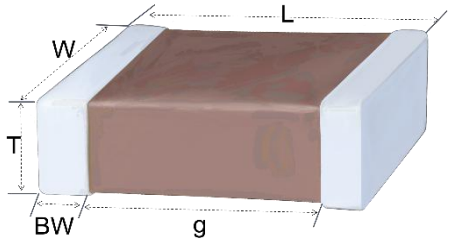
■①Product model & Features
General purpose "Commerical Grade" --General

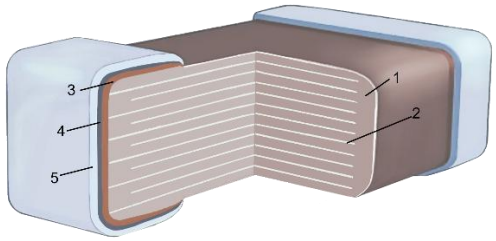
■Coding principle

CSA	1206	X5R	106	K	500	N	T
①Series	②Dimension L*W	③Temperature Characteristics	④Capacitance	⑤Capacitance Tolerance	⑥Rate Voltage	⑦Dimension T	⑧Package

■Dimension specification



■Material



■Size：(mm)

②Length	②Width	⑦Thickness	BW	g
3.20±0.30	1.60±0.30	1.60±0.30	0.30-0.80	1.5

No.	Name
1	Ceramic medium
2	Inner electrode (nickel)
3	Outer electrode (copper)
4	Nickel layer
5	Tin layer

■Rating

③Temperature Characteristics		④Capacitance	⑤Capacitance Tolerance	⑥Rate Voltage
Temp. Range	Cap. Change			
-55℃ to 85℃	±15%	10uF	±10%	50Vdc

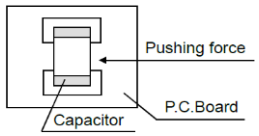
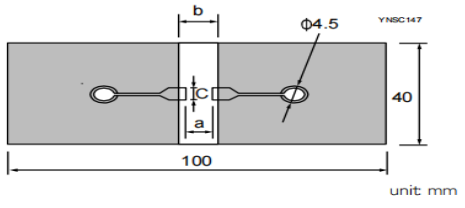
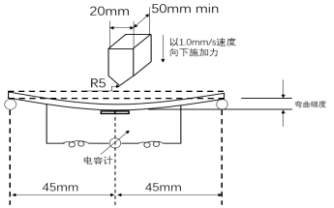
■Packing

·	Packing method	Number(piece)
T	φ180mm 卷筒__Plastic(塑帶)	2,000

■ **Specifications and test methods**

<table>
<tr><th>No</th><th>Item</th><th>Specification</th><th>Test Method(Ref. Standard:JIS C 5101, IEC60384)</th></tr>
<tr><td>1</td><td>Appearance</td><td>No defects or abnormalities.</td><td>Inspect the product visually (microscopically).</td></tr>
<tr><td>2</td><td>Dimension</td><td>Conform to specifications.</td><td>Using Measuring instrument of dimension.</td></tr>
<tr><td>3</td><td>Voltage proof</td><td>Withstand test voltage without defect or abnormality.</td><td>
<table>
<tr><th colspan="2">Material</th><th>Rate Voltage(RV)</th><th>Test Voltage</th></tr>
<tr><td rowspan="4">Class Ⅰ</td><td rowspan="4">C0G/M3L</td><td>RV≤50V</td><td>300% RV</td></tr>
<tr><td>50V＜RV≤250V</td><td>200% RV</td></tr>
<tr><td>250V＜RV≤500V</td><td>150% RV</td></tr>
<tr><td>500V＜RV≤1000V</td><td>130% RV</td></tr>
<tr><td rowspan="4">ClassⅡ</td><td rowspan="4">X7R/X7S
X5R/X6S</td><td>RV≤50V</td><td>250% RV</td></tr>
<tr><td>50V＜RV≤250V</td><td>200% RV</td></tr>
<tr><td>250V＜RV≤630V</td><td>150% RV</td></tr>
<tr><td>630V＜RV≤1000V</td><td>120% RV</td></tr>
</table>
Applied Time: 1s to 5s
Charge/discharge current: 50mA max</td></tr>
<tr><td>4</td><td>Insulation Resistance(I.R.)</td><td>X5R 10 MΩ</td><td>Test Temperature: 25℃
Test Point: Between the terminations
Test Voltage: IF≤500V: Rate Voltage
IF＞500V: 500V
Charging Time: 1 min
Charge/discharge current: 50mA max</td></tr>
<tr><td>5</td><td>Capacitance</td><td>±10%</td><td rowspan="2">Test Temperature: 25℃
Test Frequency/Voltage: 1.0±0.1KHz, 1.0±0.2Vrms</td></tr>
<tr><td>6</td><td>Q or Dissipation Factor (D.F.)</td><td>10.0%</td></tr>
</table>

