

Multilayer Ceramic Chip Capacitors



CSA Series (Commercial Grade))

Material	X7R	X7S	X6S	X5R	C0G	M3L
Temp. Range	-55°C--125°C	-55°C--125°C	-55°C--105°C	-55°C--85°C	-55°C--125°C	-55°C--85°C
Cap.Tolerance	±15%	±22%	±22%	±15%	±30ppm/°C	-500ppm/°C ~1500ppm/°C

PRECAUTIONS FOR USE

Please attach the purchase specification before using this product.

SAFETY INFORMATION

Please pay attention to safety precautions when using this product.

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.

- | | | | |
|--|--|--|---------------------------------|
| ① Aircraft equipment | ② Aerospace equipment | ③ Undersea equipment | ④ Power plant control equipment |
| ⑤ Medical equipment | ⑥ Transportation equipment (vehicles, trains, ships, etc.) | ⑦ Traffic signal equipment | |
| ⑧ Disaster prevention / crime prevention equipment | ⑨ Data-processing equipment | ⑩ Application 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 one year from the date of production. Do not open the braid before use of the product (in the case of packaging and delivery). After the braid is opened, the product should be used within three months.

storage temperature: 0°C~35°C

Storage relative humidity: <70%

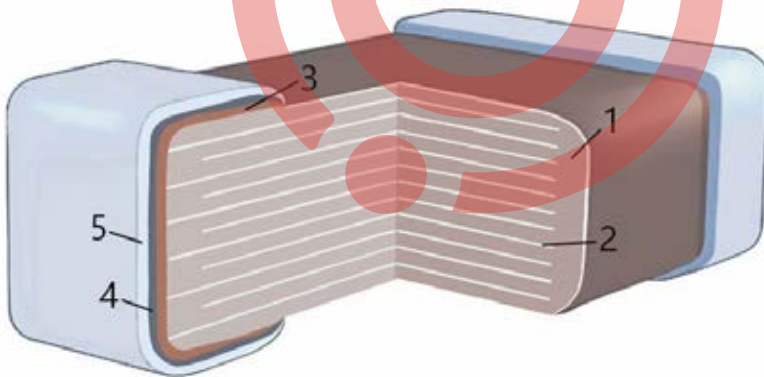
Characteristic

- Meets the IEC60384 standard
- Certified as lead-free
- halogen-free
- Non-polarity

Application

- General electronic equipment.
- Mobile devices
- Servers, computers, tablets
- Power supply circuit

Product Structure Diagram



Serial number	Designation
1	Dielectric ceramics
2	Inner electrode (nickel)
3	Outer electrode (copper)
4	Nickel layer
5	Tin layer

Product model naming rules

EX: C SA 0402 X7R 104 K 500 G T

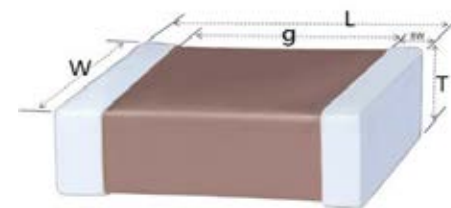
(1) (2) (3) (4) (5) (6) (7) (8) (9)

(1)	C: MLCC			(5) Capacitance Value	Cap. ≥10pF : First Two×10^third 104=10×10^4=100nF 123=12×10^3=12nF Cap. <10pF : R30=0.3pF, 1R0=1pF					
(2) Application	SA: Commerical									
(3) Product size (L*W)	Coding	inch	mm							
	00R4	008004	0201							
	01R5	01005	0402							
	0201	0201	0603							
	0402	0402	1005							
	0603	0603	1608							
	0805	0805	2012							
	1206	1206	3216							
	1210	1210	3225							
	1808	1808	4520							
	1812	1812	4532							
	2220	2220	5750							
				(6) Cap.Tolerance	A:±0.05pF	B:±0.1pF	C: ±0.25pF	D: ±0.5pF	F: ±1.0%	G: ±2%
					J: ±5%	K: ±10%	M: ±20%	Z:80/-20%		
				(7) Rate Voltage Vdc	2R5:2.5	4R0:4.0	6R3:6.3	100:10	160:16	250:25
					350:35	500:50	630:63	800:80	101:100	201:200
					251:250	451:450	501:500	631:630	102:1000	202:2000
					252:2500	302:3000	402:4000			
				(8) Thickness (mm)	A:0.10	B:0.13	C:0.18	D:0.20	E:0.30	F:0.45
					G:0.50	H:0.60	J:0.80	K:0.85	L:1.15	M:1.25
					N:1.60	P:1.90	Q:2.00	S:2.30	R:2.50	
(4) Temperature characteristic	Class I : C0G M3L ClassII : X7R X7S X6S X5R			(9) Packing	T: Finished product packaging (7 “Reel) D: Finished product packaging (13” Reel)					

