TO. DATE : 2005. . .

SPECIFICATION

PRODUCT : STARCAP

MODEL : DA SERIES

WRITTEN	CHECKED	APPROVED

總代理商：舜成有限公司 / Component Plus Inc.
TEL : 02 - 2898-4050
FAX : 02 - 2896-9157

1. Scope

These are the specifications of STARCAP(electric double layer capacitor) which you are using.

Please study these applications and approved them.

2. Part number system

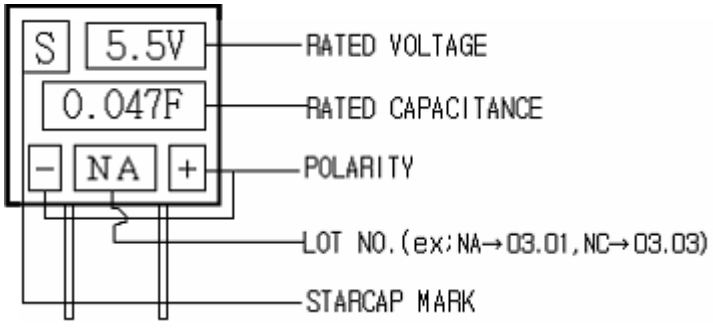
SC	DA	5R5	473	H	F
①	②	③	④	⑤	⑥

① STARCAP
② Series Name
③ Rated Voltage : 5.5Vdc
④ Capacitance : 223-0.022F, 473-0.047F, 104-0.1F
⑤ Lead Type : V - Vertical Type, H - Horizontal Type, A - Ammo Taping Type
⑥ Pb-free

3. Characteristics

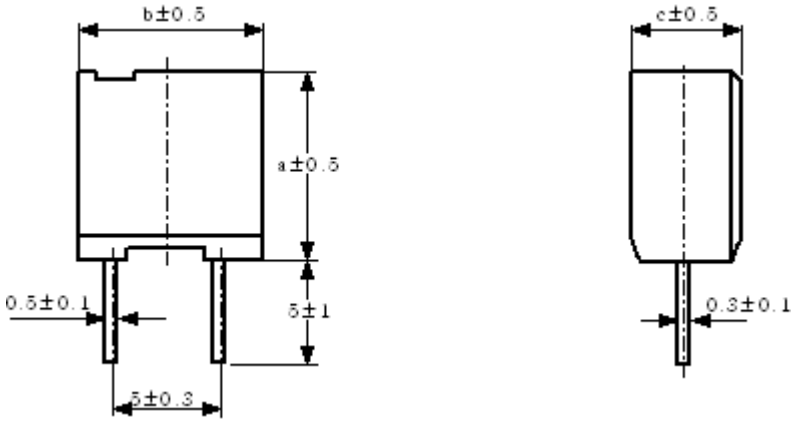
OPERATING TEMPERATURE	-25 ~ +70 ℃
RATED VOLTAGE	5.5 VDC
CAPACITANCE	0.022 ~ 0.1 F
CAPACITANCE TOLERANCE	-20 ~ 80 %
EQUIVALENT SERIES RESISTANCE	0.022F : LESS THAN 150 Ω 0.047F : LESS THAN 60 Ω 0.1F : LESS THAN 60 Ω
LEAKAGE CURRENT	0.022F : LESS THAN 50 ㎂ 0.047F : LESS THAN 70 ㎂ 0.1F : LESS THAN 150 ㎂

4. Marking



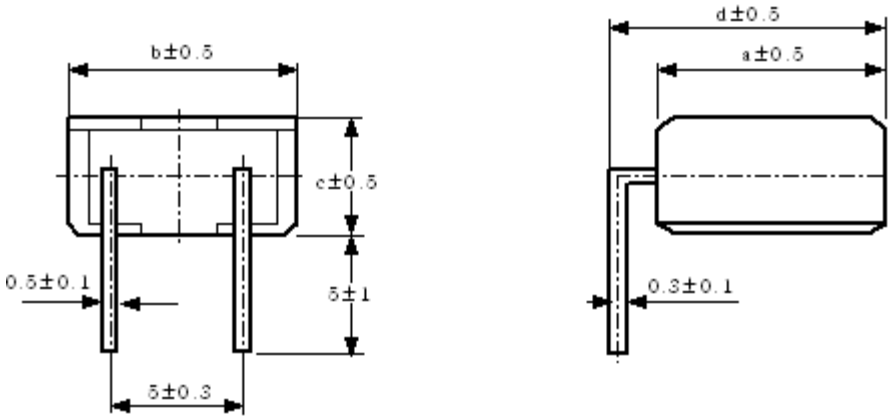
5. Construction And Dimension

1) Vertical Type (V-type)



