

Product Feature

- ◆ Universal Input: 4:1
- ◆ Package Type: SIP8
- ◆ Operating temperature range: -40°C - +85°C
- ◆ Isolation voltage: 1500VDC
- ◆ High efficiency up to: 81% (Type)
- ◆ With the output overcurrent, output short circuit protection mechanism.
- ◆ Fields of application: electric power, industrial control, etc.



Selection Guide

Part No.	Input Voltage (VDC) Nominal (Range)	Max value	Out Voltage (VDC)	Out Current (mA)Max.	Full Load Efficiency % (Typ.)	Capacitive Load (μF)Max.
SURB 1203 S-3W	12 (4.5-18)	20	3.3	700	74	1760
SURB 1205 S-3W	12 (4.5-18)	20	5	600	78	1000
SURB 1212 S-3W	12 (4.5-18)	20	12	250	80	170
SURB 1215 S-3W	12 (4.5-18)	20	15	200	80	110
SURA 1205 S-3W	12 (4.5-18)	20	±5	±300	80	#470
SURA 1212 S-3W	12 (4.5-18)	20	±12	±125	80	#100
SURA 1215 S-3W	12 (4.5-18)	20	±15	±100	80	#47
SURB 2403 S-3W	24 (9-36)	40	3.3	700	75	1760
SURB 2405 S-3W	24 (9-36)	40	5	600	80	1000
SURB 2409 S-3W	24 (9-36)	40	9	333	81	1000
SURB 2412 S-3W	24 (9-36)	40	12	250	81	170
SURB 2415 S-3W	24 (9-36)	40	15	200	81	110
SURB 2424 S-3W	24 (9-36)	40	24	125	83	110
SURA 2405 S-3W	24 (9-36)	40	±5	±300	79	#470
SURA 2412 S-3W	24 (9-36)	40	±12	±125	80	#100
SURA 2415 S-3W	24 (9-36)	40	±15	±100	81	#47
SURB 4803 S-3W	48 (18-75)	80	3.3	700	74	1760
SURB 4805 S-3W	48 (18-75)	80	5	600	79	1000
SURB 4812 S-3W	48 (18-75)	80	12	250	79	170
SURB 4815 S-3W	48 (18-75)	80	15	200	79	110
SURB 4824 S-3W	48 (18-75)	80	24	125	80	68
SURA 4805 S-3W	48 (18-75)	80	±5	±300	79	#470
SURA 4812 S-3W	48 (18-75)	80	±12	±125	79	#100
SURA 4815 S-3W	48 (18-75)	80	±15	±100	80	#47

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current(full load/no load)	12VDC Input	--	306/60	--	mA
	24VDC Input	--	140/25	--	
	48VDC Input	--	82/15	--	
Reflected Ripple Current		--	15	--	mA
Impulse Voltage	12VDC Input	-0.7	--	25	VDC
	24VDC Input	-0.7	--	50	
	48VDC Input	-0.7	--	100	
Starting Voltage	12VDC Input	3	4	4.5	VDC
	24VDC Input	4.5	6	9	
	48VDC Input	8.5	12	18	
Undervoltage Protection	12VDC Input	--	--	4	VDC
	24VDC Input	--	--	8	
	48VDC Input	--	--	16	
CTRL	turn off module	0-0.7V turn off			
	turn on module	No connect or 3.5-12V on			
Input Filter		Capacitance Filter			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	0% - 100% Load	--	±2.0	--	%
Linear Regulation	Full load, Input voltage from low limit to high limit	--	±0.3	±0.5	%
Load Regulation	10% - 100% Load	--	±0.5	±1.0	%
Ripple & Noise	20MHZ Bandwidth	--	50	150	mV
Transient Recovery Time		--	300	500	ms
Transient Response Deviation	25% load step change	--	±3	±5	%
Temperature Coefficient	Full Load	--	±0.02	±0.03	%/°C
Over Current Protection		110	140	--	%
Short-circuit Protection		Continuous, Self-Recovery			

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	100	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	1000	--	pF
Operating Temperature	Derating when operating temperature ≥ 85°C (See Figure 1)	-40	--	85	°C
Storage Temperature		-55	--	105	°C
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	°C
Switching Frequency	Full Load, Nominal Input Voltage	--	330	--	KHz
MTBF	MIL-HDBK-217F@25°C	>3500Kh			

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	3.8g (Typ.)
Cooling Method	Free air convection

