SURA & SURB S-1W

Product Feature

- Package Type：SIP8
- perating Temperature Range：-40℃ - +105℃
- Isolation Voltage：1500VDC
- 4:1 Wide Input Voltage Range
- Low Ripple & Noise
- With the output overcurrent protection and output short circuit protection mechanism
- Fields of application：electric power, industrial control, communication, Internet of Things,automobile,etc

Selection Guide

Part No.	Input Voltage (VDC)	Output			Ripple & Noise（Typ./Max.）(mVp-p)	Full Load Efficiency%（Min./Typ.）	Capacitive Load Max. (μF)
	Nominal (Range)	Voltage (VDC)	Current Max. (mA)	Current Min. (mA)			
SURB 1203 S-1W	12 (4.5-18)	3.3	303	15	100/150	73/75	2700
SURB 1205 S-1W		5	200	10		74/76	2200
SURB 1209 S-1W		9	111	6		78/80	1000
SURB 1212 S-1W		12	83	4		80/82	680
SURB 1215 S-1W		15	67	3		81/83	471
SURB 1224 S-1W		24	42	2		79/81	330
SURA 1205 S-1W		±5	±100	±5		76/78	#1000
SURA 1212 S-1W		±12	±42	±2		77/79	#470
SURA 1215 S-1W		±15	±33	±2		78/80	#330
SURB 2403 S-1W	24 (9-36)	3.3	303	15	70/100	72/74	2700
SURB 2405 S-1W		5	200	10		79/81	2200
SURB 2412 S-1W		12	83	4		81/83	680
SURB 2415 S-1W		15	67	3		81/83	470
SURB 2424 S-1W		24	42	2		81/83	330
SURA 2405 S-1W		±5	±100	±5		77/79	#1000
SURA 2412 S-1W		±12	±42	±2		81/83	#470
SURA 2415 S-1W		±15	±33	±2		81/83	#330
SURB 4803 S-1W	48 (18-75)	3.3	303	15	100/150	73/75	2700
SURB 4805 S-1W		5	200	10		74/76	2200
SURB 4812 S-1W		12	83	4		78/80	680
SURB 4815 S-1W		15	67	3		82/84	470
SURA 4805 S-1W		±5	±100	±5		77/79	#1000
SURA 4812 S-1W		±12	±42	±2		80/82	#470
SURA 4815 S-1W		±15	±33	±2		80/82	#330

each output

SURA & SURB S-1W

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load/no load)	12VDC input	--	281/40	290/60	mA
	24VDC input	--	111/15	114/30	
	48VDC input	--	55/6	57/10	
Reflected Ripple Current	12VDC input	--	30	--	
	24VDC input	--	40	--	
	48VDC input	--	55	--	
Impulse Voltage	12VDC input	-0.7	--	25	VDC
	24VDC input	-0.7	--	50	
	48VDC input	-0.7	--	100	
Starting Voltage	12VDC input	--	--	4.5	
	24VDC input	--	--	9	
	48VDC input	--	--	18	
Input Filter		Capacitance Filter			
Hot Plug		Unavailable			
CTRL	Module off	0-0.7V turn off			
	Module on	No connect or 3.5-12V on			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	10% - 100% Load,Input Voltage Range	--	±1.0	±3.0	%
No-load Output Voltage Accuracy	Input Voltage Range	--	±1.5	±5.0	
Linear Regulation	Full load, output voltage from low limit to high limit	--	±0.2	±0.5	
Load Regulation	10% - 100% Load	--	±0.4	±0.75	
Transient Recovery Time	25% load step change	--	0.5	2	ms
Transient Response Deviation		--	±2.5	±5	%
Temperature Coeffcient	Full Load	--	±0.02	±0.03	%/℃
Short-circuit Protection		Continuous, Self-Recovery			

