Safety

SPECIFICATION

SAMWHA CAPACITOR CO.,LTD

PT SAMCON

JL. RAYA SUBANG CIKUMPAY

CAMPAKA-PURWAKARTA

JAWA BARAT - INDONESIA

To. TME **No.SWC-20251016-07**

SPECIFICATION

ITEM : DISC CERAMIC CAPACITOR
(Alternating Current : Y-Cap YB,YE,YF Series)
SMALLIZE

PT.SAMCON		
Written	Checked	Approved
		
Irman Sudirman	Apang Djafar S.	Kim Jae Min
TME		

2025.10.16

SAMWHA CAPACITOR Co., Ltd
(Manufacturer : PT. SAMCON)

Record of Revision

P/N	SAMWHA SPEC	P/N	SAMWHA SPEC
-	SCB2E101K06FF7	-	SDB2G101K06FF1
-	SCB2E221K06FF7	-	SDB2G221K06FF1
-	SCB2E331K07FF7	-	SDB2G331K07FF1
-	SCB2E471K07FF7	-	SDB2G471K07FF1
-	SCE2E102M06FF7	-	SDE2G102M07FF1
-	SCE2E152M08FF7	-	SDE2G152M08FF1
-	SCE2E222M08FF7	-	SDE2G222M10FF1
-	SCE2E332M10FF7	-	SDE2G332M12FF1
-	SCE2E472M12FF7	-	SDE2G472M13FF1

No	Reason	Contents	Date of approval	Checked	Remark
1	RoHS Free	1) P.6/13 8. Solder Heat Resistance 2) P.9/13 16. The regulation of environmental pollution materials	05.11.10		
2	Material Change	Material wire from Cu wire (Sn-Cu) to Cp wire (Sn-Cu-Fe)	08.01.01		
3	Marking Code change	KTL Marking Code	09.10.01		
4	Add Soldering Profile	Flow Soldering & Iron Soldering	10.11.15		
5	Add Certification	CQC Certification Standard and Recognized No.	11.01.30		
6	Marking Code change	ENEC Code & Single Marking	11.10.29		
7	Drawing & Dimension of Taping Style	Hold Down Tape Width (Wo)	12.05.01		
8	Add Certification	UL 3rd Edition Certification standard and Recognized No	12.09.10		
9.	Marking	Marking Change	21.01.26		

Approval Standard and Recognized No.

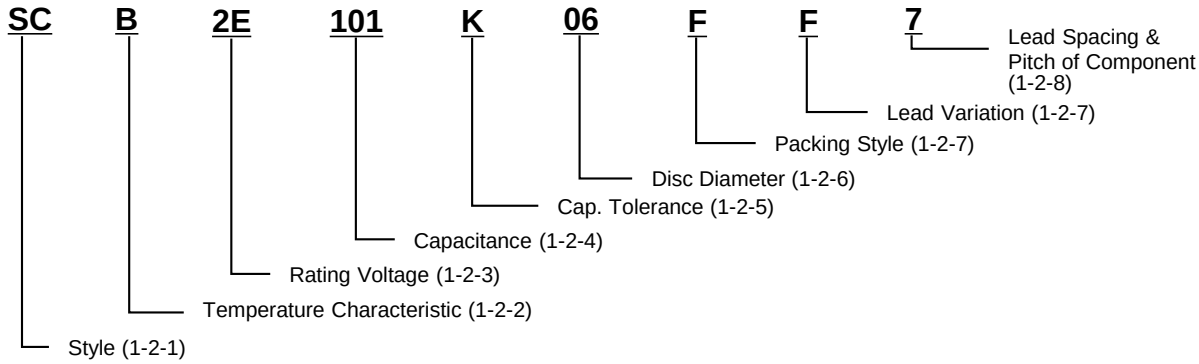
Mark		Standard	Recognized No.	Type	R.V [V ac]	Temp. Char.
UL		EN 60384-14 : 2005, 3rd edition	E97754	SD	X1 250/440 Y1 250/300	B,E,F
				SC	X1/Y2 250	
CSA		C2221 51	2476563 174670 (LR 60366)	SC	X1 300 Y2 300 or 250	B,E,F
			2476564 174670 (LR 60366)	SD	X1 400 Y1 300 or 250	
ENEC	VDE	IEC 60384-14:2013/ AMD1:2016	40015805	SC	X1/Y2 250 or 300	B,E,F
		IEC 60384-14:2013/ AMD1:2016	40015804	SD	X1 400 Y1 300	B,E
	FIMKO	EN 60384-14 : 2013 + A1:2016	ENEC16/FI/22/010 28	SC	X1 300 Y2 250	B,E,F
				SD	X1 400 Y1 250	B,E
EK/KTL/KC		K60384-14	SU03004-16001 / SU03004-16003	SC	X1 300 Y2 250	B,E,F
			SU03004-16002 / SU03004-16004	SD	X1 400 Y1 250	B,E
CQC		GB/T6346.14-2015	CQC10001054594	SC	X1 300 Y2 250 or 300	B,E,F
			CQC10001054593	SD	X1 400 Y1 250 or 300	B,E

