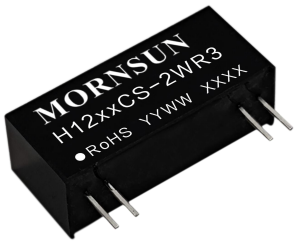
DC/DC Converter
H_CS-2WR3 Series

MORNSUN®

2 W isolated DC-DC converter
Fixed input voltage, regulated output



Continuous Short Circuit Protection

Patent Protection

CE Report EN 62368-1 | UKCA Report BS EN 62368-1 | CB IEC 62368-1 | RoHS

FEATURES

- Continuous short-circuit protection
- Operating ambient temperature range:-40℃ to +105℃
- Meets 8kV impact withstand voltage
- I/O isolation test voltage 5k VAC or 7k VDC, reinforced insulation
- Industry standard pin-out
- Electrical clearance and creepage distance above 16mm
- Meets CTI level 1
- Isolation capacitance as low as 7pF
- High efficiency up to 84%

H_CS-2WR3 series are specifically designed for applications where high voltage power systems such as photo voltaic and energy storage need to generate a set of voltage isolated from the input power supply. The design refers to IEC 62109-1 and IEC 62477-1 to meet the isolation requirements of 1500V system. It is 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 ≤5k VAC or 7k VDC);

3. Where has high requirement of Output voltage stability;

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/IEC	H1205CS-2WR3	12 (10.8-13.2)	5	400/40	80/83	1000
	H1212CS-2WR3		12	167/17	81/84	470

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	12VDC input	5VDC output	--	217/15	--	mA
		12VDC output	--	209/15	--	
Reflected Ripple Current*			--	30	--	
Surge Voltage (1sec. max.)			-0.7	--	18	VDC
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 curves(Fig. 1)			
Linear Regulation	Input voltage change: ±1%	5VDC output	--	--	±1.2	--
		12VDC output	--	--		
Load Regulation	10%-100% load	5VDC output	--	7	±20	%
		12VDC output	--	7	±15	
Ripple & Noise*	20MHz bandwidth		--	50	150	mVp-p
Temperature Coefficient	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 electric strength test for 1 minute with a leakage current of 5mA max.	5000	--	--	VAC
		7000	--	--	VDC
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	7	--	pF
Operating Temperature	Derating when operating temperature up to 71℃, (see Fig. 2)	-40	--	105	℃
Storage Temperature		-55	--	125	
Case Temperature Rise	Ta=25℃	--	25	--	
Storage Humidity	Non-condensing	5	--	95	%RH
Pin Welding Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	℃
Wave-soldering Temperature*		Peak temp.≤245℃, maximum duration time≤60s over 217℃			
Switching Frequency	Full load, nominal input voltage	--	200	--	kHz
MTBF	MIL-HDBK-217F@25℃	20000	--	--	k hours
Creepage & Clearance Distance		16	--	--	mm

Note: * For actual application, please refer to IPC/JEDEC J-STD-020D.1.

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	27.40 x 9.50 x 12.00 mm
Weight	5.2 g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B (see Fig. 4 for recommended circuit)
	RE	CISPR32/EN55032 CLASS B (see Fig. 4 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2 Contact ±6kV perf. Criteria B

