

Multi Layer Ceramic Chip Capacitor

DATA SHEET

Version: DS-01E

Tinghua Technologies Ltd

Address: 18-303,XinpuZhong Road, Panyu, Guangzhou,
511431, CHINA

Telephone: +86-20-33990632

FAX: +86-20-34508583

E-Mail: tinghua@tinghua.com

1.0 SUMMARY

•Types of Dielectric Material and Capacitor

HIGH FREQUENCY TYPE: The capacitor of this kind dielectric material is considered as Class capacitor, including high frequency COG capacitor and temperature compensating capacitor such as HG, LG, PH, RH,SH, TH, UJ, SL. The electrical properties of COG capacitor are the most stable one and have little change with temperature, voltage and time. They are suited for applications where low-losses and high-stability are required, such as filters, oscillators, and timing circuits.

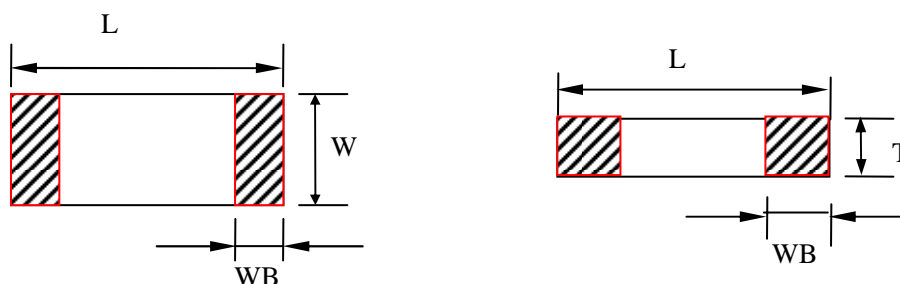
X7R: X7R material is a kind of material has high dielectric constant. The capacitor made of this kind material is considered as Class capacitor whose capacitance is higher than that of class . These capacitors are classified as having a semi-stable temperature characteristic and used over a wide temperature range, such in these kinds of circuits, DC-blocking, decoupling, bypassing, frequency discriminating etc.

Y5V: The capacitor made of this kind of material is the highest dielectric constant of all ceramic capacitors. They are used over a moderate temperature range in application where high capacitance is required because of its unstable temperature coefficient, but where moderate losses and capacitance changes can be tolerated. Its capacitance and dissipation factors are sensible to measuring conditions, such as temperature and voltage, etc.

Z5U: The capacitor made of this kind of material is considered as Class capacitor, whose temperature characteristic is between that of X7R and Y5V. The capacitance of this kind of capacitor is unstable and sensible to temperature and voltage. Ideally suited for by-passing and decoupling application circuits operating with low DC bias in the environment approaches to room temperature.

2.0 STRUCTURE AND DIMENSIONS

DIMENSIONS

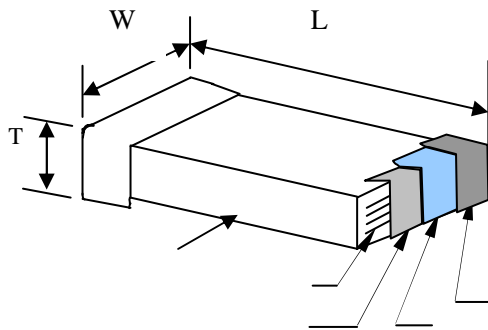


		Dimensions (mm)			
British expression	Metric expression	L	W	T	WB
0402	1005	1.00±0.05	0.50±0.05	0.50±0.05	0.25±0.10
0603	1608	1.60±0.10	0.80±0.10	0.80±0.10	0.30±0.10
0805	2012	2.00±0.20	1.25±0.20	0.70±0.20 1.00±0.20 1.25±0.20	0.50±0.20

1206	3216	3.20±0.30	1.60±0.2	0.70±0.20 1.00±0.20 1.25±0.20	0.50±0.25
1210	3225	3.20±0.30	2.50±0.30	1.25±0.30 1.50±0.30	0.75±0.25
1808	4520	4.50±0.40	2.00±0.20	≤2.0	0.75±0.25
1812	4532	4.50±0.40	3.20±0.30	≤2.5	0.75±0.20
2225	5763	5.70±0.50	6.30±0.50	≤2.5	1.00±0.25
3035	7690	7.60±0.50	9.00±0.50	≤3.0	1.00±0.25

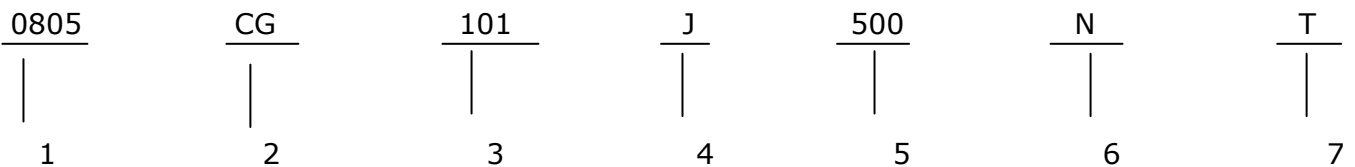
Note: We can design according to customer special requirements.

STRUCTURE



NO	Name
	Ceramic dielectric
	Inner electrode
	Substrate electrode
	Nickel Layer
	Tin Layer

3.0 HOW TO ORDER



1 DIMENSIONS

unit:inch/ mm

Size Code	0402	0603	0805	1206	1210	1808	1812	2225	3035
(L×W) inch	0.04×0 .02	0.06×0.0 3	0.08×0.0 5	0.12×0.0 6	0.12×0.1 0	0.18×0.0 8	0.18×0.1 2	0.22×0.2 5	0.30×0.3 5
(L×W) mm	1.00×0 .50	1.60×0.8 0	2.00×1.2 5	3.20×1.6 0	3.20×2.5 0	4.50×2.0 0	4.50×3.2 0	5.70×6.3 0	7.60×9.0 0

DIELECTRIC STYLE

(Dielectric Code)	CG	HG	LG	PH	RH	SH	TH	UJ	SL	B	E	F
(Dielectric)	COG	HG	LG	PH	RH	SH	TH	UJ	SL	X7R	Z5U	Y5V

NOMINAL CAPACITANCE

(unit): pF

(Express Method)	(Actual Value)	Note: the first two digits are significant; third digit denotes number of zeros; R=decimal point.
0R5	0.5	
1R0	1.0	
102	10×10^2	
224	22×10^4	
...	...	