* ENEC/VDE : mark has replaced all the following European National marks
(VDE, Fimko, Demko, Nemko, Semko..etc)

1. SCOPE

This specification relates high dielectric constant disc type fixed A.C (Alternating current) ceramic capacitor, intended for use in equipment for telecommunication and electronic devices.

1-1. Type Designation



1-2. Specification

1-2-1. Style

High dielectric constant fixed alternating current ceramic capacitor.

SC : - Testing Voltage AC 2500V (for Lead Spacing 7.5mm & 10mm)

- Testing Voltage AC 2000V (for Lead Spacing 5.0mm)

SD : Testing Voltage AC 4000V

1-2-2. Temperature Characteristics

SAMWHA Symbol	Temp. Range	Change Rate
B (Y5P)	- 25℃ ~ + 85℃	+ 10 % ~ - 10 %
E (Y5U)	- 25℃ ~ + 85℃	+ 22 % ~ - 56 %
F (Y5V)	- 25℃ ~ + 85℃	+ 22 % ~ - 82 %

* Operating temperature range guaranteed up to 125 degrees.

1-2-3. Rating Voltage

SC Type - 2E (250Vac)

SD Type - 2G (400Vac)

1-2-4. Capacitance

The nominal capacitance value in pF is expressed by three digit number.

The first two digits represent significant figures and the last digit is the number of zero to follow.

(More than 100pF), Ex. 2200pF – 222

Note : Pre-treatment : max operating temp ±2°C heating and maintain 1hr, and release 24±2hr at room condition, using LCR meter.

1-2-5. Cap. Tolerance.

Symbol	K	M	Z
Cap. Tol	± 10 %	± 20 %	+ 80 ~ - 20 %

1-2-6. Disc Diameter (only code)

Code	06	07	08	09	10	11	12	13
Dia (Φ mm)	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5

1-2-7. Packing Style & Lead Variation

Packing Style		Lead Variation	
F	Taping Type Flat Pack	K	In-Forming Type
		F	Out-Forming Type
B	Bulk	S	Straight Long Type
		N	Straight Short Type
		K	Forming Long Type
		W (L)	Forming Short Type

1-2-8. Lead Spacing & Pitch of Component (see 10/13~12/13)

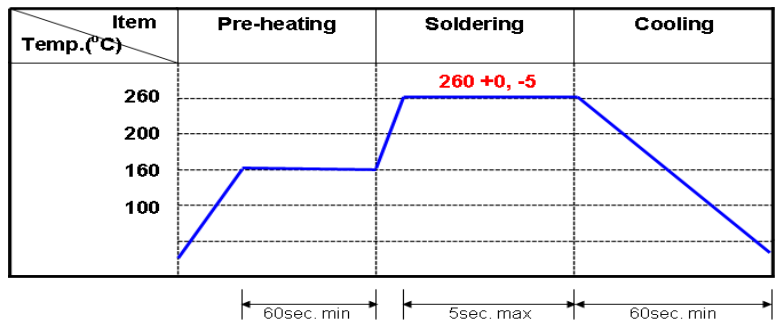
7 : F=7.5, P=15.0 (Bulk & Taping)

8 : F=7.5, P=30.0 (Taping) 1 : F=10.0, P=25.4 (Bulk & Taping)

9 : F=7.5, P=25.4 (Taping) 2 : F=10.0, P=30.0 (Taping)