Size & Packing Specifications

Generally, a $\Phi 180\text{mm}$ (7") tray is used for packing.

Each 5 disks is packed into a box, and each 12 boxes is a whole box.



Specification	Size (mm)				Packing (7")	
	Length	Width	Thickness	g	Number(piece)	Method
01R5	0.40 ± 0.02	0.20 ± 0.02	0.20 ± 0.02	0.13	20,000	Paper tape
0201	0.60 ± 0.03	0.30 ± 0.03	0.30 ± 0.03	0.20	15,000	Paper tape
	$0.60 + 0.10 / - 0.03$	$0.30 + 0.10 / - 0.03$	$0.30 + 0.10 / - 0.03$			
0402	1.00 ± 0.05	0.50 ± 0.05	0.50 ± 0.05	0.30	10,000	Paper tape
	1.00 ± 0.07	0.50 ± 0.07	0.50 ± 0.07			
	1.00 ± 0.10	0.50 ± 0.10	0.50 ± 0.10			
	$1.00 + 0.20 / - 0.05$	$0.50 + 0.20 / - 0.05$	$0.50 + 0.20 / - 0.05$			
0603	1.60 ± 0.10	0.80 ± 0.10	0.80 ± 0.10	0.60	4,000	Paper tape
	1.60 ± 0.20	0.80 ± 0.20	0.80 ± 0.20			
0805	2.00 ± 0.10	1.25 ± 0.10	0.60 ± 0.10	0.70	4,000	Paper tape
			0.85 ± 0.10			
	2.00 ± 0.20	1.25 ± 0.20	1.25 ± 0.20		3,000/2,000	Plastic tape
1206	3.20 ± 0.20	1.60 ± 0.20	0.85 ± 0.10	1.50	4,000	Paper tape
			1.25 ± 0.20		3,000/2,000	Plastic tape
			1.60 ± 0.20		2,000	Plastic tape
	3.20 ± 0.30	1.60 ± 0.30	1.60 ± 0.30		2,000	Plastic tape
1210	3.20 ± 0.30	2.50 ± 0.20	0.85 ± 0.10	1.50	2,000	Plastic tape
			1.25 ± 0.20		2,000	Plastic tape
			1.60 ± 0.20		2,000	Plastic tape
			2.00 ± 0.20		2,000/1,000	Plastic tape
	3.20 ± 0.40	2.50 ± 0.30	2.50 ± 0.30		2,000/1,000	Plastic tape



Specification	Size (mm)				Packing (7")	
	Length	Width	Thickness	Length	Number(piece)	Method
1808	4.50±0.40	2.00±0.30	1.25±0.20		2,000	Plastic tape
			1.60±0.20		2,000	Plastic tape
			2.00±0.20		1,000	Plastic tape
1812	4.50±0.30	3.2±0.30	1.25±0.20	2.50	1,000	Plastic tape
			1.60±0.20		1,000	Plastic tape
	4.50±0.40	3.2±0.40	2.00±0.20		1,000	Plastic tape
			2.50±0.30		500/1,000	Plastic tape
2220	5.70±0.40	5.0±0.40	1.25±0.2	3.50	1,000	Plastic tape
			1.60±0.20		700	Plastic tape
			2.00±0.20		700	Plastic tape
			2.50±0.3		700	Plastic tape

