

SURA ZP-6WR4



Product Feature

- ◆ Ultra-wide 4:1 Input voltage range
- ◆ Operating ambient temperature range: -40°C - +85°C
- ◆ Isolation voltage: 1600VDC
- ◆ High efficiency: 87% (Typ.)
- ◆ Output short-circuit protection, over-current protection, and over-voltage protection mechanisms.
- ◆ Application areas: Industry, Power, Instrumentation, Communication, Rail transit.



Selection Guide



Certification	Part No.	Input Voltage (VDC)		Output		Full Load	Capacitive
		Nominal (Range)	Max. ^①	Voltage (VDC)	Current(mA) Max.	Efficiency ^② (%) Typ.	Load ^③ (μF) Max.
EN	SURA 1203 ZP-6WR4	12 (4.5-18)	20	±3.3	±750	80	680
	SURA 1205 ZP-6WR4			±5	±600	82	680
	SURA 1206 ZP-6WR4			±6	±500	82	680
	SURA 1209 ZP-6WR4			±9	±334	84	330
	SURA 1212 ZP-6WR4			±12	±250	85	330
	SURA 1215 ZP-6WR4			±15	±200	85	220
	SURA 1218 ZP-6WR4			±18	±167	85	150
	SURA 1224 ZP-6WR4			±24	±125	85	100
	SURA 2403 ZP-6WR4	24 (9-36)	40	±3.3	±750	81	680
	SURA 2405 ZP-6WR4			±5	±600	83	680
	SURA 2406 ZP-6WR4			±6	±500	83	680
	SURA 2409 ZP-6WR4			±9	±334	85	330
	SURA 2412 ZP-6WR4			±12	±250	86	330
	SURA 2415 ZP-6WR4			±15	±200	86	220
	SURA 2418 ZP-6WR4			±18	±167	86	150
	SURA 2424 ZP-6WR4			±24	±125	87	100
	SURA 4803 ZP-6WR4	48 (18-75)	80	3.3	±750	80	680
	SURA 4805 ZP-6WR4			±5	±600	82	680
	SURA 4806 ZP-6WR4			±6	±500	82	680
	SURA 4809 ZP-6WR4			±9	±334	84	330
	SURA 4812 ZP-6WR4			±12	±250	86	330
	SURA 4815 ZP-6WR4			±15	±200	86	220
	SURA 4818 ZP-6WR4			±18	±167	86	150
	SURA 4824 ZP-6WR4			±24	±125	87	100

Note:

- ①. Exceeding the maximum input voltage may cause permanent damage;
- ②. Efficiency is measured at nominal input voltage and rated output load;
- ③. The specified maximum capacitive load value for positive and negative output is identical.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit	
Input Current (Full Load/No-Load)	12VDC Nominal input series, nominal input voltage	3.3V Output	--	516/5	529/10	mA	
		5/6V Output	--	610/8	625/15		
		Others output	--	595/20	610/35		
	24VDC Nominal input series, nominal input voltage	3.3V Output	--	255/4	261/8		
		5/6V Output	--	301/5	309/10		
		Others output	--	294/10	301/20		
	48VDC Nominal input series, nominal input voltage	3.3V Output	--	129/4	132/8		
		5/6V Output	--	152/4	156/8		
		9V Output	--	149/4	152/8		
		Others output	--	145/8	149/15		
	Reflected Ripple Current	Nominal input series		--	30		--
	Surge Voltage (1sec. max.)	12VDC Nominal input series		-0.7	--		25
24VDC Nominal input series		-0.7	--	50			
48VDC Nominal input series		-0.7	--	100			
Start-Up Voltage	12VDC Nominal input series		--	--	4.5		
	24VDC Nominal input series		--	--	9		
	48VDC Nominal input series		--	--	18		
Input Under-Voltage Protection	12VDC Nominal input series		3.5	4	--		
	24VDC Nominal input series		5.5	6.5	--		
	48VDC Nominal input series		12	15.5	--		
Input Filter			PI filter				
Hot Plug			Unavailable				

Output Specification

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	0%-100% load	Vo1	--	±1.0	±3.0	%
		Vo2	--	±3.0	±5.0	
Linear Regulation	Vin=Min. to Max. @Full Load	Vo1	--	±0.2	±0.5	
		Vo2	--	±0.5	±1.0	
Load Regulation	5%-100% load	Vo1	--	±0.5	±1.0	
		Vo2	--	±1.0	±3.0	
	0%-100% load		--	±3.0	±5.0	
Ripple & Noise ^①	20MHz bandwidth,100% load,parallel cable method		--	40	80	mVp-p
Transient Recovery Time	25% Load step change,nominal input voltage		--	300	500	μs
Transient Response Deviation	25% Load step change, nominal input voltage	3.3/5/6V Output	--	±5.0	±8.0	%
		Others output	--	±3.0	±5.0	
Temperature Coefficient	Full load		--	--	±0.03	%/°C
Over-Voltage Protection	Input voltage range		110	--	160	%Vo
Over-Current Protection			110	160	--	%Io
Short-Circuit Protection			Continuous,Self-Recovery			
Note: ①. Under 0%-5% load conditions,ripple & noise does not exceed 5%Vo.						