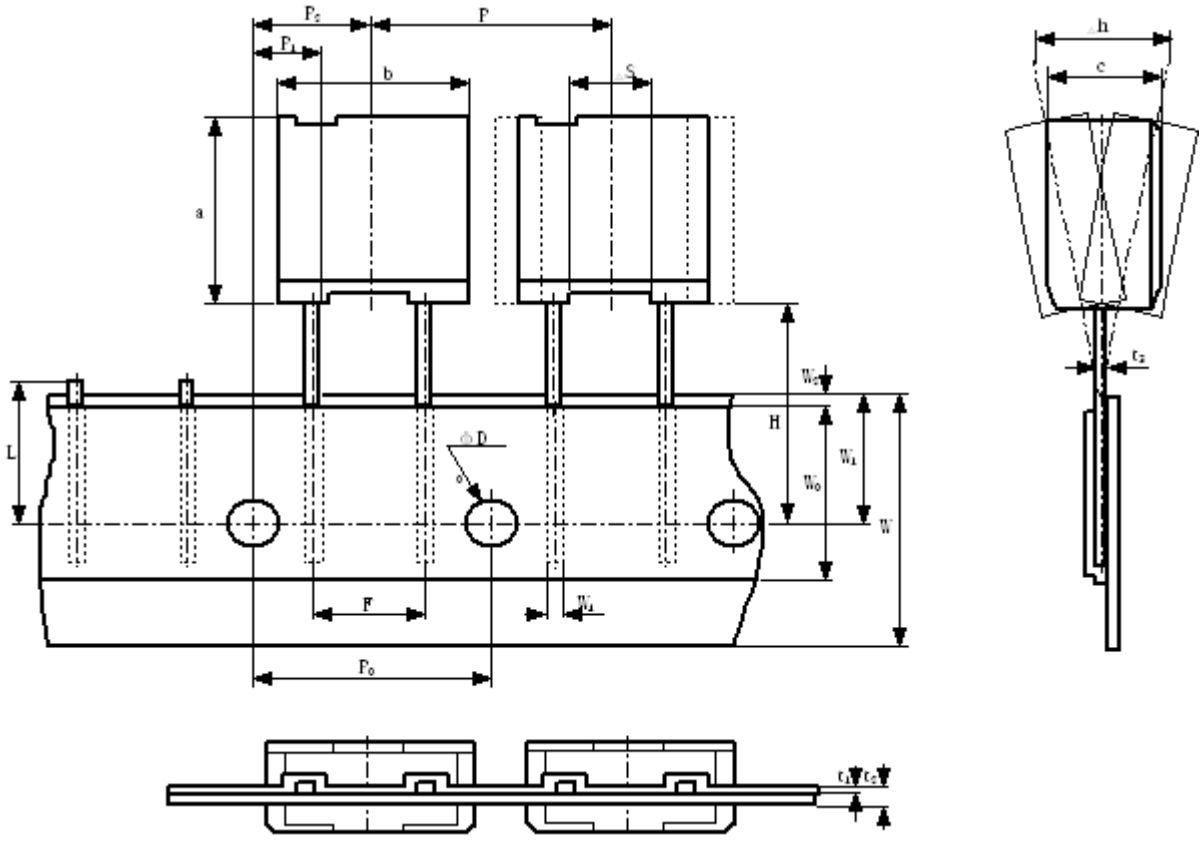
No.	Type	Rated Voltage	Capacitance	Capacitance Tolerance	Measurement (mm)		
					a	b	c
1	SCDA5R5223 V	5.5VDC	0.022F	-20 ~ 80%	10.5	9.5	5.0
2	SCDA5R5473 V	5.5VDC	0.047F	-20 ~ 80%	10.5	9.5	5.0
3	DCDA5R5104 V	5.5VDC	0.1F	-20 ~ 80%	12.5	11.5	5.0

2) Horizontal Type (H-type)



No.	Type	Rated Voltage	Capacitance	Capacitance Tolerance	Measurement (mm)		
					a	b	c
1	SCDA5R5223 V	5.5VDC	0.022F	-20 ~ 80%	10.5	9.5	5.0
2	SCDA5R5473 V	5.5VDC	0.047F	-20 ~ 80%	10.5	9.5	5.0
3	DCDA5R5104 V	5.5VDC	0.1F	-20 ~ 80%	12.5	11.5	5.0

3) Ammo Taping Type (A-type)



