

# PRODUCT DATASHEET

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**Datasheet begins on next page.**



## Feature

Miniaturized tantalum chip capacitors with extended capacitance.  
(Reduced size 1/2 to 1/3 in comparison with SCN.)

- Molded case available in four case codes.
- New low profile size.
- Compatible with automatic pick and place equipment.
- Meets or exceeds EIA standard 535BAAC.
- Environment-Friendly(Pb-free) tantalum capacitor.

## Specifications

Capacitance	Range	0.47 $\mu$ F to 680 $\mu$ F						
	Tolerance	$\pm 20\%$ (M), $\pm 10\%$ (K)						
Dissipation Factor (Tan $\delta$ )		Refer to Specification						
Leakage Current		Refer to Specification						
Rated Voltage(VR)	T $\leq$ 85 $^{\circ}$ C	2.5	6.3	10.0	16.0	20.0	25.0	35.0
Category Voltage(V)	85 $^{\circ}$ C < T $\leq$ 125 $^{\circ}$ C	1.6	4.0	6.3	10.0	13.0	16.0	22.0
Surge Voltage(V)	T $\leq$ 85 $^{\circ}$ C	3.1	8.0	13.0	20.0	25.0	32.0	44.0
	85 $^{\circ}$ C < T $\leq$ 125 $^{\circ}$ C	2	5.0	8.0	13.0	16.0	20.0	28.0
Operating Temperature		-55 $^{\circ}$ C to 125 $^{\circ}$ C						

## Standard Value and Case Size

Cap.( $\mu$ F)	R . V	2.5V(0E)	4V(0G)	6.3V(0J)	10V(1A)	16V(1C)	20V(1D)	25V(1E)	35V(1V)
0.15	154								
0.22	224								
0.33	334								
0.47	474								A
0.68	684							A	A
1.0	105						A	A	A
1.5	155					A	A	A	A, B
2.2	225				A	A	A	A, B	B
3.3	335			A	A	A	A, B	A, B	B
4.7	475		A	A	A	A, B	A, B	B	C
6.8	685		A	A	A, B	A, B	B	B, C	C
10	106		A	A, B	A, B	A, B	B, C	B, C	C, D
15	156		A, B	A, B	A, B	B, C	C	C, D	C, D
22	226		A, B	A, B	A, B, C	B, C	B, C, D	C, D	D
33	336		A, B	A, B, C	A, B, C	B, C, D	C, D	D	D
47	476		A, B, C	A, B, C	A, B, C, D	C, D	D		
68	686		B, C	B, C, D	C, D	C, D	D		
100	107		A, B, C, D	B, C, D	(B), C, D	D	D		
150	157		C, D	C, D	D	D			
220	227	B	B, C, D	C, D	D				
330	337		D	D					
470	477		D	D					
680	687								