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, test time 1 minute, leakage current less than 1mA	1600	--	--	VDC
Insulation Resistance	Input-output, resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	2200	--	pF
Operating Temperature	See Fig. 1	-40	--	+85	°C
Storage Temperature		-55	--	+125	
Storage Humidity	Non-condensing	5	--	95	%RH
Soldering Profile	Wave-soldering	260±5°C; time: 5 - 10s			
	Manual-welding	360±10°C; time: 3 - 5s			
Switching Frequency	PWM	--	300	--	kHz
Vibration		IEC/EN 61373 -Category 1, Grade B			
MTBF	MIL-HDBK-217F@25°C	1000	--	--	k Hours

Mechanical Specifications

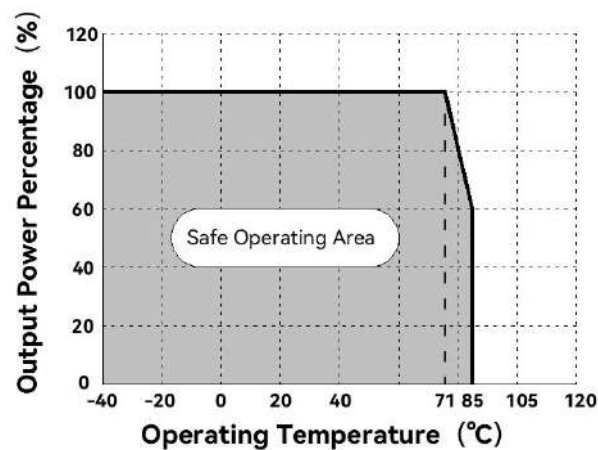
Case Material	Aluminum alloy
Package Dimensions	32.00×20.00×11.10mm
Weight	12.0g (Typ.)
Cooling Method	Free air convection

EMC Specifications

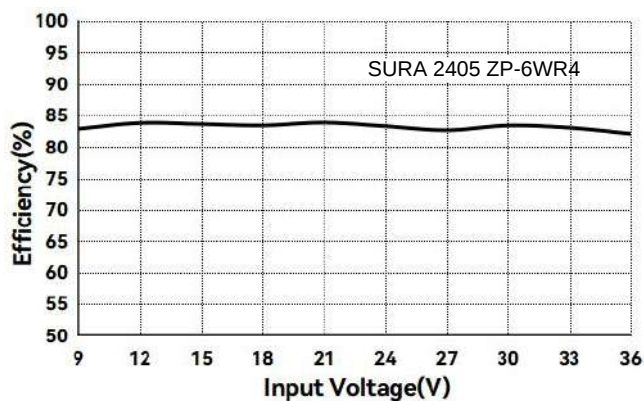
EMI	CE	CISPR32/EN55032 CLASS B (see Fig. 3-② for recommended circuit)	
	RE	CISPR32/EN55032 CLASS B (see Fig. 3-② for recommended circuit)	
EMS	ESD	IEC/EN61000-4-2 Contact ±4KV	Perf.Criteria B
	RS	IEC/EN61000-4-3 10V/m	Perf.Criteria A
	EFT	IEC/EN61000-4-4 ±2KV (see Fig. 3-① for recommended circuit)	Perf.Criteria B
	Surge	IEC/EN61000-4-5 line to line ±2KV (see Fig. 3-① for recommended circuit)	Perf.Criteria B
	CS	IEC/EN61000-4-6 3Vr.m.s	Perf.Criteria A

Typical Characteristic Curves

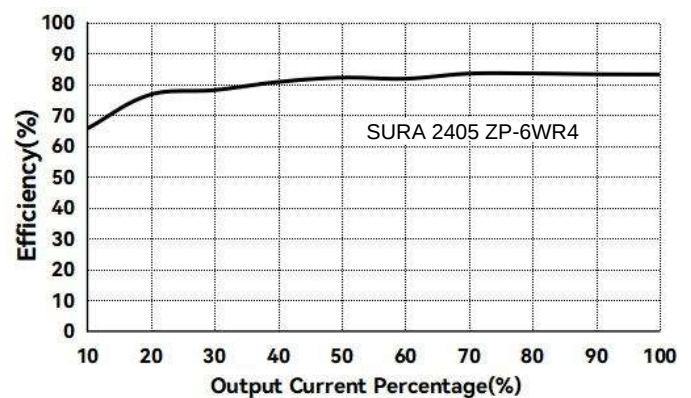
Temperature Derating Curve (Fig. 1)



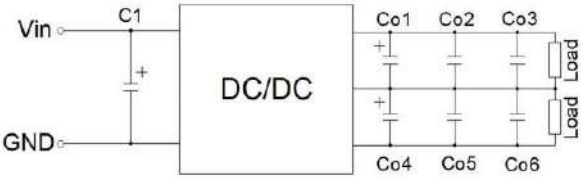
Efficiency VS Input Voltage (Full load)



Efficiency VS Output Load (Vin=24V)