ITEM	SYMBOL	DIMENSION	ITEM		SYMBOL	DIMENSION	
PITCH	P	12.7 ± 0.2	PORTION TO CUT		L	11.0 +0,-1.0	
LENGTH 1	P_1	3.85 ± 0.7	TOTAL THICKNESS		t_1	0.6 ± 0.3	
LENGTH 2	P_2	6.35 ± 1.3			t_2	1.5	
LEAD SPACING	F	5 +0.8,-0.2	DEVIATION ACROSS TAPE		Δh	0 ± 1.0	
CARRIER TAPE WIDTH	W	18.0±0.5	DEVIATION ALONG TAPE		Δs	0 ± 2.0	
HOLE DOWN TAPE WIDTH	W_0	MAX 12.5	LEAD ACROSS SECTION	WIDTH	W_4	0.5 ± 0.1	
POSITION OF HOLE	W_1	9.0 +0.5, -0.5		THICKNESS	t_3	0.3 ± 0.1	
HOLE DOWN TAPE POSITION	W_2	0.5 ± 0.5	BODY DIMENSION	HEIGHT	a	10.5±0.5	★12.5±0.5
COMPONENT BOTTOM PLANE	H	18.5 ± 0.5		WIDTH	b	9.5±0.5	★11.5±0.5
DIAMETER OF HOLE	ϕD_0	4.0 ± 0.1		THICKNESS	c	5.0±0.5	★5.0±0.5

(★ 104 ONLY)

