SVRA SVRB ZP-10WR4

Product Feature

- Package Type：DIP24
- Universal Input：2:1
- Operating temperature range：-40℃ - +85℃
- Isolation voltage：1500VDC
- High efficiency up to：88%（Type）
- Input under-voltage protection,Output short-circuit protection, over-voltage protection, over-current protection mechanism.
- 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.		
SVRB 0503 ZP-10WR4	5（4.5-9）	12	3.3	2400/0	83	1200
SVRB 0505 ZP-10WR4	5（4.5-9）	12	5	2000/0	83	1000
SVRB 0512 ZP-10WR4	5（4.5-9）	12	12	833/0	85	470
SVRB 0515 ZP-10WR4	5（4.5-9）	12	15	667/0	85	330
SVRB 0524 ZP-10WR4	5（4.5-9）	12	24	416/0	87	100
SVRA 0505 ZP-10WR4	5（4.5-9）	12	±5	±1000/0	82	# 1000
SVRA 0512 ZP-10WR4	5（4.5-9）	12	±12	±416/0	86	#470
SVRA 0515 ZP-10WR4	5（4.5-9）	12	±15	±333/0	87	#330
SVRB 1203 ZP-10WR4	12（9-18）	20	3.3	2400/0	87	1200
SVRB 1205 ZP-10WR4	12（9-18）	20	5	2000/0	83	1000
SVRB 1212 ZP-10WR4	12（9-18）	20	12	833/0	87	470
SVRB 1515 ZP-10WR4	12（9-18）	20	15	667/0	87	330
SVRB 1224 ZP-10WR4	12（9-18）	20	24	416/0	88	100
SVRA 1205 ZP-10WR4	12（9-18）	20	±5	±1000/0	83	# 1000
SVRA 1212 ZP-10WR4	12（9-18）	20	±12	±416/0	87	#470
SVRA 1215 ZP-10WR4	12（9-18）	20	±15	±333/0	87	#330
SVRB 2403 ZP-10WR4	24（18-36）	40	3.3	2400/0	87	1200
SVRB 2405 ZP-10WR4	24（18-36）	40	5	2000/0	83	1000
SVRB 2412 ZP-10WR4	24（18-36）	40	12	833/0	87	470
SVRB 2415 ZP-10WR4	24（18-36）	40	15	667/0	87	330
SVRB 2424 ZP-10WR4	24（18-36）	40	24	416/0	88	100

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Part No.	Input Voltage (VDC)		Output		Full Load Efficiency% (Typ.)	Capacitive Load(μF) Max.
	Nominal (Range)	Max.	Voltage (VDC)	Current(mA) Max.		
SVRA 2405 ZP-10WR4	24（18-36）	40	±5	±1000/0	83	# 1000
SVRA 2412 ZP-10WR4	24（18-36）	40	±12	±416/0	87	#470
SVRA 2415 ZP-10WR4	24（18-36）	40	±15	±333/0	87	#330
SVRB 4803 ZP-10WR4	48（36-75）	80	3.3	2400/0	87	1200
SVRB 4805 ZP-10WR4	48（36-75）	80	5	2000/0	83	1000
SVRB 4812 ZP-10WR4	48（36-75）	80	12	833/0	87	470
SVRB 4815 ZP-10WR4	48（36-75）	80	15	667/0	87	330
SVRB 4824 ZP-10WR4	48（36-75）	80	24	416/0	88	100
SVRA 4805 ZP-10WR4	48（36-75）	80	±5	±1000/0	83	# 1000
SVRA 4812 ZP-10WR4	48（36-75）	80	±12	±416/0	87	#470
SVRA 4815 ZP-10WR4	48（36-75）	80	±15	±333/0	87	#330

