Tantalum Capacitor (SCS Series)

The product is smaller version of the SCN series products.
The SCS series have fully molded, compliant lead frame construction designed for use in applications utilizing solder (Reflow, Wave or Vapor Phase), conductive adhesive or thermal compression bonding techniques.

General Features

Miniaturized tantalum chip capacitors with extended capacitance.
(Reduced size 1/2 to 1/3 in comparison with SCN.)
- Molded Case available in five case codes.
- Compatible with automatic pick and place equipment.
- Meets or Exceeds EIA standard 535BAAC .
- Extended Range Values

Applications

- General electronic equipment
- Smoothing Circuit of DC-DC Converters & Output side of AC-DC Converters
- De-Coupling Circuit of High Speed ICs & MPUs
- Various Other High Frequency Circuit Applications

Part Numbering

TC	SCS	0J	106	M	B	A	R
❶	❷	❸	❹	❺	❻	❼	❽

❶ Abbreviation of Tantalum Capacitor
❷ Type of Series
❸ Rated Voltage
❹ Capacitance Tolerance
❺ Capacitance Tolerance
❻ Case size
❼ Packing
❽ Packing Polarity

❶ ABBRIVIATION OF TANTALUM CAPACITOR

❷ TYPE OF SERIES

The symbol shows the type of the capacitor.

SCS : **S**amsung environmental **C**apacitor **S**tandard series

❸ RATED VOLTAGE

Symbol	DC Rated Voltage	Symbol	DC Rated Voltage
0E	2.5	**1C**	16
0G	4	**1D**	20
0J	6.3	**1E**	25
1A	10	**1V**	35

❹ CAPACITANCE

Symbol	Capacitance (㎌)	Pico Farad (pF)	Symbol	Capacitance (㎌)	PicoFarad (pF)
105	1.0	10×10^{5}	**684**	0.68	68×10^{4}
106	10.0	10×10^{6}	**475**	4.7	47×10^{5}

❺ CAPACITANCE TOLERANCE

Symbol	Tolerance(%)	Symbol	Tolerance(%)
K	±10	**M**	±20

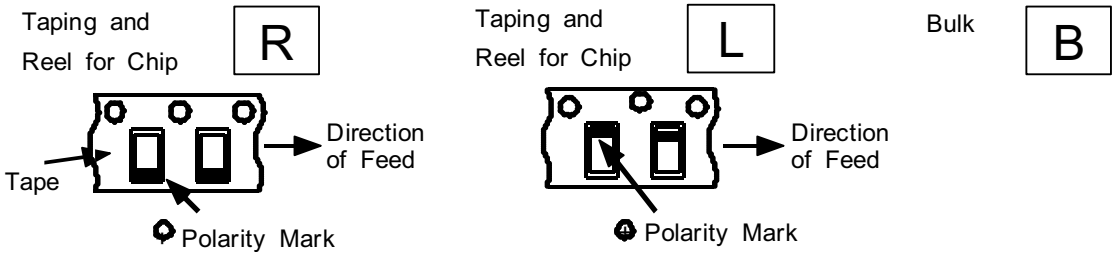
❻ CASE SIZE

Case	EIA Code	Case	EIA Code
J	1608	**C**	6032
P	2012	**D**	7343
A	3216		
B	3528		

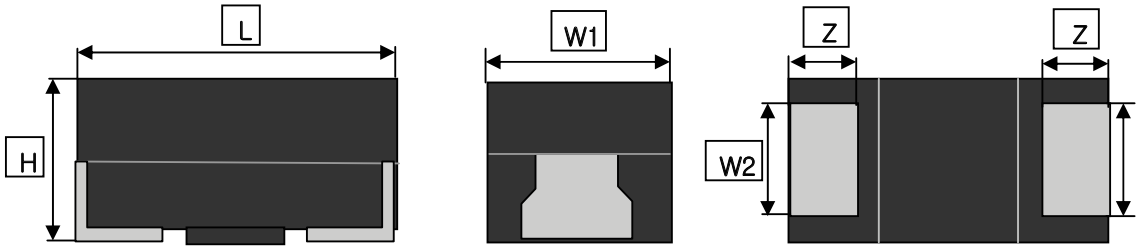
❼ PACKING

Symbol	Packing Code
A	7 inch
C	13 inch

❽ PACKING POLARITY



APPEARANCE AND DIMENSON



Code	EIA Code	DIMENSION (mm)				
		L	W_1	W_2	H	Z
P	2012	2.0 ±0.2	1.25 ±0.2	0.9 ±0.1	1.2 MAX	0.5 ±0.2
A	3216	3.2 ±0.2	1.6 ±0.2	1.2 ±0.1	1.6 ±0.2	0.8 ±0.3
B	3528	3.5 ±0.2	2.8 ±0.2	2.2 ±0.1	1.9 ±0.2	0.8 ±0.3
C	6032	6.0 ±0.3	3.2 ±0.3	2.2 ±0.1	2.5 ±0.3	1.3 ±0.3
D	7343	7.3 ±0.3	4.3 ±0.3	2.4 ±0.1	2.8 ±0.3	1.3 ±0.3