CAPACITANCE TOLERANCE

(Code)	B	C	D	F	G	J	K	M	S	Z
(Tolerance)	± 0.1 0pF	± 0.25 pF	$\pm 0.5p$ F	± 1.0 %	± 2.0 %	± 5.0 %	$\pm 10\%$	$\pm 20\%$	+50% -20%	+80% -20%

Note: These capacitance tolerance B, C, D are just applicable the capacitance that equals to or less than 10pF.

RATED VOLTAGE

(unit): V

(Express Method)	(Actual Value)	Note: the first two digits are significant; third digit denotes number of zeros; R=decimal point.
6R3	6.3	
500	50×10^0	
201	20×10^1	
102	10×10^2	
...	...	

TERMINAL MATERIAL STYLES

Termination Styles	(Express Method)
Silver Solderable Termination	S
Copper Solderable Termination	C
Nickel Barrier Termination	N

7 PACKAGE STYLES

No Marks	T	B
Bulk Bag	Taping Package	Bulk Case

4.0 Temperature Coefficient /Characteristics

Dielectric	Temperature Coefficient	Temperature Point
COG	0 ± 30 ppm/°C	+20°C → -55°C → +20°C → +125°C
HG	-33 ± 30 ppm/°C	+20°C → -55°C → +20°C → +85°C
LG	-75 ± 30 ppm/°C	+20°C → -55°C → +20°C → +85°C

CH	0±60 ppm/°C	+20°C → -55°C → +20°C → +85°C
PH	-150± 60 ppm/°C	+20°C → -55°C → +20°C → +85°C
RH	-220± 60 ppm/°C	+20°C → -55°C → +20°C → +85°C
SH	-330± 60 ppm/°C	+20°C → -55°C → +20°C → +85°C
TH	-470± 60 ppm/°C	+20°C → -55°C → +20°C → +85°C
UJ	-750± 120 ppm/°C	+20°C → -55°C → +20°C → +85°C
SL	-1000 ~ +140 ppm/°C	+20°C → -55°C → +20°C → +85°C
X7R	±15%	+20°C → -55°C → +20°C → +125°C
Z5U	-56% ~ +22%	+20°C → +10°C → +20°C → +85°C
Y5V	-80% ~ +30%	+20°C → -25°C → +20°C → +85°C

Note: Nominal temperature coefficient and allowed tolerance of class are decided by the changing of the capacitance between 20°C and 85°C.

5.0 Capacitance Range and Operating Voltage

unit: pF

Size	Rated Voltage	Capacitance Range		
		COG (NPO)	X7R	Y5V (Z5U)
0402	6.3V	0.2 ~ 470	100 ~ 100,000	1,000 ~ 1,000,000
	10V	0.2 ~ 470	100 ~ 100,000	1,000 ~ 220,000
	16V	0.2 ~ 470	100 ~ 33,000	1,000 ~ 100,000
	25V	0.2 ~ 470	100 ~ 22,000	1,000 ~ 100,000
	50V	0.2 ~ 220	100 ~ 10,000	1,000 ~ 100,000
0603	6.3V	0.3 ~ 1,000	100 ~ 1,000,000	1,000 ~ 1,000,000
	10V	0.3 ~ 1,000	100 ~ 1,000,000	1,000 ~ 1,000,000
	16V	0.3 ~ 1,000	100 ~ 220,000	1,000 ~ 1,000,000
	25V	0.3 ~ 1,000	100 ~ 150,000	1,000 ~ 470,000
	50V	0.3 ~ 1,000	100 ~ 100,000	1,000 ~ 220,000
0805	6.3V	0.5 ~ 2,700	100 ~ 2,200,000	1,000 ~ 10,000,000
	10V	0.5 ~ 2,700	100 ~ 2,200,000	1,000 ~ 10,000,000
	16V	0.5 ~ 2,700	100 ~ 470,000	1,000 ~ 2,200,000
	25V	0.5 ~ 2,700	100 ~ 220,000	1,000 ~ 2,200,000
	50V	0.5 ~ 2,200	100 ~ 100,000	1,000 ~ 1,000,000
1206	6.3V	0.5 ~ 5,600	100 ~ 10,000,000	1,000 ~ 22,000,000
	10V	0.5 ~ 5,600	100 ~ 4,700,000	1,000 ~ 22,000,000
	16V	0.5 ~ 5,600	100 ~ 10,000,000	1,000 ~ 4,700,000
	25V	0.5 ~ 5,600	100 ~ 1,000,000	1,000 ~ 2,200,000
	50V	0.5 ~ 4,700	100 ~ 470,000	1,000 ~ 1,000,000
1210	6.3V	10 ~ 10,000	470 ~ 10,000,000	4,700 ~ 10,000,000
	10V	10 ~ 10,000	470 ~ 4,700,000	4,700 ~ 10,000,000
	16V	10 ~ 10,000	470 ~ 2,200,000	4,700 ~ 10,000,000
	25V	10 ~ 10,000	470 ~ 1,000,000	4,700 ~ 1,500,000
	50V	10 ~ 7,500	470 ~ 1,000,000	4,700 ~ 1,500,000
1808	6.3V	10 ~ 10,000	470 ~ 10,000,000	4,700 ~ 33,000,000
	10V	10 ~ 10,000	470 ~ 4,700,000	4,700 ~ 22,000,000
	16V	10 ~ 10,000	470 ~ 2,200,000	4,700 ~ 22,000,000
	25V	10 ~ 10,000	470 ~ 1,000,000	4,700 ~ 10,000,000
	50V	10 ~ 6,800	470 ~ 1,000,000	4,700 ~ 2,200,000
1812	6.3V	10 ~ 15,000	470 ~ 22,000,000	10,000 ~ 33,000,000

	10V	10 ~ 15,000	470 ~ 10,000,000	10,000 ~ 22,000,000
	16V	10 ~ 15,000	470 ~ 4,700,000	10,000 ~ 22,000,000
	25V	10 ~ 15,000	470 ~ 3,300,000	10,000 ~ 10,000,000
	50V	10 ~ 10,000	470 ~ 2,200,000	10,000 ~ 10,000,000
2225	6.3V	10 ~ 47,000	470 ~ 33,000,000	10,000 ~ 47,000,000
	10V	10 ~ 47,000	470 ~ 22,000,000	10,000 ~ 33,000,000
	16V	10 ~ 47,000	470 ~ 10,000,000	10,000 ~ 22,000,000
	25V	10 ~ 47,000	470 ~ 4,700,000	10,000 ~ 10,000,000
	50V	10 ~ 27,000	470 ~ 3,300,000	10,000 ~ 10,000,000
3035	6.3V	10 ~ 100,000	470 ~ 100,000,000	10,000 ~ 47,000,000
	10V	10 ~ 100,000	470 ~ 47,000,000	10,000 ~ 33,000,000
	16V	10 ~ 100,000	470 ~ 33,000,000	10,000 ~ 22,000,000
	25V	10 ~ 100,000	470 ~ 22,000,000	10,000 ~ 10,000,000
	50V	10 ~ 47,000	470 ~ 10,000,000	10,000 ~ 10,000,000