#Each output

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load/no load)	5VDC Nominal input series, nominal input voltage	Single 3.3VDC Output	--	1908/36	1956/54	mA
		Single 5VDC Output	--	2381/20	2439/30	
		Other Output	--	2299/20	2352/30	
	12VDC Nominal input series, nominal input voltage	Single 3.3VDC Output	--	759/15	776/30	mA
		Single 5VDC Output	--	958/5	980/12	
		Other Output	--	980/9	1028/15	
	24VDC Nominal input series, nominal input voltage	Single 3.3VDC Output	--	379/10	388/25	mA
		Single 5VDC Output	--	473/5	484/12	
		Other Output	--	490/5	515/12	
	48VDC Nominal input series, nominal input voltage	Single 3.3VDC Output	--	190/8	195/20	mA
		Single 5VDC Output	--	237/5	243/12	
		Other Output	--	245/4	258/8	
Reflected Ripple Current	5VDC Nominal input series, nominal input voltage		--	60	--	VDC
	12VDC Nominal input series, nominal input voltage		--	50	--	
	24VDC Nominal input series, nominal input voltage		--	40	--	
	48VDC Nominal input series, nominal input voltage		--	30	--	

Input impulse voltage	5VDC Nominal input series, nominal input voltage	-0.7	--	15	VDC
	12VDC Nominal input series, nominal input voltage	-0.7	--	25	
	24VDC Nominal input series, nominal input voltage	-0.7	--	50	
	48VDC Nominal input series, nominal input voltage	-0.7	--	100	
Starting voltage	5VDC Nominal input series, nominal input voltage	--	--	4.5	VDC
	12VDC Nominal input series, nominal input voltage	--	--	9	
	24VDC Nominal input series, nominal input voltage	--	--	18	
	48VDC Nominal input series, nominal input voltage	--	--	36	
Input undervoltage protection	5VDC Nominal input series, nominal input voltage	3	4	--	VDC
	12VDC Nominal input series, nominal input voltage	5.5	6.5	--	
	24VDC Nominal input series, nominal input voltage	12	15.5	--	
	48VDC Nominal input series, nominal input voltage	25	30.5	--	
Input Filter		Capacitance Filter			
Hot Plug		Unavailable			
Ctrl	Module shutdown	0-0.7V shutdown			
	Module enabled	Suspended or 3.5-12V open			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy	0%- 100% load	Positive output	--	±1	±3	%
		Negative output	--	±2	±5	
Linear Regulation	Input voltage from low limit to high limit, full load	Positive output	--	±0.2	±1	%
		Negative output	--	±0.5	±1.5	
Load Regulation	10%- 100% load	Positive output	--	±0.5	±1	%
		Negative output	--	±0.8	±2	
Ripple & Noise	20MHz bandwidth 5%- 100% load	Single 3.3/5VDC Output	--	40	80	mVp-p
		Other Output	--	40	100	
Transient Recovery Time	25% load step change		--	300	500	ms
Transient response deviation	25% load step change	Single 3.3/5VDC Output	--	±5	±8	%
		Other Output	--	±3	±5	
Temperature Drift Coefficient	Full Load		--	--	±0.03	%/℃
Overcurrent protection	Input voltage range	Single 3.3/5VDC Output	110	160	230	%Io
		Other Output	110	140	190	
Short-Circuit Protection	Input voltage range		Continuous, Self-Recovery			

Note：1.Auxiliary circuit output voltage(Vo2) maximum accuracy is ±5%；2.Load regulation for 0%-100% load is ±5%.

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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	1500	--	--	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	--	85	℃
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	--	310	--	kHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K Hours

Mechanical Specification

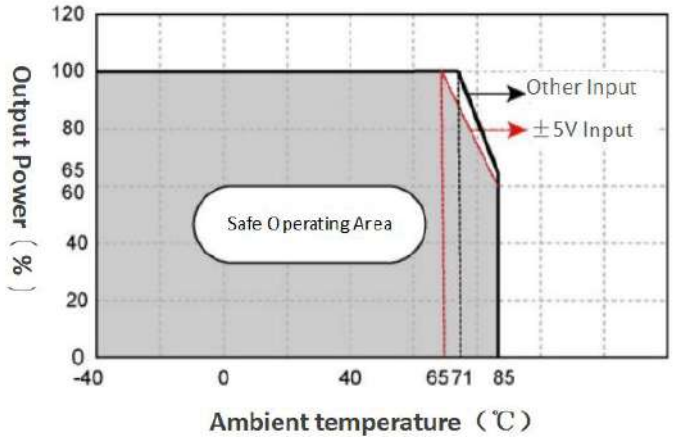
Case Material	Aluminum alloy
Package Dimensions	32.00 × 20.00 × 11.10mm
Weight	12.70g(Typ.)
Cooling Method	Free air convection

