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|---|-------------------------------|-------------|---------|------|-----------|
|  | Chip Trimmer Capacitor | Document No | Rev. No | Page | Rev. Date |
| | | STC3M-SP-08 | 3.6 | 13 | 28-Dec-09 |

PRODUCT SPECIFICATIONS

Model: STC3M Series (ver 3.6)

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-34970699
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

Cumtomer : _____

SEHWA Electronics Co., Ltd

| Approved | Checked | Prepared |
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|---|-------------------------------|-------------|---------|------|-----------|
|  | Chip Trimmer Capacitor | Document No | Rev. No | Page | Rev. Date |
| | | STC3M-SP-08 | 3.6 | 13 | 28-Dec-09 |

-CONTENTS-

- 1. SCOPE**
- 2. PART NUMBERING & APPLICATION**
- 3. DIMENSIONS, PCB LAND PATTERNS & PACKING METHO**
- 4. CHARACTERISTICS**
 - 4.1. Electrical Specifications Table
 - 4.2. Mechanical Specifications Table
 - 4.3. Environmental Specifications Table
- 5. TEST CONDITION**
 - 5.1 Normal Test Condition
 - 5.2 Standard Test Condition
- 6. TEST METHOD**
 - 6.1. Capacitance
 - 6.2. Capacitance Drift
 - 6.3. "Q" Factor
 - 6.4. Insulation Resistance
 - 6.5. Rated Voltage
 - 6.6. Rotation Torque
 - 6.7. Rotation Life
 - 6.8. Temperature coefficient
 - 6.9. Vibration Test
 - 6.10. Free Drop
 - 6.11. Solderability
 - 6.12. High Temperature Test
 - 6.13. Resistance to soldering heat
 - 6.14. Humidity Heat Test
 - 6.15. Low Temperature Test
 - 6.16. Cleaning Test
 - 6.17. Submersion Test
- 7. PACKING AND REEL DIMENSION**
- 8. CAUTIONS**

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| | | | | | |
|---|-------------------------------|-------------|---------|------|-----------|
|  | Chip Trimmer Capacitor | Document No | Rev. No | Page | Rev. Date |
| | | STC3M-SP-08 | 3.6 | 13 | 28-Dec-09 |

4. CHARACTERISTICS

4.1 Electrical Specifications Table

[TABLE-1]

| Item | STC3MA04 4pf | STC3MA06 6pf | STC3MB10 10pf | STC3MD20 20pf | STC3ME20 20pf | STC3ME30 30pf |
|---|---|------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| | Black | Blue | Ivory | Pink | Pink | Green |
| Capacitance (pF Min) | 1.8 max | 2.0 max | 3.0 max | 5.5 max | 5.5 max | 8.0 max |
| Capacitance (pF Max) | 4.5 ⁺⁵⁰ ₋₀ % | 6.0 ⁺⁵⁰ ₋₀ % | 10.0 ⁺⁵⁰ ₋₀ % | 20.0 ⁺⁵⁰ ₋₀ % | 20.0 ⁺⁵⁰ ₋₀ % | 30.0 ⁺⁵⁰ ₋₀ % |
| Capacitance Drift (Max) | ± 2% | ± 2% | ± 2% | ± 3% | ± 3% | ± 3% |
| Temperature Coefficient (ppm / °C) | NP0±300 | NP0±200 | N600±400 | N900±400 | N1200±300 | N1200±300 |
| Q ȳ (at 1 MHz, C max) | 500 Min | 500 Min | 700 Min | 500 Min | 300 Min | 300 Min |
| Insulation Resistance | 10 ⁴ MȳMin | 10 ⁴ MȳMin | 10 ⁴ MȳMin | 10 ⁴ MȳMin | 10 ⁴ MȳMin | 10 ⁴ MȳMin |
| DC Rated Voltage | 100 VDC | 100 VDC | 100 VDC | 100 VDC | 100 VDC | 100 VDC |
| DC Withstanding Voltage | 220 VDC | 220 VDC | 220 VDC | 220 VDC | 220 VDC | 220 VDC |
| Rotation Torque | 15 ~ 72 gf.cm | | | | | |
| Solderability | More than 75% of soldering wetting area shall be continuously wet with solder | | | | | |

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4.2 Mechanical Specifications Table