1-3. Requirements and Method of Test and Environmental Substance

<table>
<tr><th>NO</th><th colspan="2">ITEM</th><th>STANDARD</th></tr>
<tr><td>1.</td><td colspan="2">Temperature Range</td><td>B, E, F : - 25℃ to + 85℃
Capacitance shall be within the specified tolerance when measured at 1 Vrms, 1 ± 0.1 KHz at 20℃</td></tr>
<tr><td>2.</td><td colspan="2">Dissipation Factor (tan δ)</td><td>B : 2.5 % Max. at 1 KHz
E : 2.5 % Max. at 1 KHz
F : 5.0 % Max. at 1 KHz</td></tr>
<tr><td>3.</td><td colspan="2">Insulation Resistance</td><td>More than 10000MΩ
Applied voltage : 500V DC, charging time : 1minute</td></tr>
<tr><td rowspan="2">4.</td><td rowspan="2">Safety
Withstand Voltage (Hi-Pot Test)</td><td>Between Terminals</td><td>SC : 2500V AC for 1 ~ 5 Sec. (Charge & Discharge current 50mA max.)
SD : 4000V AC for 1 ~ 5 Sec. (Charge & Discharge current 50mA max.)
No abnormality is recognized</td></tr>
<tr><td>Between Terminal & envelope</td><td>The smaller voltage of the rated voltage x 250% or 1.3 KV AC was applied for 1 to 5 sec.
No abnormality recognized</td></tr>
<tr><td>5.</td><td colspan="2">Temperature Characteristics</td><td>
<table>
<tr><th>step / Char.</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr>
<tr><td>B</td><td>+ 20</td><td>- 25</td><td>+ 20</td><td>+ 85</td><td>+ 20</td></tr>
<tr><td>E</td><td>+ 20</td><td>- 25</td><td>+ 20</td><td>+ 85</td><td>+ 20</td></tr>
<tr><td>F</td><td>+ 20</td><td>- 25</td><td>+ 20</td><td>+ 85</td><td>+ 20</td></tr>
</table>
Capacitance is measured under the above temperature conditions.
Capacitance change rate from the 1st to the 5th is calculated.
Standardizing capacitance of the 3rd step.
Spec :
<table>
<tr><th>Char.</th><th>Change Rate</th></tr>
<tr><td>B</td><td>+ 10 % ~ - 10 %</td></tr>
<tr><td>E</td><td>+ 22 % ~ - 56 %</td></tr>
<tr><td>F</td><td>+ 22 % ~ - 82 %</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>NO</th><th colspan="2">ITEM</th><th>STANDARD</th></tr>
<tr><td>6.</td><td colspan="2">Humidity Resistance Test</td><td>Capacitor shall be subjected to 40 ± 2℃ relative humidity of 90 to 95% for 500 ± 12 hours.
After placing in room condition for 12 to 24 hours after this test shall satisfy table Ⅰ
Table Ⅰ.
<table>
<tr><td>Appearance</td><td>No remarkable damage</td></tr>
<tr><td>Cap. Change</td><td>B : ± 10% Max
E : ± 20% Max
F : ± 30% Max</td></tr>
<tr><td>Dissipation Factor
(tan δ)</td><td>B : ± 5% Max
E : ± 5% Max
F : ± 7.5% Max</td></tr>
<tr><td>Insulation Resistance</td><td>5000MΩ Min</td></tr>
</table>
Pre-treatment : Capacitor should be stored at 125±2°C for 1 hr., then placed at room condition for 24±2hrs. Before initial measurement.
Post-treatment : Capacitor should be stored for 1 to 2 hrs. at room condition .</td></tr>
<tr><td>7.</td><td colspan="2">Humidity Resistance Load Test</td><td>Temperature : 40 ± 2℃
Humidity : 90 ~ 95%
Applied Voltage : Rating Voltage
Testing time : 500 ± 12 hrs.
Rated value is the same table Ⅰ
Pre-treatment : Capacitor should be stored at 125±2°C for 1 hr., then placed at room condition for 24±2hrs. Before initial measurement.
Post-treatment : Capacitor should be stored for 1 to 2 hrs. at room condition.</td></tr>
<tr><td>8.</td><td colspan="2">Solder Heat Resistance</td><td>Solder temp. : 260 -0, + 5℃
Immersion time : 10 ± 0.5 sec
No remarkable abnormality is recognized.
Rated value is the same table Ⅰ.
Pre-treatment : Capacitor should be stored at 125±2°C for 1 hr., then placed at room condition for 24±2hrs. Before initial measurement.
Post-treatment : Capacitor should be stored for 1 to 2 hrs. at room condition.</td></tr>
<tr><td>9.</td><td>Soldering Profile</td><td>Flow Soldering</td><td> 

When soldering this product to a Pcb / Pwb, do not exceed the solder heat resistance specification of capacitor. Subjecting this product to excessive heating could melt the internal junction solder and may result in thermal shocks that can crack the ceramic element.</td></tr>
</table>