■ **Specifications and test methods**

<table>
<tr><td>7</td><td>Temperature Characteristics of Capacitance</td><td>X5R ±15%</td><td>The capacitance change should be measured after 5 min at each specified temp. stage.
After reaching thermal equilibrium at each step, measure capacitance as shown in the following table.
<table><tr><td>Step</td><td>Temperature</td></tr><tr><td>1</td><td>Reference Temp.: 25±2℃</td></tr><tr><td>2</td><td>Minimum operating Temp.: ±3℃</td></tr><tr><td>3</td><td>Reference Temp.: 25±2℃</td></tr><tr><td>4</td><td>Maximum operating Temp.: ±2℃</td></tr><tr><td>5</td><td>Reference Temp.: 25±2℃</td></tr></table></td></tr>
<tr><td>8</td><td>Adhesive Strength of Termination</td><td>No removal of the terminations or other defect should occur.</td><td>Mounting method: Solder the capacitor on the test substrate
Applied Force: 5N (0402:2.5N 0201:1N M3L:6N)
Holding Time: 10±1s
Applied Direction: Thrust is gradually applied in the center of the specimen along the horizontal direction of the P.C. plate.
  </td></tr>
<tr><td>9</td><td>Board Flex</td><td>Appearance No defects or abnormalities.
Cap. Change ±12.5%</td><td>Mounting method
Reflow solder the capacitor on the test substrate and bend 1mm
 
  </td></tr>
<tr><td>10</td><td>Solderability</td><td>95% of the terminations is to be soldered evenly and continuously.</td><td>Kind of Solder: Sn-3.0Ag-0.5Cu(Lead Free Solder)
Scaling powder : Isopropyl alcohol Rosin 25% solid solution.
Solder Temperature: 245±5°C
Test Time : 2±0.5s.
Solder position: Until both ends are completely wet</td></tr>
</table>

■ **Specifications and test methods**

<table>
<tr>
<td>11</td>
<td>Resistance to Soldering Heat</td>
<td>Appearance
Cap. Change
Q or D.F.
I.R.
Voltage Proof</td>
<td>No defects or abnormalities
C0G/M3L Within±2.5% or ±0.25pF(Which is larger)
X7R/X5R/X6S：±7.5%
Within the specified initial value
Within the specified initial value
Within the specified initial value</td>
<td>Pre-treatment：
Test Method：
Kind of Solder：
Test Temp.:
Test Time：
Preheat Temp.：
Preheat Time：
Post-treatment</td>
<td>Heat treatment:Perform a heat treatment at 150+0/-10°C for 1hour and then let sit for 24+/-2hours at room temperature, then measure.
Solder bath method
Sn-3.0Ag-0.5Cu(Lead Free Solder)
260±5℃
10±1s
110℃ to 140℃
1min
Non treatment:Let sit for 24+/-2hours at room temperature, then measure.</td>
</tr>
<tr>
<td>12</td>
<td>Temperature Cycle</td>
<td>Appearance
Cap. Change
Q or D.F.
I.R.
Voltage Proof</td>
<td>No defects or abnormalities
C0G/M3L Within±2.5% or ±0.25pF(Which is larger)
X7R/X5R/X6S：±7.5%
Within the specified initial value
Within the specified initial value
Within the specified initial value</td>
<td>Mounting method：
Pre-treatment：
Temperature Cycles：