[TABLE-2]

| Item | STC3MA04 4pf | STC3MA06 6pf | STC3MB10 10pf | STC3MD20 20pf | STC3ME30 30pf | REMARK |
|--|--------------------------|-----------------|------------------|------------------|------------------|--------|
| | Capacitance Change Ratio | | | | | |
| Resistance to Soldering heat TEST METHOD 6-13 | ±2% | ±2% | ±2% | ± 3% | ± 4% | |
| Vibration TEST METHOD 6-9 | ±2% | ±2% | ±2% | ± 3% | ± 3% | |
| Free Drop TEST METHOD 6-10 | ± 2% | ± 2% | ± 2% | ± 3% | ± 3% | |
| Rotation Life TEST METHOD 6-7 | ±3% | ±3% | ±4% | ±6% | ±10% | |
| Operating Temperature | - 25 °C to 85 °C | | | | | |

| Item | Resistance to Soldering heat TEST METHOD 6-13 | Vibration TEST METHOD 6-9 | Free Drop TEST METHOD 6-10 | Rotation Life TEST METHOD 6-7 |
|-----------------|--|------------------------------|-------------------------------|----------------------------------|
| Rotation Torque | 15 gf.cm (Min) | 15 ~ 72 gf.cm | 15 ~ 72 gf.cm | 15 ~ 72 gf.cm |

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|---|-------------------------------|-------------|---------|------|-----------|
|  | Chip Trimmer Capacitor | Document No | Rev. No | Page | Rev. Date |
| | | STC3M-SP-08 | 3.6 | 13 | 28-Dec-09 |

4.3 Environmental Specifications Table

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[TABLE-3]

| High TempTest (Test Method 6-12) | | | | | | |
|----------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------|
| Item | 4pf | 6pf | 10pf | 20pf | 30pf | REMARK |
| Cap' Change (%) | ± 2% | ± 2% | ±3% | ± 3% | ± 3% | |
| Min Q Value | 500 Min | 500 Min | 700 Min | 500 Min | 300 Min | |
| Insulation resistance | 10 ⁴ Min | 10 ⁴ Min | 10 ⁴ Min | 10 ⁴ Min | 10 ⁴ Min | |

| Humidity Test (Test Method 6-14) | | | | | | |
|----------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------|
| Item | 4pf | 6pf | 10pf | 20pf | 30pf | REMARK |
| Cap' Change (%) | ±2% | ±2% | ±3% | ±5% | ±5% | |
| Min Q Value | 300 Min | 400 Min | 500 Min | 400 Min | 200 Min | |
| Insulation resistance | 10 ⁴ Min | 10 ⁴ Min | 10 ⁴ Min | 10 ⁴ Min | 10 ⁴ Min | |

| Low Temp Test (Test Method 6-15) | | | | | | |
|----------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------|
| Item | 4pf | 6pf | 10pf | 20pf | 30pf | REMARK |
| Cap' Change (%) | ± 2% | ± 2% | ±3% | ± 3% | ± 3% | |
| Min Q Value | 500 Min | 500 Min | 700 Min | 500 Min | 300 Min | |
| Insulation resistance | 10 ⁴ Min | 10 ⁴ Min | 10 ⁴ Min | 10 ⁴ Min | 10 ⁴ Min | |

| Cleaning Test (Test Method 6-16) | | | | | | |
|----------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------|
| Item | 4pf | 6pf | 10pf | 20pf | 30pf | REMARK |
| Cap' Change (%) | ± 2% | ± 2% | ±3% | ± 3% | ± 3% | |
| Min Q Value | 500 Min | 500 Min | 700 Min | 500 Min | 300 Min | |
| Insulation resistance | 10 ⁴ Min | 10 ⁴ Min | 10 ⁴ Min | 10 ⁴ Min | 10 ⁴ Min | |

| Submersion Test (Test Method 6-17) | | | | | | |
|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------|
| Item | 3pf | 6pf | 10pf | 20pf | 30pf | REMARK |
| Cap' Change (%) | ± 2% | ± 2% | ± 2% | ± 3% | ± 3% | |
| Min Q Value | 300 Min | 400 Min | 500 Min | 400 Min | 200 Min | |
| Insulation resistance | 10 ⁴ Min | 10 ⁴ Min | 10 ⁴ Min | 10 ⁴ Min | 10 ⁴ Min | |

| | | | | | |
|---|-------------------------------|-------------|---------|------|-----------|
|  | Chip Trimmer Capacitor | Document No | Rev. No | Page | Rev. Date |
| | | STC3M-SP-08 | 3.6 | 13 | 28-Dec-09 |