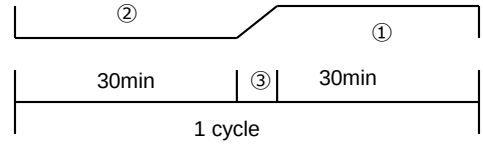
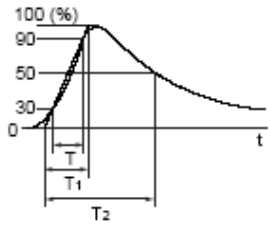
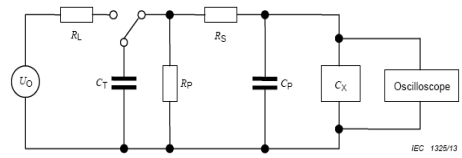
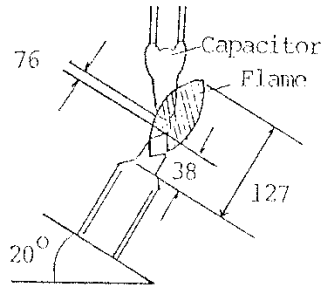
<table>
<tr><th>NO</th><th colspan="2">ITEM</th><th colspan="4">STANDARD</th></tr>
<tr><td></td><td>Soldering Profile</td><td>Iron Soldering</td><td colspan="4">When soldering capacitor with a soldering capacitor iron, it should be performed in following conditions.
Temperature of iron-tip : 400°C max.
Soldering iron wattage : 50W max.
Soldering time : 3.5 sec. max.
Failure to follow the above cautions may result, worst case, in a short circuit and cause fuming or partial dispersion when the product is used</td></tr>
<tr><td>10.</td><td colspan="2">Solderability</td><td colspan="4">After immersing in a 260±5℃ lead bath for 10 seconds, leave it at room temperature for 1 hour
[Depth of deposition: 1.5~2.0mm from the body]
After test the lead wire shall be soldered with uniformly coated on the axial direction over 75% of the circumferential direction.</td></tr>
<tr><td rowspan="7">11.</td><td colspan="2" rowspan="7">High Temperature Load Test</td><td colspan="2">Appearance</td><td>No. visible damage</td><td rowspan="7">Capacitors are to placed in a circulating air oven for 1500 +48,-0 hours the air oven is to be maintained at a temperature of 85 ± 3℃ throughout the test, each capacitor is to be subjected to a 800Vrms (AC) for SD (X1Y1) and 500Vrms (AC) for SC (X1Y2) with frequency of 50 - 60Hz.
Pre-treatment : Capacitor should be stored at 125±2°C for 1 hr., then placed at room condition for 24±2hrs. Before initial measurement.
Post-treatment : Capacitor should be stored for 1 to 2 hrs. at room condition.</td></tr>
<tr><td rowspan="3">Cap. Change</td><td>B</td><td>Within ± 10%</td></tr>
<tr><td>E</td><td>Within ± 20%</td></tr>
<tr><td>F</td><td>Within ± 30%</td></tr>
<tr><td rowspan="3">Tan δ</td><td>B</td><td>5% max</td></tr>
<tr><td>E</td><td>5% max</td></tr>
<tr><td>F</td><td>7.5% max</td></tr>
<tr><td colspan="2">I.R</td><td>5000MΩ min</td></tr>
<tr><td rowspan="8">12.</td><td colspan="2" rowspan="8">Temperature Cycling Test</td><td colspan="2">Appearance</td><td>No. visible damage</td><td rowspan="8">Temperature cycle should be measured in the following test.
Cycle time : 5 cycle
Pre-treatment : Capacitor should be stored at max operating temp(①). for 1hr., placing at room condition for 24±2hrs.
Post treatment : Capacitor should be stored for 24±2hrs at room.
※②:min. operating temperature
③:2 to 5minutes
 

Table II : Temperature Cycle
<table><tr><th>Step</th><th>Temperature (°C)</th><th>Time (min)</th></tr><tr><td>1</td><td>Min operating temp.</td><td>30</td></tr><tr><td>2</td><td>Room temp.</td><td>2 ~ 5</td></tr><tr><td>3</td><td>Max operating temp</td><td>30</td></tr><tr><td>4</td><td>Room temp.</td><td>2 ~ 5</td></tr></table></td></tr>
<tr><td rowspan="3">Cap. Change</td><td>B</td><td>Within ± 10%</td></tr>
<tr><td>E</td><td>Within ± 20%</td></tr>
<tr><td>F</td><td>Within ± 20%</td></tr>
<tr><td rowspan="3">Tan δ</td><td>B</td><td>5% max</td></tr>
<tr><td>E</td><td>5% max</td></tr>
<tr><td>F</td><td>7.5% max</td></tr>
<tr><td colspan="2">I.R</td><td>1000MΩ min</td></tr>
</table>

