SURA SURB S-6WR4

Product Feature

- Package Type：SIP8
- Universal Input：4:1
- Operating temperature range：-40℃ - +105℃
- Isolation voltage：1600VDC
- High efficiency up to：87%（Type）
- The mechanism has input under-voltage protection, output short circuit protection and over current protection。
- Fields of application：Power, industrial control, communications,Internet of Things, automotive.

Selection Guide

Part No.	Input Voltage (VDC)		Output		Full Load Efficiency% (Typ.)	Capacitive Load(μF) Max.
	Nominal (Range)	Max.	Voltage (VDC)	Current (mA) Max		
SURB 1203 S-6WR4	12（4.5-18）	20	3.3	1350	76	1800
SURB 1205 S-6WR4	12（4.5-18）	20	5	1200	80	1000
SURB 1212 S-6WR4	12（4.5-18）	20	12	500	84	470
SURB 1215 S-6WR4	12（4.5-18）	20	15	400	85	220
SURB 2403 S-6WR4	24（9-36）	40	3.3	1350	78	1800
SURB 2405 S-6WR4	24（9-36）	40	5	1200	82	1000
SURB 2406 S-6WR4	24（9-36）	40	6	1000	82	680
SURB 2409 S-6WR4	24（9-36）	40	9	667	84	470
SURB 2412 S-6WR4	24（9-36）	40	12	500	86	470
SURB 2415 S-6WR4	24（9-36）	40	15	400	87	220
SURB 2424 S-6WR4	24（9-36）	40	24	250	85	100
SURA 2405 S-6WR4	24（9-36）	40	±5	600	80	#470
SURA 2409 S-6WR4	24（9-36）	40	±9	333	83	#220
SURA 2412 S-6WR4	24（9-36）	40	±12	250	83	#120
SURA 2415 S-6WR4	24（9-36）	40	±15	200	83	#100
SURA 2424 S-6WR4	24（9-36）	40	±24	125	82	#68
SURB 4805 S-6WR4	48（18-75）	80	5	1200	82	680
SURB 4812 S-6WR4	48（18-75）	80	12	500	83	330
SURB 4815 S-6WR4	48（18-75）	80	15	400	84	150
SURB 4824 S-6WR4	48（18-75）	80	24	250	82	68
SURA 4805 S-6WR4	48（18-75）	80	±5	600	80	470#
SURA 4812 S-6WR4	48（18-75）	80	±12	250	83	120#
SURA 4815 S-6WR4	48（18-75）	80	±15	200	83	100#

#Each output

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Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load/no load)	12VDCInput		--	625/10	641/30	mA
	24VDC Input	3.3VDC Output	--	238/5	248/12	
		Other Output	--	305/5	315/12	
	48VDC Input	5VDC Output	--	156/5	166/12	
		Other Output	--	146/10	156/16	
Reflected Ripple Current			--	50	--	
Impulse Voltage	12VDC Input		-0.7	--	25	VDC
	24VDC Input		-0.7	--	50	
	48VDC Input		-0.7	--	100	
Starting Voltage	12VDC Input		--	--	4.5	VDC
	24VDC Input		--	--	9	
	48VDC Input		--	--	18	
Under-voltage Protection	12VDC Input		3.5	4	--	
	24VDC Input		5.5	6.5	--	VDC
	48VDC Input		12	15.5	--	
CTRL	turn off module		Connected to GND or (0-1.2VDC)			
	turn on module		Suspended or (3.5-12VDC)			
Input Filter			Capacitance Filter			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	5% - 100% Load		--	±1.0	±3.0	%
Linear Regulation	Full load,Input voltage from low limit to high limit		--	±0.5	±1	%
Load Regulation	5% - 100% Load		--	±0.5	±1.5	%
Ripple & Noise	20MHZ Bandwidth, 5% - 100% Load		--	50	100	mVp-p
Transient Recovery Time	25% load step change, nominal input voltage		--	0.3	0.5	ms
Transient Response Deviation	25% load step change, nominal input voltage	3.3VDC\5VDC Output	--	±5	±8	%
		Other Output	--	±3	±5	
Temperature Coeffcient	Full Load		--	--	±0.03	%/℃
Over Current Protection			110	160	--	%Io
Short-circuit Protection			Continuous, Self-Recovery			

