

# 2.7V Radial Supercapacitor



**ADCR-S02R7S**

Request Samples



Check Inventory



Various Sizes

RoHS/RoHS II Compliant

MSL Level = 1

## Features

- High power density
- Minimal discharge rate, 72 hours @ discharge<20%
- Excellent cycle life
- Green, meet RoHS requirements.

## Applications

- Power Assist Circuits
- Power Backup
- Micro Energy Storage
- IoT Energy Harvesting
- SSD applications
- DDR power back up
- RTC System power transfer to battery backup

## Electrical Specifications

Part Number	Nominal Voltage (U <sub>R</sub> )	Capacitance	Tol.	ESR (Max)	Nominal Current	Peak Current (Max)	Leakage Current	Stored Energy (Max)	Gravimetric Energy Density	Power Density	Volumetric Energy Density
ADCR-S02R7S	DC(V)	Farads	±%	mΩ	A	A	mA	mWh	Wh/kg	kW/kg	Wh/L
ADCR-S02R7SA504MB	2.7V	0.5	20	500	0.13	0.54	0.010	0.51	0.72	2.60	1.31
ADCR-S02R7SA105MB	2.7V	1.0	20	350	0.25	1.00	0.010	1.01	1.58	4.07	2.59
ADCR-S02R7SB105MB	2.7V	1.0	20	350	0.25	1.00	0.010	1.01	1.13	2.89	1.55
ADCR-S02R7SA205MB	2.7V	2.0	20	180	0.50	1.99	0.010	2.03	1.70	4.25	2.52
ADCR-S02R7SA305MB	2.7V	3.0	20	120	0.76	2.98	0.010	3.04	2.34	5.84	3.02
ADCR-S02R7SA335MB	2.7V	3.3	20	120	0.83	3.19	0.010	3.34	2.39	5.42	3.32
ADCR-S02R7SA505MB	2.7V	5.0	20	80	1.25	4.82	0.020	5.06	2.38	7.59	4.19
ADCR-S02R7SB505MB	2.7V	5.0	20	75	1.26	4.91	0.020	5.06	2.88	6.90	3.22
ADCR-S02R7SA605MB	2.7V	6.0	20	75	1.49	5.59	0.020	6.08	3.16	6.33	3.87
ADCR-S02R7SA705MB	2.7V	7.0	20	70	1.72	6.34	0.030	7.09	3.30	6.05	4.51
ADCR-S02R7SA106MB	2.7V	10	20	65	2.39	8.18	0.030	10.13	3.92	5.43	5.16
ADCR-S02R7SA156MB	2.7V	15	20	55	3.48	11.10	0.050	15.19	4.11	4.49	4.95
ADCR-S02R7SA206MB	2.7V	20	20	45	4.58	14.21	0.060	20.25	6.53	6.53	6.60
ADCR-S02R7SA256MB	2.7V	25	20	30	5.87	19.29	0.070	25.31	4.14	4.97	5.04
ADCR-S02R7SA306MB	2.7V	30	20	30	6.86	21.32	0.078	30.38	4.29	4.29	5.04

**Operating Temperature:** -40°C to +70°C

**Storage:** Temperature -30°C to +50°C, RH<60%, Max. Humidity <85% RH

**Test Conditions:** +25°C

All parameters are measured according to the IEC 62391-1 standard.