<table>
<tr><th>NO</th><th>ITEM</th><th>STANDARD</th></tr>
<tr><td>13.</td><td>Discharge Test
(Impulse Test)</td><td>
Capacitor shall withstand three times of discharges from a dump capacitor with an interval of 10 seconds between successive discharges. Test condition based on below table :
<table>
<tr><td>Type</td><td>voltage</td></tr>
<tr><td>SD</td><td>8 kVdc</td></tr>
<tr><td>SC</td><td>5 kVdc</td></tr>
</table>
<table>
<tr><th>Item</th><th>Type</th><th>Initial</th><th>After</th><th>Measurement condition</th></tr>
<tr><td>Appearance</td><td colspan="2">No remarkable damage</td><td>Visual</td></tr>
<tr><td rowspan="3">Cap</td><td>B</td><td>± 10% (K)</td><td>± 10%</td><td rowspan="6">1 Vrms,
1 ± 0.1 kHz at 20°C</td></tr>
<tr><td>E</td><td>± 20% (M)</td><td>± 20%</td></tr>
<tr><td>F</td><td>± 20%; (M)
-20% ~+80% (Z)</td><td>± 30%</td></tr>
<tr><td rowspan="3">Tan δ</td><td>B</td><td>2.5 max</td><td>5.0 max</td></tr>
<tr><td>E</td><td>2.5 max</td><td>5.0 max</td></tr>
<tr><td>F</td><td>5.0 max</td><td>7.5 max</td></tr>
<tr><td colspan="2">I.R</td><td>Min 10000MΩ</td><td>Min 1000MΩ</td><td>Voltage : 500 Vdc
Charging time : 60 sec</td></tr>
</table>




CT = charging (or tank) capacitor RS = series resistor, or charging resistor
CP = parallel capacitor RP = parallel resistor, or discharging resistor
CX = capacitor under test UO = direct voltage source
RL = loading resistor
Front time (T1)=1.2μs=1.67T
Time to half-value (T2)=50μs
<table>
<tr><th>Nominal value of C_X
mF</th><th>C_T
±10%
mF</th><th>R_P
±10%
Ω</th><th>R_S
±10%
Ω</th><th>C_P
±10%
pF</th></tr>
<tr><td>$C_X \le 0{,}003\ 9$
$0{,}003\ 9 < C_X \le 0{,}012$</td><td>0,25
0,25</td><td>234
234</td><td>62
45</td><td>7 800
7 800</td></tr>
</table>
</td></tr>
<tr><td>14.</td><td>Flaming Test</td><td>
The flame shall be applied for 15 Seconds, and than removed for 15 seconds until 5 such applications have been made.
The material to fourth cycle and more than 1 minute in last cycle.


Flame nozzle : ø9.5 mm, Dimensions in mm
</td></tr>
</table>

NO	ITEM	STANDARD	
15.	Vibration Test.	The capacitor should be firmly soldered to the supporting lead wire and vibrated at a frequency range of 10 to 55Hz, 1.5mm in total amplitude, with about a 1-minute rate of vibration change from 10Hz to 55Hz and back to 10Hz. Apply for a total of 6hrs., 2hrs. Each in mutually perpendicular directions. After test, capacitor shall satisfy table Ⅰ.	
16.	Preservation (keeping)	When solderablility is considered, capacitors are recommended to be used in 12 months	1.Temperature : 30°C ± 10°C 2.Relative Humidity : 55% ± 25
17.	The Regulation of Environmental Pollution Materials.	* Never use materials mentioned below based on International RoHS Standard. * Pb, Cd, Hg, Cr^{+6}, PBB, PBDE, Phthalate (DEHP, DBP, BBP & DIBP)	

MARKING

Marking Table (Cap 1000pF ↑)

① Type designation : SC or SD

② Nominal capacitance: 3 digit system

③ Capacitance tolerance : letter code

④ Manufacture's name : SWC

⑤ Recognized mark

⑥ X, Y Class and Rating voltage

⑦ Month of manufacture

A,M:Jan.	B,N:Feb.	C,O:Mar.
D,P:Apr.	E,Q:May	F,R:Jun.
G,S:Jul.	H,T:Aug.	I,U:Sep.
J,V:Oct,	K,W:Nov.	L,X:Dec.

From A to L are Even year,

from M to X are odd year

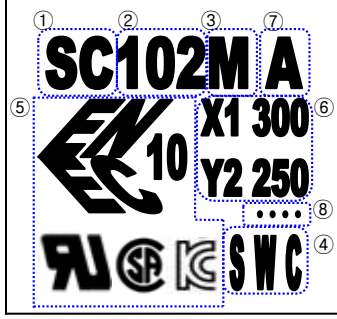
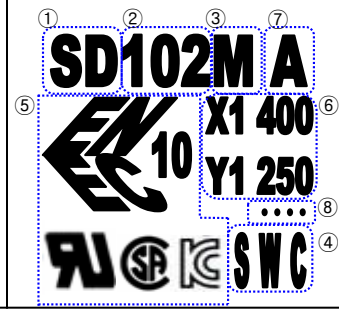
⑧ Dot Marking are week of month

example : • Week 1

• • Week 2

• • • Week 3

• • • • Week 4

SC TYPE	SD TYPE
FRONT	FRONT
	

Marking Table (Cap 680pF ↓)