Note: We can design according to customer special requirements

6.0 TEMPERATURE COMPENSATING MLCC

Temperature Coefficient Styles : HG, LG, PH, RH, SH, TH, UJ, SL

●APPLICATION :

For this kind capacitor, its capacitance changes linearly with the temperature. So it is mainly used in the resonant circuits with large change of temperature

and high requirements to compensate the temperature, such as the resonator in the TV set.

SIZE	Rated Voltage	Capacitance (pF)								
		HG	LG	PH	RH	SH	TH	UJ	SL	
0603	50V	0.5~82		0.5~82		0.5~10	0	0.2~12	0	0.2~100
	100V	0.5~68		0.5~82		0.5~10	0	0.2~10	0	0.2~470

0805	50V	0.5~100	0.5~120	0.5~15 0	0.5~18 0	0.5~100 0
	100V	0.5~100	0.5~120	0.5~15 0	0.5~18 0	0.5~470
	200V	0.5~82	0.5~100	0.5~12 0	0.5~15 0	0.5~330
1206	50V	0.5~390	0.5~470	0.5~56 0	0.5~68 0	0.5~470 0
	100V	0.5~330	0.5~390	0.5~47 0	0.5~56 0	0.5~220 0
	200V	0.5~270	0.5~330	0.5~39 0	0.5~47 0	0.5~560
	500V	0.5~180	0.5~220	0.5~27 0	0.5~33 0	0.5~470
	1000V	0.5~150	0.5~180	0.5~20 0	0.5~27 0	0.5~390

Note: We can design according to customer special requirements.

7.0 Hi-Q COG MLCC

●Application:

Hi-Q COG capacitors are ideally suited for RF and microwave application requiring high

Q, low ESR, and high resonant frequency.

●Note for CQ and CF:

The following Q value is just confirmed by general customer. If there is a higher requirement for Q value requirements, we

can design and produce according to the special requirements.

For the customer whose requirements for frequency is between 1MHz and 2.4GHz or higher frequency, we can design it according to their requirements.

The frequency of CQ is a little higher than that of CF. Please choose them according to your requirements.

●CQ Capacitance value and Q value

Capacitance (pF)	Q value at 300MHz		Capacitance (pF)	Q value at 300MHz		Capacitance (pF)	Q value at 300MHz	
	0805	0603		0805	0603		0805	0603
4.7	1000	800	11	450	360	24	200	160
5.2	900	720	12	400	320	27	175	140
5.6	850	680	13	375	300	30	150	120
6.2	800	640	14	350	280	33	140	112
6.8	700	560	15	325	260	36	130	104
7.5	650	520	16	300	240	39	120	96
8.2	575	460	18	250	200	43	110	88
9.1	525	420	20	225	180	47	100	80
10	500	400	22	215	172	----	----	----

•CF Capacitance value and Q value

Capacitance (pF)	Q value at 300MHz		Capacitance (pF)	Q value at 300MHz		Capacitance (pF)	Q value at 300MHz	
	0805	0603		0805	0603		0805	0603
4.7	400	320	15	130	104	47	40	32
5.2	360	288	16	120	96	51	36	29
5.6	340	272	18	100	80	56	34	28
6.2	320	256	20	90	72	62	32	26
6.8	280	224	22	86	69	68	30	24
7.5	260	208	24	80	64	75	28	23
8.2	230	184	27	70	56	82	26	21
9.1	210	168	30	60	48	91	24	20
10	200	160	33	56	45	100	22	18
11	180	144	36	52	42	110	20	16
12	160	128	39	48	39	120	28	15
13	150	120	43	44	36	130	16	13
14	140	112	-----	-----	-----	-----	-----	-----

8.0 HIGH VOLTAGE MLCC

Middle & high voltage MLCC is a kind of special design MLCC that bases on the technology of general MLCC. This kind of MLCC has stable high voltage reliability and suitable to SMT. Middle & high MLCC is widely applicable for many direct high voltage circuits in which it can improve the performance of the circuit.

•APPLICATIONS

Analog & Digital Modems
LAN/WAN Interface
Lighting Ballast Circuits
Voltage Multipliers
DC-DC Converters
Back-lighting Inverters

•Capacitance value and Rated Voltage

SIZE	Rated Voltage	Capacitance (pF)		
Size Code		NPO	X7R	Y5V
0603	100V	0.5~680	100~10000	2200~68000
	200V	0.5~470	100~6800	-----
0805	100V	0.5~1500	150~33000	10000~100000
	200V	0.5~820	150~22000	10000~56000
	250V	0.5~820	150~22000	10000~56000
	500V	0.5~560	150~10000	-----
1206	100V	0.5~3000	150~120000	10000~330000
	200V	0.5~2000	150~47000	10000~150000
	250V	0.5~2000	150~47000	10000~150000
	500V	0.5~1000	150~22000	-----
	1000V	0.5~680	150~5600	-----