5. TEST CONDITION

5.1 Normal Test Condition

Unless otherwise specified, test and measurement shall be performed under the standard condition:

- Ordinary temperature : 15 ~ 30 °C
- Humidity : Relative humidity 45 ~ 85 %

5.2 Standard Test Condition

If there is any doubts arise about the results, measurements shall be made under the following condi

- Ordinary temperature : 20 ± 2 °C
- Humidity : Relative humidity 65 ± 5 %

6. TEST METHOD

6.1. Capacitance

When measured at a frequency of 1.0±0.2MHz, Minimum capacitance shall not be greater than specified, and Maximum capacitance shall not be less than the specified maximum capacitance.

6.2. Capacitance Drift

The capacitor shall be measured at the maximum capacitance position with test frequency of 1.0±0.2MHz. (Rotate the rotor at the sped of 10r/min. by one direction.)
After then set the initial value in 5seconds and leave it for 120±20 minutes.

6.3. “Q” Factor

The capacitor shall be measured at the maximum capacitance position with test frequency of 1.0±0.2MHz. (Measurement voltage is 1V±0.1Vrms)

6.4. Insulation Resistance

Insulation resistance shall be measured at the Maximum capacitance position with 300V voltage.
The charge time is 60±5sec.

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| | | | | | |
|---|-------------------------------|-------------|---------|------|-----------|
|  | Chip Trimmer Capacitor | Document No | Rev. No | Page | Rev. Date |
| | | STC3M-SP-08 | 3.6 | 13 | 28-Dec-09 |

6.5. Rated Voltage

The capacitor shall be measured at the maximum capacitance position.

Measurement voltage is DC 150V for 1 hours.

No short, damage or deterioration shall be found after finishing the test.

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6.6. Rotation Torque

The rotor shall be turned 360° clockwise and counter-clockwise before measurement.

Rotate the rotor at the speed “10 round/min”, clockwise and counter-clockwise while the test the torque shall be measured.

6.7. Rotation Life

The capacitor shall be measured at the maximum capacitance position.

Rotate the rotor 180° clockwise and turn it back. And then rotate the rotor 180° counter clockwise and turn it back to original position. This is one cycle.

After repeating 60cycle, measure the capacitance. (Rotation speed is “10 round/min”)

6.8. Temperature coefficient

Capacitance adjust measurement at 80 ~ 90 percent of maximum rated capacitance shall be made at the temperatures specified in the [Table-1] and the capacitance shall be made after the capacitor has reached thermal stability.

[Table-1]

| Step | 1 | 2 | 3 | 4 | 5 |
|----------|-------|--------|-------|-------|-------|
| Sequence | 20±2℃ | -25±2℃ | 20±2℃ | 85±3℃ | 20±2℃ |

The temperature coefficient shall be calculated in accordance with the following formula

$$TC = \frac{(C2 - C1)}{(T2 - T1)} \cdot 10^6$$

TC : Temperature coefficient(ppm/℃) in temperature T2
 C1 : Initial capacitance value(pF) at step 3.
 C2 : Capacitance(pF) at specified temperature.
 T1 : 25℃ (step 3)
 T2 : Test temperature (step 3 or 4)

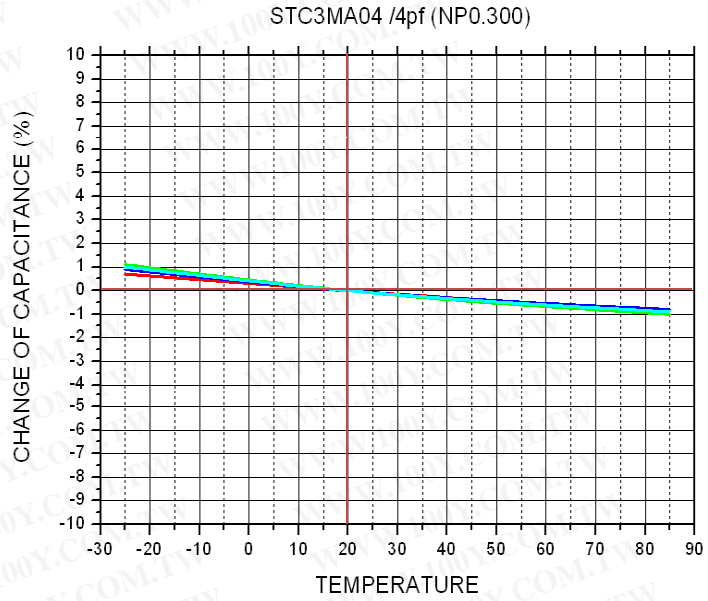
Capacitance-change shall be within the limits that of specified in [Table-1] & [figure-1]

