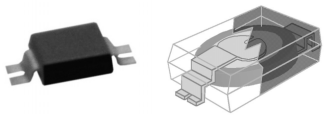
Surface Mount Disc Capacitors

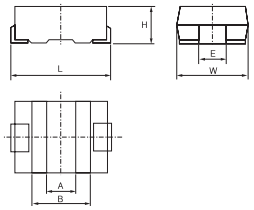
Introduction

- Samwha's high voltage ceramic capacitors offer superior performance and reliability.
- SMDC is the resin molded SMD type that surface mounting is available.
- SMDC exhibits high reliability through use of disc capacitor element.
- Competitive lower maintenance cost is guaranteed.
- Wide rated voltage ranges from 1kV to 6kV, through a disc element which withstand high voltage and outcurve terminals.
- Design flexibility ensures down sizing and higher resistance to outer impact.

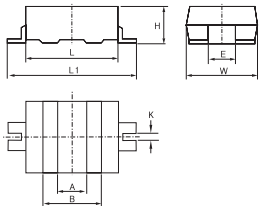
Shape & Dimensions



Inside Terminal (Style 1)
(Development Product)



Outside Terminal (Style 2)
(Mass Product)



(Unit : mm)

Rated Voltage	Capacitance (pF)	L ±0.5	W ±0.3	H ±0.2	E ±0.2	A	B	K ±0.1	L1 ±0.3	L2 Min.	Terminal Form	Development/Mass
3kV	5 ~ 33	5.7	4.5	2.3	2.5	1.7	3.1	-	-	-	Style 1	Development
4kV	5 ~ 33	5.7	4.5	2.3	2.5	1.7	3.1	-	-	-	Style 1	Development
	39 ~ 47	7.1	6.3	2.4	2.5	2.0	3.7	-	-	-	Style 1	Development
	18 ~ 27	5.5	4.5	2.3	2.5	1.7	3.1	0.5	9.4	6.7	Style 2	Mass
	39 ~ 47	7.1	6.3	2.4	2.5	2.0	3.7	0.5	10.8	7.9	Style 2	Development
5kV	5 ~ 15	5.5	4.5	2.3	2.5	1.7	3.1	0.5	9.4	6.7	Style 2	Mass
	18 ~ 27	7.1	6.3	2.4	2.5	2.0	3.7	0.5	10.8	7.9	Style 2	Development
6kV	5 ~ 15	7.1	6.3	2.4	2.5	2.0	3.7	0.5	10.8	7.9	Style 2	Development

How to Order(Product Identification)

SCC O 3H 150 J 2 E 00

1 2 3 4 5 6 7 8

1 Style

Mark	Product Name	Mark	Product Name
SCC	Temperature Compensating Type	SSD	AC250/400V(Testing Voltage:AC4000V)
SCK	High Dielectric Type	SSC	AC250(Testing Voltage:AC2500V)
SCG	Semiconductor Type		

2 Capacitance temperature characteristic

SCC Type (PPM/℃)				SCK, SCG, SSC, SSD Type	
C	NPO(0)	T	N470(-470)	B	Y5P(+10~-10%)
L	N80(-80)	U	N750(-750)	R	Y5R(+15~-15%)
P	N150(-150)	O	SL(+350~-1000)	E	Y5U(+22~-56%)
R	N220(-220)			F	Y5V(+22~-82%)
S	N330(-330)				

3 Rating Voltage

1A	10V	1B	12.5V	1C	16V	1E	25V					1H	50V		
2A	100V	2B	125V			2E	250V			2G	400V	2H	500V		
3A	1kV	3B	1.25kV	3D	2kV			3F	3.15kV	3G	4kV	3H	5kV	3J	6.3kV
4A	10kV	4B		4C	16kV										

4 Capacitance

(in picofarads) The first two digits indicate significant digits. The 3rd digit indicate the number of zero following.