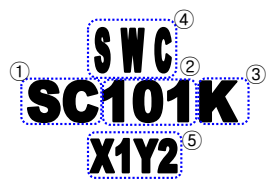
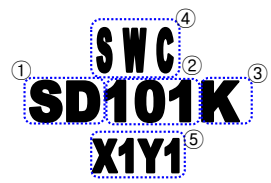
1) Type designation : SC or SD

2) Nominal capacitance: 3 digit

3) Capacitance tolerance : letter code

4) Manufacture's name : SWC

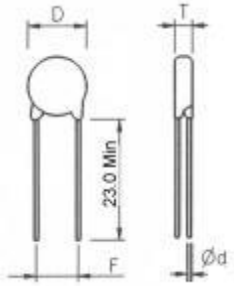
5) X,Y Class

SC TYPE	SD TYPE
FRONT	FRONT
	

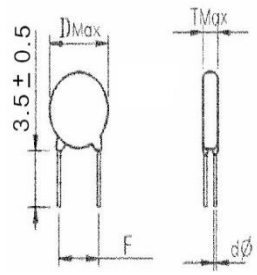
2. STYLE AND DIMENSIONS

2-1. Bulk

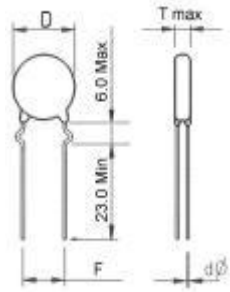
BS Type (Straight Long Type)



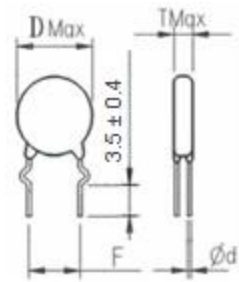
BN Type (Straight Short Type)



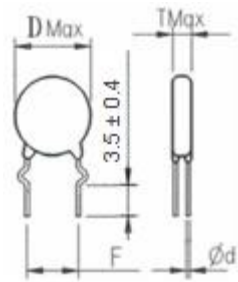
BK Type (Forming Long Type)



BW Type (Forming Short-kink)



BL Type (Forming Short-kink)

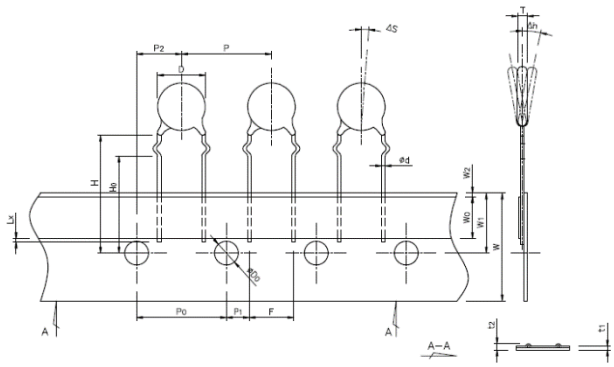


[Unit : mm]

TYPE	TEMP CHAR.	CAPACITANCE (pF)	DIMENSIONS			
			D max	T max	F ± 1.0	d(φ) ± 0.05
SC	B	100, 220	6.5	6.0	5.0, 7.5, 10.0	0.50 / 0.60
		330, 470	7.5	6.0	5.0, 7.5, 10.0	0.50 / 0.60
		680	8.5	6.0	5.0, 7.5, 10.0	0.50 / 0.60
	E	1000	6.5	6.0	5.0, 7.5, 10.0	0.50 / 0.60
		1500, 2200	8.5	6.0	5.0, 7.5, 10.0	0.50 / 0.60
		3300	10.5	6.0	5.0, 7.5, 10.0	0.50 / 0.60
		4700	12.5	6.0	7.5, 10.0	0.60
	F	4700	8.5	6.0	7.5, 10.0	0.60
		10000	14.5	6.0	7.5, 10.0	0.60
SD	B	100, 220	6.5	6.0	10.0	0.60
		330, 470	7.5	7.0	10.0	0.60
	E	680, 1000	7.5	7.0	10.0	0.60
		1500	8.5	7.0	10.0	0.60
		2200	10.5	7.0	10.0	0.60
		3300	12.5	7.0	10.0	0.60
		4700	13.5	7.0	10.0	0.60