Post-treatment：</td>
<td>Solder the capacitor on the test substrate
Heat treatment:Perform a heat treatment at 150+0/-10°C for 1hour and then let sit for 24+/-2hours at room temperature, then measure.
5 Cycles
<table><tr><th>Step</th><th>Temperature</th><th>Time</th></tr><tr><td>1</td><td>Minimum Temp.：±3℃</td><td>30±3 min</td></tr><tr><td>2</td><td>Room temperature</td><td>2~5 min</td></tr><tr><td>3</td><td>Maximum Temp.：±3℃</td><td>30±3 min</td></tr><tr><td>4</td><td>Room temperature</td><td>2~5 min</td></tr></table>
Non treatment:Let sit for 24+/-2hours at room temperature, then measure.</td>
</tr>
</table>

■ **Specifications and test methods**

13	High Temperature High Humidity	Appearance Cap. Change Q or D.F. I.R.	No defects or abnormalities. ±12.5% less than 2 x specified value 500MΩ or 25 Ω·F	Mounting method Pre-treatment: TestTemperature Test Humidity: Test Time: Test Voltage: Charge/discharge current: Voltage regulation "After voltage treatment of the capacitor at test temperature and voltage for 1 hour", place the electrical vessel under ambient conditions for 24±2 hours prior to measurement, using this measurement as the initial value.	Solder the capacitor on the test substrate Heat treatment:Perform a heat treatment at 150+0/-10°C for 1hour and then let sit for 24+/-2hours at room temperature, then measure. 40±2℃ 90%RH to 95%RH 500±24h Rate Voltage（Not more than 630V） 50mA max
14	Life	Appearance Cap. Change Q or D.F. I.R.	No defects or abnormalities. ±12.5% less than 2 x specified value 1,000MΩ or 50 Ω·F	Mounting method Pre-treatment: TestTemperature Test Time Test Voltage Charge/discharge current: Voltage regulation "After voltage treatment of the capacitor at test temperature and voltage for 1 hour", place the electrical vessel under ambient conditions for 24±2 hours prior to measurement, using this measurement as the initial value.	Solder the capacitor on the test substrate Heat treatment:Apply the test voltage at the test temperature for 1hour and then let sit for 24+/-2hours at room temperature, then measure. Max. Operating Temp.:±3℃ 1000±12h 100% R.V. 50mA MAX

Product Packaging

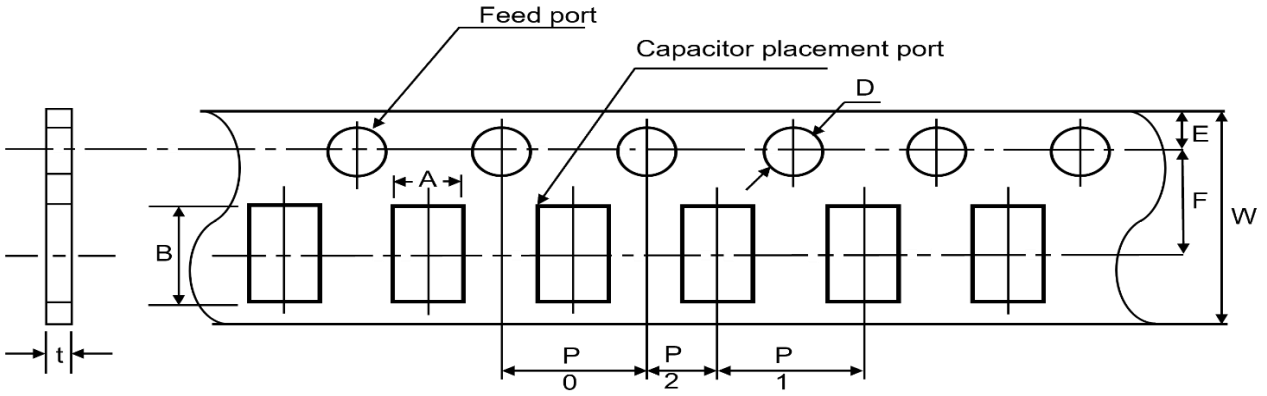
At present, the most common way of packaging is to carry coil packaging. A coil with a diameter of 180mm (7") can contain 1000~20000 capacitors, or coil packaging can be carried out according to customer requirements.

