DC/DC Converter

SUWB4805S-3WR2

3W isolated DC-DC converter in SIP package,
Ultra-wide input and regulated single output

Patent Protection RoHS

FEATURES

- Ultra-wide input voltage range (9~60VDC)
- I/O isolation test voltage 1.5K VDC
- Input under-voltage protection, over-current, output short-circuit protection
- Operating ambient temperature range: -40℃ to +85℃
- Industry standard pin-out
- Meets EN62368 standard

SUWB4805S-3WR2 is isolated 3W DC-DC converter products with an ultra-wide input voltage range (9~60VDC). It features input to output isolation is tested with 1500VDC, operating temperature of -40℃ to +85℃, input under-voltage protection, over-current and short circuit protection. It is widely used in applications such as industrial controls, electric power, instrumentation and communications.

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency② (%) Min./Typ.	Max. Capacitive Load(μF)
		Nominal (Range)	Max. ①	Voltage (VDC)	Current(mA) Max./Min.		
--	SUWB4805S-3WR2	48 (9-60)	75	5	600/0	75/77	1000

Notes:
① Exceeding the maximum input voltage may cause permanent damage;
② Efficiency is measured at nominal input voltage and rated output load.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no load)	Nominal input voltage	--	82/8	84/16	mA
Reflected Ripple Current		--	50	--	
Surge Voltage (1sec. max.)		-0.7	--	80	VDC
Start-up Voltage		--	--	9	
Input under-voltage protection		5.5	6.5	--	
Input Filter		Capacitance filter			
Hot Plug		Unavailable			
Ctrl*	Module on	Ctrl pin open or pulled high (TTL 3.5-12VDC)			
	Module off	Ctrl pin pulled low to GND (0-1.2VDC)			
	Input current when off	--	6	10	mA

Note: *The Ctrl pin voltage is referenced to input GND.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Voltage Accuracy	5%-100% load	--	±1	±2	%
Linear Regulation	Input voltage variation from low to high at full load	--	±0.5	±1	
Load Regulation①	5%-100% load	--	±0.5	±1	
Transient Recovery Time	25% load step change, nominal input voltage	--	300	500	μs
Transient Response Deviation		--	±5	±8	%
Temperature Coefficient	Full load	--	--	±0.03	%/℃
Ripple & Noise②	20MHz bandwidth, 5%-100% load	--	75	100	mV p-p
Over-current Protection	Input voltage range	110	160	250	%Io
Short-circuit Protection		Continuous, self-recovery			

Note:
① Load regulation for 0%-100% load is ±3%;
② Ripple & Noise at < 5% load is 5%Vo max. The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information.

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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.	1500	--	--	VDC
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100KHz/0.1V	--	1000	--	pF
Operating Temperature	See Fig. 1	-40	--	+85	℃
Storage Temperature		-55	--	+125	
Storage Humidity	Non-condensing	5	--	95	%RH
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	--	500	--	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.

Mechanical Specifications

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

Typical Characteristic Curves

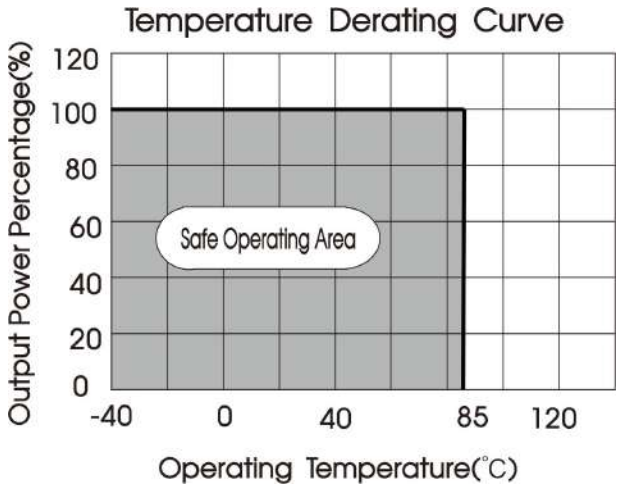

Fig. 1

DC/DC Converter

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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 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(VDC)	Cin	Cout
48	100μF/100V	10μF/25V