EMC Specifications

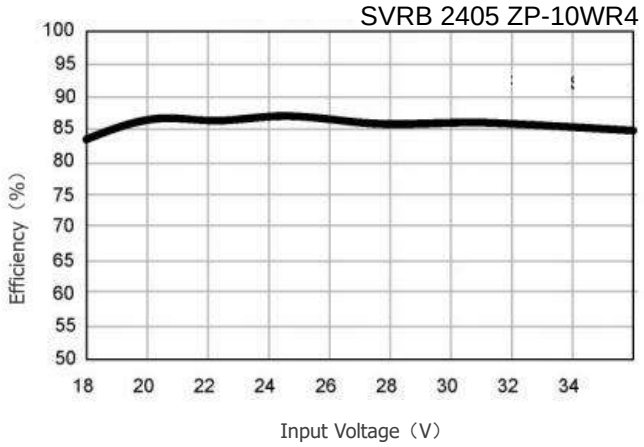
EMI	CE	CISPR32/EN55032	CLASS A (without extra components)/ CLASS B (Recommended circuit diagram 3-②)	
	RE	CISPR32/EN55032	CLASS A (without extra components)/ CLASS B (Recommended circuit diagram 3-②)	
EMS	ESD	IEC/EN61000-4-2	Contact±4KV	Perf.Criteria B
	RS	IEC/EN61000-4-3	10V/m	Perf.Criteria A
	EFT	IEC/EN61000-4-4	±2KV (Recommended circuit diagram 3-①)	Perf.Criteria B
	Surge	IEC/EN61000-4-5	±2KV (Recommended circuit diagram 3-①)	Perf.Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s	Perf.Criteria A
	Voltage sag, drop, and short-term interruption immunity	IEC/EN61000-4-29	0-70%	perf.Criteria B

Typical Characteristic Curves

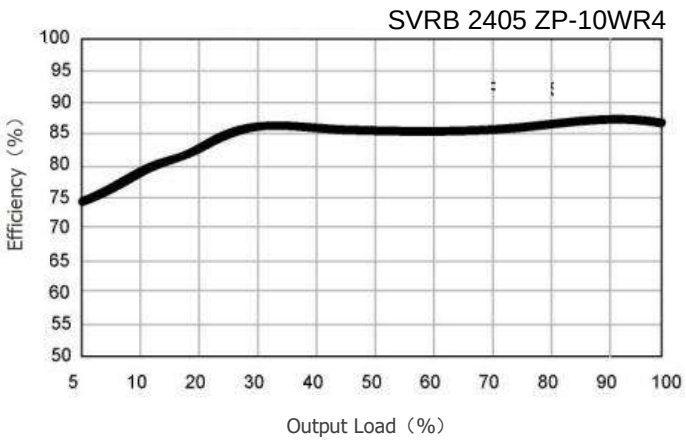
Temperature Derating Curve（Figure 1）



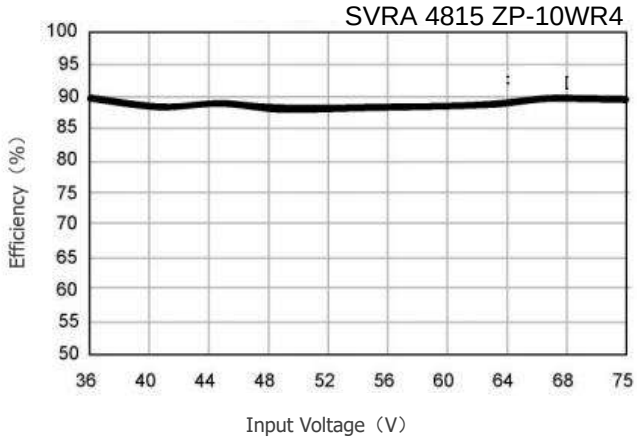
Efficiency VS Curve (Full load)