( ): Under Development

Precautions in using  
Tantalum Capacitors

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SCN Series

**SCS Series**

SCS-P Series

SCM Series

SCF Series

SCE Series

SCL Series

PCS Series

PCL Series

Marking  
Specification

Taping  
Specification



## Ratings & Part Number Reference

Part Number	Case Size	Capacitance (μF)	DC Leakage (μA) @ +25 °C Max.	DF (%) @ +25 °C 120Hz Max.	ESR (Ω) @ +25 °C 100KHz Max.
2.5 volt Rating @ +85 °C (1.6 volt Rating @ +125 °C)					
TCSCS0E227*BAR	B	220	5.5	18	1.2
4 volt Rating @ +85 °C (2.5 volt Rating @ +125 °C)					
TCSCS0G475*AAR	A	4.7	0.5	8	8.0
TCSCS0G685*AAR	A	6.8	0.5	8	6.0
TCSCS0G106*AAR	A	10	0.5	8	6.0
TCSCS0G156*AAR	A	15	0.6	8	4.0
TCSCS0G156*BAR	B	15	0.6	8	3.5
TCSCS0G226*AAR	A	22	0.9	8	4.0
TCSCS0G226*BAR	B	22	0.9	8	3.5
TCSCS0G336*AAR	A	33	1.3	8	4.0
TCSCS0G336*BAR	B	33	1.3	8	3.5
TCSCS0G476*AAR	A	47	1.9	8	2.0
TCSCS0G476*BAR	B	47	1.9	8	3.5
TCSCS0G476*CAR	C	47	1.9	8	1.8
TCSCS0G686*BAR	B	68	2.7	8	1.8
TCSCS0G686*CAR	C	68	2.7	8	1.6
TCSCS0G107*AAR	A	100	4.0	30	2.0
TCSCS0G107*BAR	B	100	4.0	8	0.8
TCSCS0G107*CAR	C	100	4.0	8	1.6
TCSCS0G107*DAR	D	100	4.0	8	0.8
TCSCS0G157*CAR	C	150	6.0	8	1.2
TCSCS0G157*DAR	D	150	6.0	8	0.8
TCSCS0G227MBAR	B	220	8.8	18	0.5
TCSCS0G227*CAR	C	220	8.8	8	0.6
TCSCS0G227*DAR	D	220	8.8	8	0.9
TCSCS0G337*DAR	D	330	13.2	8	0.7
TCSCS0G477*DAR	D	470	18.8	10	0.6
6.3 volt Rating @ +85 °C (4 volt Rating @ +125 °C)					
TCSCS0J335*AAR	A	3.3	0.5	8	8.0
TCSCS0J475*AAR	A	4.7	0.5	8	6.0
TCSCS0J685*AAR	A	6.8	0.5	8	6.0
TCSCS0J106*AAR	A	10	0.6	8	4.0
TCSCS0J106*BAR	B	10	0.6	8	3.5
TCSCS0J156*AAR	A	15	0.9	8	4.0
TCSCS0J156*BAR	B	15	0.9	8	3.5
TCSCS0J226*AAR	A	22	1.4	8	2.0
TCSCS0J226*BAR	B	22	1.4	8	3.5
TCSCS0J336*AAR	A	33	2	6	2.0
TCSCS0J336*BAR	B	33	2	8	3.0
TCSCS0J336*CAR	C	33	2	8	1.8
TCSCS0J476*AAR	A	47	3	12	2.0
TCSCS0J476*BAR	B	47	3	8	1.3
TCSCS0J476*CAR	C	47	3	8	1.6
TCSCS0J686*BAR	B	68	4.3	8	3.5
TCSCS0J686*CAR	C	68	4.3	8	1.2
TCSCS0J686*DAR	D	68	4.3	8	0.8
TCSCS0J107MBAR	B	100	6.3	10	0.8
TCSCS0J107*CAR	C	100	6.3	8	0.8
TCSCS0J107*DAR	D	100	6.3	8	0.8
TCSCS0J157*CAR	C	150	9.5	8	1.3
TCSCS0J157*DAR	D	150	9.5	8	0.9
TCSCS0J227*CAR	C	220	13.9	8	0.6
TCSCS0J227*DAR	D	220	13.9	8	0.7
TCSCS0J337*DAR	D	330	20.8	8	0.5
TCSCS0J477*DAR	D	470	29.6	10	0.3