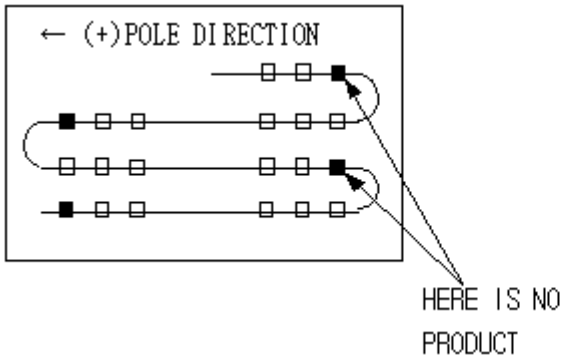
6. Specifications And Test Method

<table>
<tr><th colspan="2">ITEM</th><th colspan="2">SPECIFICATION</th><th>TEST CONDITION</th></tr>
<tr><td colspan="2">OPERATING TEMP. RANGE</td><td colspan="2">-25℃ ~ +70℃</td><td></td></tr>
<tr><td colspan="2">RATED VOLTAGE</td><td colspan="2">5.5VDC</td><td></td></tr>
<tr><td colspan="2">CAPACITANCE</td><td colspan="2">0.022 ~ 0.1F</td><td>TO SEE MEASURE METHOD</td></tr>
<tr><td colspan="2">CAPACITANCE TOLERANCE</td><td colspan="2">+80% , -20%</td><td>TO SEE MEASURE METHOD</td></tr>
<tr><td colspan="2">EQUIV. SERIES. RES. (ESR)</td><td colspan="2">TO SEE CONSTRUCTION&DIM.</td><td>FRE. : 1㎑, 1㎃</td></tr>
<tr><td colspan="2">LEAKAGE CURRENT (30MIN)</td><td colspan="2">TO SEE CONSTRUCTION&DIM.</td><td>VOLT:5.5V,
TO SEE MEASURE METHOD
RES. : 0.022F~0.1F 100Ω</td></tr>
<tr><td rowspan="9">TEMPERATURE CHARACTERISTICS</td><td>CAPACITANCE</td><td rowspan="2">STAGE 2</td><td>±50% OF INI. VAL</td><td rowspan="9"><table><tr><th>STAGE</th><th>TEMPERATURE</th></tr><tr><td>1</td><td>20±2℃</td></tr><tr><td>2</td><td>-25±2℃</td></tr><tr><td>3</td><td>20±2℃</td></tr><tr><td>4</td><td>70±2℃</td></tr><tr><td>5</td><td>20±2℃</td></tr></table></td></tr>
<tr><td>ESR</td><td>3 TIMES OF INI. VAL</td></tr>
<tr><td>CAPACITANCE</td><td rowspan="3">STAGE 4</td><td>±30% OF INI. VAL</td></tr>
<tr><td>ESR</td><td>SPEC. VALUE</td></tr>
<tr><td>LC (30MIN)</td><td>SPEC. VALUE</td></tr>
<tr><td>CAPACITANCE</td><td rowspan="3">STAGE 5</td><td>±30% OF INI. VAL</td></tr>
<tr><td>ESR</td><td>SPEC. VALUE</td></tr>
<tr><td>LC (30MIN)</td><td>SPEC. VALUE</td></tr>
<tr><td colspan="2">LEAD STRENGTH</td><td colspan="2" rowspan="2">LEAD TERMINAL SHALL NOT BE SEPARATED</td><td>LOAD 1㎏ , 10±1 SEC</td></tr>
<tr><td colspan="2">LEAD BEND STRENGTH</td><td>LOAD:1㎏ ANGLE 90° ,1CYCLE</td></tr>
<tr><td rowspan="4">VIBRATION RESISTANCE</td><td>CAPACITANCE</td><td colspan="2">SPEC. VALUE</td><td rowspan="4">AMPLITUDE: 1.5㎜
FREQUENCY: 10~55㎐
DIRECTION:X,Y,Z 3DIRECTIONS
TEST TIME: 6HOURS</td></tr>
<tr><td>ESR</td><td colspan="2">SPEC. VALUE</td></tr>
<tr><td>LC(30MIN)</td><td colspan="2">SPEC. VALUE</td></tr>
<tr><td>APPEARANCE</td><td colspan="2">NO MARKED DEFECT</td></tr>
<tr><td colspan="2">SOLDER ABILITY</td><td colspan="2">LEAD TERMINAL SHALL NOT BE SEPARATED</td><td>SOLDER TEMP:230±5℃
IMMERSION TIME:5±0.5SEC
DIP LENGTH : TO 1.6㎜ FROM BOTTOM OF THE BODY</td></tr>
<tr><td rowspan="4">HUMIDITY</td><td>CAPACITANCE</td><td colspan="2">90%↑ OF SPEC. VAL</td><td rowspan="4">TEMP:40±2℃
HUMIDITY:90 ~ 95%고
TEST TIME:240±8HOURS
NO VOLTAGE APPLIED</td></tr>
<tr><td>ESR</td><td colspan="2">1.2TIMES ↓ OF SPE. V</td></tr>
<tr><td>LC(30MIN)</td><td colspan="2">1.2TIMES ↓ OF SPE. V</td></tr>
<tr><td>APPEARANCE</td><td colspan="2">NO MARKED DEFECT</td></tr>
<tr><td rowspan="4">SOLDER ABILITY</td><td>CAPACITANCE</td><td colspan="2">SPEC. VALUE</td><td rowspan="4">SOLDER TEMP:260±5℃
IMMERSION TIME:10±0.5SEC
DIP LENGTH : TO 1.6㎜ FROM BOTTOM OF THE BODY</td></tr>
<tr><td>ESR</td><td colspan="2">SPEC. VALUE</td></tr>
<tr><td>LC(30MIN)</td><td colspan="2">SPEC. VALUE</td></tr>
<tr><td>APPEARANCE</td><td colspan="2">NO MARKED DEFECT</td></tr>
<tr><td rowspan="2">SELF DISCHARGE CHARACTERISTICS</td><td rowspan="2">CAPACITANCE</td><td rowspan="2">MORE THAN 4.2V</td><td>CHARGING CONDITION</td><td>VOLTAGE:5.0V
RESISTANCE:0Ω
CHARGE TIME:24h</td></tr>
<tr><td>NEGLIGE-NCE CONDITION</td><td>24h NEGLIGENCE IN OPEN STATE
TEMP:LESS THAN 25℃
HUMIDITY:LESS THAN RH 70%</td></tr>
<tr><td rowspan="4">ENDURANCE</td><td>CAPACITANCE</td><td colspan="2">±30% OF SPEC. VAL</td><td rowspan="4">TEMP:70±2℃
TEST TIME : 1000±24HOURS
APPLIED VOLTAGE : 5.5V DC</td></tr>
<tr><td>ESR</td><td colspan="2">4TIMES ↓ OF SPE. V</td></tr>
<tr><td>LC(30MIN)</td><td colspan="2">3TIMES ↓ OF SPE. V</td></tr>
<tr><td>APPEARANCE</td><td colspan="2">NO MARKED DEFECT</td></tr>
<tr><td rowspan="4">SURGE VOLTAGE</td><td>CAPACITANCE</td><td>±90% OF SPEC. VAL</td><td rowspan="4">TEMP:70±2℃, VOLTAGE:6.3V
CHARGE:30SEC., DISCHARGE:5MIN. 30SEC. , CYCLE:1,000CYCLE
CHARGE RESISTANCE:150~560Ω
DISCHARGE RESISTANCE:0Ω</td></tr>
<tr><td>ESR</td><td>1.2TIMES ↓ OF SPE. V</td></tr>
<tr><td>LC(30MIN)</td><td>1.2TIMES ↓ OF SPE. V</td></tr>
<tr><td>APPEARANCE</td><td>NO MARKED DEFECT</td></tr>
</table>

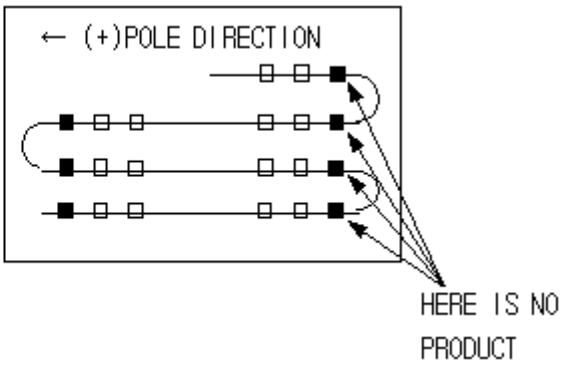
7. Packing Specification (Ammo Packing)

The tape with capacitor is creased each 25 pitches and packed zigzag into the case, when body of the capacitor is piled on other body under it.