Capacitance and ESR are measured with  $I(\text{mA}) = 8(C \cdot U_R)$

**Nominal Current:** 5 Seconds to discharge from  $U_R$  to  $1/2U_R$

**Peak Current (Max.):** 1 second to discharge to  $U_R$  to  $1/2U_R$

**Leakage Current:** Measured after 72h at  $U_R$



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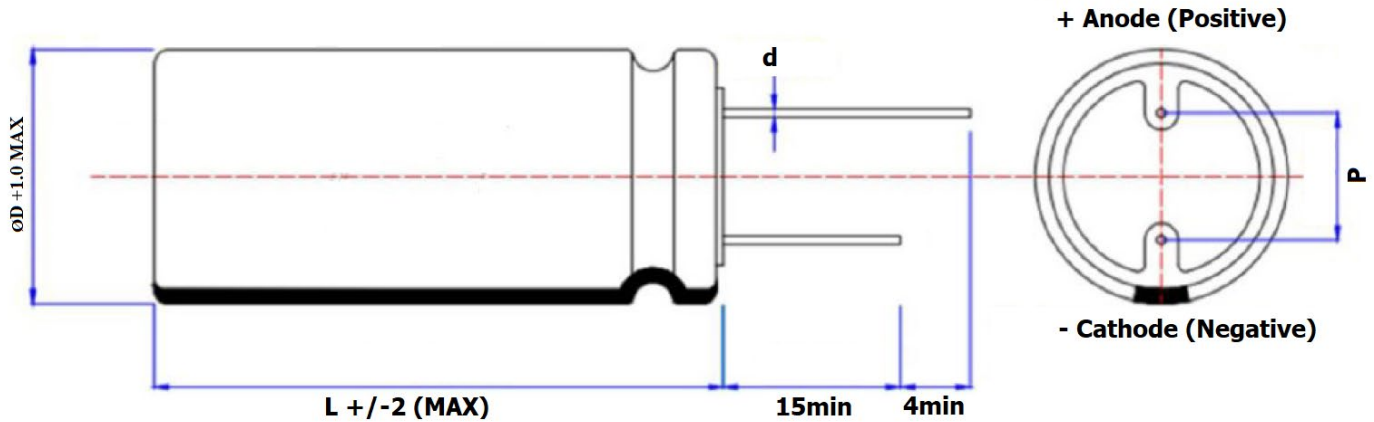


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MSL Level = 1

## Mechanical Specifications



Dimensions	D	L	P	d
ADCR-S02R7SA504MB	6.3±1.0	12.5±1.5	2.5±0.5	0.5±0.05
ADCR-S02R7SA105MB	6.3±1.0	12.5±1.5	2.5±0.5	0.5±0.05
ADCR-S02R7SB105MB	8.0±1.0	13.0±1.5	3.5±0.5	0.6±0.05
ADCR-S02R7SA205MB	8.0±1.0	16.0±1.5	3.5±0.5	0.6±0.05
ADCR-S02R7SA305MB	8.0±1.0	20.0±1.5	3.5±0.5	0.6±0.05
ADCR-S02R7SA335MB	8.0±1.0	20.0±1.5	3.5±0.5	0.6±0.05
ADCR-S02R7SA505MB	8.0±1.0	24.0±1.5	3.5±0.5	0.6±0.05
ADCR-S02R7SB505MB	10.0±1.0	20.0±1.5	5.0±0.5	0.6±0.05
ADCR-S02R7SA605MB	10.0±1.0	20.0±1.5	5.0±0.5	0.6±0.05
ADCR-S02R7SA705MB	10.0±1.0	20.0±1.5	5.0±0.5	0.6±0.05
ADCR-S02R7SA106MB	10.0±1.0	25.0±2.0	5.0±0.5	0.6±0.05
ADCR-S02R7SA156MB	12.5±1.0	25.0±2.0	5.0±0.5	0.6±0.05
ADCR-S02R7SA206MB	12.5±1.0	25.0±2.0	5.0±0.5	0.6±0.05
ADCR-S02R7SA256MB	16.0±1.0	25.0±2.0	7.5±0.5	0.8±0.05
ADCR-S02R7SA306MB	16.0±1.0	30.0±2.0	7.5±0.5	0.8±0.05

Dimensions: mm



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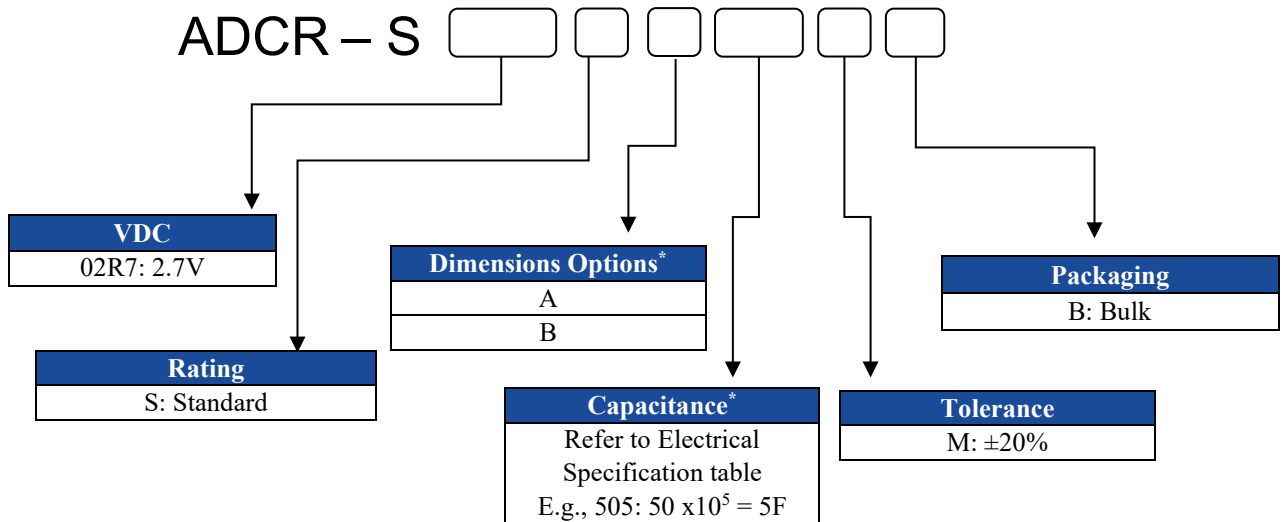