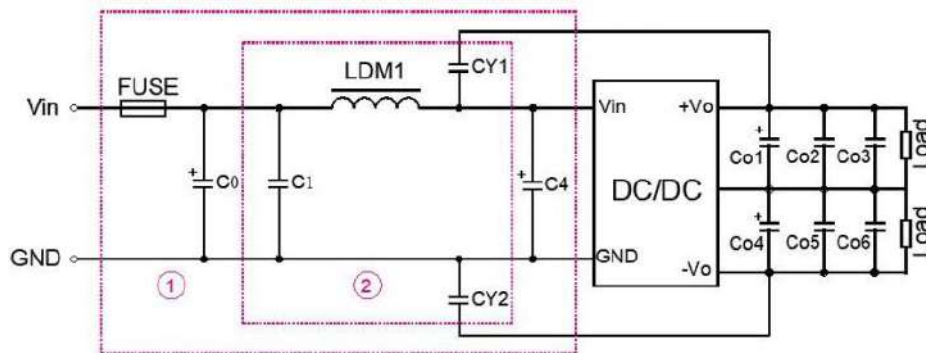


Typical Circuit Design And Application

Recommended Circuit (Fig. 2)	Recommended Capacitive Load Value Table				
	Vout	C1	Co1/Co4	Co2/Co5	Co3/Co6
	3.3/5/6VDC	100μF/100V	47μF/16V	10μF/50V	0.1μF/16V
	9/12/15VDC	100μF/100V	47μF/25V	10μF/50V	0.1μF/25V
	18/24VDC	100μF/100V	47μF/50V	10μF/50V	0.1μF/50V

All DC/DC converters in this series are tested according to the recommended circuit (Fig. 2) before leaving the factory. If further reduction of input and output ripple is required, the input and output external capacitors C1 and Co1/Co2/Co3/Co4/Co5/Co6 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.

EMC Recommended Circuit (Fig. 3)



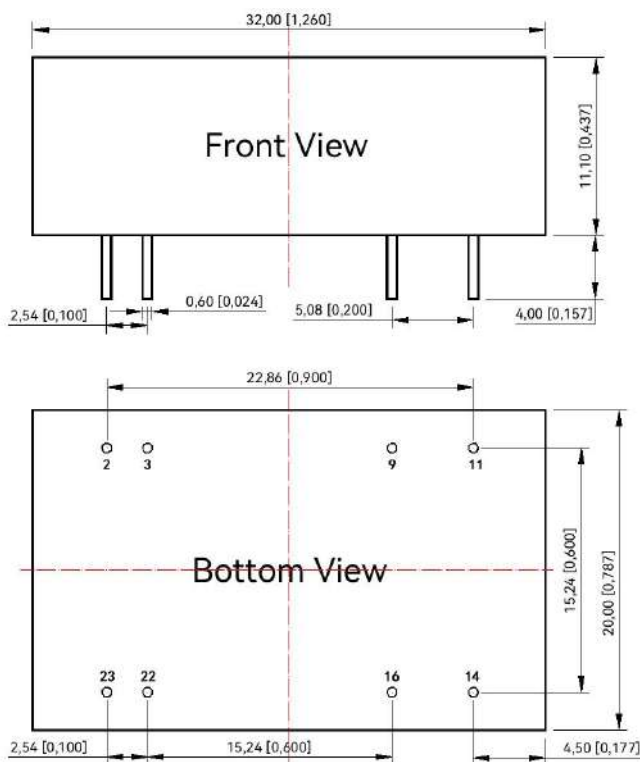
Notes: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

EMC Recommended Parameter Table

Model	Vin:12VDC	Vin:24VDC	Vin:48VDC
FUSE	Select according to the actual input current of the customer		
C0,C4	330μF/50V		330μF/100V
C1	4.7μF/50V		4.7μF/100V
LDM1	10μH		
Co1,Co2,Co3,Co4,Co5,Co6	Refer Fig. 2 Capacitive load value table		
CY1,CY2	1nF/2kVDC		

Dimensions and Recommended Layout

Dimensions



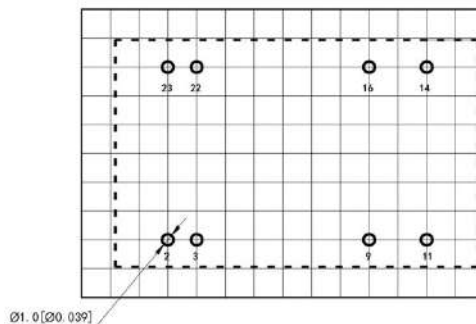
Note:

Unit: mm[inch]

Pin section tolerances: $\pm 0.10 [\pm 0.004]$

General tolerances: $\pm 0.50 [\pm 0.020]$

PCB Printing Layout



The grid distance is 2.54mm x 2.54mm

Pin Definition Table

Pin	Dual
2,3	GND
9,16	COM
11	-Vo
14	+Vo
22,23	Vin

Packaging Instructions

Packaging Information

Product quantity (pcs/tube)	Electrostatic bag quantity (pcs/bag)	Inner carton quantity (pcs/carton)	Outer carton quantity (pcs/carton)
16	80	320	1280

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: $\leq \pm 5\%$. 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.