1. Packing quantity

Specification	Size (mm)			Packing (7 “)	
	Length	Width	Thickness	Number(piece)	Method
01005	0.40	0.20	0.20	20,000	Paper tape
0201	0.60	0.30	0.30	15,000	Paper tape
0402	1.00	0.50	0.50	10,000	Paper tape
0603	1.60	0.80	0.80	4,000	Paper tape
0805	2.00	1.25	0.60	4,000	Paper tape
			0.85	4,000	Paper tape
			1.25	3,000	Plastic tape
1206	3.20	1.60	0.85	4,000	Paper tape
			1.25	3,000	Plastic tape
			1.60	2,000	Plastic tape
1210	3.20	2.50	1.25	2,000	Plastic tape
			1.60	2,000	Plastic tape
			2.00	1,000	Plastic tape
			2.50	1,000	Plastic tape

2. Tape Size

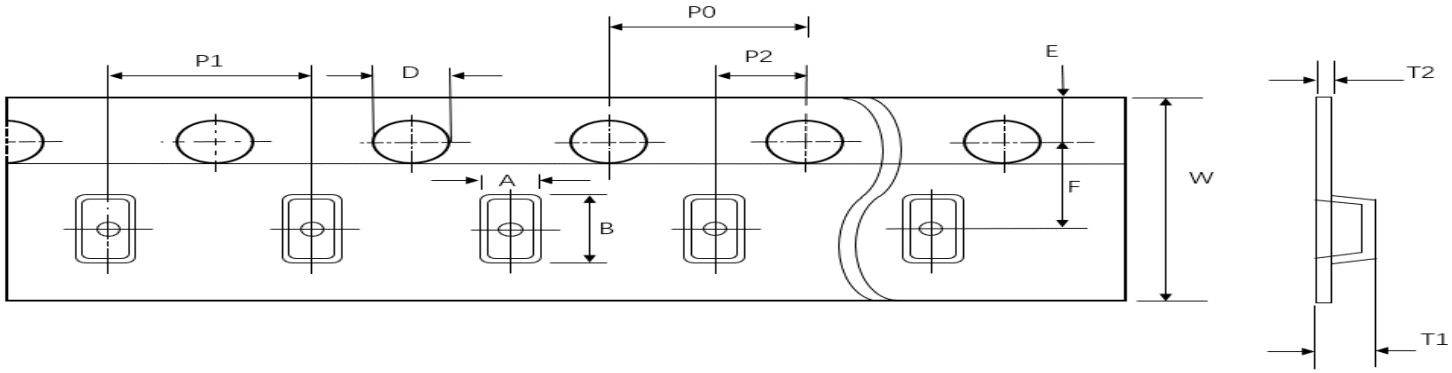
■ **Specifications and test methods**



	01005 (0402)	0201 (0603)	0402 (1005)	0603 (1608)	0805 (2012)	1206 (3216)
P1	2.00±0.05(1.0 ±0.05)			4.00±0.10		
P0	4.00±0.10			4.00±0.10		
P2	2.00±0.05			2.00±0.05		
A	0.25±0.02	0.38±0.03	0.62±0.05	1.00±0.01	1.55±0.10	2.05±0.10
B	0.46±0.02	0.68±0.03	1.12±0.05	1.90±0.10	2.30±0.10	3.60±0.10
W	8.00±0.30			8.00±0.30		
E	1.75±0.10			1.75±0.10		