2. EMC compliance circuit

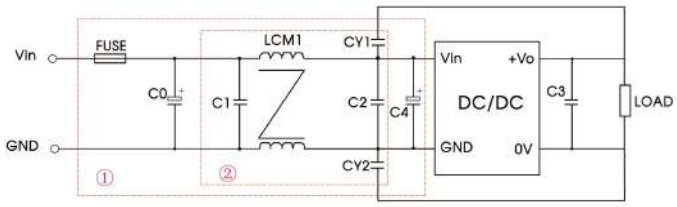


Fig. 3

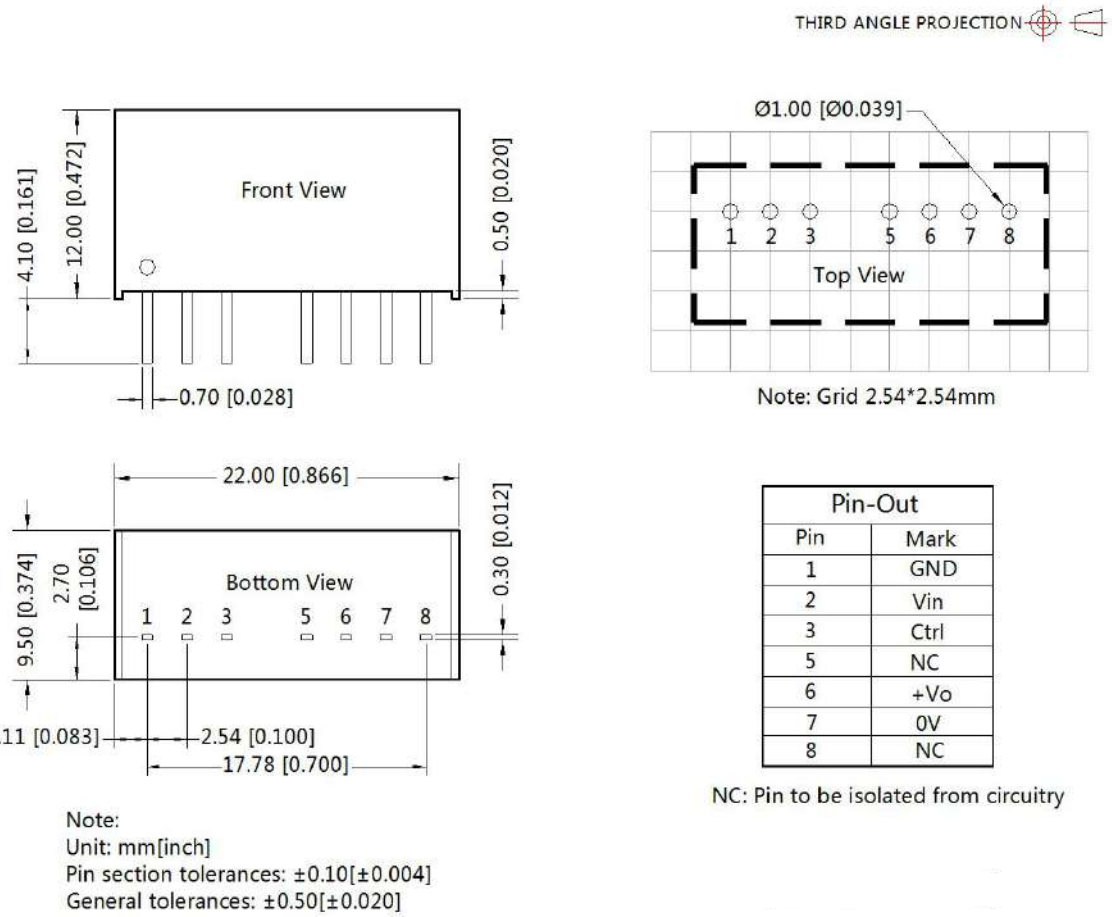
Notes: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs

Parameter description:

Model	Vin: 48V
FUSE	Select fuse value according to actual input current
C0/C4	330μF/100V
C1/C2	4.7μF/100V
C3	Refer to the Cout in Fig.2
LCM1	1.4-1.7mH（TN150P-RH12.7*12.7*7.9）
CY1/CY2	1nF/400VAC

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

Dimensions and Recommended Layout



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

NC: Pin to be isolated from circuitry

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

Note:

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 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.