(223, 473 type)



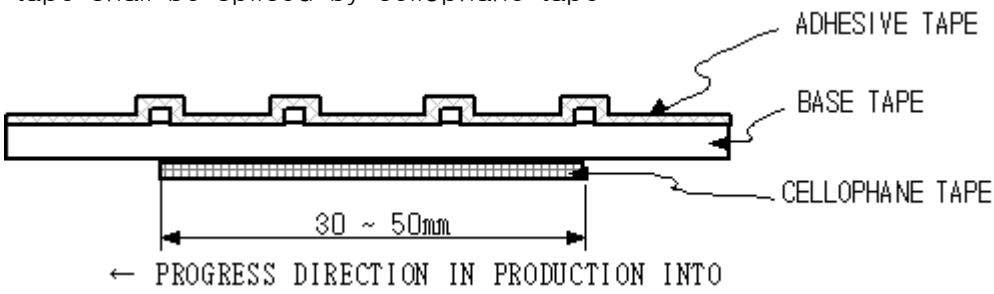
(104 type)



8. Splicing of tape

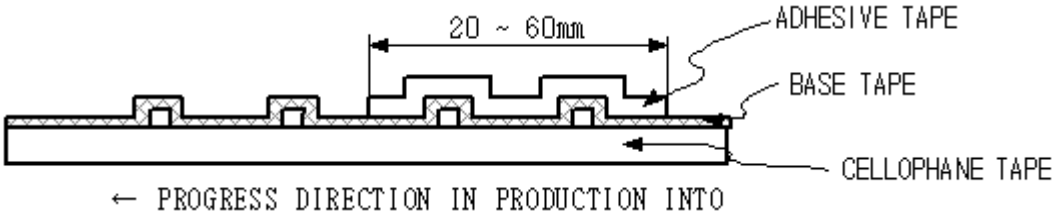
1) When base tape is spliced ;

Base tape shall be spliced by cellophane tape



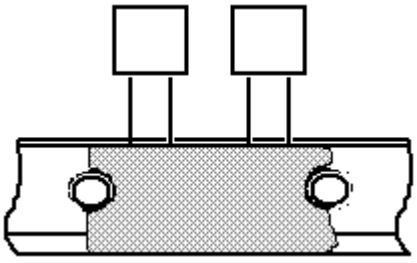
2) When adhesive tape is spliced ;

Adhesive tape shall be spliced with overlapping



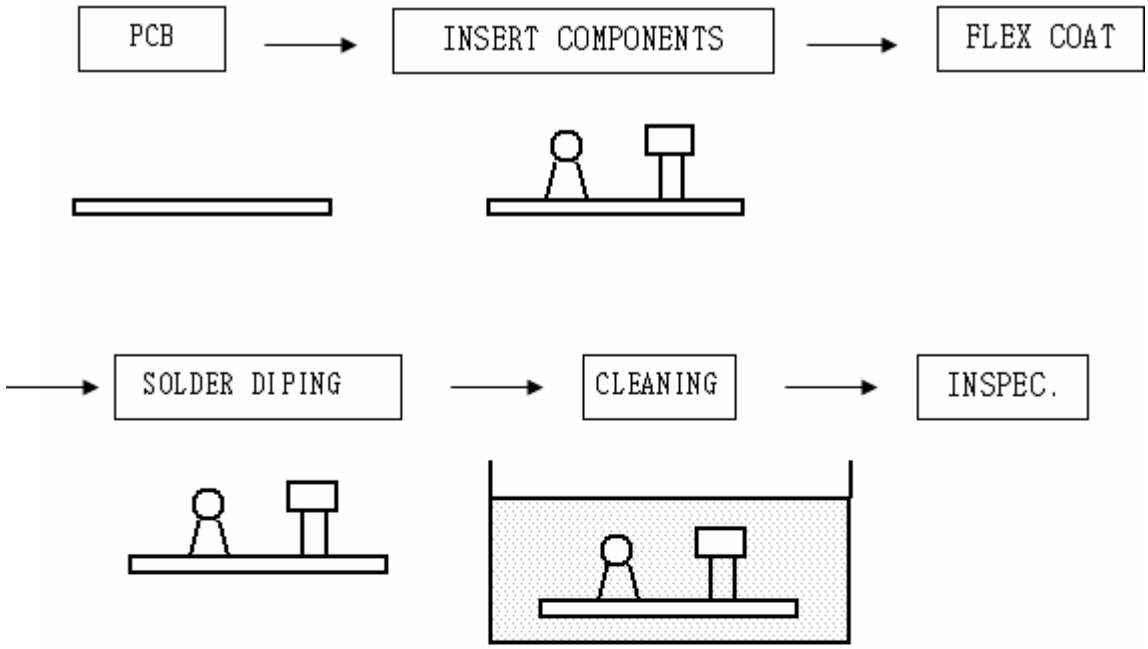
3) When both tapes are spliced at a time ;