F	3.50±0.05			3.50±0.05		
D	φ1.50+0.10/-0.03			φ1.50+0.10/-0		
t	0.25±0.02	0.35±0.03	0.60±0.05	1.1Below		

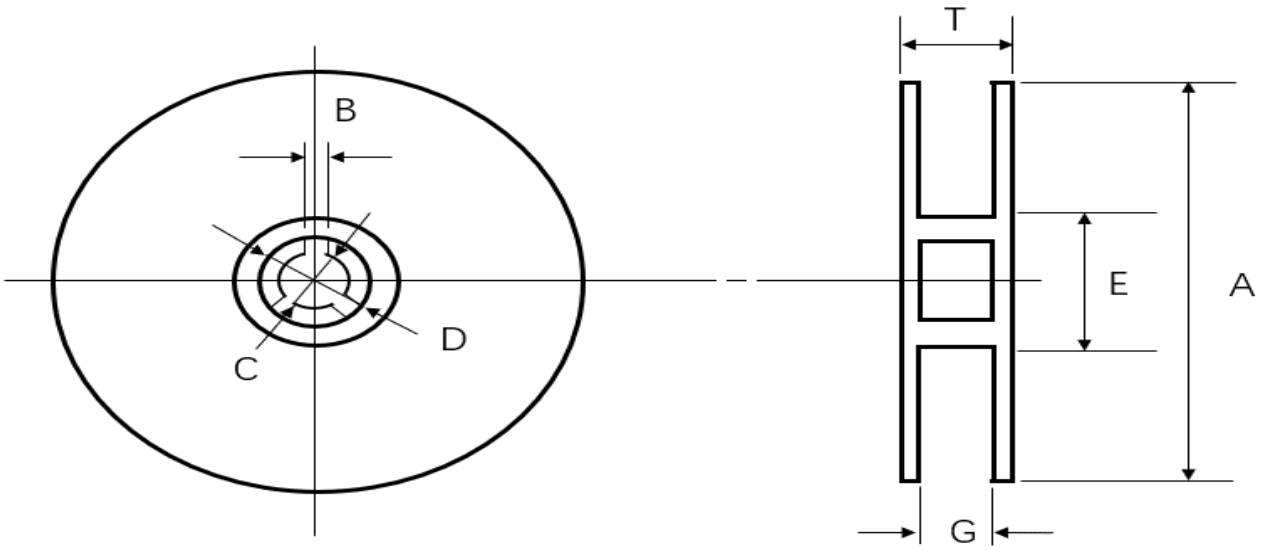
3.Plastic Size

■ **Specifications and test methods**



	0603 (1608)	0805 (2012)	1206 (3216)	1210 (3225)
P1	4±0.1	4±0.1	4±0.1	4±0.1
P0	4±0.1	4±0.1	4±0.1	4±0.1
P2	2±0.05	2±0.05	2±0.05	2±0.05
A	1.2±0.2	1.45±0.2	1.9±0.2	2.8±0.2
B	2.0±0.2	2.3±0.2	3.5±0.2	3.6±0.2
W	8±0.3	8±0.2	8±0.2	8±0.2
E	1.75±0.1	1.75±0.1	1.75±0.1	1.75±0.1
F	3.5±0.05	3.5±0.05	3.5±0.05	3.5±0.05
D	1.5 (+0.1/-0.0)	1.5 (+0.1/-0.0)	1.5 (+0.1/-0.0)	1.5 (+0.1/-0.0)
T1	1.4 max	2.5 max.	2.5 max.	2.5 max.
T2	0.25±0.1	0.305±0.1	0.30±0.1	0.30±0.1

4. Disk Size



Disk Size	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	G (mm)	T (mm)
7″Reel	Φ178±2.0	2.0±0.5	Φ13±1.0	Φ21±0.8	Φ50 or more	10±1.0	13±1.0

5. Packing method and specification

Under normal circumstances, the material tray with Φ180mm (7") is used for packaging. Every 5 disks are packaged into a box, and every 12 boxes are a whole box.

