

SCHMID-M

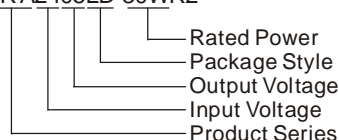
SVRA_LD-30WR2 SERIES

30W, WIDE INPUT, ISOLATED & REGULATED
DUAL OUTPUT DC-DC CONVERTER



PART NUMBER SYSTEM

SVRA2405LD-30WR2



FEATURES

- Efficiency up to 89%
- 2:1 wide input voltage range
- Operating temperature range: -40°C ~ +85°C
- 1.5KVDC isolation
- Output short circuit , over current and over voltage protection
- Meet CISPR22/EN55022 CLASS A
- Industry standard pinout
- Inverse polarity protection for A2S(chassis mounting)and A4S(DIN-Rail mounting)

APPLICATION

The SVRA_LD-30WR2 series offer 30W of output, with 2:1 wide input voltage of 18-36VDC, 36-75VDC and features 1500VDC isolation, over current and short-circuit protection etc, as well as six-sided metal shielding. All models are particularly suited to industrial control, electric power, instrumentation, tele-communications etc.

SELECTION GUIDE

Model Number ①	Input Voltage (VDC)		Output Voltage (VDC)	Output Current (mA)		Input Current (mA)(typ.)		reflection ripple Current (mA,typ.)	Max. Capacitor Load (max,µF)	Efficiency ③ (% ,typ.) @ Max. load
	Nominal (Range)	Max ②		Max.	Min.	@ Max.load	@ No load			
SVRA2405LD-30WR2	24 (18-36)	40	± 5	± 3000	± 150	1460	120	20	± 3000	88
SVRA2409LD-30WR2			± 9	± 1667	± 83	1440	20	10	± 470	88
SVRA2412LD-30WR2			± 12	± 1250	± 63	1440	20	10	± 470	88
SVRA2415LD-30WR2			± 15	± 1000	± 50	1440	20	10	± 470	89
SVRA2424LD-30WR2			± 24	± 625	± 32	1440	20	10	± 300	89
SVRA4805LD-30WR2	48 (36-75)	80	± 5	± 3000	± 150	730	80	20	± 3000	88
SVRA4812LD-30WR2			± 12	± 1250	± 63	720	20	10	± 470	89
SVRA4815LD-30WR2			± 15	± 1000	± 50	720	20	10	± 470	89
SVRA4824LD-30WR2			± 24	± 625	± 32	720	20	10	± 300	89

Note: ① series with suffix "H" are heat sink mounting for example SVRA2405LD-30WHR2. series with suffix "A2S" are chassis mounting, with suffix "A4S" are DIN-Rail mounting, for example SVRA2405LD-30WR2A2S is chassis mounting, SVRA2405LD-30WR2A4S is DIN-Rail mounting. If the application has a higher requirement for heat dissipation, you can choose modules with heat sink.

② Absolute maximum rating without damage on the converter, but it isn't recommended.

③ The efficiency of "A2S" and "A4S" is approx. 2% lower for the protection of inverse polarity.

INPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1sec. max.)	24VDC Input Models	-0.7	--	50	VDC
	48VDC Input Models	-0.7	--	100	
Start-up Voltage	24VDC Input Models	--	17.8	18	VDC
	48VDC Input Models	--	35.8	36	
Under Voltage Shutdown	24VDC Input Models	16	--	--	VDC
	48VDC Input Models	32	--	--	
Start-up Time	Nominal input & constant resistance load	--	10	--	ms

Ctrl [†]	Models ON	Ctrl open or connect TTL high level (2.5-12VDC)			
	Models OFF	Ctrl connect GND or low level (0-1.2VDC)			
	Input current at shutdown	--	1	--	mA
Input Filter		Pi Filter			
*The Ctrl control pin voltage is refer to GND.					

OUTPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Unit	
Positive Output Voltage Accuracy		--	±1	±3	%	
Negative Output Voltage Accuracy						
Output Voltage Balance	Dual output, Balance load	--	±0.5	±1		
Line Regulation	Input voltage from low to high at 100% load	--	±0.2	±0.5		
Cross Regulation	Dual output, main output 50% load, Supplement output from 10% to 100% load	--	±5	±7		
Load Regulation	From 5% to 100% load Nominal input	--	±0.5	±1		
Transient Recovery Time	25% load step change	--	300	500	μs	
Transient Response Deviation		--	±3	±5	%	
Temperature Drift	100% load	--	±0.02	--	%/°C	
Ripple & Noise *	20MHz bandwidth	--	50	100	mVp-p	
Over Voltage Protection	Full input voltage	5VDC output	--	6	--	VDC
		9VDC output	--	10.8	--	
		12VDC output	--	15	--	
		15VDC output	--	18	--	
		24VDC output	--	28	--	
Over Current Protection	Full input voltage	110	130	160	%	
Short Circuit Protection		Hiccup, automatic recovery				

Note: *Ripple and noise tested by "parallel cable" method. See detailed operation instructions at *DC-DC Application Notes*.

COMMON SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input -Output, tested for 1 minute, leakage current less than 1 mA	1500	--	--	VDC
Isolation Resistance	Input -Output, test at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input -Output, 100KHz/0.1V	--	2000	--	pF
Switching Frequency	PWM mode	--	400	--	KHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	K hours
Case Material		Aluminum Alloy			
Size	PCB mounting (Without heat sink)	50.8x25.4x11.8			mm
	PCB mounting (With heat sink)	50.8x25.4x16.3			
	A2S chassis mounting (Without heat sink)	76.0x31.5x21.2			
	A4S DIN-Rail mounting (Without heat sink)	76.0x31.5x25.8			
	A2S chassis mounting (With heat sink)	76.0x31.5x25.1			
	A4S DIN-Rail mounting (With heat sink)	76.0x31.5x29.7			
Weight	PCB mounting (Without heat sink)	--	24	--	g
	PCB mounting (With heat sink)	--	37	--	
	A2S chassis mounting (Without heat sink)	--	46	--	
	A4S DIN-Rail mounting (Without heat sink)	--	66	--	
	A2S chassis mounting (With heat sink)	--	59	--	
	A4S DIN-Rail mounting (With heat sink)	--	79	--	

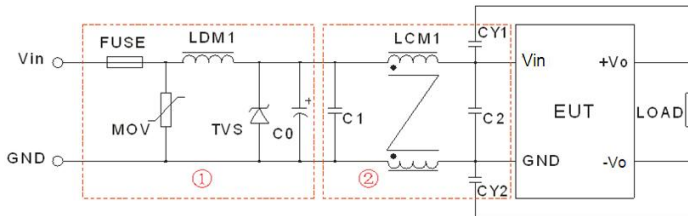
ENVIRONMENTAL SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	5	--	95	%
Operating Temperature	See Temperature Derating Curve (see Figure 3)	-40	--	85	°C
Storage Temperature		-55	--	125	
The Max. Case Temperature	Operating Temperature curve range	--	--	105	
Soldering Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free Air Convection			
Shake		10-55Hz, 10G, 30 Min. along X, Y and Z			

EMC SPECIFICATIONS

EMI	CE	CISPR22/EN55022	CLASS A (Without External Circuit) / CLASS B (External Circuit Refer to Figure1-②)	
	RE	CISPR22/EN55022	CLASS A (Without External Circuit) / CLASS B (External Circuit Refer to Figure1-②)	
EMS	ESD	IEC/EN61000-4-2	Contact $\pm 4\text{KV}$	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	$\pm 2\text{KV}$ (External Circuit Refer to Figure1-①)	perf. Criteria B
	Surge	IEC/EN61000-4-5	$\pm 2\text{KV}$ (External Circuit Refer to Figure1-①)	perf. Criteria B
	CS	IEC/EN61000-4-6	3Vr.m.s	perf. Criteria A
	Voltage dips, short and interruptions immunity	IEC/EN61000-4-29	0%-70%	perf. Criteria B