R denotes decimal. Ex.) 0.5pF : 0R5, 10pF : 100, 100pF : 101

5 Cap. Tolerance

Mark	Cap. Tolerance	Mark	Cap. Tolerance	Mark	Cap. Tolerance
C	±0.25pF	J	±5%	P	+100%, -0%
D	±0.5pF	K	±10%	Z	+80%, -20%
F	±1.0pF	M	±20%		

6 Style

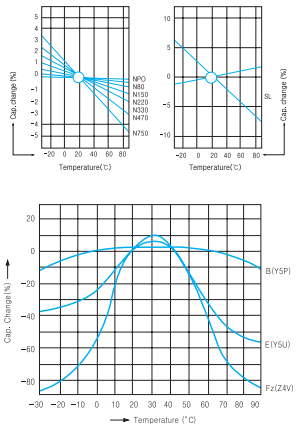
Mark	Terminal Form
1	Inside Terminal
2	Outside Terminal

7 Packing Style

Mark	Packaging Style
B	Bulk
E	Embossed Carrier Taping

8 Spare Code

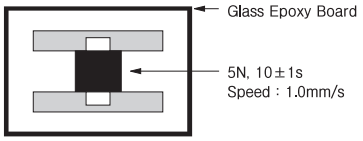
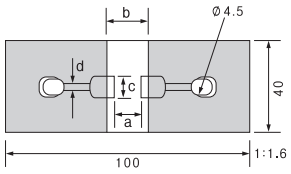
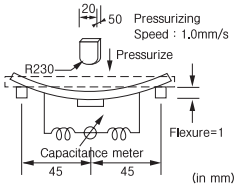
Electrical Performance

No.	Item	Requirement		Test Conditions
		SCC Type	SCK, SCG, SSC, SSD Type	
1	Operating Temperature Range	-25℃ ~ 110℃	B,E : -25℃ ~ +85℃ F : +10℃ ~ +65℃	
2	Capacitance	Within the specified range		- Temperature : 20±2℃ - Frequency : 1±0.1MHz(SCC Type) 1±0.1KHz (SCK,SCG,SSC,SSD Type) - Relative Humidity : 60~70% - Measure voltage : 1±0.1Vrms
3	Dissipation Factor (tanδ, Q)	Q ≥ 400+20C (C : capacitance, pF)	B,E : 2.5% Max. F : 5.0% Max.	
4	Insulation resistance	More than 10000MΩ		- Applied Voltage : • To be below 500V - Rating Voltage • Above 500V - 500V - Charge Time : 60±5sec
5	Dielectric Withstanding Voltage	No remarkable abnormality is recognized		- Testing Voltage R.V / 3kV / 4kV~ W.V / R.V × 1.75 / R.V × 1.5 For 1 to 5 sec.(Between terminals) The discharge current, however was 50 mA or less
6	Capacitance temperature Characteristics			Based on Items 2.2. 12 of EIA RS-198-C

Temperature and Humity Test Characteristics

No.	Item		Requirement		Test Conditions
			SCC Type	SCK, SCG, SSC, SSD Type	
1	High Temperature Test	Appearance	No. visible damage		- Temperature : 85±2℃ - Test voltage : 1.2 times of the rated voltage - Operating time of test : 1000 +48,/ -0 hours After testing, The capacitor shall be subjected to the standard test condition for a period 4~24 hours and shall be measured. Charge and discharge current shall be 50 mA or less. ※Standard test condition : -Temperature : 20±2℃ - Frequency : 1± 0.1MHz(SCC Type) 1± 0.1KHz (SCK, SCG, SSC, SSD Type) - Relative Humidity : 60 ~ 70% - Measure voltage : 1± 0.1Vrms
		Capacitance Change	±5% or ±0.5 pF Whichever is larger from initial measurement	B : With ± 10% E : With ± 20% F : With ± 30%	
		Dissipation Factor (tanδ, Q)	Q ≥ 200	B,E : 5% Max. F : 7.5% Max.	
		I.R	More than 2000MΩ		
2	Humidity Resistance Test	Appearance	No. visible damage		- Temperature : 40±2℃ - Relative Humidity : 90~95% R.H - Operating time of test : 500 +24, -0 hours After testing, The capacitor shall be subjected to the standard test condition for a period 4~24 hours and shall be measured. Charge and discharge current shall be 50 mA or less. ※Standard test condition : -Temperature : 20±2℃ - Frequency : 1± 0.1MHz(SCC Type) 1± 0.1KHz (SCK, SCG, SSC, SSD Type) - Relative Humidity : 60 ~ 70% - Measure voltage : 1± 0.1Vrms
		Capacitance Change	±5% or ±0.5 pF Whichever is larger from initial measurement	B : With ± 10% E : With ± 20% F : With ± 30%	
		Dissipation Factor (tanδ, Q)	Q ≥ 200	B,E : 5% Max. F : 7.5% Max.	
		I.R	More than 500MΩ		
3	Temperature Cycle Test	Appearance	No. visible damage		- The capacitors shall be subjected to 5cycles of the temperature cycle under Table. Step. / Temperature(℃) / Period(minutes) 1 / -25, +0/-3 / 30 2 / Standard test condition / 10~15 3 / +85, +0/-3 / 30 4 / Standard test condition / 10~15 After testing, The capacitor shall be subjected to the standard test condition for a period 4~24 hours and shall be measured. Charge and discharge current shall be 50 mA or less. ※Standard test condition : -Temperature : 20±2℃ - Frequency : 1± 0.1MHz(SCC Type) 1± 0.1KHz (SCK, SCG, SSC, SSD Type) - Relative Humidity : 60 ~ 70% - Measure voltage : 1± 0.1Vrms
		Capacitance Change	±5% or ±0.5 pF Whichever is larger from initial measurement	B : With ± 10% E : With ± 20% F : With ± 30%	
		Dissipation Factor (tanδ, Q)	Q ≥ 200	B,E : 5% Max. F : 7.5% Max.	
		I.R	More than 1000MΩ		