	2000V	0.5~150	150~1500	-----
1210	100V	10~4700	150~220000	10000~820000
	200V	10~3300	150~120000	10000~390000
	250V	10~3300	150~120000	10000~390000
	500V	10~2000	150~33000	-----
	1000V	10~820	150~10000	-----
	2000V	10~470	150~6800	-----
	Rated	Capacitance (pF)		
Size Code	Voltage	NPO	X7R	Y5V
1808	100V	10~4700	150~220000	10000~820000
	200V	10~3300	150~220000	10000~390000
	250V	10~3300	150~220000	10000~390000
	500V	10~1800	150~39000	-----
	1000V	10~820	150~10000	-----
	2000V	10~470	150~6800	-----
	3000V	10~330	150~2200	-----
	4000V	10~150	150~1000	-----
	5000V	10~150	150~1000	-----
1812	100V	10~10000	150~330000	10000~1000000
	200V	10~5600	150~150000	10000~470000
	250V	10~5600	150~150000	10000~470000
	500V	10~3900	150~100000	-----
	1000V	10~1200	150~27000	-----
	2000V	10~680	150~10000	-----
	3000V	10~470	150~4700	-----
	4000V	10~220	150~1500	-----
	5000V	10~220	150~1500	-----
2225	100V	10~27000	150~100000 0	10000~2000000
	200V	10~12000	150~470000	10000~680000
	250V	10~12000	150~470000	10000~680000
	500V	10~6800	150~330000	-----
	1000V	10~2200	150~56000	-----
	2000V	10~1000	150~27000	-----
	3000V	10~680	150~6800	-----
	4000V	10~560	150~3300	-----
	5000V	10~560	150~3300	-----
3012	100V	10~18000	150~680000	10000~1500000
	200V	10~8200	150~390000	10000~560000
	250V	10~8200	150~390000	-----
	500V	10~4700	150~270000	-----
	1000V	10~1600	150~39000	-----
	2000V	10~680	150~22000	-----
	3000V	10~470	150~3300	-----

	4000V	10~330	150~2700	-----
	5000V	10~330	150~2700	-----

Note: We can design according to the customer requirements.

Measurement method for high voltage MLCC

Rated voltage range	Measuring Method
500V≤Vr≤1000V	Force 150%Rated voltage for 5 second. Max current should not exceed 50 mA.
1000V<Vr≤2000V	Force 120%Rated voltage for 5 seconds. Max.current should not exceed 50 mA.
2000V<Vr≤5000V	Force 120%Rated voltage for 5 seconds. Max.current should not exceed 10 mA.

9.0 Reliability Test

Item	Technical Specification						Test Method and Remarks			
	Class	Should be within the specified tolerance.						Capacitance	Measuring Frequency	Measuring Voltage
Capacitance	Class	Should be within the specified tolerance.						≤1000pF	1MHZ±10%	1.0±0.2Vrms
	Class	Should be within the specified tolerance.						> 1000 pF	1KHZ±10%	
(DF, tanδ) Dissipation Factor	Class	DF≤0.15%						≤1000 pF	1MHZ±10%	1.0±0.2Vrms
	Class	X7R	50V ≤2.5%	25V ≤3.5%	16V ≤3.5%	10V ≤5.0%	6.3V ≤5.0% (C < 3.3μF) ≤10.0% (C≥3.3μF)	C≤10μF Test Frequency: 1KHZ±10% Test Voltage: 1.0±0.2Vrms		
	Class	Y5V	50V、25V ≤5.0% (C < 1.0μF)		16V (C < 1.0μF)	10V ≤12.5%	6.3V ≤12.5%	C > 10μF X7R、Y5V Test Frequency: 120±24 HZ Test Voltage: 0.5±0.1Vrms		
	Class	Z5U	50V、25V ≤9.0% (C≥1.0μF)		16V ≤9.0% (C≥1.0μF)	10V	6.3V	Z5U: Test Frequency: 1±0.1KHZ Test Voltage: 0.5±0.05Vrms		

(IR) Insulation Resistance	Class	C≤10 nF, Ri≥50000MΩ C > 10 nF, Ri•C _R ≥500S				Measuring Voltage: Rated Voltage Duration: 60±5s	
	Class	X 7 R	C≤25 nF, Ri≥10000MΩ C > 25 nF, Ri•C _R > 100S				
Item	Class	Y 5 V Z 5 U	C≤25 nF, Ri≥4000MΩ C > 25 nF, Ri•C _R > 100S			Test Method and Remarks	
	Technical Specification						
	(DWV) Dielectric Withstanding Voltage	No breakdown or damage.					Measuring Voltage: Class :300% Rated voltage Class :250% Rated voltage Duration: 5±1s Charge/ Discharge Current: 50mA max. (This method excludes high-voltage MLCC)
	Solderability	At least 95% of the terminal electrode is covered by new solder. Visual Appearance: No visible damage.					Solder Temperature: 235±5 Duration: 2±0.5s
	Resistance to Soldering Heat	Item	NPO 至 SL NPO to SL	X7R	Y5V		Z5 U
ΔC/C		≤0.5%	-5~+10 %	-10~+20 %			
DF		Same to initial value.					
IR		Same to initial value.					
Appearance: No visible damage. At least 95% of the terminal electrode is covered by new solder.							
Resistance to Flexure of Substrate (Bending Strength)	Appearance: No visible damage.						

	$\Delta C/C$	$\leq \pm 10\%$	45±2 45±2 Test Board: Al ₂ O ₃ or PCB Warp: 1mm Speed: 0.5mm/sec. Unit: mm The measurement should be made with the board in the bending position.
Item	Technical Specification		Test Method and Remarks
Termination Adhesion	No visible damage.		Applied Force: 5N Duration: 10±1S
Temperature Cycle	$\Delta C/C$ Class : $\leq \pm 1\%$ or $\pm 1pF$, whichever is larger. Class : B: $\leq \pm 10\%$ E,F: $\leq \pm 20\%$		Preheating conditions: up-category temperature, 1h Recovery time: 24±1h Initial Measurement Cycling Times: 5 times, 1 cycle, 4 steps:
	Ste	Temperature ()	Time (min.)
	1	Low- category temp. (NPO/X7R: -55 Y5V/-25 Z5U:+10)	30
	2	Normal temp. (+20)	2 ~ 3
	3	Up- category temp. (NPO/X7R: +125 Y5V/Z5U: +85)	30
4	Normal temp. (+20)	2 ~ 3	
			Recovery time after test: 24±2h
Moisture Resistance	$\Delta C/C$	Class : $\leq \pm 2\%$ or $\pm 1pF$, whichever is larger. Class : B: $\leq \pm 10\%$ E,F: $\leq \pm 30\%$	Temperature: 40±2 Humidity: 90~95%RH Voltage: Rated Voltage Duration: 500h Charge/Discharge Current: 50mA max. Recovery conditions: Room temperature Recovery Time: 24h (Class1) or 48h (Class2)
	DF	Not more than twice of initial value.	
	IR	Class : Ri≥2500MΩ OR Ri•CR≥25S whichever is smaller.	
		Class : Ri≥1000MΩ OR Ri•CR≥25S whichever is smaller.	
Appearance: No visible damage.			
Item	Technical Specification		Test Method and Remarks