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General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Insulation Voltage	Input-output, test time 1 minute, leakage current less than 1mA	1600	--	--	VDC
Insulation Resistance	Input-output, insulated voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz,0.1V	--	1000	--	pF
Operating Temperature	See Figure 1	-40	--	105	℃
Storage Temperature		-55	--	125	℃
Storage Humidity	Non-condensing	5	--	95	%RH
Pin welding can withstand the highest temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	℃
Switching Frequency	Full Load, Nominal Input Voltage	--	300	--	kHz
MTBF	MIL-HDBK-217F@25℃	>1000Kh			

Mechanical Specification

Case Material	Black plastic; flame-retardant and heat-resistant（UL 94V-0 rated）
Package Dimensions	22.00 x 9.50 x 12.00mm
Weight	4.9g（Typ.）
Cooling Method	Free air convection

EMC Specifications

EMI	CE	CISPR32/EN55032 CLASS B(Recommended circuit as shown in Figure 3-②)	
	RE	CISPR32/EN55032 CLASS B(Recommended circuit as shown in Figure 3-②)	
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(Recommended circuit as shown in Figure 3-①)	Perf.Criteria B
	Surge	IEC/EN61000-4-5 line to line ±1KV(Recommended circuit as shown in Figure 3-①)	Perf.Criteria B
	CS	IEC/EN61000-4-6 3Vr.m.s	Perf.Criteria A

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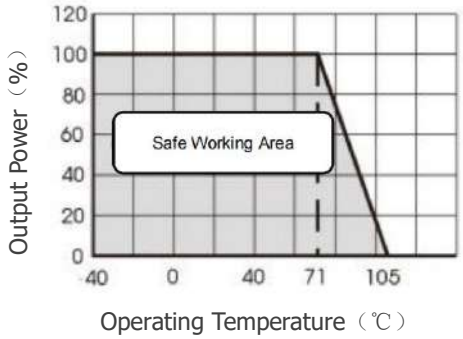
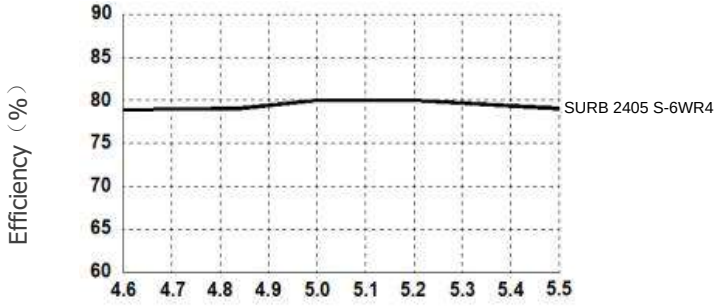
Typical Characteristic Curves

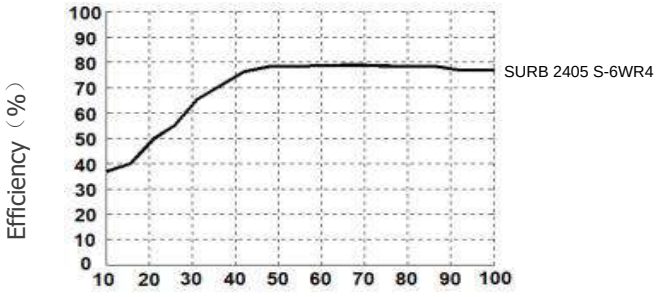
Temperature Derating Curve（Figure 1）



Efficiency VS Input Voltage (full load)