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|---|-------------------------------|-------------|---------|------|-----------|
|  | Chip Trimmer Capacitor | Document No | Rev. No | Page | Rev. Date |
| | | STC3M-SP-08 | 3.6 | 13 | 28-Dec-09 |

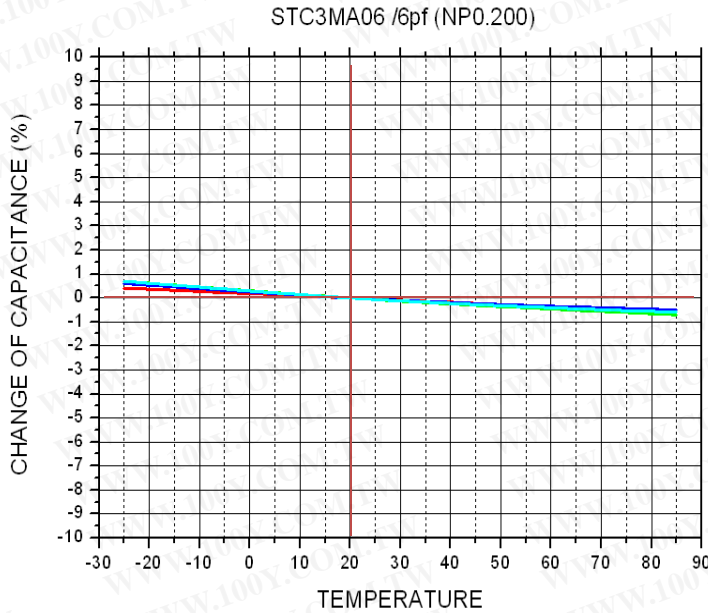
[Figure-1]