EMC RECOMMENDED CIRCUIT



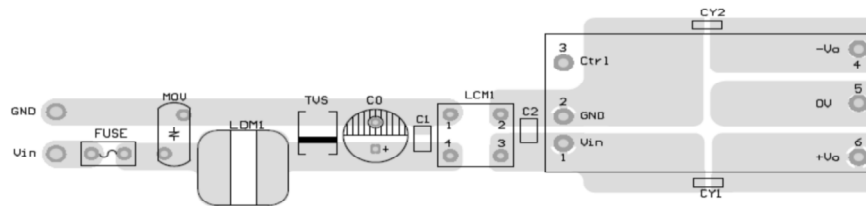
(Figure 1)

Note: 1. In Figure 1, part① is EMS recommended external circuit, part② is EMI recommended external circuit. Choose according to requirements.
2. FL2D-30-102 is the EMC auxiliary component of our company.

Recommended external circuit parameters:

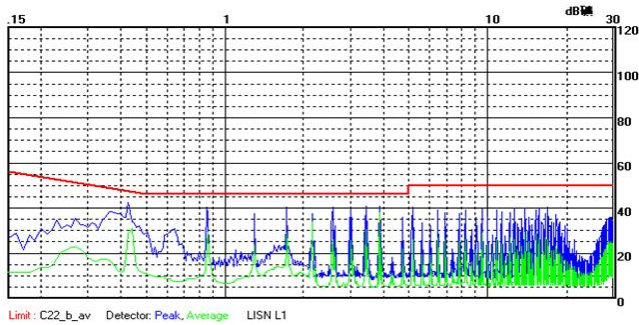
Model	SVRA24_LD-30WR2	SVRA48_LD-30WR2
FUSE	Choose according to practical input current	
MOV	S14K35	S14K60
LDM1	56 μH	56 μH
TVS	SMCJ48A	SMCJ90A
C0	330 $\mu\text{F}/50\text{V}$	330 $\mu\text{F}/100\text{V}$
C1,C2	4.7 $\mu\text{F}/50\text{V}$	2.2 $\mu\text{F}/100\text{V}$
LCM1	1mH (FL2D-30-102)	
CY1,CY2	1nF/2KV	1nF/2KV

EMC RECOMMENDED CIRCUIT PCB LAYOUT

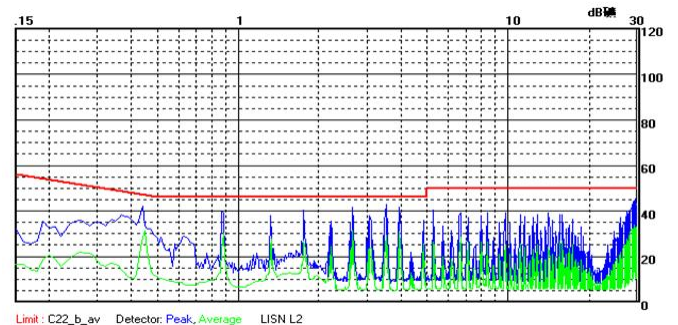


(Figure 2)

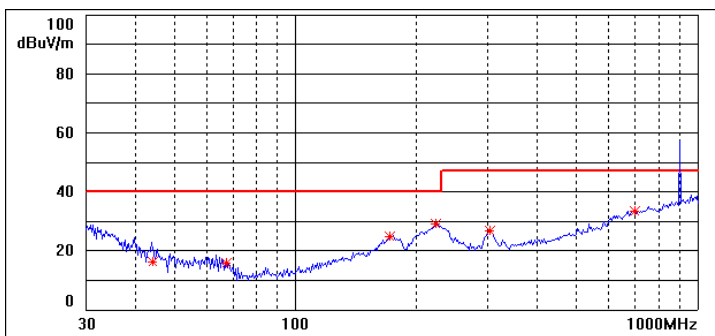
EMI TEST WAVEFORM (CLASS B APPLICATION CIRCUIT)