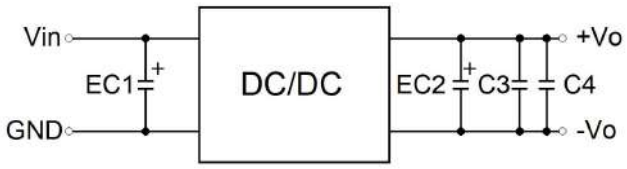


Efficiency VS Output Load（Vin=24V）



Typical Circuit Design and Application

Application circuit（Figure 2）

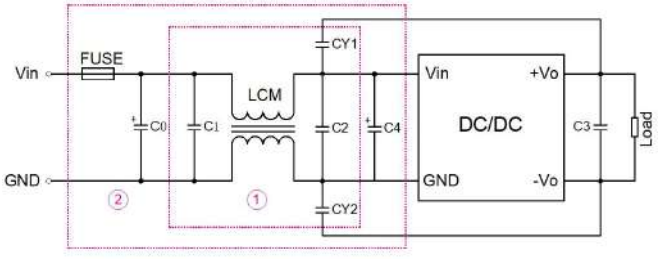


Recommended Capacitive Load Value Table

Vout(VDC)	EC1(uF)	EC2(uF)	C3(uF)	C4(uF)
3.3/5VDC	100μF/50V	100uF/16V	10uF/50V	0.1uF/16V
12/15VDC	100μF/50V	47μF/25V	10μF/50V	0.1μF/25V
24VDC	100μF/50V	47μF/50V	10μF/50V	0.1μF/50V

All DC/DC converters in this series are tested according to the recommended testing circuit (Figure 2) before leaving the factory. If further reduction of input and output ripple is required, the input and output external capacitors Cin and Cout can be increased or a capacitor with a small series equivalent impedance value can be selected, but the capacitance value cannot exceed the maximum capacitive load of the product.

Application circuit（Figure 3）



Note: Part 1 in Figure 3 is for EMC testing; The second part is used for EMI filtering, which can be selected according to the demand.

EMI Recommended Parameter Table

Model	Vin：12V	Vin：24V	Vin：48V
FUSE	Select according to the actual input current of the customer		
C0、C4	330uF/25V	330uF/50V	220uF/100V
C1、C2	10μF/50V		
LCM	1.4-1.7mH		
C3	22μF/50V		
CY1、CY2	1nF/400VAC		

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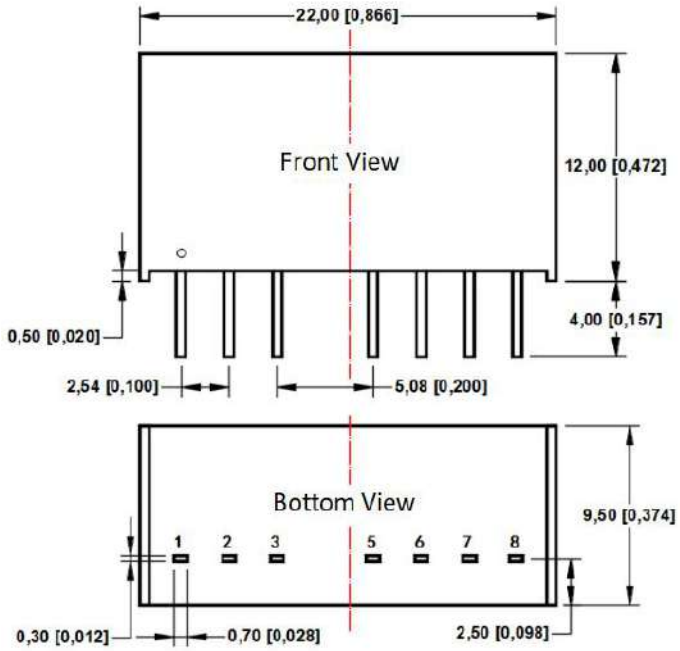
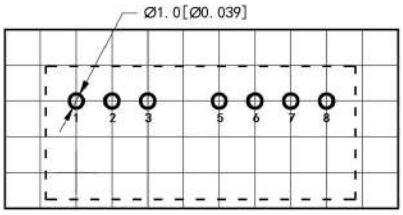
Dimensions and Recommended Layout

Dimensions



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

PCB Printing Layout



The grid distance is 2.54mm x2.54mm

Pin Definition Table

Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	CTRL	CTRL
5	NC	NC
6	+Vo	+Vo
7	-Vo	COM
8	NC	-Vo

NC：Pin to be isolated from circuity

Note:

- The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
- It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
- Suggested dual output module load imbalance: ≤ ± 5%. If it exceeds ± 5%, it cannot be guaranteed that the product performance meets all performance indicators in this manual;
- The maximum capacitive load is tested within the input voltage range and under full load conditions;
- Unless otherwise specified, all indicators in this manual are measured at Ta=25 °C, humidity<75% RH, nominal input voltage, and output rated load;
- All indicator testing methods in this manual are based on our company's corporate standards;
- Our company can provide product customization, and specific requirements can be directly contacted by our technical personnel;
- Product specifications are subject to change without prior notice.