Part Number	Case Size	Capacitance (μF)	DC Leakage (μA) @+25 °C Max.	DF (%) @+25 °C 120Hz Max.	ESR (Ω) @+25 °C 100KHz Max.
10 volt Rating @+85 °C (6.3 volt Rating @+125 °C)					
TCSCS1A225*AAR	A	2.2	0.5	8	8.0
TCSCS1A335*AAR	A	3.3	0.5	8	6.0
TCSCS1A475*AAR	A	4.7	0.5	8	6.0
TCSCS1A685*AAR	A	6.8	0.7	8	6.0
TCSCS1A685*BAR	B	6.8	0.7	8	3.5
TCSCS1A106*AAR	A	10	1	8	2.0
TCSCS1A106*BAR	B	10	1	8	3.5
TCSCS1A156*AAR	A	15	1.5	8	4.0
TCSCS1A156*BAR	B	15	1.5	8	3.5
TCSCS1A226*AAR	A	22	2.2	8	2.0
TCSCS1A226*BAR	B	22	2.2	8	3.0
TCSCS1A226*CAR	C	22	2.2	8	1.8
TCSCS1A336*AAR	A	33	3.3	12	2.0
TCSCS1A336*BAR	B	33	3.3	8	1.8
TCSCS1A336*CAR	C	33	3.3	8	1.6
TCSCS1A476MAAR	A	47	9.4	20	3.0
TCSCS1A476*BAR	B	47	4.7	8	1.6
TCSCS1A476*CAR	C	47	4.7	8	1.2
TCSCS1A476*DAR	D	47	4.7	8	0.8
TCSCS1A686*CAR	C	68	6.8	8	0.9
TCSCS1A686*DAR	D	68	6.8	8	0.8
TCSCS1A107*CAR	C	100	10	8	1.2
TCSCS1A107*DAR	D	100	10	8	0.7
TCSCS1A157*DAR	D	150	15	8	0.8
TCSCS1A227*DAR	D	220	22	8	0.4
16 volt Rating @+85 °C (10 volt Rating @+125 °C)					
TCSCS1C155*AAR	A	1.5	0.5	8	8.0
TCSCS1C225*AAR	A	2.2	0.5	8	6.0
TCSCS1C335*AAR	A	3.3	0.5	8	6.0
TCSCS1C475*AAR	A	4.7	0.7	8	4.0
TCSCS1C475*BAR	B	4.7	0.7	8	3.5
TCSCS1C685*AAR	A	6.8	1.0	8	3.5
TCSCS1C685*BAR	B	6.8	1.0	8	3.5
TCSCS1C106*AAR	A	10	1.6	8	3.0
TCSCS1C106*BAR	B	10	1.6	8	3.5
TCSCS1C156*BAR	B	15	2.4	8	3.0
TCSCS1C156*CAR	C	15	2.4	8	1.8
TCSCS1C226*BAR	B	22	3.5	8	2.3
TCSCS1C226*CAR	C	22	3.5	8	1.6
TCSCS1C336*BAR	B	33	5.3	8	1.4
TCSCS1C336*CAR	C	33	5.3	8	1.5
TCSCS1C336*DAR	D	33	5.3	8	0.8
TCSCS1C476*CAR	C	47	7.5	8	1.4
TCSCS1C476*DAR	D	47	7.5	8	0.8
TCSCS1C686*CAR	C	68	10.9	8	1.4
TCSCS1C686*DAR	D	68	10.9	8	0.8
TCSCS1C107*DAR	D	100	16	8	0.7
TCSCS1C157*DAR	D	150	24	8	0.4

Precautions in using  
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4 Characteristics  
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SCN Series