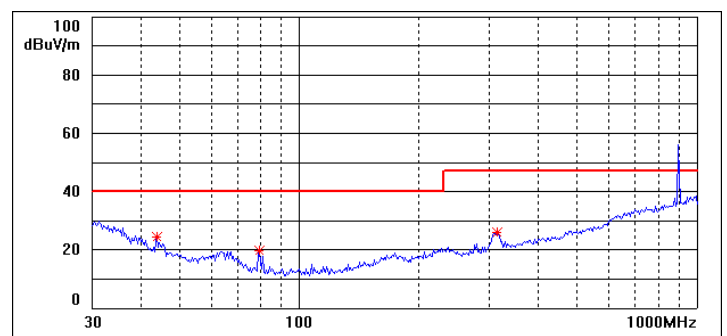
SVRA2405LD-30WR2 CE (Positive line)



SVRA2405LD-30WR2 CE (Negative line)



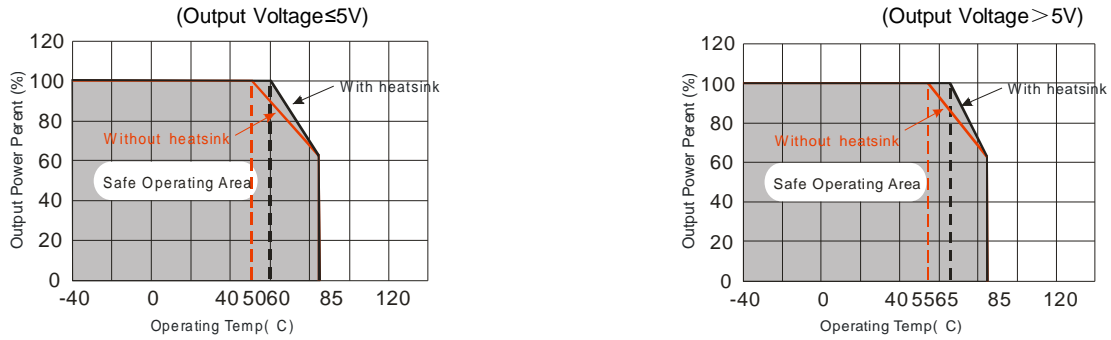
SVRA2405LD-30WR2 RE (Horizontal)



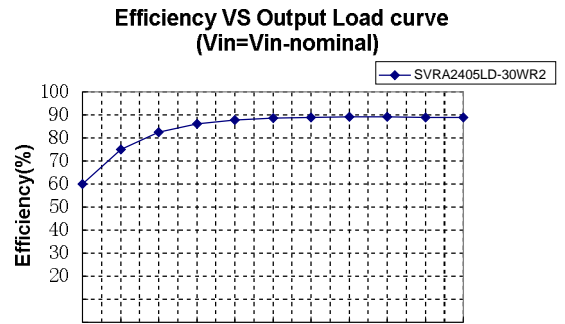
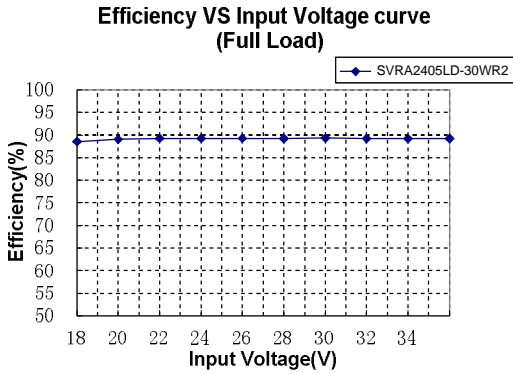
SVRA2405LD-30WR2 RE (Vertical)

PRODUCT TYPICAL PERFORMANCE CURVE

Temperature derating curve



(Figure 3)



PCB MOUNTING(WITHOUT HEATSINK) OUTLINE DIMENSIONS,RECOMMENDED FOOTPRINT

MECHANICAL DIMENSIONS

The mechanical drawings show the component's dimensions. The front view shows a width of 11.80 mm [0.465] and a height of 4.10 mm [0.161]. The bottom view shows a total length of 50.80 mm [2.000] and a footprint length of 45.72 mm [1.800]. Pin locations are marked with numbers 1 through 6. A diameter of 1.00 mm [0.039] is specified for the mounting holes.