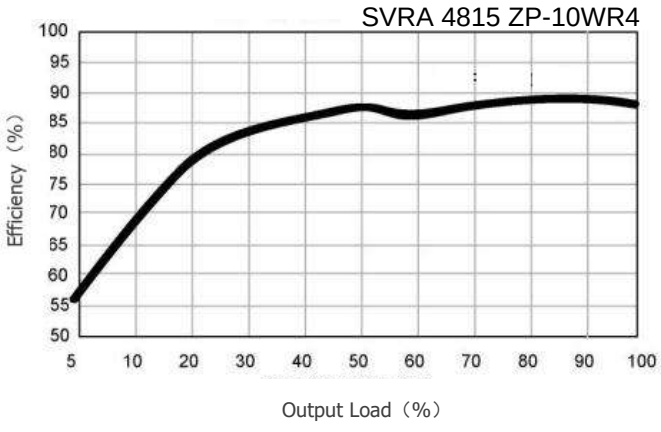
Efficiency VS Output Load（Vin=24V）



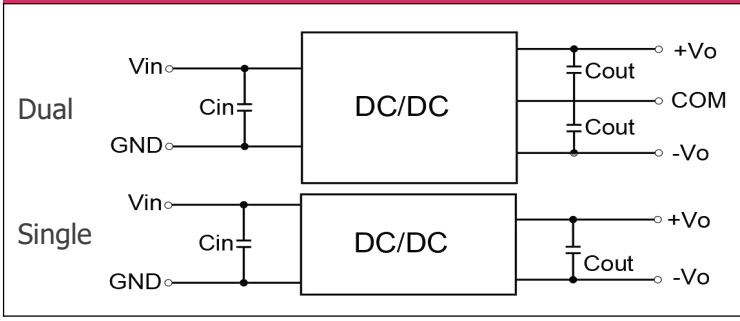
Efficiency VS Input Voltage Curve (Full load)



Efficiency VS Output Load（Vin=48V）



Typical Circuit Design and Application

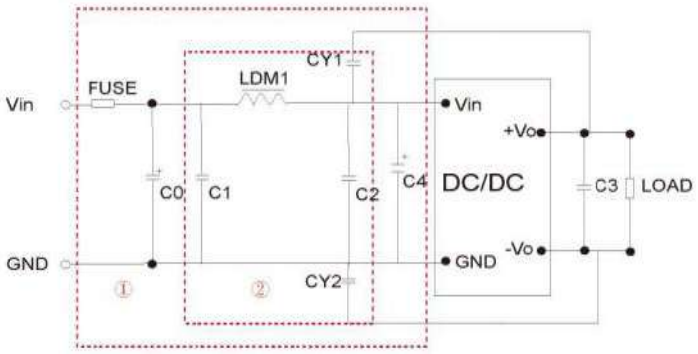
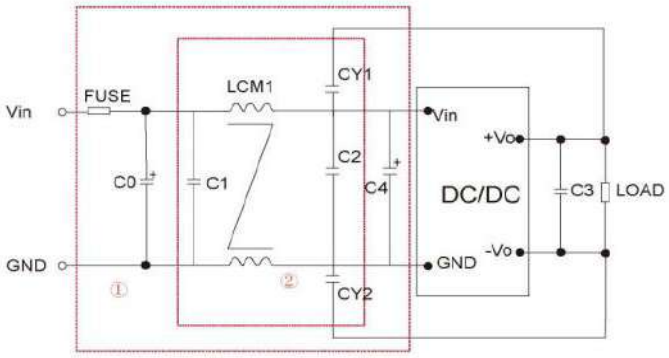
Application circuit（Figure2）	Recommended Capacitive Load Value Table		
	Vin	12/24V	48V
	Cin	100uF	10-47uF
	Cout	10uF	

Application circuit description：

1. All DC/DC converters in this series are tested according to the recommended testing circuit (Figure 2) before leaving the factory.