*** Temperature characteristics**

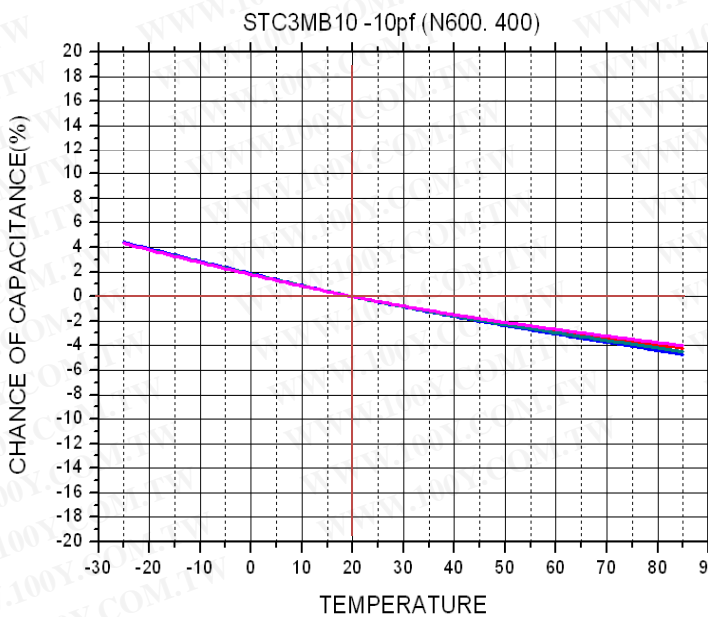
***STC3MA04- 4pf CURVE**



***STC3MA06- 6pf CURVE**



***STC3MB10- 10pf CURVE**

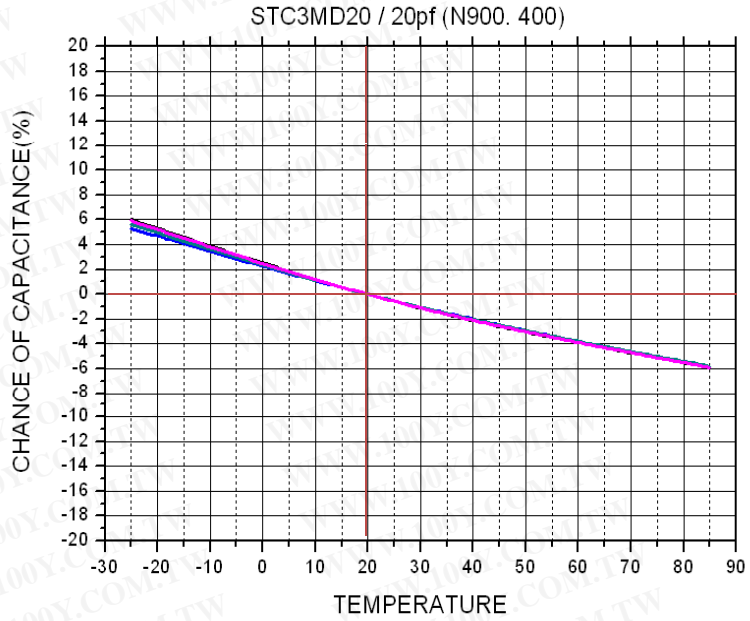


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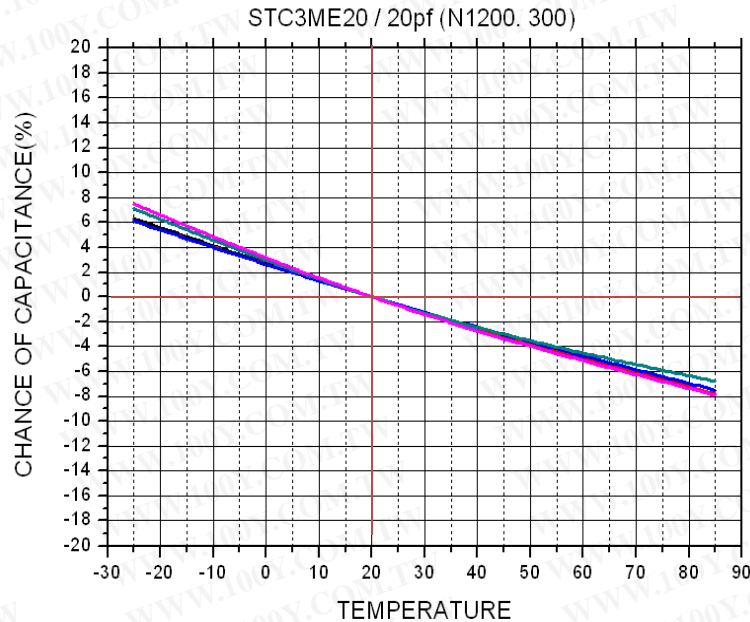
[Figure-1]

*** Temperature characteristics:**

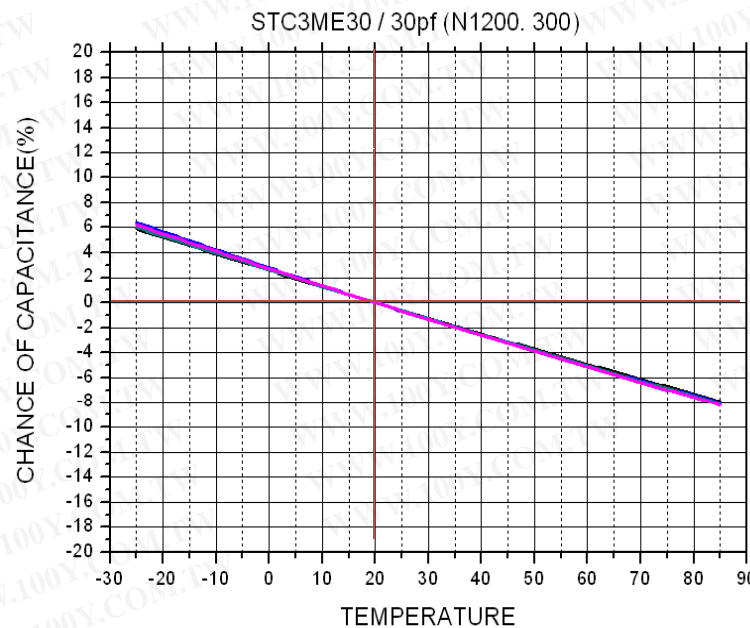
***STC3MD20- 20pf CURVE**



***STC3ME20- 20pf CURVE**



***STC3ME30- 30pf CURVE**



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| | | | | | |
|---|-------------------------------|-------------|---------|------|-----------|
|  | Chip Trimmer Capacitor | Document No | Rev. No | Page | Rev. Date |
| | | STC3M-SP-08 | 3.6 | 13 | 28-Dec-09 |

6.9. Vibration Test

The capacitor shall be measured at the maximum capacitance position.

