DC/DC Converter

CWRF1215S-3W

MORNSUN®

3W isolated DC-DC converter
Wide input and regulated single output

Patent Protection RoHS

FEATURES

- The production process is controlled in accordance with IATF16949, and the components meet the AEC-Q100 standard, which is used in the automotive industry
- High isolation voltage: 4.3k VDC
- Operating temperature range: -40℃ to +105℃
- Industry standard pin-out
- Wide input voltage range (2:1)
- High efficiency up to 82%

CWRF1215S-3W product is 3W output power, input voltage range 7-18VDC, isolation voltage 4300VDC, the production process is controlled according to the requirements of the IATF16949 system, and the components meet the AEC-Q100 standard, which is widely used in automotive systems and related equipment.

Selection Guide

Part No.	Input Voltage (VDC)		Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load (μF)Max.
	Nominal (Range)	Max.①	Voltage (VDC)	Current (mA) Max./Min.		
CWRF1215S-3W	12 (7-18)	20	15	200/10	80/82	680

Note: ①Exceeding the maximum input voltage may cause permanent damage.

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 Surge 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	%
Linear Regulation	Input voltage variation from low to high at full load	--	±5	±10	
Load Regulation	5%-100% load	--	±5	±10	
Temperature Coefficient	Full load	--	--	±0.03	%/℃
Ripple & Noise*	20MHz bandwidth, 5%-100% load	--	100	200	mVp-p
Short-circuit Protection	Input voltage range	None			

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 Electric Strength Test for 1 minute with a leakage current of 1mA max.	4300	--	--	VDC
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	30	--	pF
Operating Temperature	see Fig. 1	-40	--	105	℃

Storage Temperature		-55	--	125	
Pin Soldering Resistance Temperature*	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	
	Wave soldering,10 seconds	255	260	265	
Storage Humidity	Non-condensing	5	--	95	%RH
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

Note:*The pin resistance temperature is not the actual set temperature of the soldering iron, but the temperature required for a good solder joint. The actual set temperature by the customer needs to be comprehensively set based on the thickness of the PCB, the size of the copper cladding, the power of the soldering iron, and the selection of the soldering iron tip.

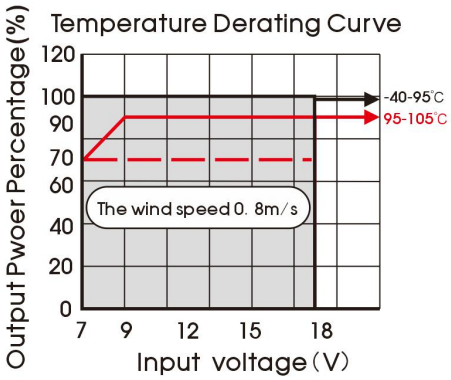
Physical Specifications

Case Material	Black flame-retardant and heat-resistant plastic (UL94-V0)
Dimensions	22.00 x 9.5 x 12.00mm
Weight	5.0g (Typ.)
Cooling method	Free convection

EMC Specifications

EMI	CE	EN55025/CISPR25	CLASS 3 (see Fig.3-② and Fig.3-③ for recommended circuit)	
	RE	EN55025/CISPR25	CLASS 3 (see Fig.3-② and Fig.3-③ for recommended circuit)	
EMS	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	±2kV (see Fig.3-① for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A

Product Characteristic Curve



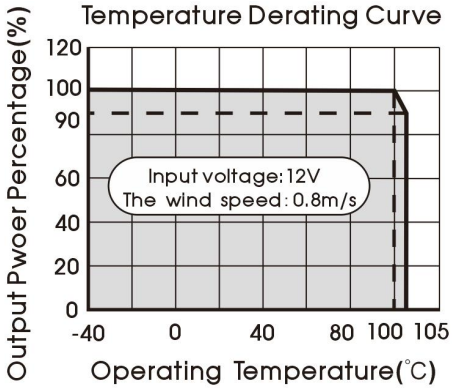
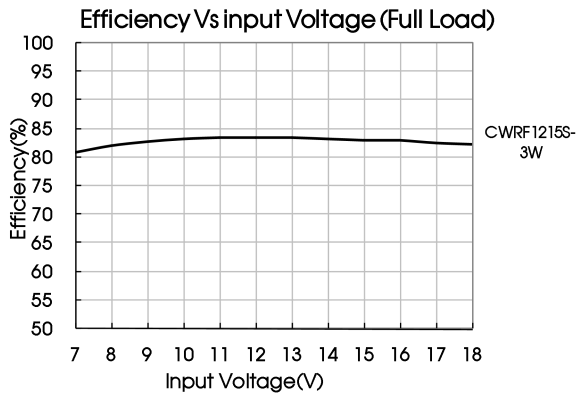
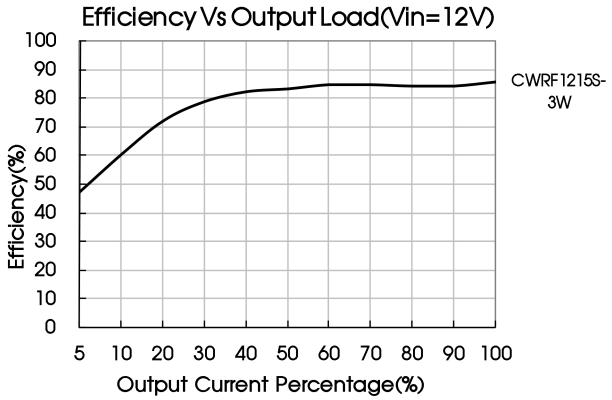