● Standard value and Case size

▶ SCS Series

Standard value and case size

Cap.(μF) \ R.V	154	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	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

▶ SCS-P Series

Standard value and case size

Cap.(μF) \ R.V	224	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

RELIABILITY TEST CONDITION

Reliability Test and Judgment Condition 1

Item	Performance	Test condition
Capacitance	Within specified tolerance	120㎐, maximum 1.0Vrms, maximum 1.5Volt D.C, at 25℃
Tan δ (DF)	Within specified value	120㎐, maximum 1.0Vrms, maximum 1.5Volt D.C, at 25℃
Impedance (Z) & ESR	Within specified value	100k㎐, maximum 1.0Vrms, maximum 1.5Volt D.C, at 25℃
Leakage current	0.01CV or 0.5㎂ whichever is greater	The rated DC voltage shall be applied to terminals across the test capacitor charge Time: 5 min.
Temperature Characteristics	"-55℃ : △C/C -10~0% "+85℃ : △C/C 0~10% "+125℃ : △C/C 0~15%	From -55℃ to 125℃,
Surge withstanding Voltage	Capacitance change : within ±5 % Tan δ, LC : initial spec.	85±2℃, Surge voltage Charge 30±5s -> Discharge 5.5±0.5min 1000cycle Charge discharge resister :33Ω
Adhesion Strength	No peeling shall be occur on the terminal electrode	19.6N, for 5±1 sec
Electrode Strength	Within specified tolerance Tan δ, LC : initial spec.	Bending to the limit (3mm) with 1.0mm/sec.
Solderability	More than 95% of terminal surface is to be soldered newly	SnAg3.0Cu0.5 solder :245+/5℃, 3±0.3sec (preheating : 80~120℃ for 10~30sec.)
Resistance to Soldering heat	Capacitance change : within ±15% Tan δ, LC : initial spec.	Solder pot : 260±5℃, 10±1sec.
Vibration Test	Capacitance change : within ±5% Tan δ, LC : initial spec.	Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours ´ 3 direction (x, y, z)
Moisture Resistance	Capacitance change : within ±10% Tan δ, LC : initial spec.	40±2℃, 90~95%RH, 500+8/-0hrs
High Temperature Resistance	Capacitance change : within ±10% Tan δ :initial spec LC : 125% or less specified initial value	With the rated voltage(85℃) Max. operating temperature(125 ℃) 2000/-0hrs
Storage at Low Temperature	Capacitance change : within ±10% Tan δ, LC : initial spec.	-55±2℃, 240±8hrs
Temperature Cycling	Capacitance change : within ±5% Tan δ, LC : initial spec	1 cycle condition (Min. operating temperature → 25℃ → Max. operating temperature → 25℃) 5 cycle test