PIN CONNECTION	
Pin	Function
1	Vin
2	GND
3	Ctrl
4	-Vo
5	0V
6	+Vo

Note:
 Unit :mm[inch]
 Pin diameter tolerances :±0.10[±0.004]
 Pin height tolerances :±0.50[±0.020]
 General tolerances:±0.30[±0.012]

THIRD ANGLE PROJECTION

RECOMMENDED FOOTPRINT DETAILS

The recommended footprint details show a 6-pin footprint with a grid of 2.54*2.54mm. The pin diameter is specified as Ø1.50 [0.059]. The footprint dimensions are 54.30 mm [2.138] in length and 20.00 mm [0.787] in width. The distance between the center of pin 1 and pin 6 is 13.20 mm [0.520].

Note : Grid 2.54*2.54mm

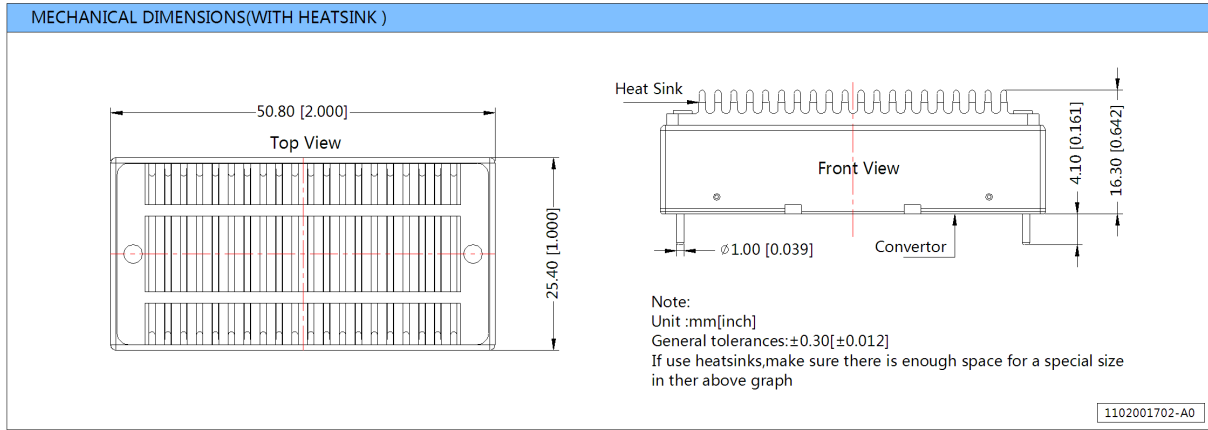
TUBE PACKAGING DIMENSIONS (WITHOUT HEATSINK)

The tube packaging dimensions show a tube with a length of 54.30 mm [2.138] and a height of 20.00 mm [0.787]. The distance between the center of pin 1 and pin 6 is 13.20 mm [0.520].

Note:
 Unit :mm[inch]
 General tolerances :±0.50[±0.020]
 L=230[9.055] Tube Quantity:7 pcs
 Inner carton(S): L*W*H=255*170*80
 Outer carton(S): L*W*H=375*280*270, 6 inner cartons(S)