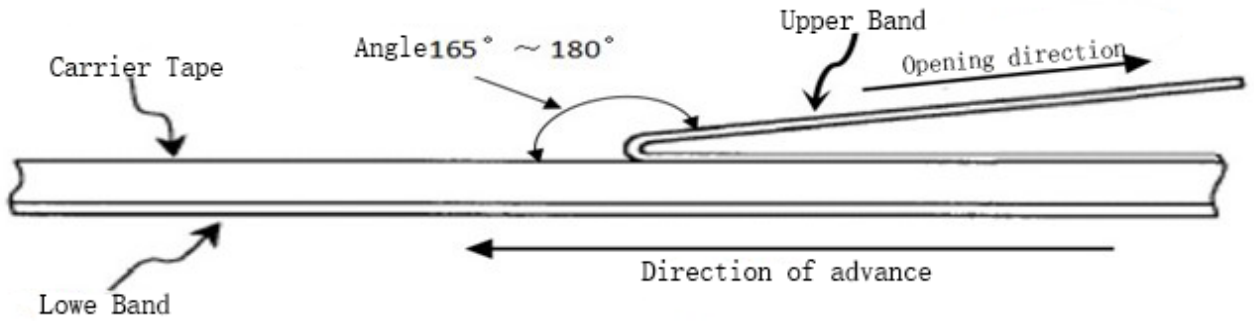
Size	Carrier tape	Tray size	disk/Box	box/Carton

■ **Specifications and test methods**

01005	Paper tape	7"	5	12
0201	Paper tape	7"	5	12
0402	Paper tape	7"	5	12
0603	Paper tape	7"	5	12
0805	Paper tape/Plastic tape	7"	5	12
1206	Paper tape/Plastic tape	7"	5	12
1210	Plastic tape	7"	5	12

6. Instructions for use of reel tape

When the finished product is in use, the upper band (film) is at a speed of 300±10mm/min, an Angle of 165° ~ 180° (as shown below), and the peeling strength is 0.1N ~ 0.7N (10g.f≤ peeling force ≤ 70g.f).



Limitation of Applications

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property.

①Aircraft equipment ②Aerospace equipment ③Undersea equipment ④Power plant control equipment
⑤Medical equipment ⑥Transportation equipment(vehicles,trains,ships,etc.) ⑦Traffic signal equipment
⑧Disaster prevention / crime prevention equipment ⑨Data-processing equipment ⑩Application of similar complexity and/or reliability requirements to the applications listed in the above

Methods of transportation and storage

1.Transportation:

Packaged products suitable for modern transportation, in the process of transportation to prevent rain and acid and alkali corrosion, gravity throwing and force extrusion.

2.Storage:

The storage period to ensure good weldability of the product is: the storage period is two years from the date of production, do not open the braid before use (in the case of packaging has been delivered), after opening the braid, the product should be used within three months.

Storage temperature:	5℃~40℃
Storage relative humidity:	10%~75%
Environment:	free from harmful chemicals
Packaging:	Core sound original packaging
Solar radiation:	700 W/m2, should avoid direct light source irradiation

Precautions for use

Multi-layer Ceramic Chip Capacitors(MLCC) may have short circuit or open circuit under the harsh working environment beyond the use frequency described in this letter of admission or related instructions, or under the action of external mechanical force overpressure. Or it may smoke, burn or even explode, so when using, we should first consider to follow the relevant instructions in this acknowledgement, if there is anything unclear, please contact our technical department, Quality Control Department or production Department.