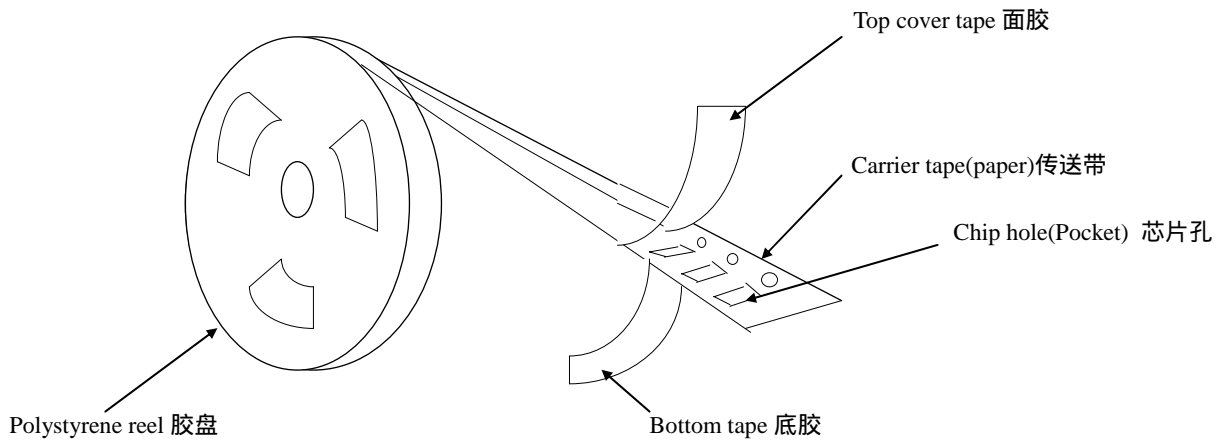
Life Test	$\Delta C/C$	Class : $\leq \pm 2\%$ or $\pm 1pF$, whichever is larger. Class : B: $\leq \pm 20\%$ E,F: $\leq \pm 30\%$	Applied Voltage: $2 \times$ Rated Voltage Duration: 1000h Charge/ Discharge Current: 50mA max. Recovery Conditions: Room Temperature Recovery Time: 24h (Class 1), or 48h (Class2)
	DF	Not more than twice of initial value.	
	IR	Class : $R_i \geq 4000M\Omega$ OR $R_i \cdot C_R \geq 40S$ whichever is smaller.	
		Class : $R_i \geq 2000M\Omega$ OR $R_i \cdot C_R \geq 50S$ whichever is smaller.	
Visual Appearance: No visible damage.			

Note: Pretreatment (only for class2 capacitor)

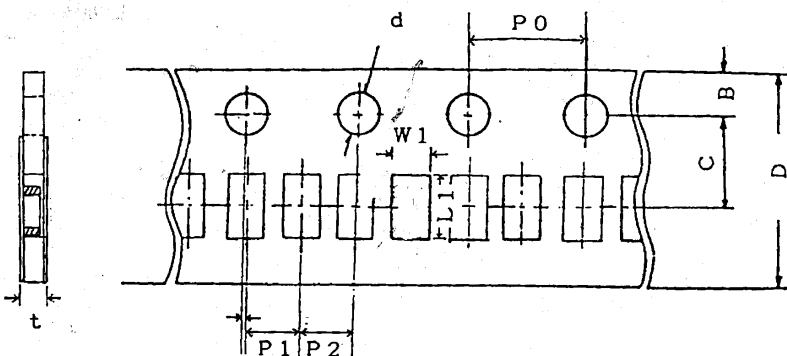
Pretreatment (only for class2 capacitor) is a method to treat the capacitor before measurement. First, place the capacitor in the up-category temperature or other specified higher temperature environment for 1hour. Then recovery the capacitor at standard pressure conditions for 24 ± 1 hours.

10.0 PACKAGE

• PAPER TAPING

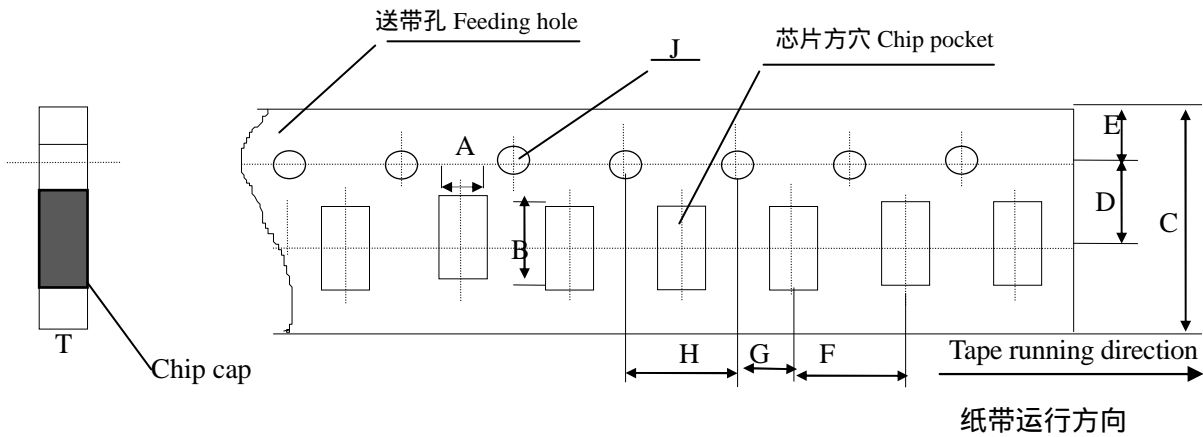


0402 Dimensions of paper taping for 0402 type



代号 Code	W1	L1	D	C	B	P1	P2	P0	d	t
0402	0.65 ± 0.20	1.15 ± 0.20	8.00 ± 0.20	3.50 ± 0.05	1.75 ± 0.10	2.00 ± 0.05	2.00 ± 0.05	4.00 ± 0.10	1.50 -0/+0.10	0.80 Below

Dimensions of paper taping for 0603 , 0805 , 1206 types.

