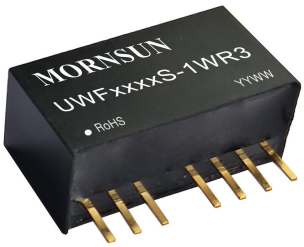
DC/DC Converter

UWE/F_S-1WR3 series

MORNSUN®

1W isolated DC-DC converter in SIP package
Ultra-wide input and regulated single/dual output



Patent Protection

3 years Warranty

CE EN62368-1

UKCA BS EN62368-1

RoHS

FEATURES

- Ultra-wide input voltage range (8:1)
- High efficiency up to 74%
- No-load power consumption as low as 0.12W
- I/O isolation test voltage 3k VDC
- Operating ambient temperature range: -40℃ to +105℃
- Input under-voltage protection, output short-circuit, over-current protection
- Industry standard pin-out

UWE/F_S-1WR3 series of isolated 1W DC-DC converter products with an ultra-wide 8:1 input voltage range. They feature efficiencies of up to 74%, 3000VDC input to output isolation, operating ambient temperature range of -40℃ to +105℃, input under-voltage protection, output short circuit, over-current protection and they are widely used in applications such as medical care, industrial control, electric power, instruments and communication fields.

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency② (%) Min./Typ.	Capacitive Load③ (μF)Max.
		Nominal (Range)	Max. ①	Voltage(VDC)	Current (mA) Max.		
EN/BS EN	UWE1205S-1WR3	12 (4.5-36)	40	±5	±100	69/71	220
	UWE1212S-1WR3			±12	±42	72/74	150
	UWE1215S-1WR3			±15	±33	72/74	68
	UWF1205S-1WR3			5	200	69/71	470
	UWF1209S-1WR3			9	111	69/72	220
	UWF1212S-1WR3			12	83	72/74	330
	UWF1215S-1WR3			15	67	72/74	220

Note:
① Exceeding the maximum input voltage may cause permanent damage;
② Efficiency is measured at nominal input voltage and rated output load;
③ The specified maximum capacitive load value for positive and negative output is identical.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5V/±5V output	--	117/10	121/15	mA
	Others	--	116/10	121/15	
Reflected Ripple Current		--	50	--	
Surge Voltage (1sec. max.)		-0.7	--	50	VDC
Start-up Voltage		--	--	4.5	
Input Under-voltage Protection		2.5	3.5	--	
Input Filter		Capacitance Filter			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	0% -100% load		--	±1	±3	%
Line Regulation	Full load, the input voltage is from low to high	Vo1	--	--	±0.5	
		Vo2	--	--	±1	

Load Regulation	5% -100% load		Vo1	--	--	±1	%
			Vo2	--	--	±1.5	
Cross Regulation	Dual output, Vo1 load at 50%, Vo2 load at range of 25%-100%			--	--	±5	
Transient Recovery Time	25% load step change, nominal input voltage			--	300	500	μs
Transient Response Deviation		5V/ ±5V output		--	±5	±8	%
		Others		--	±3	±5	
Temperature Coefficient	Full load			--	--	±0.03	%/℃
Ripple & Noise①	20MHz bandwidth, 5% -100% load			--	60	100	mVp-p
Over-current Protection	Input voltage range			110	--	300	%Io
Short-circuit Protection				Continuous, self-recovery			

Note:
①Under 0% -5% load conditions, ripple & noise does not exceed 5%Vo. 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.	3000	--	--	VDC
Insulation Resistance	Input-output insulation at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	40	--	pF
Operating Temperature	See Fig. 1	-40	--	+105	℃
Storage Humidity	Without condensation	5	--	95	%RH
Storage Temperature		-55	--	+125	℃
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	+300	
Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency *	PWM mode	--	300	--	kHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	k hours

Note: *Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

Physical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94-V0)
Package Dimensions	22.00 × 9.50 ×12.00 mm
Weight	4.6g (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 ±6kV	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.3-①for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A

Typical Characteristic Curve

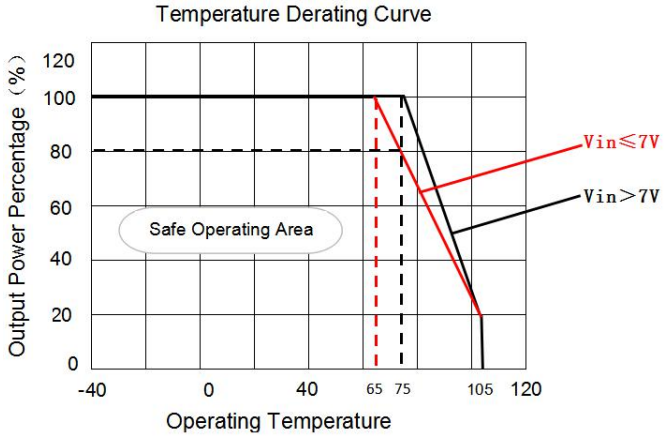


Fig. 1

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 Cin and Cout or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.