Typical Characteristic Curves

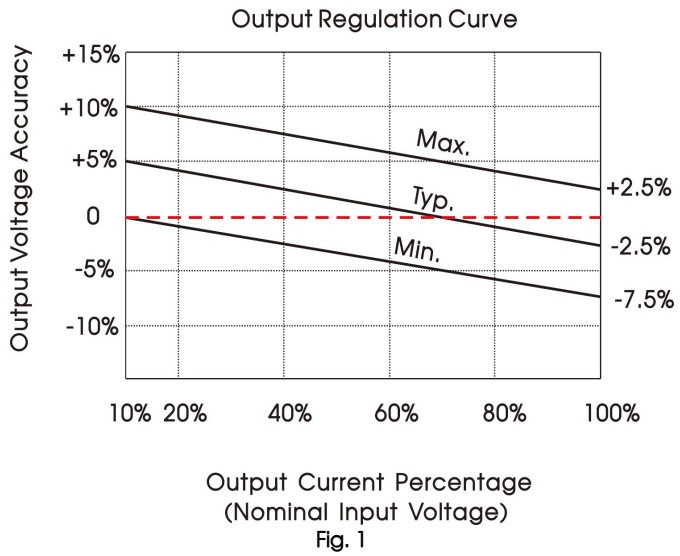


Fig. 1

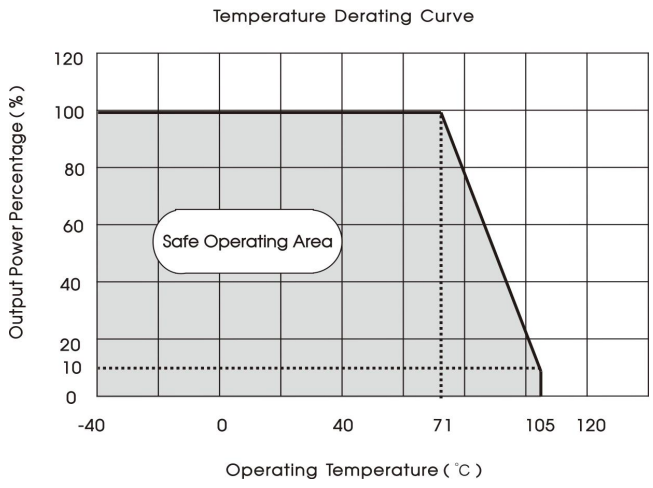
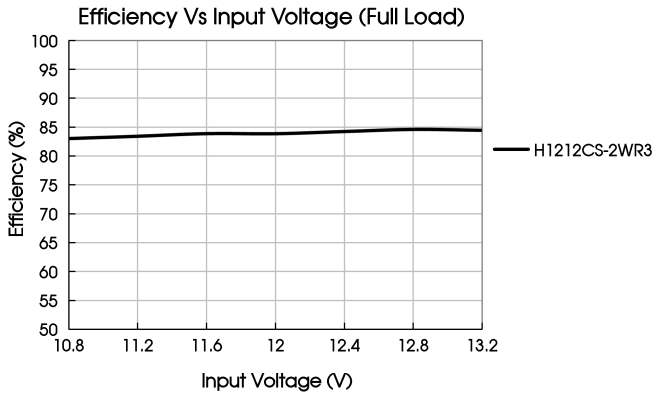
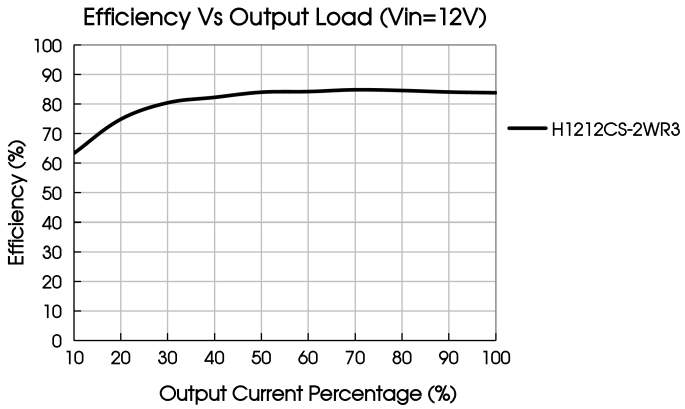


Fig. 2





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.

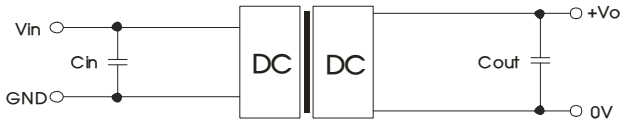


Fig. 3

Table 1: Recommended input and output capacitor values

Vin	Cin	Vo	Cout
12VDC	4.7μF/25V	5VDC	10μF/16V
		12VDC	4.7μF/25V

2. EMC (CLASS B) compliance circuit

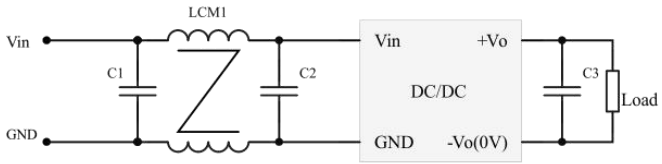


Fig. 4

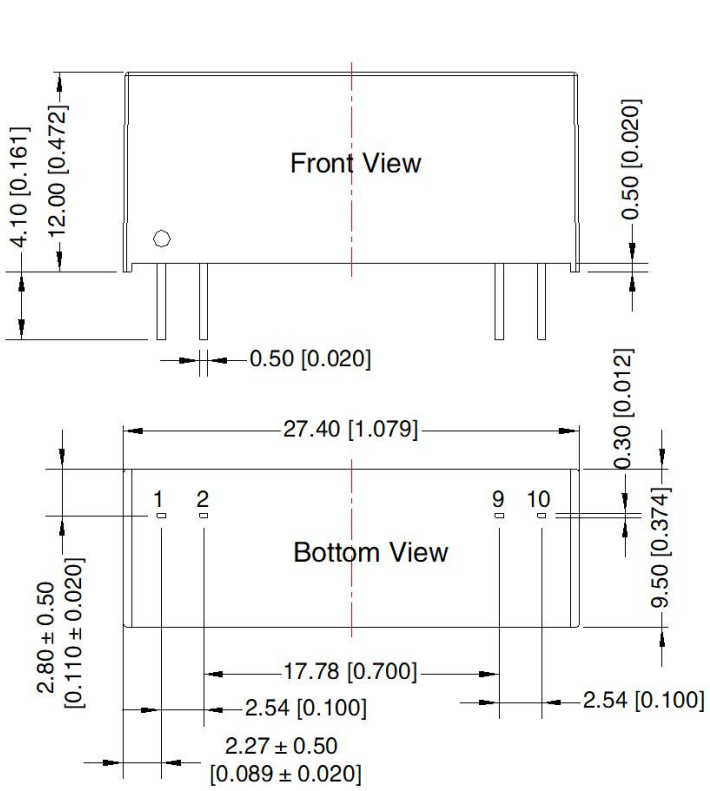
Table 2: Recommended EMC filter values

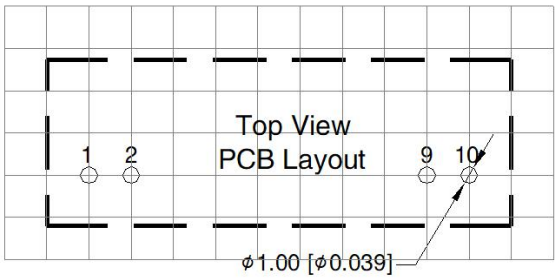
Input voltage		12VDC
Emissions	C1/C2	22μF/25V
	C3	Refer to the Cout in table 1
	LCM1	4.7 mH recommended to use MORNSUN's FL2D-30-472

3. In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor on the output side (The sum of the efficient power and resistor consumption power is not less than 10%).

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

Pin-Out	
Pin	Mark
1	Vin
2	GND
9	0V
10	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: 58200015;
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.

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