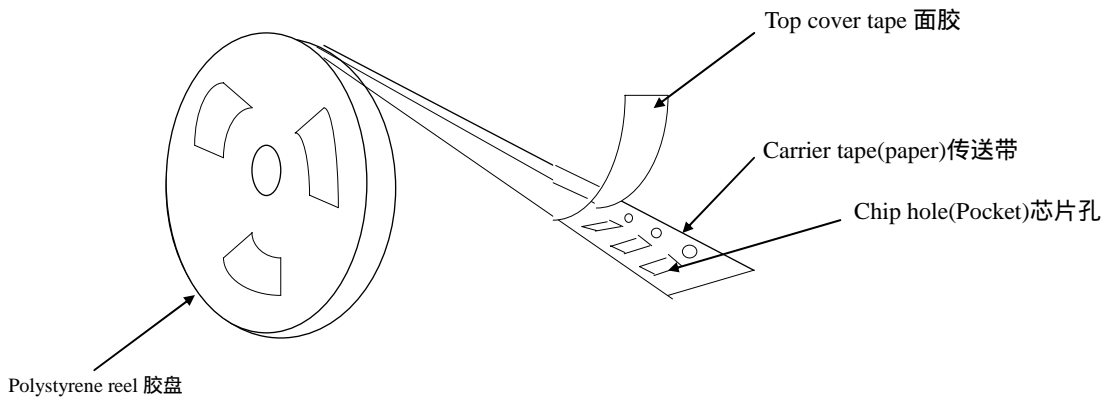


Unit: mm

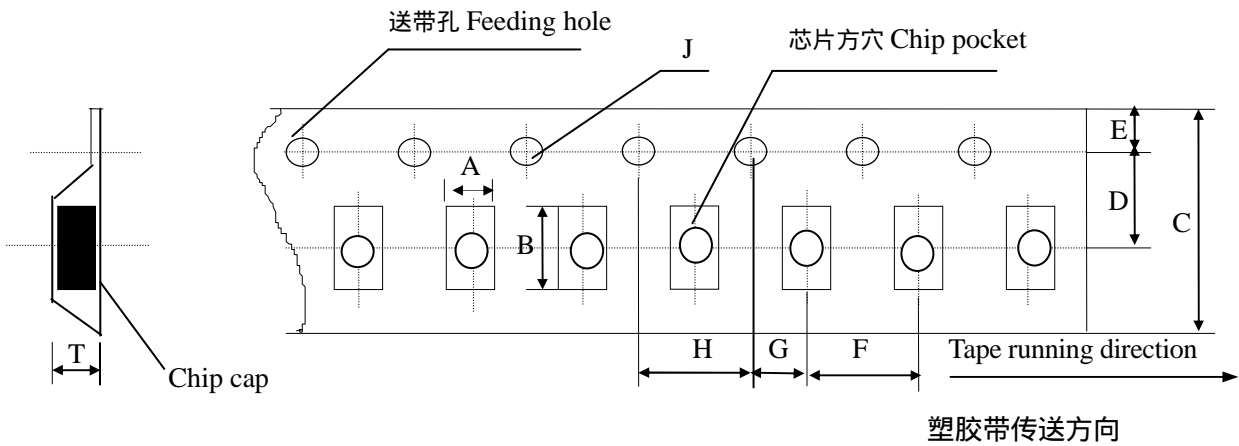
代号 Code 纸带规格 paper size	A	B	C	D*	E	F	G*	H	J	T
0603	1.10 ± 0.20	1.90 ± 0.20	8.00 ± 0.20	3.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	4.00 ± 0.10	1.50 -0/+0.1 0	1.10 Below
0805	1.45 ± 0.20	2.30 ± 0.20	8.0 ± 0.20	3.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	4.00 ± 0.10	1.50 -0/+0.1 0	1.10 Below
1206	1.80 ± 0.20	3.40 ± 0.20	8.00 ± 0.20	3.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	4.00 ± 0.10	1.50 -0/+0.1 0	1.10 Below

Note: The place with "*" means where needs exactly dimensions.

• **EMBOSSED TAPING**



Dimensions of embossed taping for 0805~1812 type



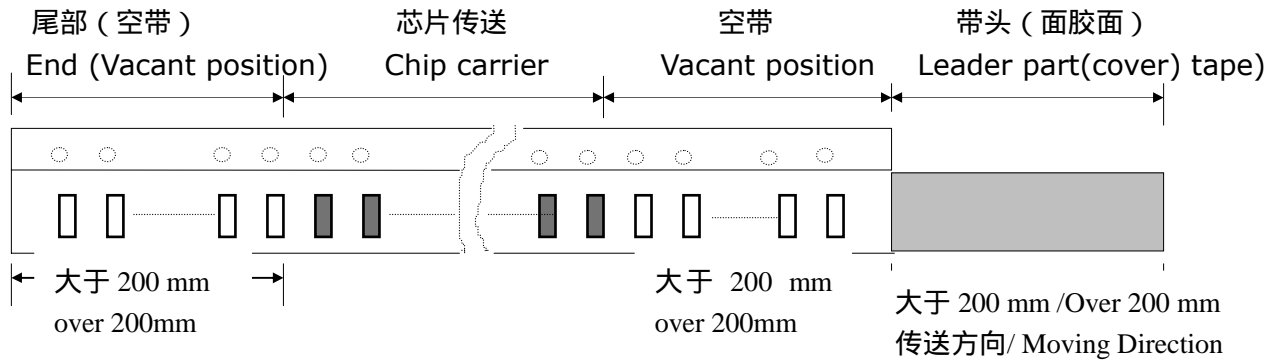
unit: mm

代号 Code 规格 Tape size	A	B	C	D*	E	F	G*	H	J	T
0805	1.55 ± 0.20	2.35 ± 0.20	8.00 ± 0.20	3.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	4.00 ± 0.10	1.50 -0/+0.1 0	1.50 Below
1206	1.95 ± 0.20	3.60 ± 0.20	8.00 ± 0.20	3.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	4.00 ± 0.1	1.50 -0/+0.1 0	1.50 Below
1210	2.70 ± 0.10	3.42 ± 0.10	8.00 ± 0.10	3.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	1.55 -0/+0.1 0	1.55 ± 0.10
1808	2.20 ± 0.10	4.95 ± 0.10	12.00 ± 0.10	5.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	1.50 -0/+0.1 0	1.80 ± 0.10