RELIABILITY TEST CONDITION

Reliability Test and Judgment Condition 2

Item	Performance	Test condition
Capacitance	Within specified tolerance	120㎐, maximum 1.0Vrms, maximum 1.5Volt D.C, at 25℃
Tan δ (DF)	Within specified value	120㎐, maximum 1.0Vrms, maximum 1.5Volt D.C, at 25℃
Impedance (Z) & ESR	Within specified value	100k㎐, maximum 1.0Vrms, maximum 1.5Volt D.C, at 25℃
Leakage current	0.01CV or 0.5㎂ whichever is greater	The rated DC voltage shall be applied to terminals across the test capacitor charge Time: 5 min.
Temperature Characteristics	"-55℃ : △C/C -25~0% "+85℃ : △C/C 0~20% "+125℃ : △C/C 0~20%	From -55℃ to 125℃,
Surge withstanding Voltage	Capacitance change : within ±30% Tan :150% or less specified initial value LC : initial spec.	85±2℃, Surge voltage Charge 30±5s -> Discharge 5.5±0.5min 1000cycle Charge discharge resister :33Ω
Adhesion Strength	No peeling shall be occur on the terminal electrode	19.6N, for 5±1 sec
Electrode Strength	Within specified tolerance Tan δ, LC : initial spec.	Bending to the limit (3mm) with 1.0mm/sec.
Solderability	More than 95% of terminal surface is to be soldered newly	SnAg3.0Cu0.5 solder :245+/5℃, 3±0.3sec (preheating : 80~120℃ for 10~30sec.)
Resistance to Soldering heat	Capacitance change : within ±30% Tan :150% or less specified initial value LC : 200% or less specified initial value	Solder pot : 260±5℃, 10±1sec.
Vibration Test	Capacitance change : within ±15% Tan δ, LC : initial spec.	Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours ´ 3 direction (x, y, z)
Moisture Resistance	Capacitance change : within ±30% Tan :150% or less specified initial value LC : 200% or less specified initial value	40±2℃, 90~95%RH, 500+8/-0hrs
High Temperature Resistance	Capacitance change : within ±30% Tan :150% or less specified initial value LC : 125% or less specified initial value	With the rated voltage(85℃) Max. operating temperature(125 ℃) 2000/-0hrs
Storage at Low Temperature	Capacitance change : within ±30% Tan :150% or less specified initial value LC : initial spec.	-55±2℃, 240±8hrs
Temperature Cycling	Capacitance change : within ±30% Tan :150% or less specified initial value LC : 200% or less specified initial value	1 cycle condition (Min. operating temperature → 25℃ → Max. operating temperature → 25℃) 5 cycle test

RELIABILITY TEST CONDITION

Reliability Test and Judgment Condition 3

Item	Performance	Test condition
Capacitance	Within specified tolerance	120㎐, maximum 1.0Vrms, maximum 1.5Volt D.C, at 25℃
Tan δ (DF)	Within specified value	120㎐, maximum 1.0Vrms, maximum 1.5Volt D.C, at 25℃
Impedance (Z) & ESR	Within specified value	100k㎐, maximum 1.0Vrms, maximum 1.5Volt D.C, at 25℃
Leakage current	0.01CV or 0.5㎂ whichever is greater	The rated DC voltage shall be applied to terminals across the test capacitor charge Time: 5 min.
Temperature Characteristics	"-55℃ : △C/C -15~0% "+85℃ : △C/C 0~15% "+125℃ : △C/C 0~20%	From -55℃ to 125℃,
Surge withstanding Voltage	Capacitance change : within ±5 % Tan δ, LC : initial spec.	85±2℃, Surge voltage Charge 30±5s -> Discharge 5.5±0.5min 1000cycle Charge discharge resister :33Ω
Adhesion Strength	No peeling shall be occur on the terminal electrode	19.6N, for 5±1 sec
Electrode Strength	Within specified tolerance Tan δ, LC : initial spec.	Bending to the limit (3mm) with 1.0mm/sec.
Solderability	More than 95% of terminal surface is to be soldered newly	SnAg3.0Cu0.5 solder :245+/5℃, 3±0.3sec (preheating : 80~120℃ for 10~30sec.)
Resistance to Soldering heat	Capacitance change : within ±15% Tan δ, LC : initial spec.	Solder pot : 260±5℃, 10±1sec.
Vibration Test	Capacitance change : within ±5% Tan δ, LC : initial spec.	Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours ´ 3 direction (x, y, z)
Moisture Resistance	Capacitance change : within ±10% Tan δ, LC : initial spec.	40±2℃, 90~95%RH, 500+8/-0hrs
High Temperature Resistance	Capacitance change : within ±10% Tan δ :initial spec LC : 125% or less specified initial value	With the rated voltage(85℃) Max. operating temperature(125 ℃) 2000/-0hrs
Storage at Low Temperature	Capacitance change : within ±10% Tan δ, LC : initial spec.	-55±2℃, 240±8hrs
Temperature Cycling	Capacitance change : within ±5% Tan δ, LC : initial spec	1 cycle condition (Min. operating temperature → 25℃ → Max. operating temperature → 25℃) 5 cycle test

RELIABILITY TEST CONDITION

Table 1 : Maximum Dissipation Factor at Specified Temperatures

Maximum Dissipation Factor, %			
-55℃(%)	+25℃(%)	+85℃(%)	+125℃(%)
9	4	7	9
10	6	8	10
12	8	10	12
15	10	13	15
17	12	15	17
27	18	27	36
30	20	30	40
45	30	45	60