The capacitor shall be kept under the condition of the full amplitude of 1.8mm for 2hours. (120 cycle

Test is performed under Traverse method: 1cycle = 1 minute, 10Hz(Start) ~ 50Hz ~ 10Hz(End)

6.10. Free Drop

The capacitor shall be measured at the maximum capacitance position.

The samples shall be attached on 50g jig. And then drop it onto wood board from 1.2m height

3times in each mutually perpendicular direction. Total 9 times.

6.11. Solderability

Dip the terminal in the solder bath set at the solder temperature $230 \pm 5^\circ\text{C}$ for $3 \pm 1\text{sec}$.

The terminal shall be dipped more than 75% of portion.

Solder: 3C05, 5A35 (sn-ag)

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6.12. High Temperature Test

The capacitor shall be measured at the maximum capacitance position.

The chamber temperature shall be kept $85 \pm 3^\circ\text{C}$. Keep the sample capacitor in the chamber for

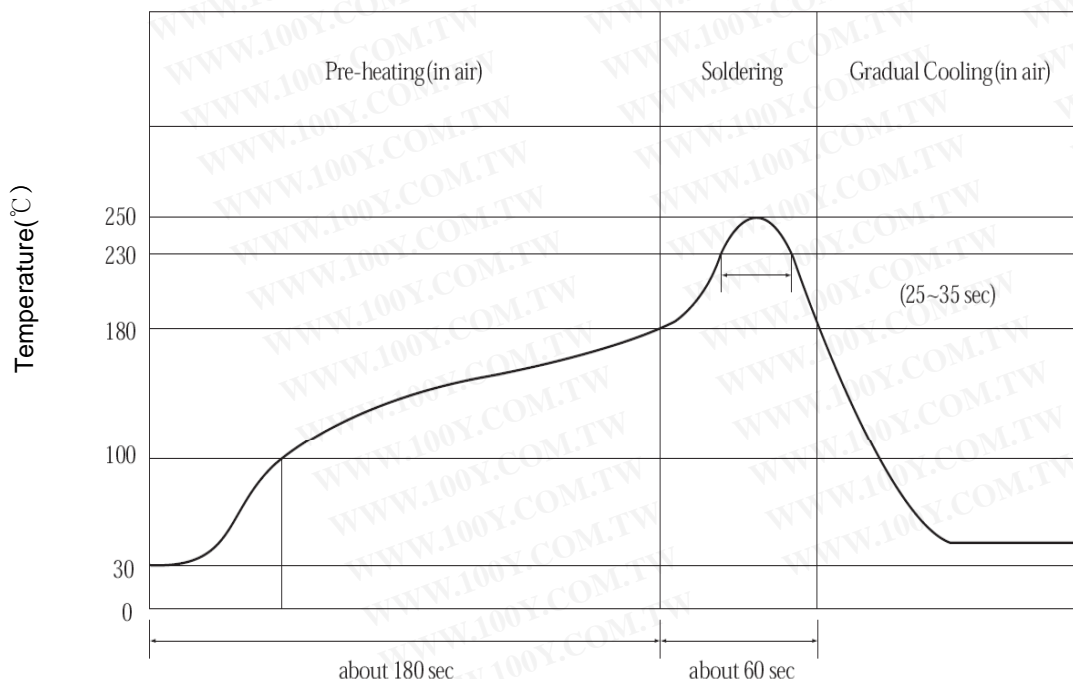
72 ± 2 hours. After then, keep the sample capacitor in normal condition for 2hours before measure

6.13. Resistance to soldering heat

The capacitor shall be measured at the maximum capacitance position. Do the reflow of [Figure-2].

After then, keep the capacitor in "NORMAL TEST CONDITION" for 2hours before measure it.