* Please refer to individual specification for details

COMPONENTES ELETRÔNICOS

Capacitance Range
【C0G】 01005~1210

[illegible]



【X7R/X7S/X7T】01005~0805

Size (inch)	Thick (code)	RV (Vdc)	CSA Series - X7R/X7S/X7T																							
			101	151	221	331	471	681	102	152	222	332	472	682	103	223	473	683	104	224	474	105	225	475	106	
1005	0.20(D)	25																								
0201	0.30 (E)	6.3																								
		10																								
		16																								
		25																								
		50																								
0402	0.50 (G)	6.3																								
		10																								
		16																								
		25																								
		50																								
0603	0.80 (J)	100																								
		250																								
		6.3																								
		10																								
		16																								
0805	0.85 (K)	25																								
		50																								
		100																								
		250																								
		500																								
	1.25 (M)	6.3																								
		10																								
		16																								
		25																								
		50																								
0805	1.25 (M)	100																								
		250																								
		500																								
		1000																								
		1000																								



【X7R/X7S】 1206~1210

Size (inch)	Thick (code)	RV (Vdc)	CSA Series - X7R/X7S																			
			101	221	331	471	102	222	472	103	223	473	104	224	474	105	225	475	106	226	476	
1206	0.85 (K)	50																				
		100																				
		250																				
		500																				
		630																				
		1000																				
		2000																				
	1.25 (M)	16																				
		25																				
		50																				
		100																				
		250																				
		500																				
		630																				
	1.60 (N)	1000																				
		2000																				
		10																				
		16																				
		25																				
50																						
1210	1.25 (M)	100																				
		250																				
		500																				
		630																				
		1000																				
		2000																				
	1.60 (N)	16																				
		25																				
		50																				
		100																				
		500																				
		630																				
2.00 (Q)	1000																					
	2000																					
	25																					
	50																					
	100																					
	250																					
2.50 (R)	500																					
	630																					
	6.3																					
	10																					
	16																					
	25																					



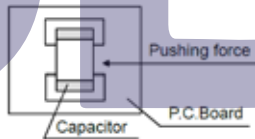
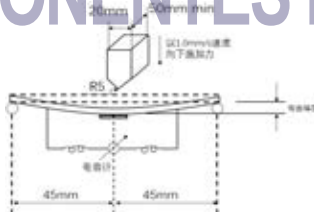
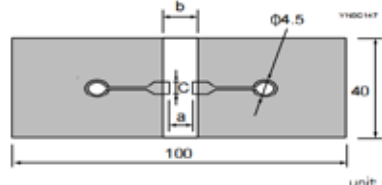
【X5R】 01005~1210

Size (inch)	Thick (code)	RV (Vdc)	CSA Series - X5R												
			153	223	473	104	224	474	105	225	475	106	226	476	107
01005	0.20 (D)	6.3 10													
0201	0.30 (E)	6.3													
		10													
		16													
		25													
0402	0.50 (G)	6.3													
		10													
		16													
		25													
		50													
0603	0.80 (J)	6.3													
		10													
		16													
		25													
		50													
0805	1.25 (M)	6.3													
		10													
		16													
		25													
		50													
1206	1.60 (N)	6.3													
		10													
		16													
		25													
		50													
1210	2.50 (R)	6.3													
		10													
		16													
		25													
		50													



Specifications and Test Methods

No	Item	Specification	Test Method(Ref. Standard:JIS C 5101, IEC60384)					
1	Appearance	No defects or abnormalities.	Inspect the product visually (microscopically).					
2	Dimension	Conform to specifications.	Using Measuring instrument of dimension.					
3	Voltage proof	Withstand test voltage without defect or abnormality.	Material		Rate Voltage(RV)		Test Voltage	
			Class I	C0G/M3L	RV≤50V		300% RV	
					50V < RV≤250V		200% RV	
					250V < RV≤500V		150% RV	
					500V < RV≤1000V		130% RV	
			Class II	X7R/X7S X5R/X6S	RV≤50V		250% RV	
					50V < RV≤250V		200% RV	
					250V < RV≤630V		150% RV	
					630V < RV≤1000V		120% RV	
			Applied Time		1s to 5s			
Charge/discharge current		50mA max						
4	Insulation Resistance(I.R.)	Meet the initial specifications	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						
5	Capacitance	Meet the initial specifications	Test Temperature		25℃			
6	Q or D.F.	Meet the initial specifications	Material		Cap.	Frequency	Voltage	
			Class I	C0G/M3L	C≤1000pF	1.0±0.1MHz	0.5-5.0Vrms	
					C>1000pF	1.0±0.1KHz	1.0±0.2Vrms	
			Class II	X7R/X7S X5R/X6S	C > 10uF	120Hz±24Hz	0.5V±0.1Vrms	
					C≤10uF	1.0±0.1KHz	1.0±0.2Vrms	