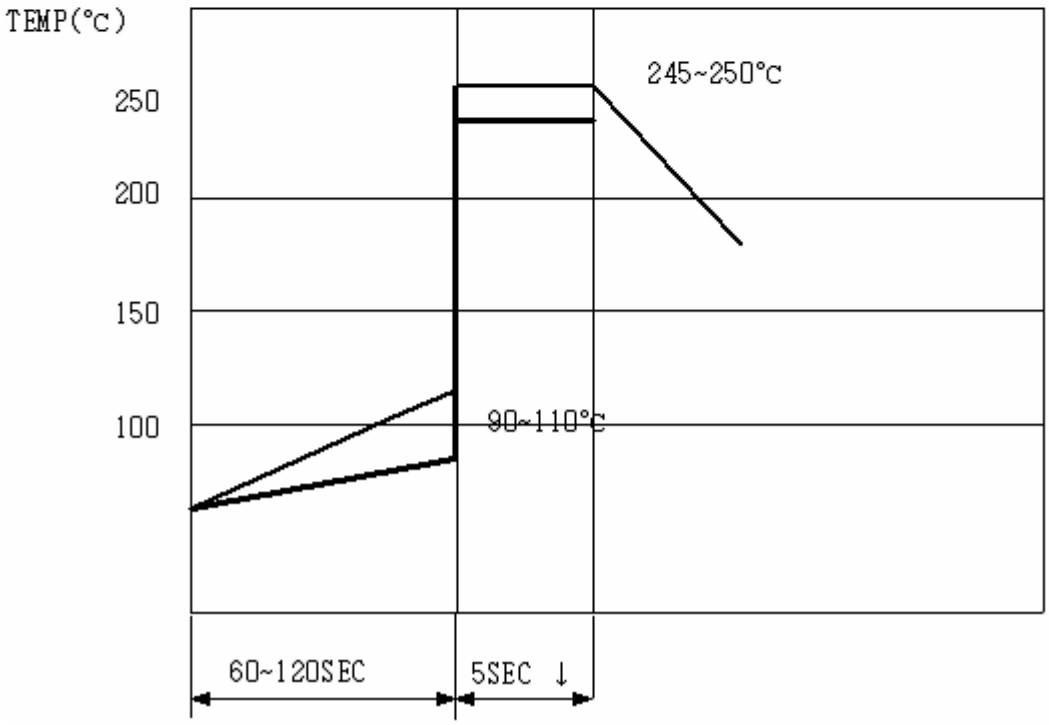
Base tape and adhesive tape shall be spliced with splicing tape