[Figure-2]



| | | | | | |
|---|-------------------------------|-------------|---------|------|-----------|
|  | Chip Trimmer Capacitor | Document No | Rev. No | Page | Rev. Date |
| | | STC3M-SP-08 | 3.6 | 13 | 28-Dec-09 |

6.14. Humidity Heat Test

The capacitor shall be measured at the maximum capacitance position.

The chamber temperature shall be kept $40\pm 2^{\circ}\text{C}$ with 90~95% RH.

Keep the sample capacitor in the chamber for 72 ± 4 hours.

After then, keep the sample capacitor in normal condition for 2hours before measure it.

6.15. Low Temperature Test

The capacitor shall be measured at the maximum capacitance position.

The chamber temperature shall be kept $-25\pm 3^{\circ}\text{C}$. Keep the sample capacitor in the chamber for

72 ± 2 hours. After then, keep the sample capacitor in normal condition for 2hours before measure

6.16. Cleaning Test

The capacitor shall be set approximately maximum capacitance position.

Put the capacitor in toluene, and washer for 20 min

Put the capacitor at the normal condition for drying for 1 hour for measurement.

6.17. Submersion Test

The capacitor shall be set approximately maximum capacitance position.

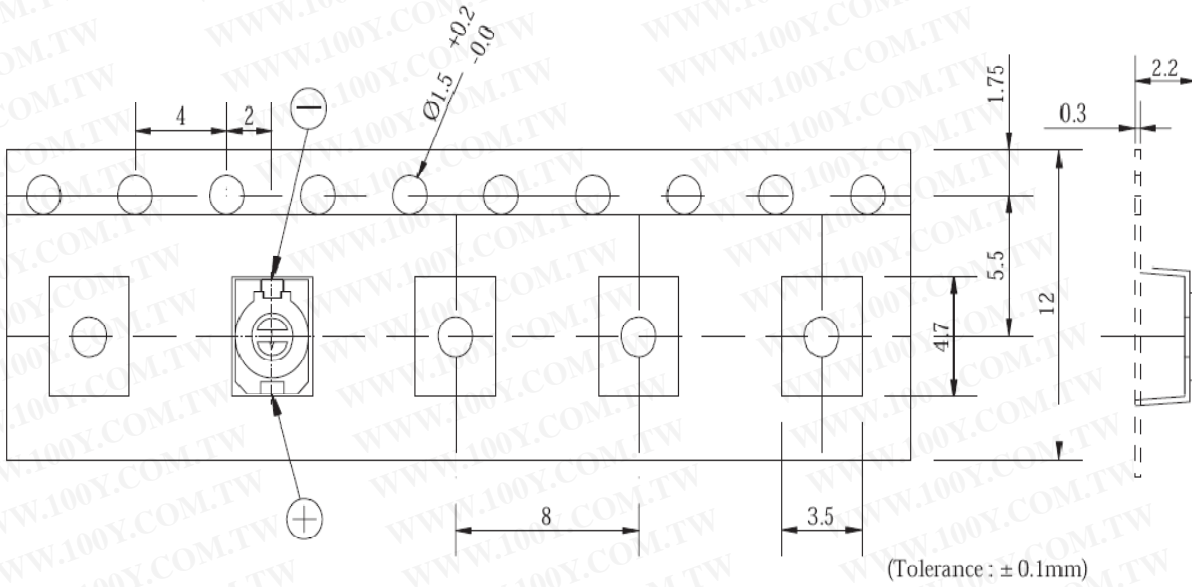
Put the capacitor in water for 1 Hour.

Put the capacitor at the normal condition for drying for 2 hour for measurement.

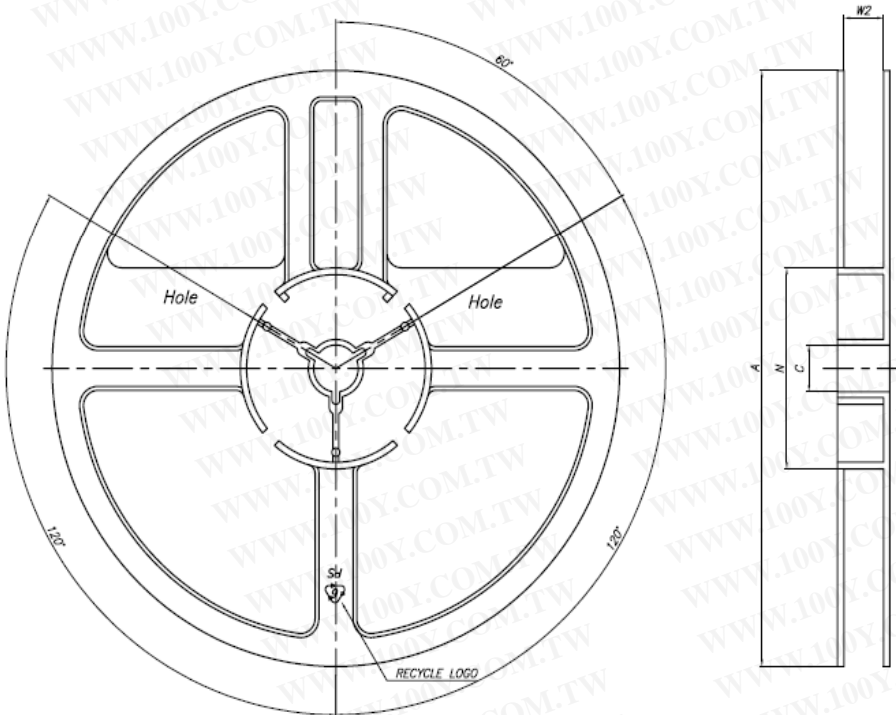
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7. PACKING AND REEL DIMENSION

*TAPING SEPCIFICATION

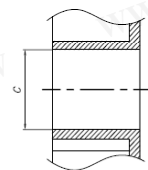
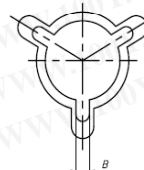


*REEL DIMENSION



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| PartNo | A | B | C | N | W2 |
|---------|--|----------|---------------------------------------|---------------------------------------|---------------------------------------|
| 7"-12mm | 178.00 ^{+0.0} _{-2.0} | 2.00±0.5 | 13.00 ^{+0.5} _{-0.2} | 60.00 ^{+2.0} _{-0.0} | 12.40 ^{+2.0} _{-0.0} |



Detail of Pin Hole
 (Scale:2/1)

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|---|-------------------------------|-------------|---------|------|-----------|
|  | Chip Trimmer Capacitor | Document No | Rev. No | Page | Rev. Date |
| | | STC3M-SP-08 | 3.6 | 13 | 28-Dec-09 |

8. CAUTIONS

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Adjustment :

- 1) Maximum pressure of screwdriver should be less than 100g.f
High pressure can lead to extensive setting drift or damage to internal elements.
- 2) Use recommended screwdriver. VESSEL 9000, or the tip of screwdriver shall be insulated such as ceramic.
If a screwdriver is not suitable for trimmer capacitor, it can lead function failure or spoil or degrade the characteristics
- 3) After removing from the reflow soldering, cool it down at the room temperature at least 4 hrs. If down time is insufficient, capacitance drift can be larger due to expansion and shrinkage caused by the heat of resin used for the product, and thermal characteristics of dielectric ceramic.

Soldering :

- 1) Please refer recommended solder profile [Figure-2]. If the soldering conditions are not suitable, trimmer capacitor may deviate from the specified performances characteristic.
- 2) Please use proper amount of Solder. The amount of solder is critical. Insufficient amounts of solder can lead to insufficient soldering strength on the PCB. Excessive amounts of solder may cause bridging between the terminals or the contact failure due to flux invasion into the moveable part and contact area. Flux invasion can cause the degrading of products characteristics.
- 3) Do not touch a trimmer capacitor body and terminal directly by a soldering iron. If soldering iron contacts it, the trimmer capacitor may be seriously damaged.
- 4) Do not use flow-soldering (dipping soldering).
- 5) Do not use inappropriate adhesives, such as bond and instant glue.
It might penetrate into trimmer cap.
- 6) When SEHWA recommended land-pattern is not used, please check mounting alignment

Store :

- 1) It is recommended to use within 6 months after delivery.
- 2) Components should be stored under temperature of -10~40℃ and Humidity of 30~70% RH.
- 3) Do not store the trimmer capacitor in corrosive condition.
- 4) Do not open the package until just prior to using
- 5) Do not store under direct sunlight or dewy environment.

Others :

- 1) Before using trimmer capacitors, please test and make prototype product after assembly in your particular mass productions line.
- 2) Do not warp and / or bend PCB to prevent trimmer capacitor from breakage.
- 3) Do not use locking paint or any substance to secure the rotor position.