No	Item	Specification	Test Method(Ref. Standard:JIS C 5101, IEC60384)																													
7	Temperature Characteristics of Capacitance	<table><tr><th colspan="2">Material</th><th>Cap. Change</th></tr><tr><td rowspan="2">Class I</td><td>C0G</td><td>Within $\pm 30\text{ppm}/^{\circ}\text{C}$</td></tr><tr><td>M3L</td><td>Within $-0.1\%/^{\circ}\text{C} \sim -0.2\%/^{\circ}\text{C}$</td></tr><tr><td rowspan="4">Class II</td><td>X5R</td><td>$\pm 15\%$</td></tr><tr><td>X6S</td><td>$\pm 22\%$</td></tr><tr><td>X7R</td><td>$\pm 15\%$</td></tr><tr><td>X7S</td><td>$\pm 22\%$</td></tr></table>	Material		Cap. Change	Class I	C0G	Within $\pm 30\text{ppm}/^{\circ}\text{C}$	M3L	Within $-0.1\%/^{\circ}\text{C} \sim -0.2\%/^{\circ}\text{C}$	Class II	X5R	$\pm 15\%$	X6S	$\pm 22\%$	X7R	$\pm 15\%$	X7S	$\pm 22\%$	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><th>Step</th><th>Temperature</th></tr><tr><td>1</td><td>Reference Temp.: $25\pm 2^{\circ}\text{C}$</td></tr><tr><td>2</td><td>Minimum operating Temp.: $\pm 3^{\circ}\text{C}$</td></tr><tr><td>3</td><td>Reference Temp.: $25\pm 2^{\circ}\text{C}$</td></tr><tr><td>4</td><td>Maximum operating Temp.: $\pm 2^{\circ}\text{C}$</td></tr><tr><td>5</td><td>Reference Temp.: $25\pm 2^{\circ}\text{C}$</td></tr></table>	Step	Temperature	1	Reference Temp.: $25\pm 2^{\circ}\text{C}$	2	Minimum operating Temp.: $\pm 3^{\circ}\text{C}$	3	Reference Temp.: $25\pm 2^{\circ}\text{C}$	4	Maximum operating Temp.: $\pm 2^{\circ}\text{C}$	5	Reference Temp.: $25\pm 2^{\circ}\text{C}$
Material		Cap. Change																														
Class I	C0G	Within $\pm 30\text{ppm}/^{\circ}\text{C}$																														
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4	Maximum operating Temp.: $\pm 2^{\circ}\text{C}$																															
5	Reference Temp.: $25\pm 2^{\circ}\text{C}$																															
8	Adhesive Strength of Termination	No removal of the terminations or other defect should occur.	Mounting method Solder the capacitor on the test substrate Applied Force 5N (0402:2.5N 0201:1N M3L:6N) Holding Time $10\pm 1\text{s}$ Applied Direction Thrust is gradually applied in the center of the specimen along the horizontal direction of the P.C. plate. 																													
9	Substrate Bending test	Appearance No defects or abnormalities. Cap. Change $[C<1\mu\text{F}]$ X7R/X5R: $\pm 10\%$ C0G: $\pm 1\%$ or 0.5 pF (Which is larger) $[C\geq 1\mu\text{F}]$ X7R/X5R: $\pm 12.5\%$	Mounting method Reflow solder the capacitor on the test substrate and bend 1mm   unit: mm																													
10	Solderability	95% of the terminations is to be soldered evenly and continuously.	Kind of Solder Sn-3.0Ag-0.5Cu(Lead Free Solder) Scaling powder Isopropyl alcohol Rosin 25% solid solution. Solder Temperature $245\pm 5^{\circ}\text{C}$ Test Time $2\pm 0.5\text{s}$. Solder position Until both ends are completely wet																													