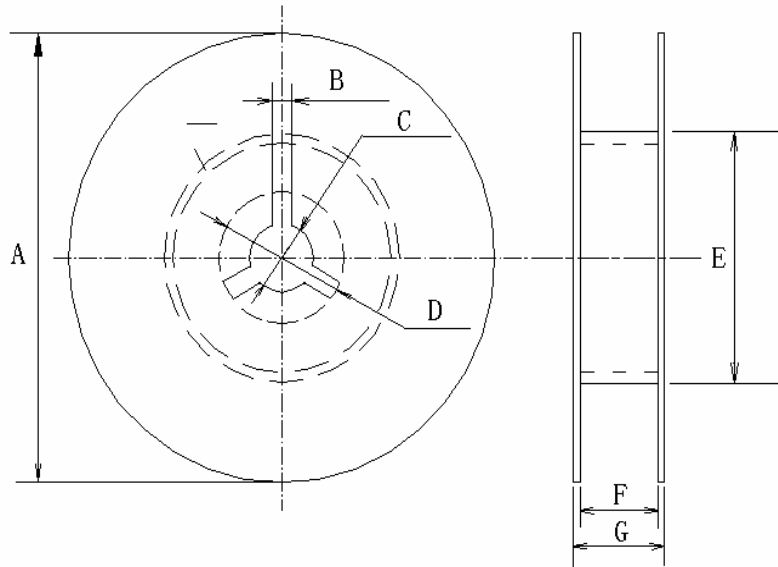
1812	3.66 ± 0.10	4.95 ± 0.10	12.00 ± 0.10	5.50 ± 0.05	1.75 ± 0.10	8.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	1.55 -0/+0.	1.85 ± 0.10
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Note: The place with "*" means where needs exactly dimensions.

● **Structure of leader part and end part of the carrier paper**



Reel Dimensions (unit: mm)



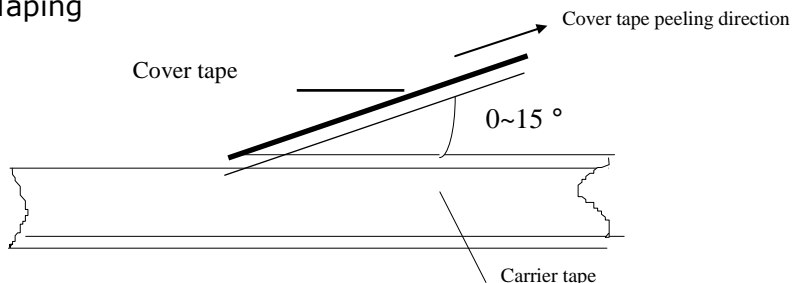
尺寸代码 (CODE)

卷盘型号	A	B	C	D	E	F	G
7'REEL	φ178±2.0	3.0	φ13±0.5	φ21±0.8	φ50 或更大 φ50 or more	10.0±1.5	12max
13'REEL	φ330±2.0	3.0	φ13±0.5	φ21±0.8	φ50 或更大 φ50 or more	10.0±1.5	12max

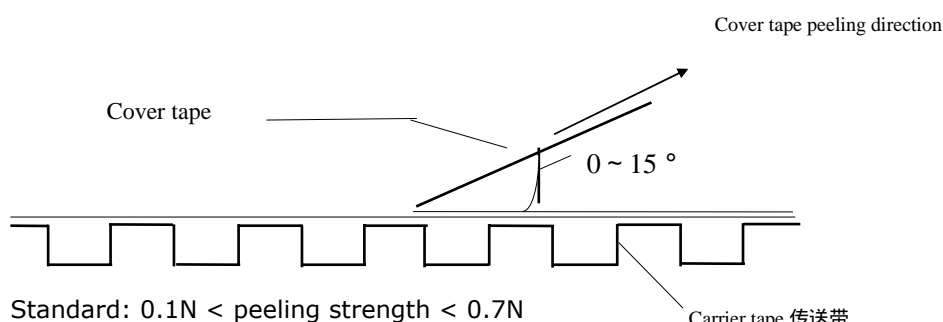
• **Taping specification**

Top tape peeling strength

(a) Paper Taping



(b) Embossed Taping



Standard: 0.1N < peeling strength < 0.7N

No paper dirty remains on the scotch when peeling, and sticks to top and bottom tape.

Bulk Case Package

unit:mm

Symbol	A	B	T	C	D	E
Dimension	6.80±0.10	8.80±1.00	12.00±0.10	15.00+0.10/-0	2.00+0/-0.10	4.70±0.10
Symbol	F	W	G	H	L	I
Dimension	31.50+0.20/-0	36.00+0/-0.20	19.00±0.35	7.00±0.35	110.00±0.70	5.00±0.35

Packing Quantity

(SIZE)	(PACKAGE STYLE & QUANTITY) unit: pcs			
	PT	ET	BC	BP
0402	10000	-----	20000	5000
0603	5000	-----	15000	5000
0805	5000	2500	10000	5000
1206	5000	2500	5000	5000
1210	-----	2000	-----	2000
1808	-----	2000	-----	2000
1812	-----	2000	-----	2000
2225	-----	-----	-----	500
3035	-----	-----	-----	-----

Note: We can choose packing style and quantity can be according to the customer's requirement.

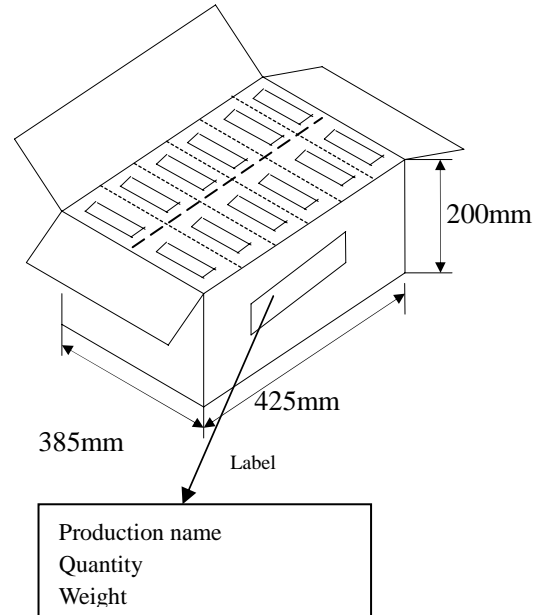
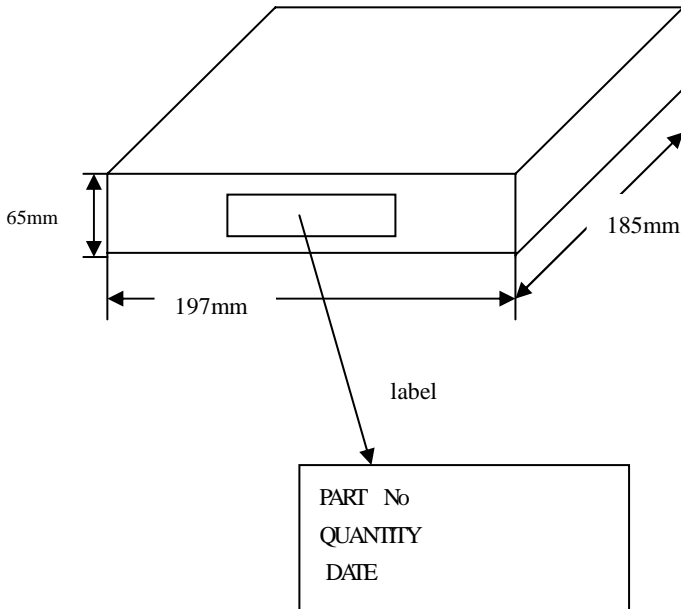
● **Outer packing**

The first package

Quantity: 5 reels (Max 25000pcs)

The second package

Quantity: 12 cases (Max 300000pcs)



11.0 Storage Methods

The guaranteed period for solderability is 6 months (Under delivery package condition).