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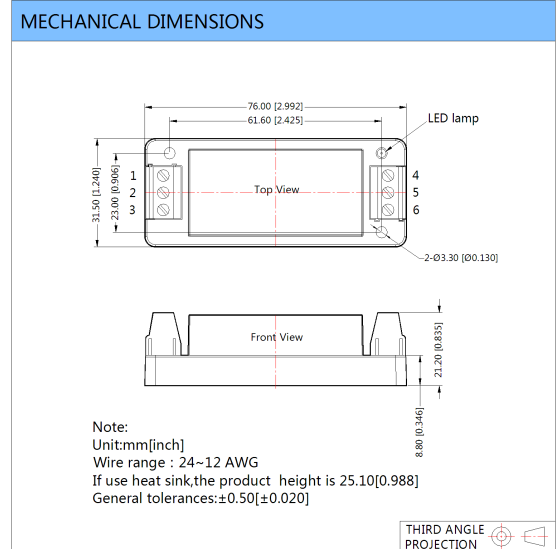
PCB MOUNTING (With heatsink) OUTLINE DIMENSIONS



SVRA_LD-30WR2A2S CHASSIS MOUNTING OUTLINE DIMENSIONS



Footprint Details						
Pin	1	2	3	4	5	6
Function	Ctrl	GND	Vin	-Vo	0V	+Vo

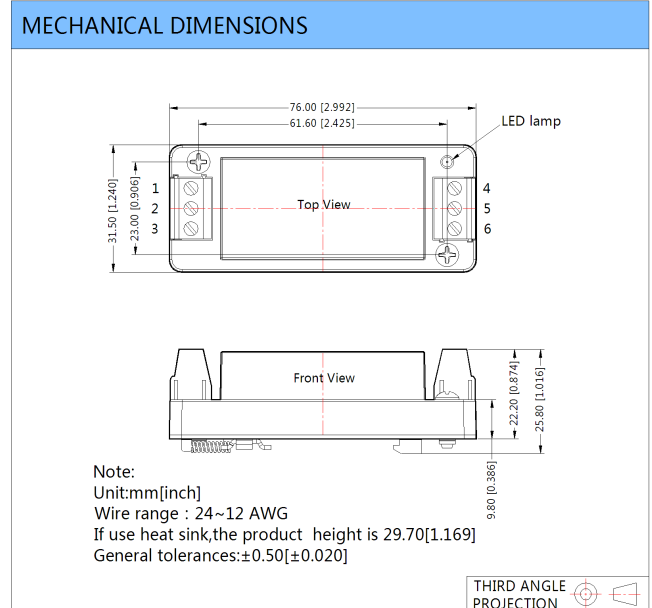


SVRA_LD-30WR2A4S DIN-RAIL MOUNTING OUTLINE DIMENSIONS

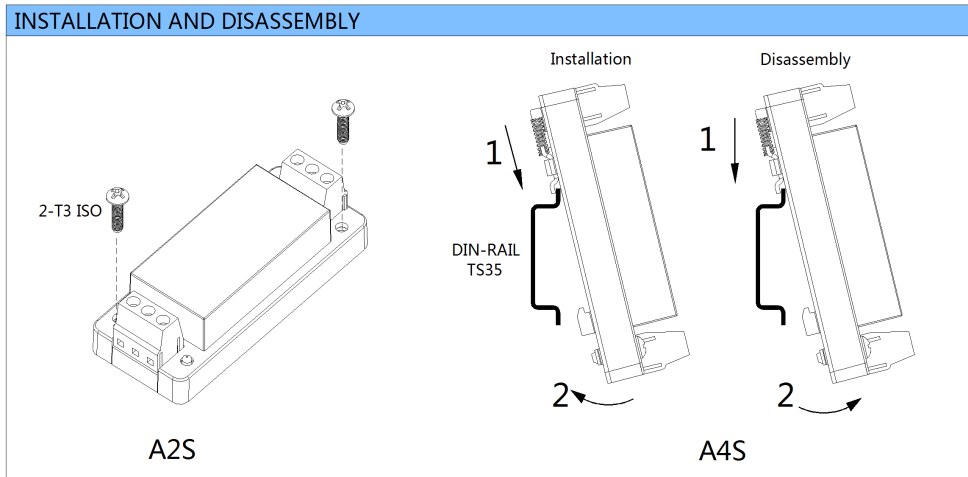


DIN-rail modules are fitting to TS35 rails

Footprint Details						
Pin	1	2	3	4	5	6
Function	Ctrl	GND	Vin	-Vo	0V	+Vo

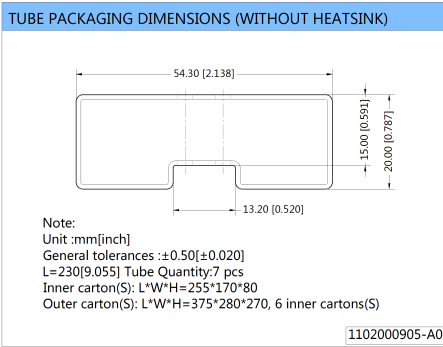


INSTALLATION & DISASSEMBLY

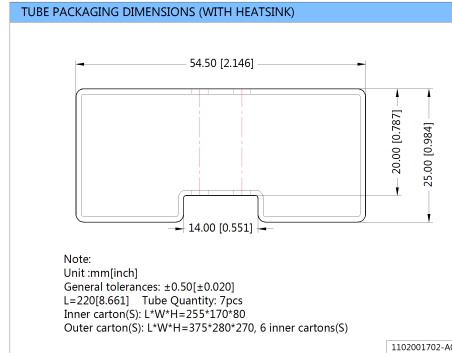


PACKAGE DIAGRAM

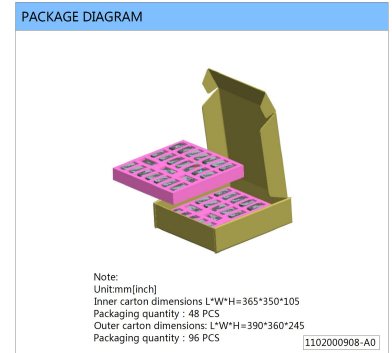
PCB mounting Series (Without heat sink)



PCB mounting Series (With heat sink)



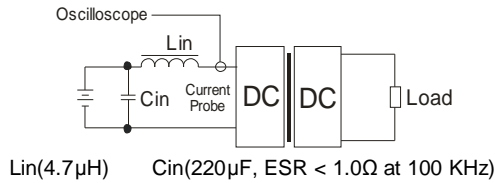
Special Package Series (A2S/A4S)



TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor L_{in} and Capacitor C_{in} to simulate source impedance.

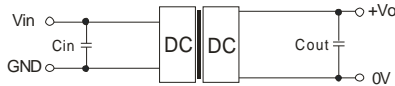


DESIGN CONSIDERATIONS

1) Recommended circuit

All the SVRA_LD-30WR2 Series have been tested according to the following recommended test circuit before leaving the factory (see Figure 4).

If you want to further decrease the input/output ripple, you can increase a capacitance-values properly or choose capacitors with low ESR, but the total capacitance of the filter capacitor must not exceed the Max. Capacitive Load.



(Figure 4)

EXTERNAL CAPACITOR TABLE (TABLE 2)

Output Voltage (VDC)	Cout (μ F)	Cin (μ F)
± 5	220	100
$\pm 9/\pm 12/\pm 15$	100	
± 24	47	

2) It is not recommended to increase the output power capability by connecting two or more converters in parallel. The product is not hot-swappable

Note:

1. Min. load shouldn't be less than 5%, otherwise ripple maybe increased dramatically, If the product operates under min. load, it may not be guaranteed to meet all specifications listed. Operation under minimum load will not damage the converter.
2. Recommended Dual output models unbalanced load: $\leq \pm 5\%$, If the product operates $> \pm 5\%$, it may not be guaranteed to meet all specification Listed, please contact our technical person for more detail.
3. Max. Capacitive Load is tested at input voltage range and full load.
4. All specifications measured at $T_a=25^\circ\text{C}$, humidity $<75\%$, nominal input voltage and rated output load unless otherwise specified.
5. In this datasheet, all test methods are based on our corporate standards.
6. All characteristics are for listed models, and non-standard models may perform differently. Please contact our technical support for more details.
7. Please contact our technical support for any specific requirement.
8. Specifications of this product are subject to changes without prior notice.