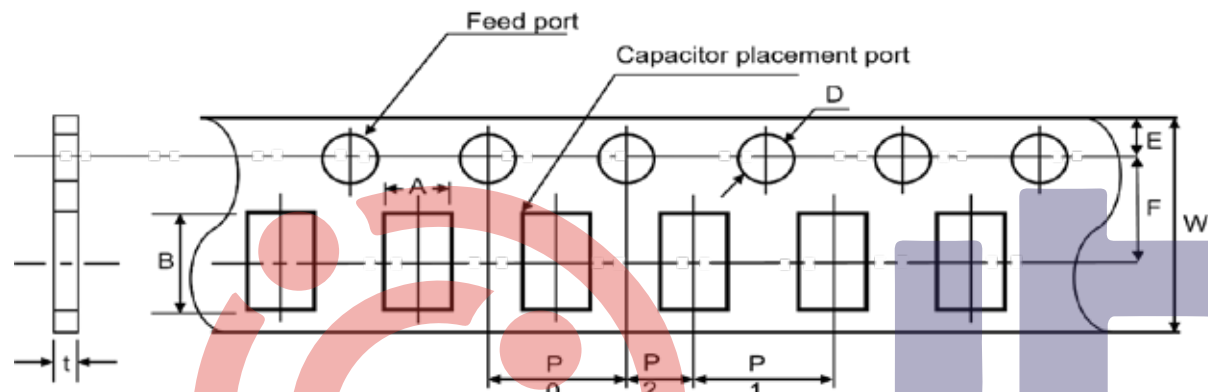
No	Item	Specification	Test Method(Ref. Standard:JIS C 5101, IEC60384)																
11	Resistance to Soldering Heat	Appearance No defects or anomalies Cap. Refer to the individual specifications Q or D.F. Refer to the individual specifications I.R. Refer to the individual specifications Voltage proof No defects or anomalies	Pre-treatment Test Method Kind of Solder Test Temperature Test Time Preheat Temp. Preheat Time Post-treatment	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°C 10±1s 110°C to 140°C 1min Non treatment:Let sit for 24+/-2hours at room temperature, then measure.															
12	Temperature Cycle	Appearance No defects or anomalies Cap. Refer to the individual specifications Q or D.F. Refer to the individual specifications I.R. Refer to the individual specifications	Mounting method Pre-treatment Temperature Cycles	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°C</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°C</td><td>30±3 min</td></tr><tr><td>4</td><td>Room temperature</td><td>2~5 min</td></tr></table> Post-treatment	Step	Temperature	Time	1	Minimum Temp.: ±3°C	30±3 min	2	Room temperature	2~5 min	3	Maximum Temp.: ±3°C	30±3 min	4	Room temperature	2~5 min
Step	Temperature	Time																	
1	Minimum Temp.: ±3°C	30±3 min																	
2	Room temperature	2~5 min																	
3	Maximum Temp.: ±3°C	30±3 min																	
4	Room temperature	2~5 min																	
			Post-treatment	Non treatment:Let sit for 24+/-2hours at room temperature, then measure.															

No	Item	Specification	Test Method(Ref. Standard:JIS C 5101, IEC60384)	
13	High Temperature High Humidity	Appearance No defects or anomalies Cap. Refer to the individual specifications Q or D.F. Refer to the individual specifications I.R. Refer to the individual specifications	Mounting method Solder the capacitor on the test substrate Pre-treatment 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. Test Temperature 40±2°C Test Humidity 90%RH to 95%RH Test Time 500±24h Test Voltage Rate Voltage (Not more than 630V) Charge/discharge current 50mA max 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.	
14	Life	Appearance No defects or anomalies Cap. Refer to the individual specifications Q or D.F. Refer to the individual specifications I.R. Refer to the individual specifications	Mounting method Solder the capacitor on the test substrate Pre-treatment Heat treatment:Apply the test voltage at the test temperature for 1hour and then let sit for 24+/-2 hours at room temperature, then measure. Test Temperature Max. Operating Temp.:±3°C Test Time 1000±12h Test Voltage Refer to the individual specifications Charge/discharge current 50mA max 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.	