Mechanical test and Environmental Substance

No.	Item		Requirement		Test Conditions
			SCC Type	SCK, SCG, SSC, SSD Type	
1	Adhesive Strength of Terminal		No removal of the termination or other defect should occur.		Solder the capacitor to the testing jig (glass epoxy board) shown in Fig. 2 using a eutectic solder. Then apply 5 N force in the direction of the arrow. The soldering should be used the reflow method and should be conducted with care so that the soldering is uniform and free of defects such as heat shock.  Fig.2
2	Vibration Resistance	Appearance	No. visible damage		The capacitor should be subjected to a simple harmonic motion having a total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55Hz. The frequency range, from 10 to 55Hz and return to 10Hz, should be traversed in approximately 1 min. This motion should be applied for a period of 2hrs. in each 3mutually perpendicular directions (total of 6hrs.)
		Capacitance Change	±5% or ±0.5 pF Whichever is larger from initial measurement	B : With ± 10% E : With ± 20% F : With ± 30%	
		Dissipation Factor (tan δ, Q)	Q ≥ 200	B,E : 5% Max. F : 7.5% Max.	
		I.R	More than 1000MΩ		
3	Bending Strength	Appearance	No. visible damage		Solder the capacitor to the testing jig (glass epoxy board) shown in Fig. 3 using a eutectic solder. Then apply a force in the direction shown in Fig. 4. The soldering should be done either with an iron or using the reflow method and should be conducted with care so that the soldering is uniform and free of defects such as heat shock.
		Capacitance Change	±5% or ±0.5 pF Whichever is larger from initial measurement	B : With ± 10% E : With ± 20% F : With ± 30%	
			 Fig.3		 Fig.4
4	Solderability Test		Visual examination terminals area shall be at least 90% covered with a new solder coating		Soldering Method : Reflow Soldering - Maximum Temperature : 250℃ max. (245± 5℃, 5± 0.5 sec.) - Preheating Temperature : 150~180℃, 60~180 sec.
5	Solder Heat Resistance	Appearance	No. visible damage		Soldering Method : Reflow Soldering - Maximum Temperature : 250℃ max. (245± 5℃, 5± 0.5 sec.) - Preheating Temperature : 150~180℃, 60~180 sec. - After testing, The capacitors shall be subjected to the standard test condition for a period 24 hours and shall be measured.
		Capacitance Change	±5% or ±0.5 pF Whichever is larger from initial measurement	B : With ± 5% E : With ± 15% F : With ± 20%	
		Dielectric Strength	No. Failure		
6	The regulation of environmental pollution materials.		※ Never use materials mentioned below in high voltage products regulated this document. ※ Pb, Hg, Cr+6, PBB, PBDE : 100ppm, Cd : 5ppm ※ Exception : - Pb of solder : <1000ppm - Pb of ceramic(dielectric)		