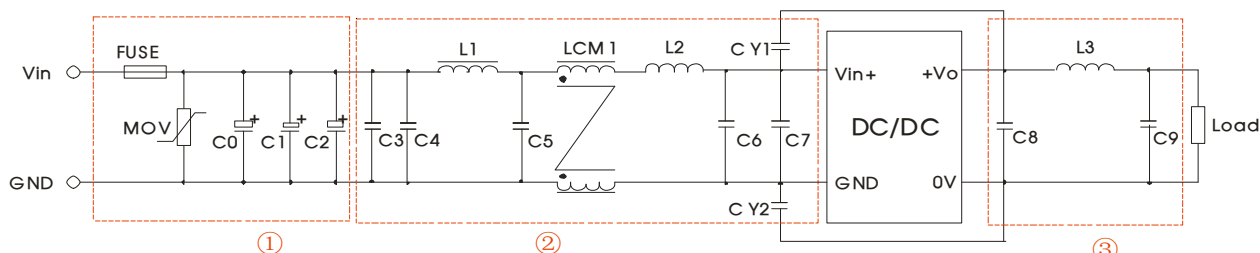


Fig. 3

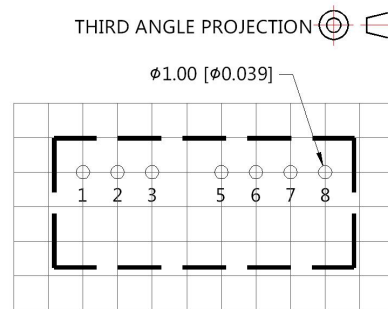
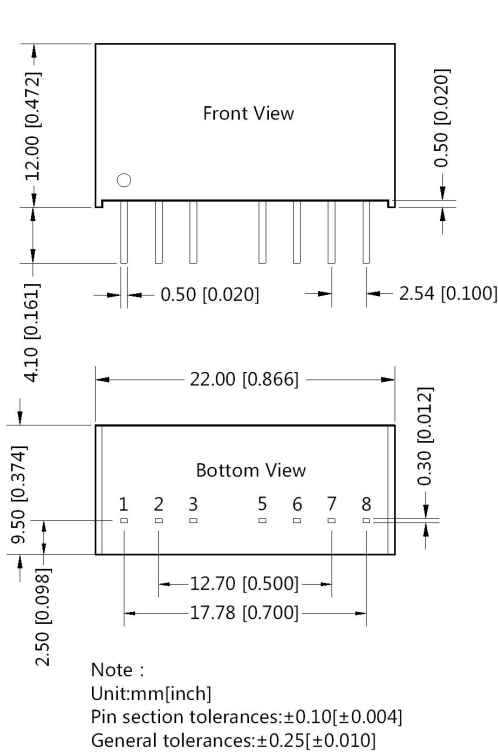
Note: Part ① in the Fig. 3 is used for EMS test ; part ② and part③ are used for EMI filtering; selected based on needs.

Model	CWRF1215S-3W
FUSE	Choose according to actual input current
MOV	S14K20
C_0, C_1, C_2	330 μ F/50V
C_3	4.7 μ F/50V
C_4	10 μ F/50V
L_1	330 μ H
C_5	0.1 μ F/50V
LCM1	10mH
L_2, L_3	600 Ω /100MHz
C_6, C_8, C_9	0.1nF/50V
C_7	1nF/50V
C_{Y1}, C_{Y2}	561K/400VAC

3. The product does not support output in parallel with power per liter use

4. For more information please find DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout



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

NC: No connection

- Note:
1. Packing Information please refer to 'Product Packing Information'. Packing bag number: 58210004;
 2. Recommended used in more than 5% load, if the load is lower than 5%, then the ripple index of the product may exceed the specification, but does not affect the reliability of the product;
 3. The max. capacitive load should be tested within the input voltage range and under full load conditions;
 4. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25°C, humidity<75%RH, when inputting nominal voltage and outputting rated 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. 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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