Fig. 1





Design Reference

1. Typical application

All DC-DC converters of this mode 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 Cin and Cout 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	12VDC
Cin	100μF/35VDC
Cout	100μF/35VDC

2. EMC compliance circuit

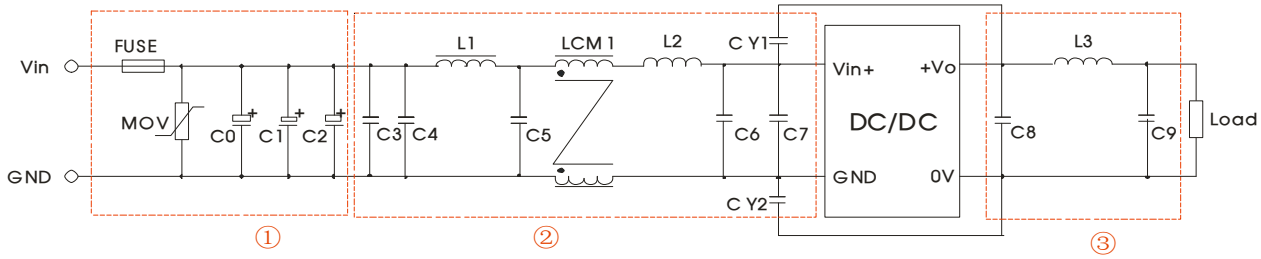


Fig. 3

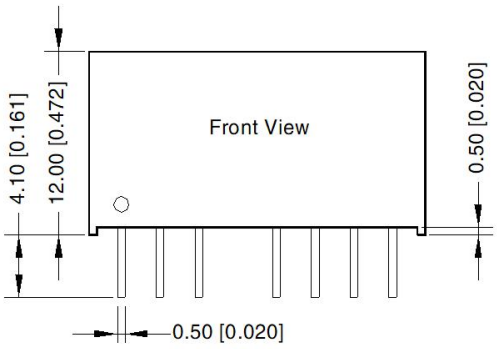
Note: Part ① in the Fig. 3 is used for EMS test; part ② and part③ are used for EMI filtering; selected based on needs.

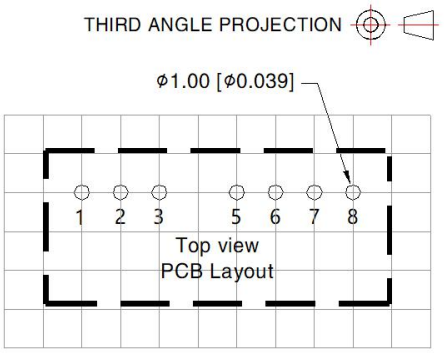
Model	CWRF1215S-3W
FUSE	Choose according to actual input current
MOV	S14K20
C0, C1, C2	330uF/50V
C3	4.7μF/50V
C4	10μF/50V
L1	330uH
C5	0.1μF/50V
LCM1	10mH
L2, L3	600Ω/100MHz
C6, C8, C9	0.1nF/50V
C7	1nF/50V
CY1, CY2	561k/400VAC

3. The products do not support parallel connection of their output

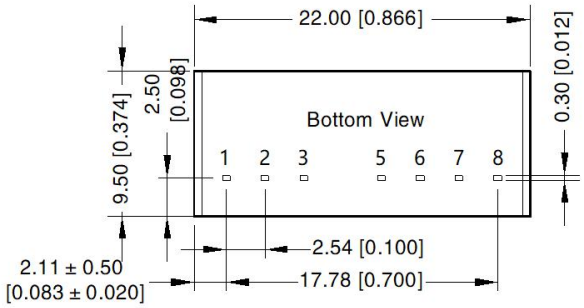
4. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout





Note: Grid 2.54*2.54mm



Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.25[± 0.010]

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

NC: Pin to be isolated from circuitry

Note: CS is the output terminal of the output rectifier circuit, and an external filter capacitor can further reduce the output Ripple & Noise.

Note:
1. For additional information on Product Packaging please refer to www.mornsun-power.com. 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. TThe 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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