Storage conditions:

Temperature: 5~40

Relative Humidity 20~70%

12.0 Precautions For Use

The Multi-layer Ceramic Capacitors (MLCC) may fail in a short circuit mode in an open circuit mode when subjected to severe conditions of electrical environment and / or mechanical stress beyond the specified "rating" and specified "conditions" in the specification, which will result in burn out, flaming or glowing in the worst case. Following "precautions for "safety" and Application Notes shall be taken in your major consideration. If you have a question about the precautions for handling, please contact our engineering section or factory.

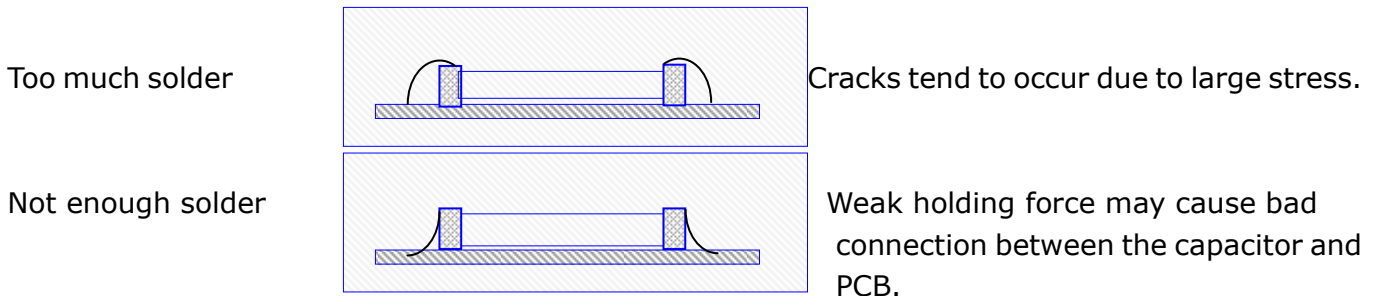
Soldering Profile

To avoid the crack problem by sudden temperature change, follow the temperature profile in the adjacent graph (refer to the graph in the enclosure page).

Manual Soldering

Manual soldering can pose a great risk of creating thermal cracks in capacitors. The hot soldering iron tip comes into direct contact with the end terminations, and operator's

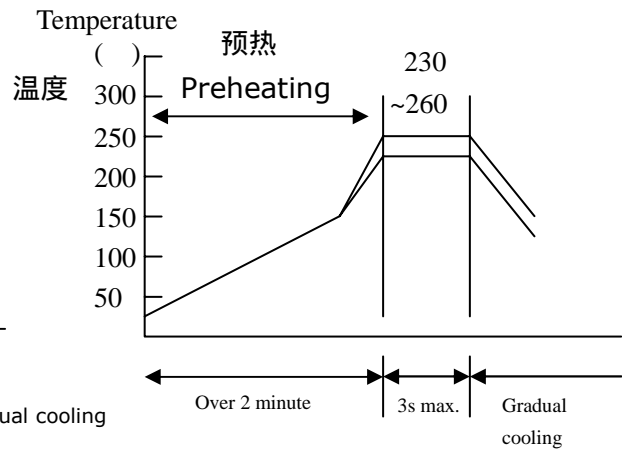
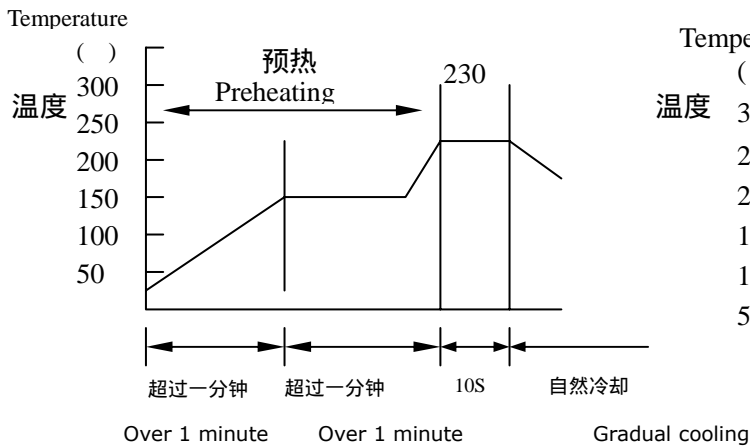
careless may cause the tip of the soldering iron to come into direct contact with the ceramic body of the capacitor. Therefore the soldering iron must be handled carefully, and pay much attention to the selection of the soldering iron tip and temperature contact of the tip.



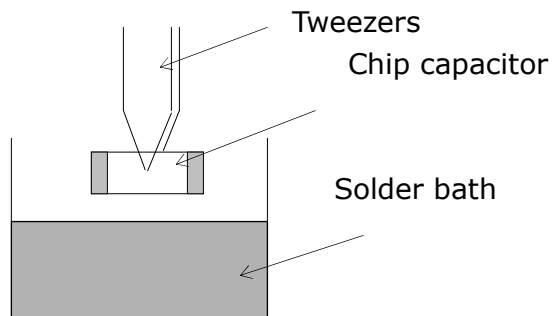
13.0 The temperature profile for soldering

Re-flow soldering

Wave soldering



Test methods for solderability and leachability



For more information, please contact us.

TINGHUA Technologies Limited

Address: #18-303,XINPU ZHONGLU , GUANGZHOU, 511431,CHINA

TEL:+86-20-33990632

FAX:+86-20-34508583

Web Site: www.tinghua.com

E-Mail: Tinghua@tinghua.com