Various Sizes

RoHS/RoHS II Compliant

MSL Level = 1

## Part Number Identification



\*Only part numbers listed in the Electrical Specs table are available. For custom builds, please contact us.

## Part Marking



Example of the Markings of a 1.0F 2.7V capacitor

Capacitance (F)

Rated Voltage (V)

Polarity (negative bar on the sleeve to indicate the cathode)



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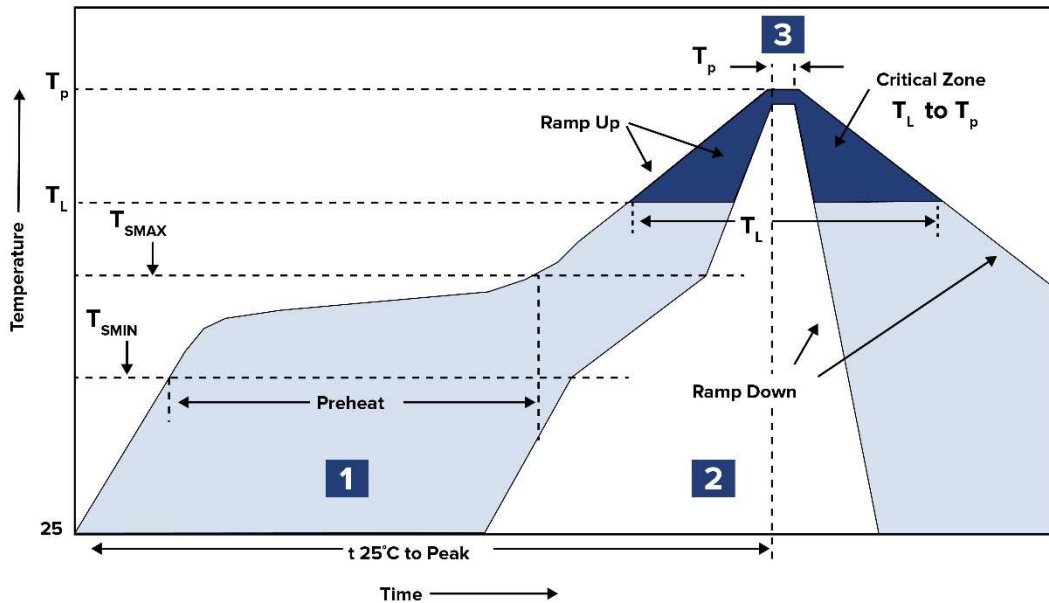


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## Reflow Profile



Zone	Description	Temperature	Times
1	Preheat	$T_{SMIN} \sim T_{SMAX}$ 100°C ~ 150°C	60 ~ 120 sec.
2	Reflow	$T_L$ 200°C	30 ~ 40 sec.
3	Peak heat	$T_p$ 240°C±5°C	5 sec. MAX

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## Packaging

Part Number	Quantity (PCS/bag)
ADCR-S02R7SA504MB	2000
ADCR-S02R7SA105MB	2000
ADCR-S02R7SB105MB	1500
ADCR-S02R7SA205MB	1000
ADCR-S02R7SA305MB	1000
ADCR-S02R7SA335MB	1000
ADCR-S02R7SA505MB	1000
ADCR-S02R7SB505MB	800
ADCR-S02R7SA605MB	800
ADCR-S02R7SA705MB	800
ADCR-S02R7SA106MB	600
ADCR-S02R7SA156MB	400
ADCR-S02R7SA206MB	400
ADCR-S02R7SA256MB	250
ADCR-S02R7SA306MB	200

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## INTERNAL ONLY INFORMATION