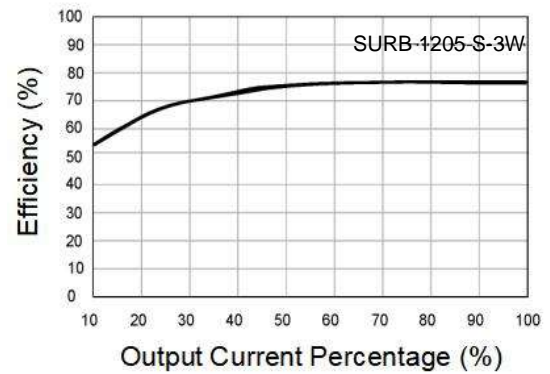
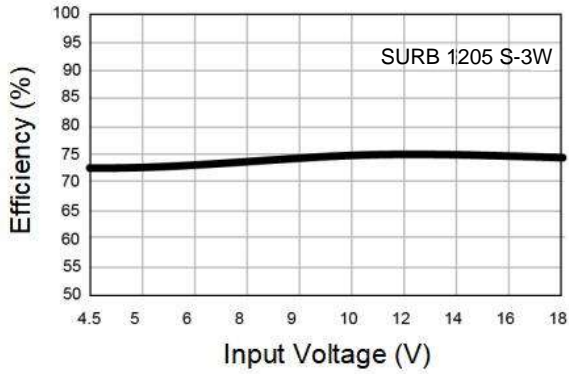
EMC Specifications

EMI	CE	CISPR32/EN55032 CLASS B (Application circuit 3)
	RE	CISPR32/EN55032 CLASS B (Application circuit 3)
EMS	ESD	IEC/EN61000-4-2 Contact ± 8KV perf. Criteria B

Typical Characteristic Curves

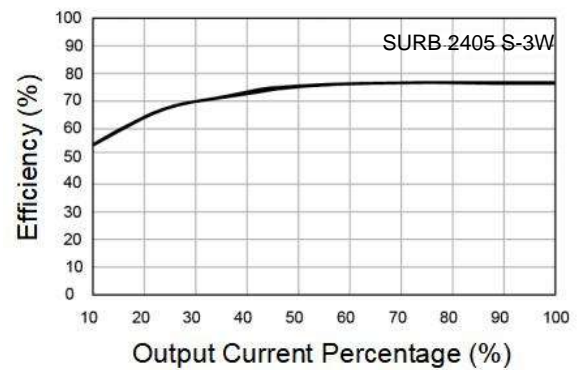
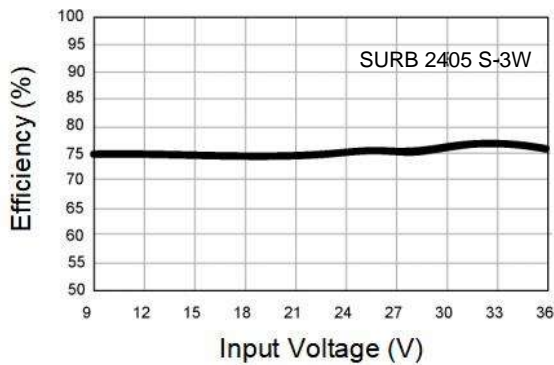
Efficiency VS Input Voltage (full load)

Efficiency VS Output Load (Vin=12V)

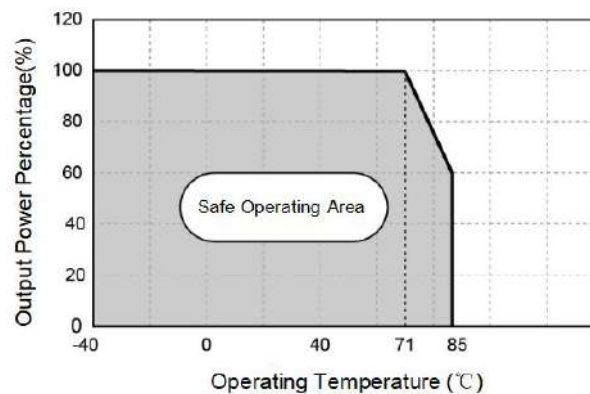


Efficiency VS Input Voltage (full load)

Efficiency VS Input Voltage (Vin=24V)



Temperature Derating Curve (Figure 1)

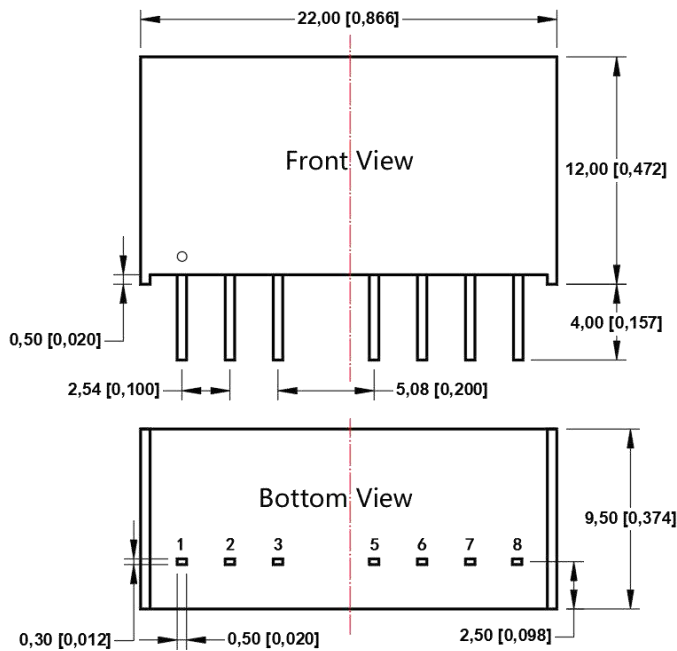


Typical Circuit Design and Application

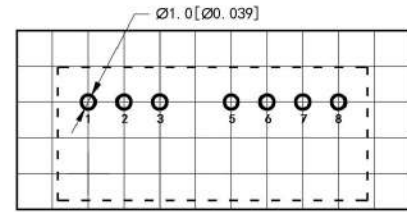
Application circuit (Figure 2)	Recommended Capacitive Load Value Table	
<p>The diagram shows a DC/DC converter block. The input is labeled V_{in} and GND. A capacitor $C1$ is connected in parallel between V_{in} and GND. The output is labeled $+V_o$ and GND. A capacitor C_{out} is connected in parallel between $+V_o$ and GND.</p>	$C_{in}(\mu F)$	$C_{out}(\mu F)$
	100	22
Application circuit (Figure 3)	EMI Recommended Parameter Table	
<p>The diagram shows a detailed circuit for EMI filtering. It starts with an input V_{in} and GND. A FUSE is connected in series with V_{in}. A capacitor $C0$ is connected in parallel between V_{in} and GND. A common-mode choke $LCM1$ is connected in series with V_{in}. Two capacitors, $CY1$ and $CY2$, are connected in parallel between the V_{in} line and GND before the choke. After the choke, a capacitor $C1$ is connected in parallel between V_{in} and GND. A second common-mode choke is connected in series with V_{in}. Two capacitors, $C2$ and $C4$, are connected in parallel between the V_{in} line and GND after the second choke. The output of the circuit is a DC/DC converter with input V_{in} and GND, and output $+V_o$ and $-V_o$. A capacitor $C3$ is connected in parallel between $+V_o$ and $-V_o$. A LOAD is connected in parallel between $+V_o$ and $-V_o$. Two red boxes are drawn around the circuit: the first box (labeled 1) encloses the FUSE, $C0$, $LCM1$, $CY1$, and $CY2$; the second box (labeled 2) encloses the second $LCM1$, $C2$, and $C4$.</p> <p>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.</p>		$V_{in}:12V$ $V_{in}:24V$
	FUSE	Select according to the actual input current of the customer
	C0、C4	330uF/35V 330uF/50V
	C1、C2	10 μ F/50V
	LCM1	1.4-1.7mH
	C3	22 μ F/50V
	CY1、CY2	1nF/400VAC

Dimensions and Recommended Layout

Dimensions



PCB Printing Layout



The grid distance is 2.54mm x2.54mm

Pin Definition Table

Pin	Function (single)	Function (double)
1	GND	GND
2	V _{in}	V _{in}
3	CTRL	CTRL
5	NC	NC
6	+V _o	+V _o
7	-V _o	COM
8	NC	-V _o

NC: Pin to be isolated from circuitry

Note:

Unit: mm[inch]
 Pin section tolerances: $\pm 0.10[\pm 0.004]$
 General tolerances: $\pm 0.50[\pm 0.020]$

- ✧ 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: $\leq \pm 5\%$. If it exceeds $\pm 5\%$, 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 $T_a=25\text{ }^\circ\text{C}$, 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.