2-2. Taping

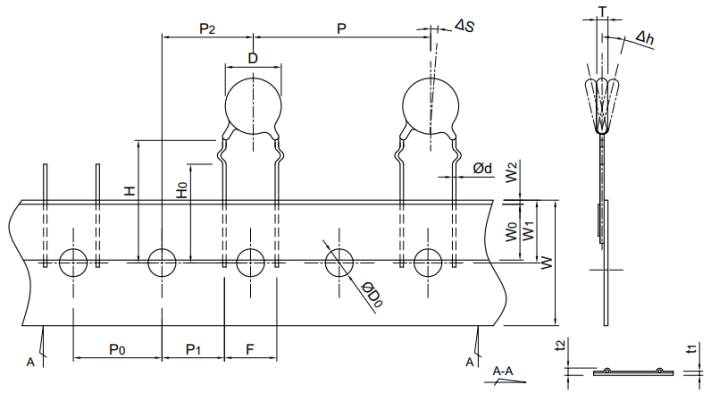
FF7



[Unit : mm]

ITEM	SYMBOL	TAPING SPECIFICATION	NOTE
		FF7	
Body Diameter	D	14.5 Max	
Body Thickness	T	6.0 Max	
Lead Diameter	Φd	0.60 ± 0.05	
Pitch of Sprocket Hole	Po	15.0 ± 0.3	
Pitch of Component	P	15.0 ± 1.0	
Lead Length from Hole Center to Lead	P1	3.75 ± 1.0	
Lead Length from Hole Center to Component Center	P2	7.5 ± 1.5	
Lead Spacing	F	7.5 ± 1.0	
Deviation Along Tape.Left or Right	△S	0 ± 1.0	
Deviation Across Tape	△h	0 ± 2.0	
Carrier Tape Width	W	18.0 + 1.0 - 0.5	
Hold Down Tape Width/Masking Tape Width	Wo	8.0 Min	
Position of Sprocket Hole	W1	9.0 ± 0.5	
Hold Down Tape Position	W2	3.0 Max	
Lead-Wire Clinch Height	Ho	16.0 ± 0.5	
Height of Component Hole	H	20.0 + 1.5 - 1.0	
Diameter of Sprocket Hole	ΦDo	4.0 ± 0.2	
Total Tape Thickness	t_1	0.7 ± 0.2	
Total Thickness, Tape and Lead Wire	t_2	1.7 Max	
Lead Wire Protrusion	Lx	1.0 Max	

FF1



[Unit : mm]

ITEM	SYMBOL	TAPING SPECIFICATION	NOTE
		FF1	
Body Diameter	D	13.5 Max	
Body Thickness	T	7.0 Max	
Lead Diameter	dΦ	0.60 ± 0.05	
Pitch of Sprocket Hole	Po	12.7 ± 0.3	
Pitch of Component	P	25.4 ± 1.0	
Lead Length from Hole Center to Lead	P1	7.7 ± 1.0	
Lead Length from Hole Center to Component Center	P2	12.7 ±1.5	
Lead Spacing	F	10.0 ± 1.0	
Deviation Along Tape, Left or Right	△S	0 ± 1.0	
Deviation Across Tape	△h	0 ± 2.0	
Carrier Tape Width	W	18.0 + 1.0 - 0.5	
Hold Down Tape Width/Masking Tape Width	Wo	8.0 Min	
Position of Sprocket Hole	W1	9.0 ± 0.5	
Hold Down Tape Position	W2	3.0 Max	
Lead-Wire Clinch Height	Ho	16.0 ± 0.5	
Height of Component from Hole Center	H	20.0 + 1.5 - 1.0	
Diameter of Sprocket Hole	ΦDo	4.0 ± 0.2	
Total Tape Thickness	t_1	0.7 ± 0.2	
Total Thickness, Tape and Lead Wire	t_2	1.7 Max	
Lead Wire Protrusion	Lx	1.0 Max	

▣ PACKING SPECIFICATION

1) BULK

TYPE		PACKING QUANTITY [pcs]				
DIVISION	L/W DIVISION [mm]	DIAMETER [Φ]	INNER BOX		OUT BOX	
			VINIL PAPER BAG	IBB 140	OBB 150	OBB 300
3 ~ 8 KV (Y-CAP)	Long	~ 7	500 +2, -0	5,000	-	20,000
		8 ~ 11		4,000	-	16,000
		12 ~ 14		3,000	6,000	-
		15 ~ 16		2,500	5,000	-
		17 ~ 20	200 +1, -0	2,000	4,000	-
	Short	~ 9	500 +2, -0	10,000	20,000	-
		10 ~ 11	500 +2, -0	7,500	15,000	-
		12 ~ 14	500 +2, -0	5,000	10,000	-
		15 ~ 16	500 +2, -0	4,000	8,000	-
		17 ~ 20	200 +1, -0	2,000	4,000	-