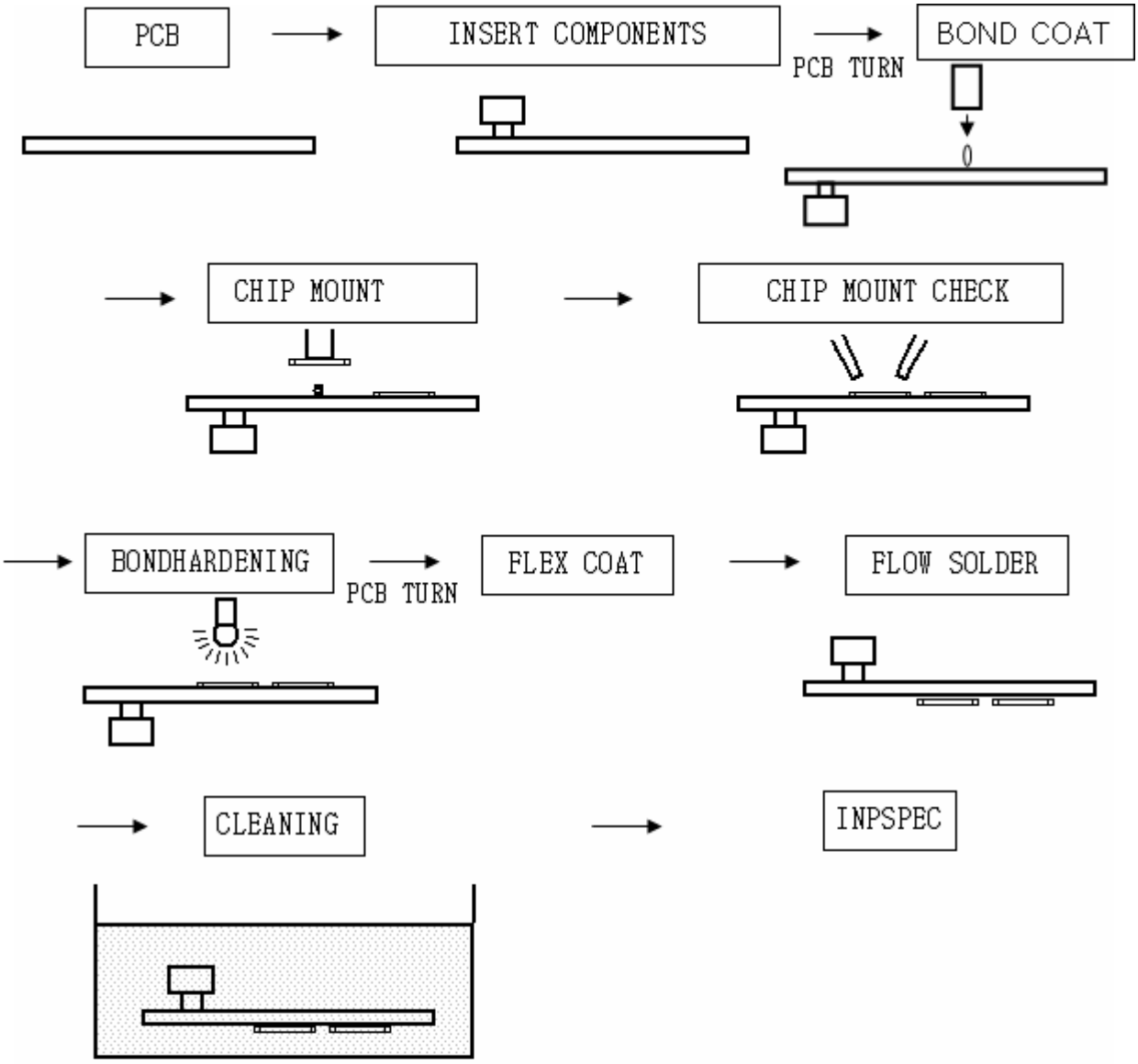
8. Solder heating condition

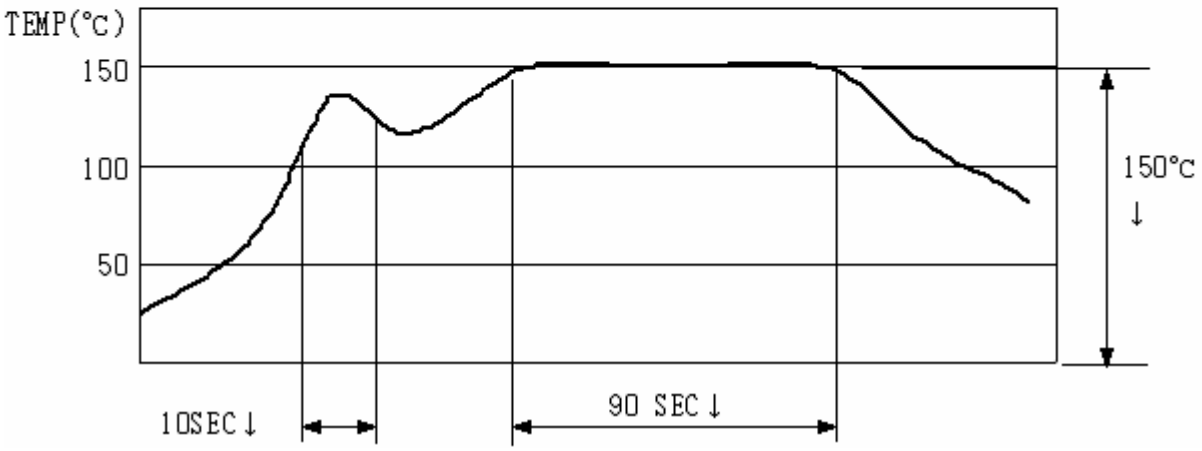
1) Solder dipping method



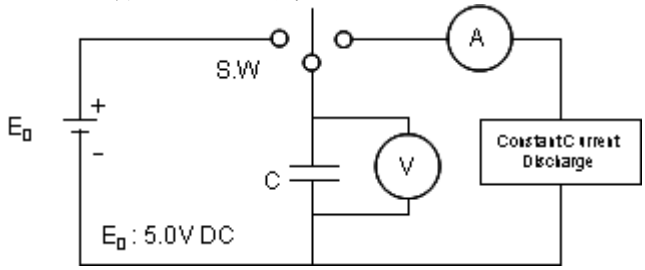
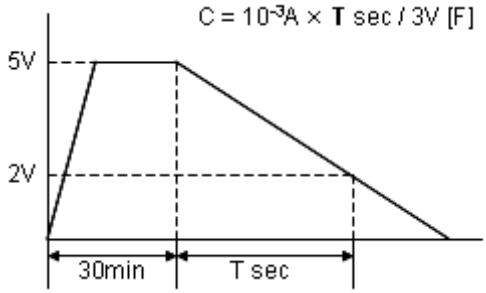
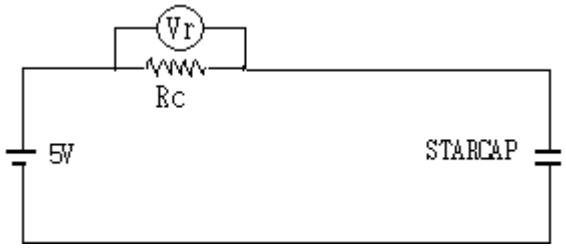