SURA & SURB S-1W

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Insulation Voltage	Input-output, test time 1 minute, leakage current less than 1mA	1500	--	--	VDC
Insulation Resistance	Input-output, insulated voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	120	--	pF
Operating Temperature	Derating when operating temperature≥85℃, (See Figure 1)	-40	--	105	℃
Storage Temperature		-55	--	105	
Storage Humidity	Non-condensing	--	--	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	330	360	kHz
MTBF	MIL-HDBK-217F@25℃	>1000Kh			

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant（UL 94V-0 rated）
Package Dimensions	22.00 * 12.00 * 9.50 mm
Weight	3.8g (Typ.)
Cooling Method	Free air convection

EMC Specifications

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

Typical Characteristic Curves

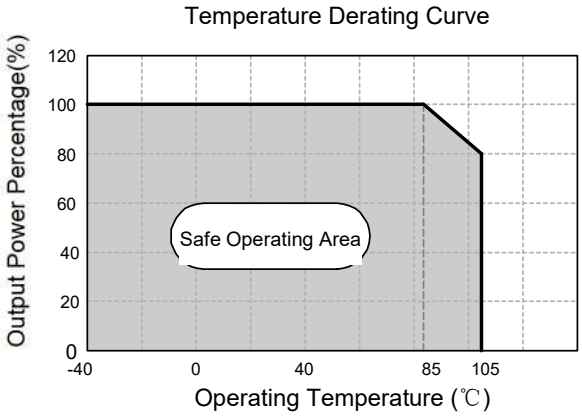
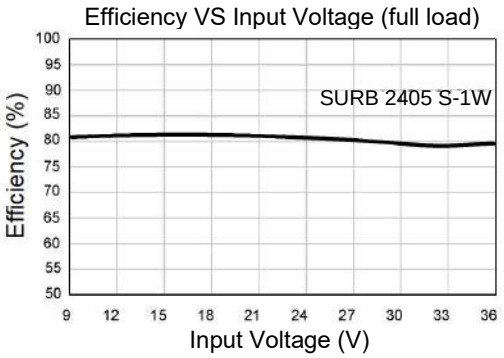
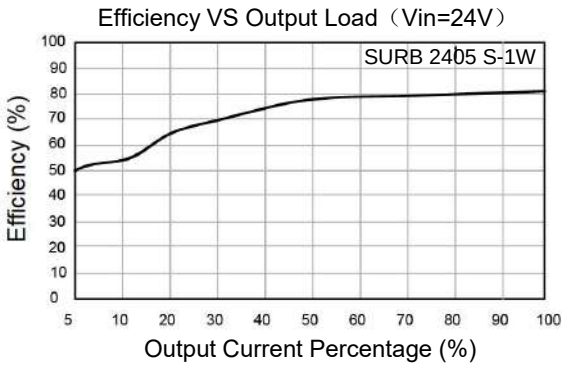
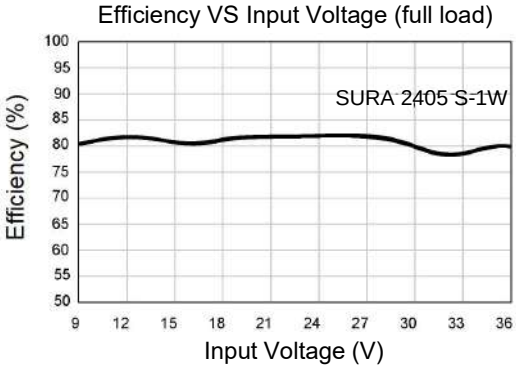
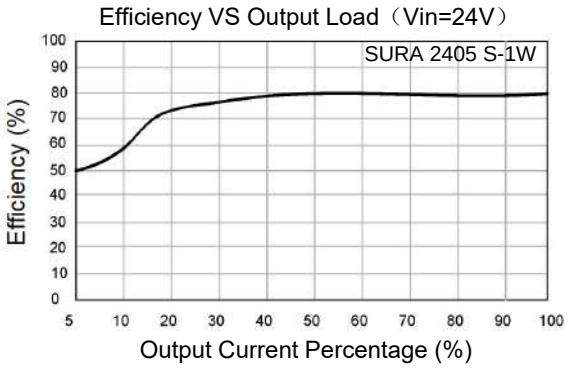