• ETC : SCE222M10, 332M12, F472M10(12) BK7 = 400 +1, -0

• ETC : SCE2E222M10FF7, SCE2E472M14 FF8 = 1,000 +1, -0 (IN), 5,000(OUT)

2) TAPING

DIVISION	F [mm]	TYPE	PITCH	DIAMETER [Φ]	VOLTAGE [V]	BOX H [mm]	PACKING QUANTITY [pcs]	
							IBR	OBR
3 KV~	5.0	FF5	12.7	ALL	SC, SD	52	1,000 +5, -0	5,000
	7.5	FF7	15.0	14.0↓			1,000 +5, -0	5,000
		FF8	30.0	15.0↑			600 +5, -0	3,000
		FF9	25.4	ALL			600 +5, -0	3,000
	10.0	FF1	25.4	ALL			600 +5, -0	3,000
		FS1	25.4				600 +5, -0	3,000
		FF2	30.0				500 +5, -0	2,000

3) PACKING BOX DIMENSIONS

PACKING STYLE		CATEGORY	L × W × H [mm]
BULK	IBB (Inner Box Bulk)	IBB 140	250 × 235 × 130
	OBB (Out Box Bulk)	OBB 150 (IBB 140 × 2)	485 × 265 × 145
TAPING	INNER BOX	IBR 52	325 × 280 × 55
	OUT BOX	OBR 52 (IBR 52 × 5)	340 × 310 × 290

4) STACKING BOX (Maximum)

PACKING STYLE	INBOX	OUTBOX
BULK	6	6
TAPING	10	6

▣ MATERIAL LIST

NO	Material Name	Substance	Hazardous Substance Existences						Remarks
			Pb	Hg	Cr	Cr^{+6}	PBB	PBDE	
1	Dielectric Powder	$BaTiO_3$	X	X	X	X	X	X	
2	Ag Paste	Ag	X	X	X	X	X	X	
3	Solder	Sn, Ag, Cu	X	X	X	X	X	X	
4	Epoxy Resin	Epoxy	X	X	X	X	X	X	
5	Lead Wire	Cu, Sn, Fe	X	X	X	X	X	X	Plating thickness : Min 3 μm. (material : tin)

▣ Label Type

▣ Bulk Style

BULK TYPE		
PLASTIC	INBOX	OUTBOX
		

▣ Taping Style

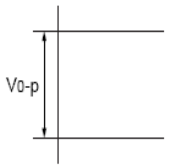
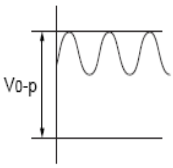
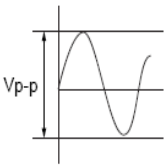
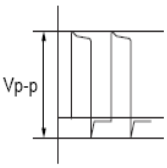
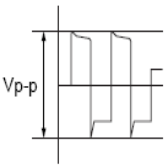
TAPING TYPE		
PLASTIC	INBOX	OUTBOX
		

■ Notices:

▶ Caution

1. Operating Voltage

When DC-rated capacitors are to be used in AC or ripple current circuits, be sure to maintain the V_{P-P} value of the applied voltage or the V_{0-P} that contains DC bias within the rated voltage range. When the voltage is started to apply to the circuit or it is stopped applying, the irregular voltage may be generated for a transit period because of resonance or switching. Be sure to use a capacitor within rate voltage containing these irregular resonance.

Voltage	DC Voltage	DC+AC Voltage	AC Voltage	Pulse Voltage (1)	Pulse Voltage (2)
Positional Measurement					

2. Operating Temperature And Self-Generated Heat

Keep the surface temperature of a capacitor below the upper limit of its rated operating temperature range. Be sure to take into account the heat generated by the capacitor itself. When the capacitor is used in a high frequency current, pulse current or the like, it may have self-generated heat due to dielectric loss. Applied voltage should be the load such as self-generated heat is within 20°C on the condition of atmosphere temperature 25°C. When measuring, use a thermocouple of small thermal capacity-K of ø0.1mm and be in the condition where capacitor is not affected by radiant heat of other components and wind of surroundings. Excessive heat may lead to deterioration of the capacitor's characteristics and reliability. (Never attempt to perform measurement with the cooling fan running. Otherwise, accurate measurement cannot be ensured.)

▶ **Notice (Capacitance change of capacitors)**

For some of the capacitors, capacitance value may change considerably in the temperature range, or by applied DC voltage. and capacitor has aging characteristics (capacitance decreases by keeping as it is)