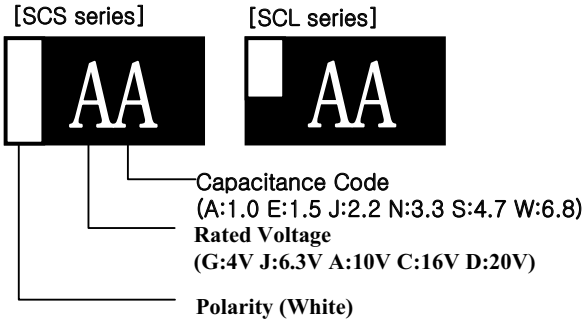
Table 2 : Maximum DC Leakage Current at Specified Temperatures

Maximum DC Leakage Current, μA			
Specified initial value	-55℃(μA)	+85℃(μA)	+125℃(μA)
0.01CV or 0.5 μA whichever is greater	-	0.1CV or 5 μA whichever is greater	0.125CV or 6.25 μA whichever is greater

PACKAGING

● MARKING

▶ P,R CASES



Capacitance Range	1 DIGIT	2 DIGIT
< 1.0㎌	A Small Letter	A Small Letter
1.0㎌≤ Cap.< 10㎌	A Capital Letter	A Small Letter
≥ 10㎌	A Capital Letter	A Capital Letter

【Code Reference】

㎌ \ V	4	6.3	10	16	20
0.22	gj	jj	aj	cj	
0.33					
0.47	gs	js	as	cs	ds
0.68	gw	jw	aw	cw	dw
1.0	Ga	Ja	Aa	Ca	
1.5					
2.2	Gj	Jj	Aj	Cj	
3.3	Gn	Jn	An		
4.7	Gs	Js	As	Cs	
6.8	Gw	Jw			
10	GA	JA	AA		
15					
22	GJ	JJ			

PACKAGING

● MARKING

▶ A,S CASES

[SCN,SCS,SCE series]

[SCL, series]

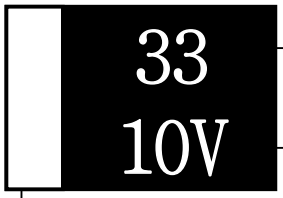
Capacitance Code in pF

Rated Voltage
(G:4V J:6.3V A:10V C:16V D:20V E:25V V:35V)

Polarity (White)

▶ B,T CASES

[SCN,SCS,SCE series]

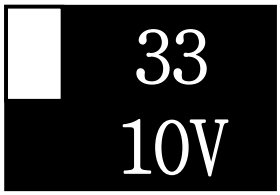


Capacitance Code in μF

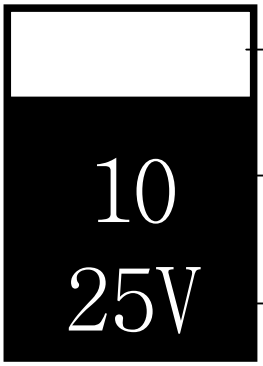
Rated Voltage

Polarity (White)

[SCL series]



▶ C,D CASES



Polarity (White)

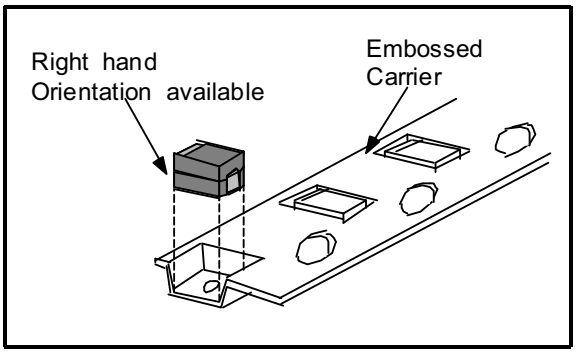
Capacitance Code in μF

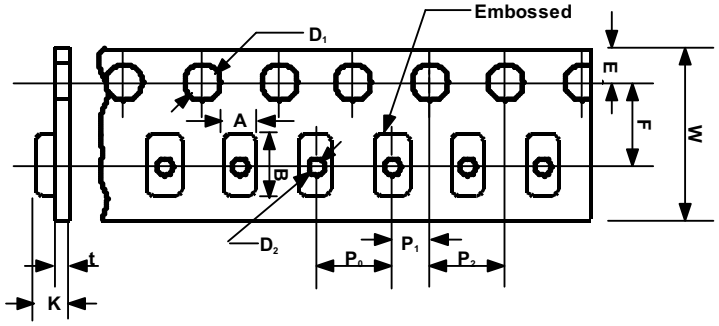
Rated Voltage

● EMBOSSED PLASTIC TAPE

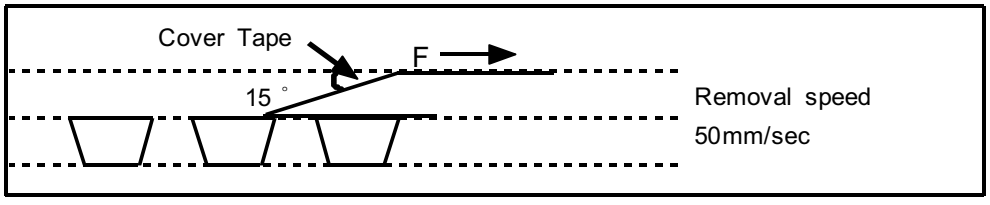
The tantalum chip capacitors shall be packaged in tape and reel form for effective use.