2) Reflow soldering method


PCB
INSERT COMPONENTS
PCB TURN
BOND COAT
CHIP MOUNT
CHIP MOUNT CHECK
BONDHARDENING
PCB TURN
FLEX COAT
FLOW SOLDER
CLEANING
INPSPEC


TEMP(℃)
150
100
50
150℃
↓
10SEC↓
90 SEC↓

9. Measuring Method Of Characteristics

CAPACITANCE	1) CHARGE THE STARCAP WITH 2±0.05㎃ 2) READ THE TIME TAKEN FOR THE VOLTAGE TO RISE FROM 2±0.05V TO 5.0±0.05V. THE TIME MEASURED IS INDICATED BY "T". 3) CALCULATE CAPACITANCE USING THE FOLLOWING FORMULA.  
EQUIVALENT RESISTANCE	MEASURE ESR BY THE LCR METER. FREQUENCY : 1㎑ BAIS VOLTAGE : 0V
LEAKAGE CURRENT	1) APPLY 5.0±0.1V TO THE STARCAP. 2) MEASURE Vr AFTER 30±0.5 MIN. 3) CALCULATE CURRENT USING THE FOLLOWING FORMULA. 
☞ THE STARCAP SHOULD BE SHORTED BEFORE EACH MEASUREMENT AS FOLLOWS ; CAPACITANCE : 60 MIN., ESR : 15 MIN., LC : 15 MIN.	

10. Caution For Use

Please be careful following point when you use STARCAP.

1) Don't apply more than rated voltage.
   If you apply more than rated voltage, STARCAP's electrolyte is electrolyzed. And its ESR gets higher. At the worst, it is broken.

2) Don't use for ripple absorption.

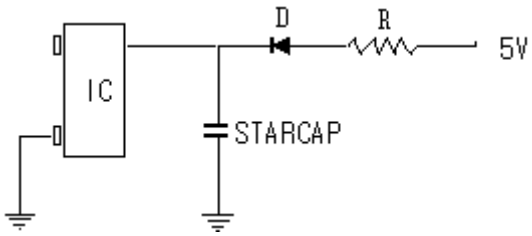
3) Polarity
   The STARCAP is non-polar fundamentally. However STARCAP is made polarity, when it is packed.
   Please mount it in accordance with its polarity for the maintaining best condition.

4) Operating temperature and life
   Generally speaking, STARCAP has a lower leakage current, longer back-up time and longer life in the low temp.
   But, it has a higher leakage current, shorter back-up time and shorter life in the high temp.
   Please design to keep STARCAP away a calorific parts.

5) Cleaning
   STARCAP is a proof against cleaning. Cleaning guarantee is as follows ; Solvent : Freon Test 45℃.
   Ultrasonic wave : Less than 38㎑, Less than 20 Watt/Liter.
   Immersing time : Less than 10 Min.
   ultrasonic wave must not be centered.

6) Soldering
   When you solder by solder iron, please do quickly it within 3 Sec.
   Please don't touch the resin case of STARCAP by solder iron.
   Because the resin may be melted by its heat.

7) Following Figure Show The General Back-up Circuit.



D : Diode for protection of counter
R : Resistor for protection of electric power source

8) Short Circuit STARCAP
You can short-circuit between terminals without resister.
However when you short circuit frequently, please let us know.
We think that frequently condition id as follows ;
Charge : 30 Sec., Discharge : 30 Sec., Cycle : 1000 Cycle, Temp.: 85℃

9) Storage
Please store STARCAP in following condition ;
Temp. : 15 ~ 35℃, Humidity : 45 ~ 75% RH, Non-dust

10) Please don't disassemble STARCAP. Because its electrolyte is organic solvent.

11) When you use bond cure skin, please contact us for its condition.

12) Series connection of STARCAP causes a difference of applied voltage for each STARCAP, because of dispersion of capacitance and ESR.
As a result, it's possible to apply over-rated voltage.
Please inform us if you are using STARCAP in series connection.
And please design so as not to apply over-rated voltage to each STARCAP, and use STARCAPs in same lot.

11. PACKING WAY

PRODUCT		QUANTITY(PCS)			SIZE(W×H×T)	
		Vinyl bag	Inner Box	Outer Box	Inner Box(㎜)	Outer Box(㎜)
SCDA5R5223	Taping	-	1,000	5,000	340×260×50	350×270×270
	Bulk	500	2,500	10,000	295×230×140	485×310×310
SCDA5R5473	Taping	-	1,000	5,000	340×260×50	350×270×270
	Bulk	500	2,500	10,000	295×230×140	485×310×310
SCDA5R5104	Taping	-	1,000	5,000	340×260×50	350×270×270
	Bulk	500	2,500	10,000	295×230×140	485×310×310