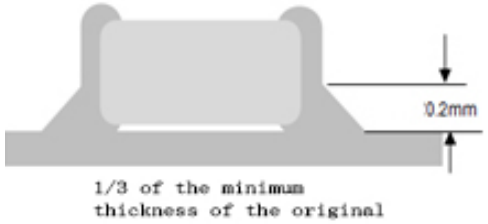
1. The amount of solder used in welding

A.Too much solder will cause capacitor damage due to excessive pressure at the capacitor end

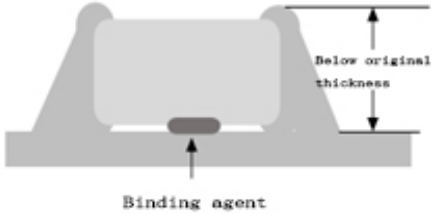
B.Too little solder fixed force is insufficient, may cause capacitor chip and line contact is poor.

2.Recommended amount of solder:

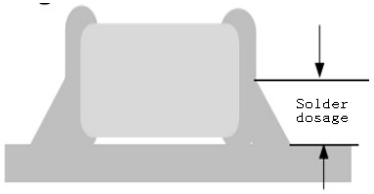
A. Optimal amount of solder for reflow welding



B. Optimum amount of solder for wave soldering



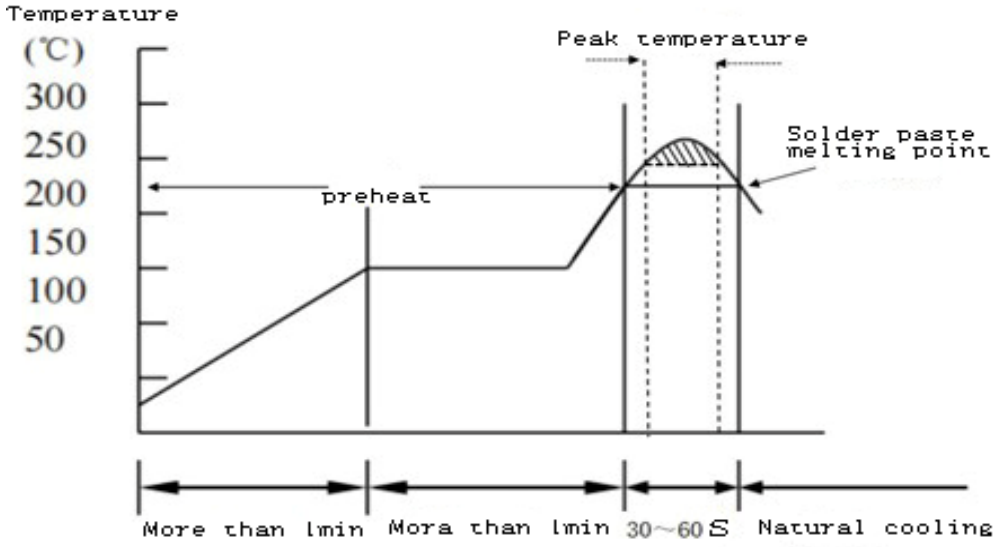
C. The optimal amount of solder used for repair with soldering iron



3.Recommended welding temperature curve:

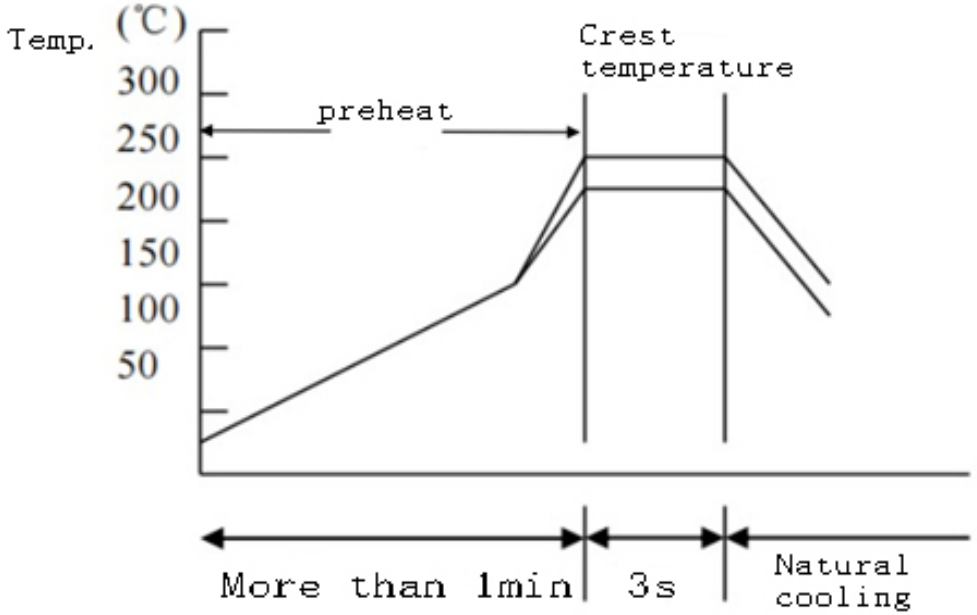
Reflow welding

■ **Specifications and test methods**



Solder type	Pb-Sn welding	Lead-free welding
Peak temperature	230℃ ~ 250℃	240℃ ~ 260℃
Peak time	3s ~ 10s	3s ~ 10s

Wave soldering

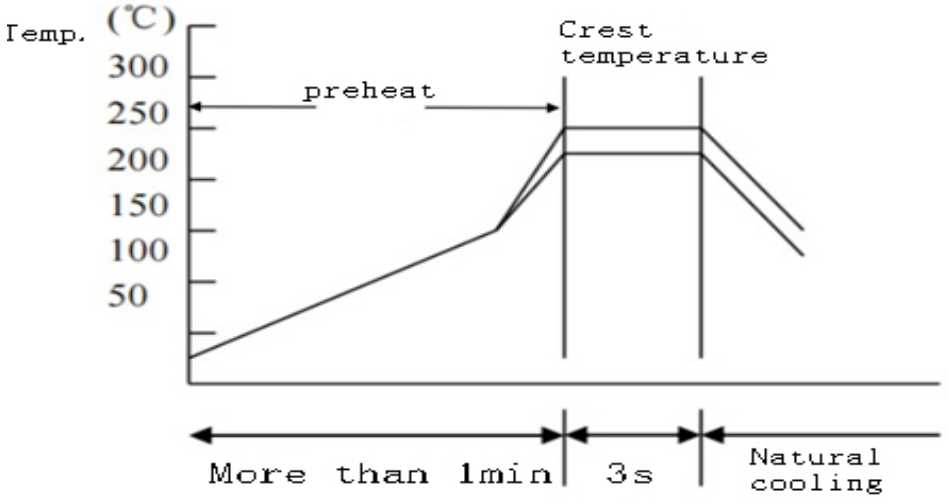


Solder type	Pb-Sn welding	Lead-free welding
Peak temperature	230℃～260℃	240℃～270℃
Peak time	Within 3s	Within 3s

Hand welding

Manual welding is easy to cause micro-cracking or partial cracking of porcelain because of uneven local heating of capacitor. Therefore, the use of electric iron manual welding should be carefully operated, and the choice of the tip of the electric branding iron and tip temperature control should be more careful.

■ **Specifications and test methods**



Preheat	Temperatur	Power	Diameter	Time	Tin paste	Notice
△≤130℃	≤350℃	≤20W	Recommended 1mm	≤3s	≤1/2 Capacitance height	Do not contact the iron head directly with the ceramic body