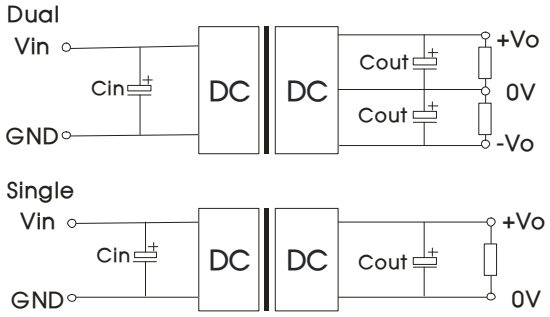


Fig. 2

Parameter description:

Single Vout (VDC)	Cout (μF)	Cin (μF)	Dual Vout (VDC)	Cout (μF)	Cin (μF)
5/9/12/15	22 (25V)	100 (50V)	±5/±12/±15	22 (25V)	100 (50V)

2. EMC compliance circuit

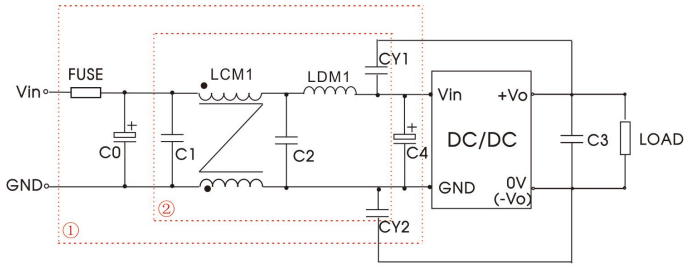


Fig. 3

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

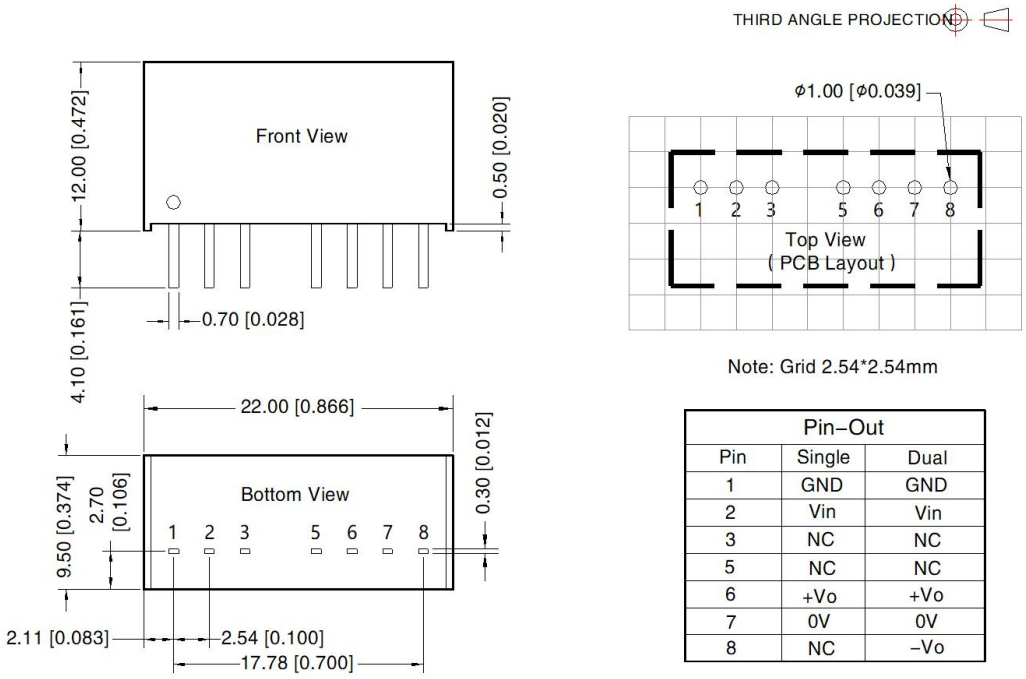
Parameter description:

Model	Vin: 12V
FUSE	Select fuse value according to actual input current
C0	1000μF/50V
C4	100μF/50V
C1/C2	4.7μF/50V
C3	22μF/50V
LCM1	2.2mH, recommended to use MORNSUN's FL2D-10-222
LDM2	4.7μH
CY1/CY2	1nF/3kV

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

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

NC: Not available for electrical connection

Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.50[± 0.020]

Note:
1. For additional information on Product Packaging please refer to www.mornsun-power.com. packaging number: 58210004;
2. The maximum capacitive load offered were tested at input voltage range and full load;
3. 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;
4. All index testing methods in this datasheet are based on company corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. 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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