SCS Series

SCS-P Series

SCM Series

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Marking  
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Part Number	Case Size	Capacitance ( $\mu$ F)	DC Leakage ( $\mu$ A) @ +25 °C Max.	DF (%) @ +25 °C 120Hz Max.	ESR ( $\Omega$ ) @ +25 °C 100KHz Max.
20 volt Rating @ +85 °C (13 volt Rating @ +125 °C)					
TCSCS1D105*AAR	A	1.0	0.5	6	10.0
TCSCS1D155*AAR	A	1.5	0.5	8	8.0
TCSCS1D225*AAR	A	2.2	0.5	8	7.0
TCSCS1D335*AAR	A	3.3	0.7	8	4.0
TCSCS1D335*BAR	B	3.3	0.7	8	3.5
TCSCS1D475*AAR	A	4.7	1.0	8	3.5
TCSCS1D475*BAR	B	4.7	1.0	8	3.5
TCSCS1D685*BAR	B	6.8	1.4	8	3.5
TCSCS1D106*BAR	B	10	2.0	8	3.0
TCSCS1D106*CAR	C	10	2.0	8	1.8
TCSCS1D156*CAR	C	15	3.0	8	1.7
TCSCS1D226*BAR	B	22	4.4	6	1.8
TCSCS1D226*CAR	C	22	4.4	8	1.6
TCSCS1D226*DAR	D	22	4.4	8	0.8
TCSCS1D336*CAR	C	33	6.6	8	1.2
TCSCS1D336*DAR	D	33	6.6	8	0.8
TCSCS1D476*DAR	D	47	9.4	8	0.7
TCSCS1D686*DAR	D	68	13.6	8	0.7
TCSCS1D107*DAR	D	100	20.0	8	0.9
25 volt Rating @ +85 °C (16 volt Rating @ +125 °C)					
TCSCS1E684*AAR	A	0.68	0.5	6	10.0
TCSCS1E105*AAR	A	1.0	0.5	6	8.0
TCSCS1E155*AAR	A	1.5	0.5	8	8.0
TCSCS1E225*AAR	A	2.2	0.6	8	6.0
TCSCS1E225*BAR	B	2.2	0.6	8	4.5
TCSCS1E335*AAR	A	3.3	0.8	6	3.7
TCSCS1E335*BAR	B	3.3	0.8	8	3.5
TCSCS1E475*BAR	B	4.7	1.2	8	3.0
TCSCS1E685*BAR	B	6.8	1.7	8	2.8
TCSCS1E685*CAR	C	6.8	1.7	8	1.9
TCSCS1E106*BAR	B	10	2.5	8	1.8
TCSCS1E106*CAR	C	10	2.5	8	1.5
TCSCS1E156*CAR	C	15	3.7	8	1.5
TCSCS1E156*DAR	D	15	3.7	8	1.0
TCSCS1E226*CAR	C	22	5.5	8	1.2
TCSCS1E226*DAR	D	22	5.5	8	0.8
TCSCS1E336*DAR	D	33	8.2	8	0.7
35 volt Rating @ +85 °C (22 volt Rating @ +125 °C)					
TCSCS1V474*AAR	A	0.47	0.5	6	12.0
TCSCS1V684*AAR	A	0.68	0.5	6	10.0
TCSCS1V105*AAR	A	1.0	0.5	6	7.5
TCSCS1V155*AAR	A	1.5	0.5	8	7.5
TCSCS1V155*BAR	B	1.5	0.5	8	5.0
TCSCS1V225*BAR	B	2.2	0.7	8	4.2
TCSCS1V335*BAR	B	3.3	1.2	8	3.5
TCSCS1V475*CAR	C	4.7	1.6	8	2.5
TCSCS1V685*CAR	C	6.8	2.3	8	2.0
TCSCS1V106*CAR	C	10	3.5	8	1.6
TCSCS1V106*DAR	D	10	3.5	8	1.0
TCSCS1V156*CAR	C	15	5.3	8	1.4
TCSCS1V156*DAR	D	15	5.2	8	0.8
TCSCS1V226*DAR	D	22	7.7	8	0.9
TCSCS1V336MDAR	D	33	11.5	6	0.9

All technical data relates to an ambient temperature of +25 °C.  
 Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.0 volts.  
 DCL is measured at rated voltage after 5 minutes.  
 \* Insert K for  $\pm 10\%$  tolerance and M for  $\pm 20\%$ .



## Feature

- Reduced to about 1/3 the cubic volume of the SCN.
- New low profile case size.  
(0805 size tantalum chip capacitors)
- Compatible with automatic pick and place equipment.
- Meets or exceeds EIA standard 535BAAC.

## Specifications

Capacitance	Range	0.22 $\mu$ F to 22 $\mu$ F						
	Tolerance	$\pm 20\%$ (M), $\pm 10\%$ (K)						
Dissipation Factor (Tan $\delta$ )		Refer to Specification						
Leakage Current		between 0.01CV and 0.5 $\mu$ A, whichever is larger						
Rated Voltage(VR)	T $\leq 85^{\circ}$ C	4.0	6.3	10.0	16.0	20.0	25.0	35.0
Category Voltage (V)	85 $^{\circ}$ C < T $\leq 125^{\circ}$ C	2.5	4.0	6.3	10.0	13.0	16.0	22.0
Surge Voltage (V)	T $\leq 85^{\circ}$ C	5.2	8.0	13.0	20.0	25.0	32.0	44.0
	85 $^{\circ}$ C < T $\leq 125^{\circ}$ C	3.2	5.0	8.0	13.0	16.0	20.0	28.0
Operating Temperature		-55 $^{\circ}$ C to 125 $^{\circ}$ C						