2. If further reduction of input and output ripple is required, the input and output external capacitor Cin1 can be connected Increase or select capacitors with small series equivalent impedance values for Cin2, Cs, and Cout, Cs are used to reduce ripple, and if the ripple meets the demand, there is no need to add Cs. But suitable filtering capacitors should be selected, as excessive capacitance may cause startup problems. For each output, under safe and reliable working conditions, the maximum capacitance value of its filtering capacitor cannot exceed the maximum capacitive load of the product.

EMC Solutions - Recommended Circuits

3.3VDC、5VDC Output（Figure3）	Other Output（Figure4）
	

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

EMI Recommended Parameter Table				
Model	Vin：5V	Vin：12V	Vin：24V	Vin：48V
FUSE	Select based on the actual input current of the customer			
C0 、C4	820μF/16V	470μF/35V	330μF/50V	330μF/100V
C1 、C2	10μF/50V			10μF/100V
C3	Refer to the Cout in Fig.2			
LCM1	1.4-1.7mH			
LDM1	10uH			
CY1 、CY2	1nF/2KV			

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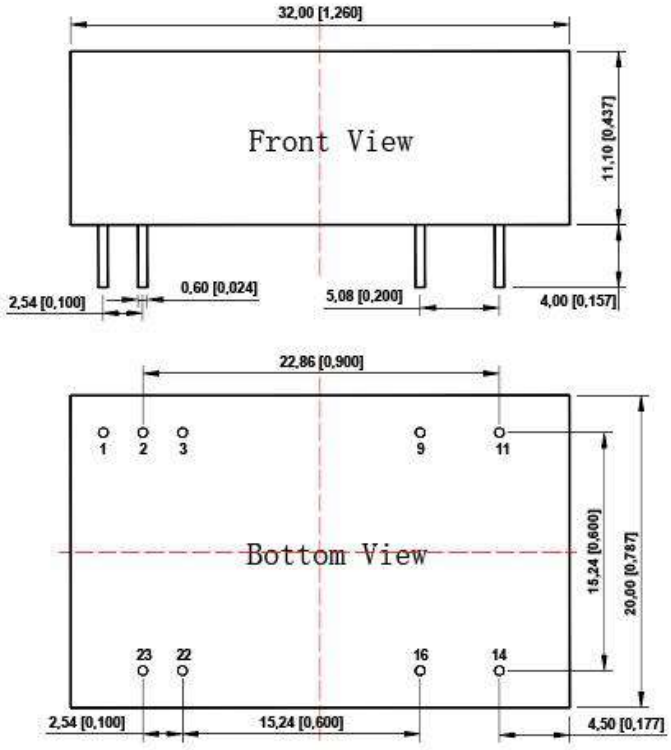
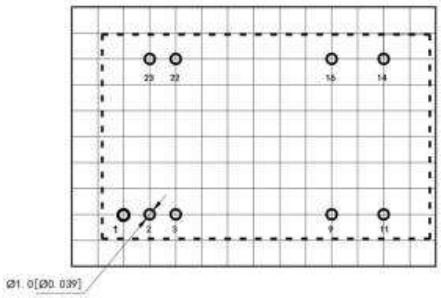
Dimensions and Recommended Layout

Dimensions	PCB Printing Layout



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



The grid distance is 2.54mm x2.54mm

Pin Definition Table

Pin	Single	Double
1	CTRL	CTRL
2	GND	GND
3	GND	GND
9	NO PIN	COM
11	NC	-Vo
14	+Vo	+Vo
16	-Vo	COM
22	Vin	Vin
23	Vin	Vin

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 ℃, 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.