- Tape : Semitransparent embossed plastic
- Cover tape : Attached with press, polyester
- The tension of removing the cover tape, F=10～70g

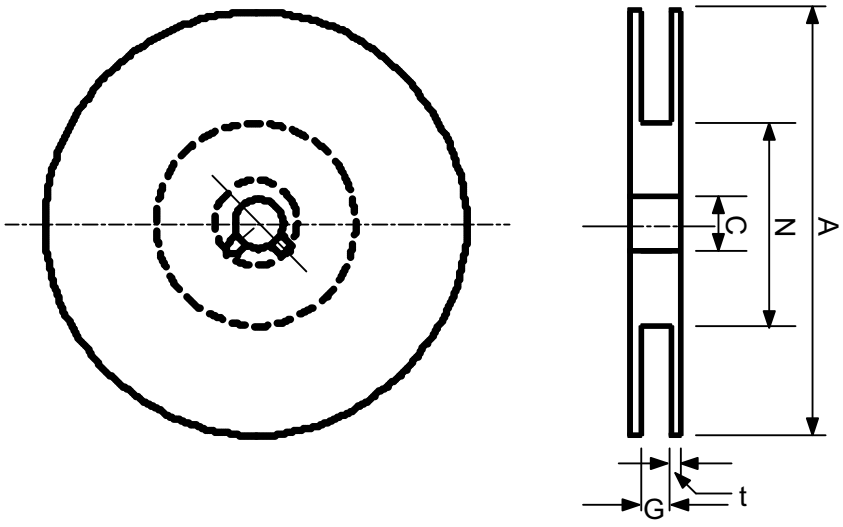




Case Code	W±0.3 (±0.002)	F±0.1 (±0.004)	E±0.1 (±0.004)	P0±0.1 (±0.004)	P±0.1 (±0.004)	P2±0.1 (±0.004)	D+0.1 (+0.004)	D.Min.	t	A±0.2 (±0.008)	B±0.2 (±0.008)	K±0.2 (±0.008)
Q	8 (0.315)	3.5 (0.138)	1.75 (0.069)	4 (0.157)	2 (0.079)	4 (0.157)	ø1.5 (0.059)	ø0.6 (0.024)	0.25 (0.0098)	0.98 (0.039)	1.80 (0.071)	0.82 (0.032)
J,K												1.0 (0.039)
R								ø1.0 (0.039)	0.2 (0.008)	1.4 (0.055)	2.3 (0.091)	1.1 (0.043)
P												1.4 (0.055)
S										1.9 (0.075)	3.5 (0.138)	1.3 (0.051)
A												1.9 (0.075)
T									0.3 (0.012)	3.3 (0.130)	3.8 (0.150)	1.3 (0.051)
B												2.1 (0.083)
C	12 (0.472)	5.5 (0.217)		8 (0.315)				ø1.5 (0.059)		3.7 (0.146)	6.4 (0.252)	3.0 (0.118)
D										4.8 (0.189)	7.7 (0.303)	3.3 (0.130



● REEL DIMENSION



Tape Width	A±2 (±0.079)	N Min.	C±0.5 (±0.020)	D±0.5 (±0.020)	B±051 (±0.020)		t+0.5 (±0.020)	R
8mm	ø178 (7)	ø50 (1.969)	ø13 (0.512)	ø21 (0.827)	2 (0.079)	10 (0.394)	2 (0.079)	0.99 (0.039)
12mm						14 (0.551)		
8mm	ø330 (13)	ø80 (3.150)	ø13 (0.512)	ø21 (0.827)	2 (0.079)	10 (0.394)	2 (0.079)	0.99 (0.039)
12mm						14 (0.551)		

Case Size reference	180mm(7") reel	330mm(13") reel
J	4,000pcs	-
P	3,000pcs	-
A , B	2,000pcs	8,000pcs
C , D	500pcs	2,500pcs

ERROR: undefined
OFFENDING COMMAND: 24 .56

STACK: