SURA & SURB D-10WR4

Product Feature

- Package Type：2″X 1″
- Input voltage range：4:1
- Operating temperature range: -40℃ - +85℃
- Isolation voltage：1500VDC
- High efficiency up：87%（Typ.）
- Equipped with output short-circuit protection, overcurrent protection, and overvoltage protection mechanisms.
- Fields of application：Industry, Power, Instrumentation, Communication, Rail transit.

Selection Guide

Part No.	Input Voltage (VDC)		Output		Full Load Efficiency% (Typ.)	Capacitive Load (μF) Max.
	Nominal (Range)	Max.	Voltage (VDC)	Current (mA) Max./Min.		
SURB 2403 D-10WR4	24 (9-36)	40	3.3	2400/0	78	2200
SURB 2405 D-10WR4	24 (9-36)	40	5	2000/0	83	2200
SURB 2409 D-10WR4	24 (9-36)	40	9	1111/0	85	680
SURB 2412 D-10WR4	24 (9-36)	40	12	833/0	86	470
SURB 2415 D-10WR4	24 (9-36)	40	15	667/0	86	330
SURB 2424 D-10WR4	24 (9-36)	40	24	416/0	88	100
SURA 2405 D-10WR4	24 (9-36)	40	±5	±1000/0	83	#1000
SURA 2409 D-10WR4	24 (9-36)	40	±9	±555/0	86	#680
SURA 2412 D-10WR4	24 (9-36)	40	±12	±416/0	87	#470
SURA 2415 D-10WR4	24 (9-36)	40	±15	±333/0	87	#330
SURA 2424 D-10WR4	24 (9-36)	40	±24	±208/0	87	#100
SURB 4803 D-10WR4	48 (18-75)	80	3.3	2400/0	79	2200
SURB 4805 D-10WR4	48 (18-75)	80	5	2000/0	83	2200
SURB 4812 D-10WR4	48 (18-75)	80	12	833/0	87	470
SURB 4815 D-10WR4	48 (18-75)	80	15	667/0	87	330
SURB 4824 D-10WR4	48 (18-75)	80	24	416/0	88	100
SURA 4805 D-10WR4	48 (18-75)	80	±5	±1000/0	83	#1000
SURA 4812 D-10WR4	48 (18-75)	80	±12	±416/0	87	#470
SURA 4815 D-10WR4	48 (18-75)	80	±15	±333/0	87	#330
SURA 4824 D-10WR4	48 (18-75)	80	±24	±208/0	87	#100

#each output

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Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load/no-load)	24VDC nominal input series	3.3VDC Output	--	423/5	438/12	mA
		Other Output	--	502/5	522/12	
	48VDC nominal input series	3.3VDC Output	--	190/4	215/8	
		Other Output	--	251/4	258/8	
Reflected Ripple Current	24VDCnominal input series		--	40	--	mA
	48VDCnominal input series		--	30	--	
Impulse Voltage	24VDCnominal input series		-0.7	--	50	VDC
	48VDCnominal input series		-0.7	--	100	
Starting Voltage	24VDCnominal input series		--	--	9	VDC
	48VDCnominal input series		--	--	18	
Input undervoltage protection	24VDCnominal input series		5.5	6.5	--	VDC
	48VDCnominal input series		12	15.5	--	
Start time	Nominal input and constant resistance load		--	10	--	ms
Ctrl	turn on module		Suspended or 3.5V-12V conductive			
	turn off module		Turn off 0V-1.2V			
Input Filter			PI filter			
Hot plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	5%-100% load	Vo1	--	±1.0	±3	%
		Vo2	--	±3.0	±5	
Linear Regulation	Vin=Min. to Max. @Full Load	Vo1	--	±0.2	±0.5	%
		Vo2	--	±0.5	±1	
Load Regulation	5%-100% load	Vo1	--	±0.5	±1	%
		Vo2	--	±0.5	±1.5	
Ripple & Noise	20MHz bandwidth,100% load		--	40	80	mVp-p
Cross regulation rate	Dual output, main circuit 50% loaded, auxiliary circuit 10% -100% loaded		--	--	±5	%
Transient Recovery Time	25% Load Step Change,nominal input voltage		--	0.3	3	ms
Transient Response Deviation	25% Load Step Change,nominal input voltage		--	±3	±5	%
Temperature Coefficient	Full Load		--	--	±0.03	%/°C
Over Current Protection	input voltage range		110	140	--	%Io
Short-Circuit Protection	input voltage range		Continuous, Self-Recovery			

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General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation 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	--	2000	--	pF
Operating Temperature	See Fig 1	-40	--	+85	℃
Storage Temperature		-55	--	+125	℃
Storage Humidity	Non-condensing	5	--	95	%RH
Soldering Profile	1.5mm from case for 10 sec	--	--	300	℃
Switching Frequency	PWM	--	300	--	kHz
MTBF	MIL-HDBK-217F@25℃	1000			K Hours
Vibration		IEC/EN 61373 Vehicle body 1B level			

Mechanical Specifications

Case Material	Aluminum alloy
Package Dimensions	50.80 x 25.40 x 12.00mm
Weight	30.00g(Typ.)
Cooling Method	Free air convection

EMC Specifications

EMI	CE	CISPR32/EN55032	CLASS A
	RE	CISPR32/EN55032	CLASS A
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	perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line±2KV	perf. Criteria B
	CS	IEC/EN61000-4-6 3Vr.m.s	perf. Criteria A
	Voltage sag	IEC/EN61000-4-29 0%-70%	perf. Criteria B

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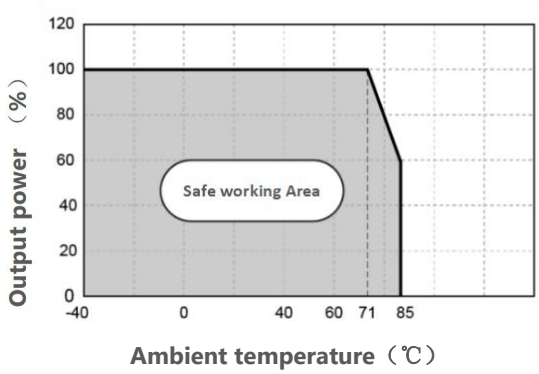
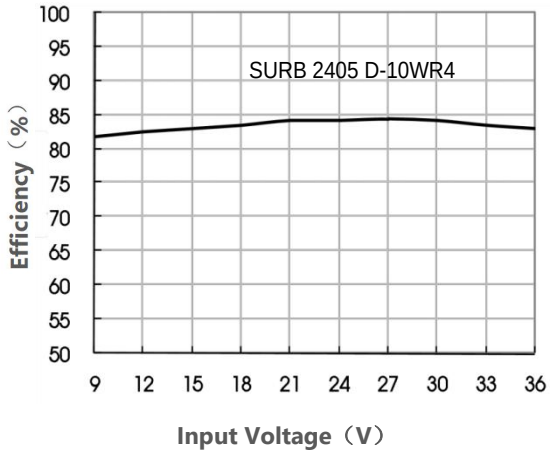
Typical Characteristic Curves

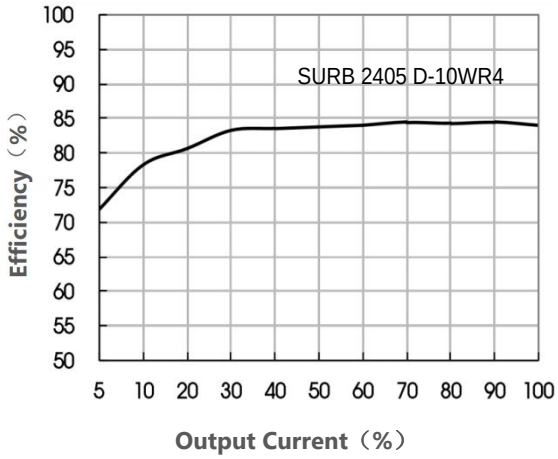
Temperature Derating Curve （Figure 1）



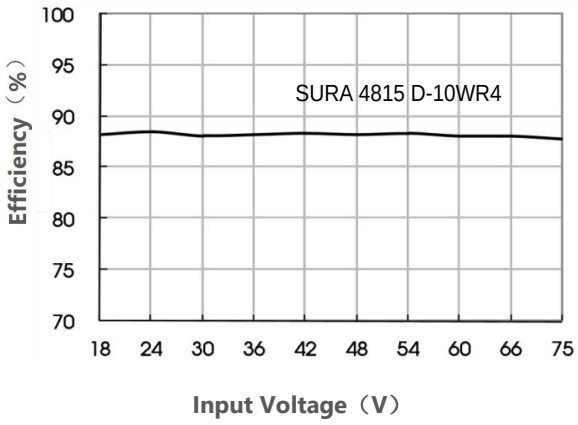
Efficiency Vs Input Voltage (Full Load)



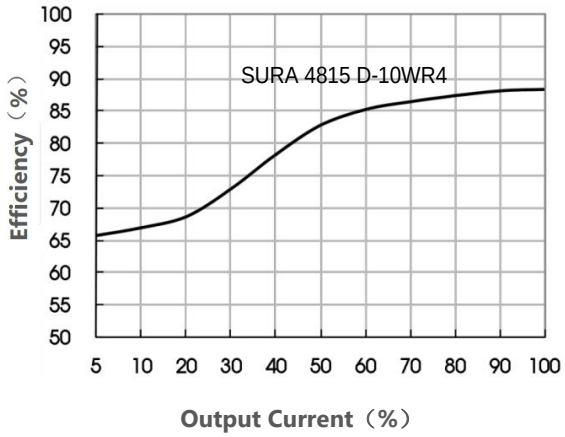
Efficiency Vs Output Load (Vin=24V)



Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load (Vin=48V)



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Typical Circuit Design And Application

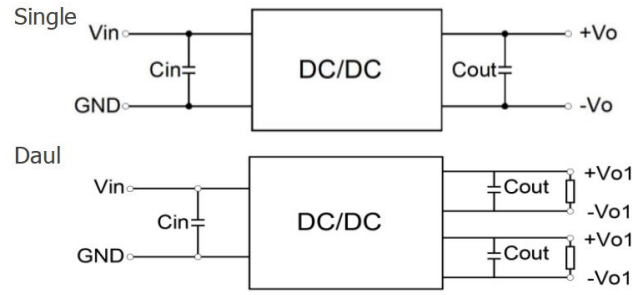
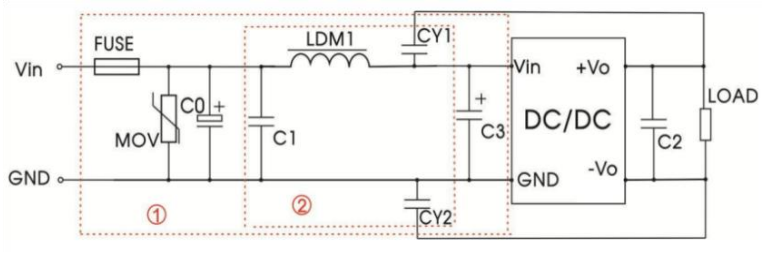
Figure 2	Recommended component parameters		
	Vin	24V	48V
	Cin	100uF	47uF-100uF
	Cout	10uF	

Figure 3	EMI Recommended component parameters		
	Vin(VDC)	Vin：24V	Vin：48V
	FUSE	Choose according to actual input current	
	MOV	20D470K	14D101K
	C0、C3	330uF/50V	330uF/100V
	C1	4.7uF/50V	2.2uF/100V
	C2	Refer to the Cout in Figure 2	
	LDM1	4.7uF	
	CY1/CY2	1nF/2KV	

Note: Part ① of Figure 3 is used for EMS testing; Part 2 is used for EMI filtering and can be selected according to requirements.

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.

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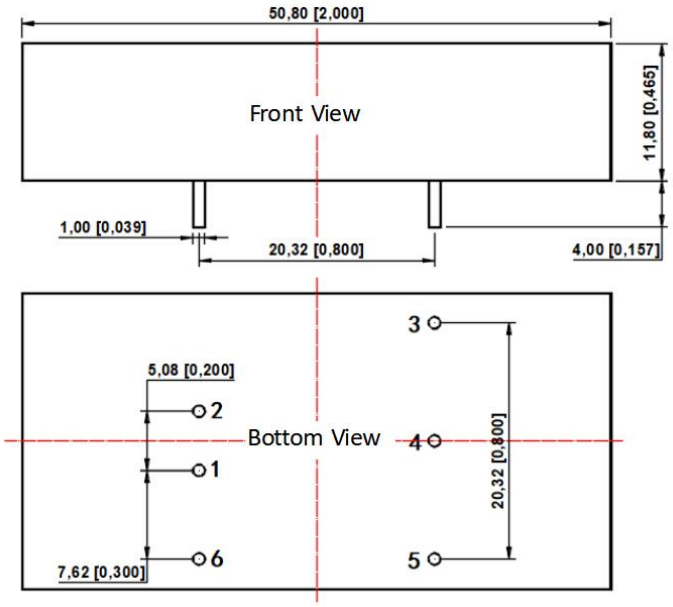
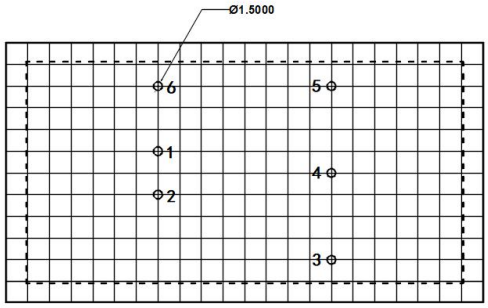
Dimensions and Recommended Layout

Dimensions	PCB Printing Layout





The grid distance is 2.54 x 2.54mm

Note:

Unit: mm[inch]

Pin section tolerances:±0.10[±0.004]

General tolerances:±0.50[±0.020]

Pin Definition Table

Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	Trim	COM
5	-Vo	-Vo
6	Ctrl	Ctrl

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 ℃, 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.