### Reliability Data

Item	Requirement		Test Condition	
Characteristics in different temperature	Step 2	$\Delta C$	Less than or equal to 30% of the initial value	Step 1 : +25°C±2°C Step 2 : -40°C±2°C Step 3 : +70°C±2°C Step 4 : +25°C±2°C
		ESR	Less than or equal to 400% of the initial value	
	Step 3	$\Delta C$	Less than or equal to 30% of the initial value	
		ESR	Less than or equal to the initial value	
		LC	Less than or equal to 4 times the initial value	
	Step 4	$\Delta C$	Satisfies the range of 20% of the initial rating	
		ESR	Satisfies the initial value	
		LC	Satisfies the initial value	
	Endurance	$\Delta C$	Less than or equal to 30% of the initial value	
ESR		Less than or equal to 4 times the initial value		
LC		Less than or equal to the initial measurement		
Appearance		No leakage or mechanical damage		
Cycle life	$\Delta C$	Less than or equal to 30% of the initial value	Applied voltage : 2.7V Temperature : +25°C±2°C Cycles : 500000	
	ESR	Less than or equal to 4 times the initial value		
Humidity Characteristics	$\Delta C$	Satisfies the range of 30% of the initial rating	Temperature : +40°C±2°C Relative humidity : 90~95%RH Test time : 240h	
	ESR	Less than or equal to 2 times the initial value		
	LC	Less than or equal to 4 times the initial value		
	Appearance	No leakage or mechanical damage		
Temperature cycle	C	Satisfies the initial value	Temperature cycle : -40°C±2°C→normal temperature→+70°C±2°C→normal temperature Cycles : 5	
	ESR	Satisfies the initial value		
	LC	Satisfies the initial value		
	Appearance	No mechanical damage or leakage		
Shelf life	C	Satisfies the range of 20% of the initial rating	Applied voltage : 0V Temperature : +70°C±2°C Time : 1000h	
	ESR	Less than or equal to 3 times the initial value		
	LC	Less than or equal to the initial measurement		
	Appearance	No leakage or mechanical damage		
Self discharge characteristics (voltage holding characteristics)	Voltage between positive and negative poles≥2.16V		Charging process: normal temperature, no load, rated voltage charge 24h Placement process: temperature less than or equal to 25 °C, relative humidity less than 60% RH, open 24 h	
Lead strength	No damage to the outlet			
Solder ability	More than 3/4 of the terminal surface is covered by a tin layer			



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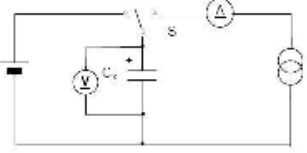
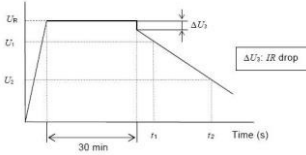
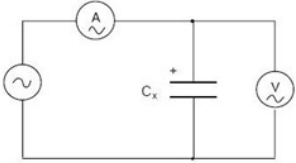
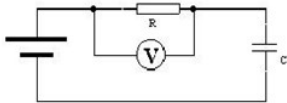
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## Measuring Method

<p>Capacitance</p>	<p>Measurement by Permanent electrotransport :</p> <ol style="list-style-type: none"> <li>1.DC voltage of constant current/constant voltage source is set as rated voltage (UR).</li> <li>2.Set the constant current value of the constant current discharge device.</li> <li>3.Switch the switch S to dc power supply, and charge at constant voltage for 30min after the constant current/constant voltage source reaches the rated voltage.</li> <li>4.After charging for 30min, switch S is changed to the constant exile device to discharge with constant current.</li> <li>5.Measure the time t1 and t2 of the voltage from U1 to U2 at both ends of the capacitor, as shown in the figure, and calculate the capacitance value according to the following equation</li> </ol>   $C = \frac{I \times (t_2 - t_1)}{U_1 - U_2}$
<p>Resistance</p>	<p>AC impedance measurement The circuit as shown in the figure below is used for measurement</p>  <p>Capacitor resistance Ra shall be computed by the type:</p> $R_a = \frac{U}{I}$ <p>Ra ac impedance (Ω); Effective value of U ac voltage (V R.M.S); Effective value of I ac current (V R.M.S).</p>
<p>Leakage Current</p>	<p>DC leakage current measurement principle is as follows</p>  <ol style="list-style-type: none"> <li>1.Discharge: before the measurement begins, the capacitor should be fully discharged.The discharge process lasts from 1h to 24h.</li> <li>2. Leakage current shall be measured at rated temperature and rated voltage (UR).The charging voltage reached 95% after the maximum 30min charging time. The charging time was selected from 30min , 1h , 2h , 4h , 8h , 12h , 24h , 48h , 72h and shall be specified in the detail specification 3.Stable power supply, such as dc stabilized power supply, should be used.</li> <li>4. through the protection under 1000 Ω resistance to capacitor voltage</li> </ol>