Figure 1









Circuit Design and Application

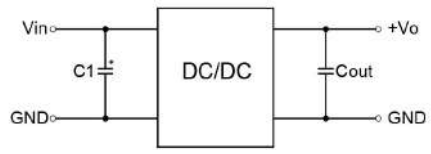


Figure 2

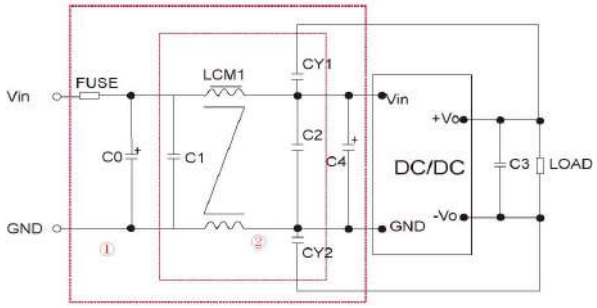


Figure 3

Recommended Capacitive Load Value Table	
Cin(μF)	Cout(μF)
100	10

EMI Recommended Parameter Table		
Model	Vin:12V	Vin:24V
FUSE	Select according to the actual input current of the customer	
C0、C4	330uF/35V	330uF/50V
C1、C2	10μF/50V	
LCM1	1.4-1.7mH	
C3	22μF/50V	
CY1、CY2	1nF/400VAC	

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.

Note：

1.The input voltage cannot exceed the specified range value, otherwise permanent and irreparable damage may be caused ;

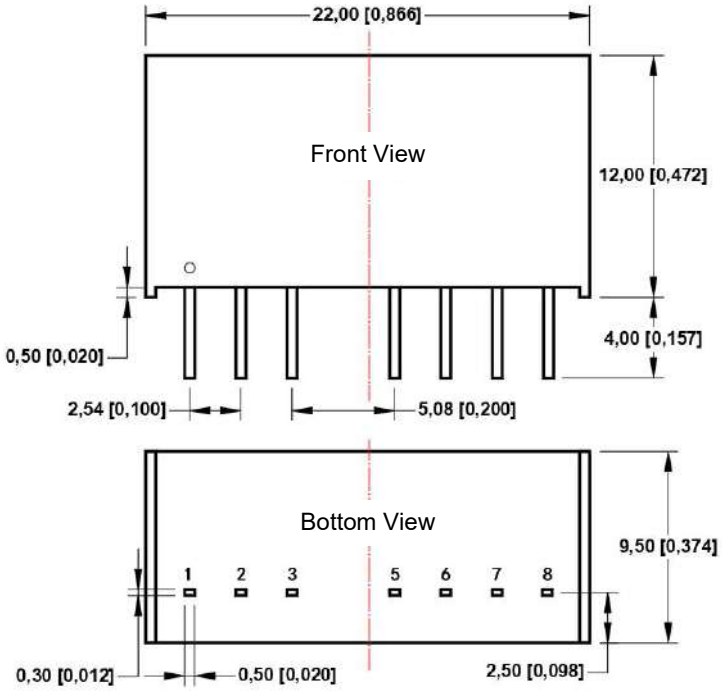
2. Unless otherwise specified,the parameters in this datasheet were measured at 25℃, humidity 40%~75%, input nominal voltage and output pure resistance mode under full load;

3. All index test methods are based on our company's enterprise standards.

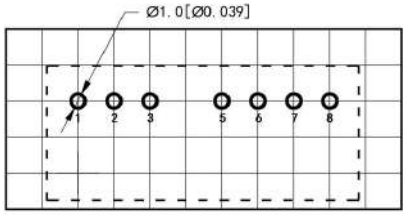
SURA & SURB S-1W

Dimensions and Recommended Layout

Dimensions	PCB Printing Layout & Pin Definition Table



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



Note: The grid distance is 2.54mm*2.54mm

Pin	Function (single)	Function (double)
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