## Standard value and case size

Cap.( $\mu$ F)	R . V	4V(0G)	6.3V(0J)	10V(1A)	16V(1C)	20V(1D)
0.22	224	P	P	P	P	
0.33	334					
0.47	474	P	P	P	P	P
0.68	684	P	P	P	P	P
1.0	105	P	P	P	P	
1.5	155					
2.2	225	P	P	P	P	
3.3	335	P	P	P		
4.7	475	P	P	P		
6.8	685	P	P			
10	106	P	P	P		
15	156					
22	226	P	P			
33	336		P	(P)		
47	476		(P)	(P)		
100	107	(P)	(P)			

( ): Under Development

Precautions in using  
Tantalum Capacitors

4 Characteristics  
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SCN Series

SCS Series

**SCS-P Series**

SCM Series

SCF Series

SCE Series

SCL Series

PCS Series

PCL Series

Marking  
Specification

Taping  
Specification

## Ratings &amp; Part Number Reference

Part Number	Case Size	Capacitance ( $\mu$ F)	DC Leakage ( $\mu$ A) @ +25 °C Max.	DF (%) @ +25 °C 120Hz Max.	ESR ( $\Omega$ ) @ +25 °C 100KHz Max.
4 volt Rating @ +85 °C (2.5 volt Rating @ +125 °C)					
TCSCS0G224*PAR	P	0.22	0.5	4	25
TCSCS0G474*PAR	P	0.47	0.5	4	25
TCSCS0G684*PAR	P	0.68	0.5	4	20
TCSCS0G105*PAR	P	1	0.5	6	20
TCSCS0G225*PAR	P	2.2	0.5	6	15
TCSCS0G335*PAR	P	3.3	0.5	6	8
TCSCS0G475*PAR	P	4.7	0.5	8	9
TCSCS0G685*PAR	P	6.8	0.5	6	8
TCSCS0G106*PAR	P	10	0.5	8	6
TCSCS0G226*PAR	P	22	0.9	8	3
6.3 volt Rating @ +85 °C (4 volt Rating @ +125 °C)					
TCSCS0J224*PAR	P	0.22	0.5	4	25
TCSCS0J474*PAR	P	0.47	0.5	4	25
TCSCS0J684*PAR	P	0.68	0.5	4	20
TCSCS0J105*PAR	P	1	0.5	6	20
TCSCS0J225*PAR	P	2.2	0.5	6	15
TCSCS0J335*PAR	P	3.3	0.5	6	8
TCSCS0J475*PAR	P	4.7	0.5	8	9
TCSCS0J685*PAR	P	6.8	0.5	6	8
TCSCS0J106*PAR	P	10	0.6	8	5
TCSCS0J226MPAR	P	22	1.4	8	4
TCSCS0J336MPAR	P	33	2.1	18	2
10 volt Rating @ +85 °C (6.3 volt Rating @ +125 °C)					
TCSCS1A224*PAR	P	0.22	0.5	4	25
TCSCS1A474*PAR	P	0.47	0.5	4	25
TCSCS1A684*PAR	P	0.68	0.5	4	20
TCSCS1A105*PAR	P	1	0.5	6	20
TCSCS1A225*PAR	P	2.2	0.5	6	15
TCSCS1A335*PAR	P	3.3	0.5	6	8
TCSCS1A475*PAR	P	4.7	0.5	8	4
TCSCS1A106*PAR	P	10	1.0	8	6
16 volt Rating @ +85 °C (10 volt Rating @ +125 °C)					
TCSCS1C224*PAR	P	0.22	0.5	6	25
TCSCS1C474*PAR	P	0.47	0.5	6	25
TCSCS1C684*PAR	P	0.68	0.5	6	20
TCSCS1C105*PAR	P	1.0	0.5	6	20
TCSCS1C225*PAR	P	2.2	0.5	6	6.5
20 volt Rating @ +85 °C (13 volt Rating @ +125 °C)					
TCSCS1D474*PAR	P	0.47	0.5	4	25
TCSCS1D684*PAR	P	0.68	0.5	4	20

All technical data relates to an ambient temperature of +25 °C.  
 Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.0 volts.  
 DCL is measured at rated voltage after 5 minutes.  
 \* Insert K for  $\pm 10\%$  tolerance and M for  $\pm 20\%$ .