Product Packaging

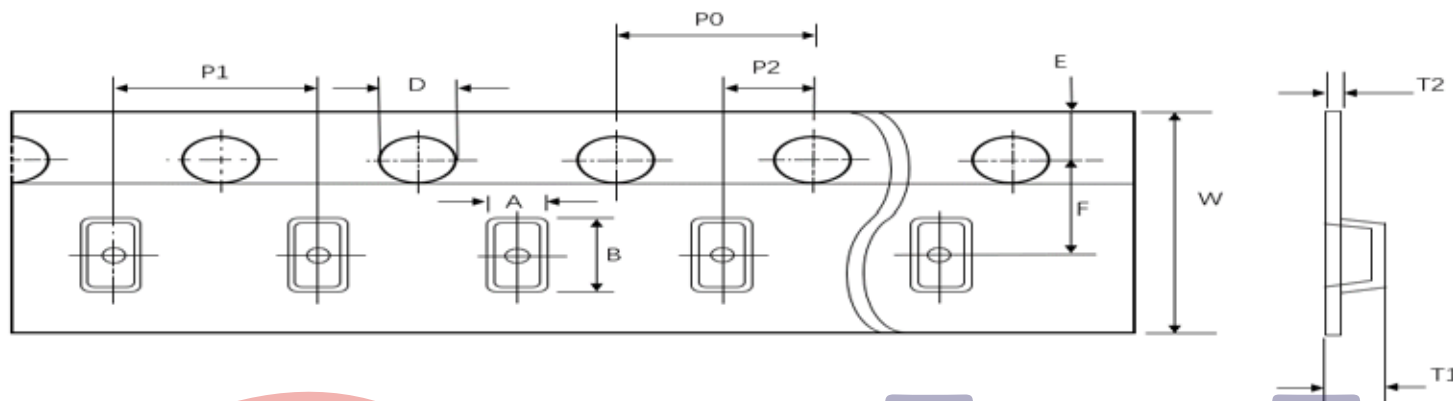
At present, the most common way of packaging is to carry coil packaging. A coil with a diameter of 180mm (7") can contain 1000~20000 capacitors, or coil packaging can be carried out according to customer requirements.

1. Tape Size



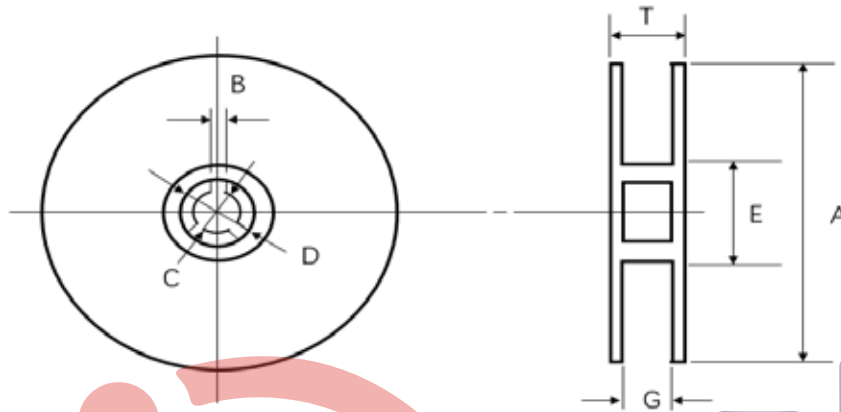
	01005 (0402)	0201 (0603)	0402 (1005)	0603 (1608)	0805 (2012)	1206 (3216)
P1	2.00±0.05(1.0 ±0.05)			4.00±0.10		
P0	4.00±0.10			4.00±0.10		
P2	2.00±0.05			2.00±0.05		
A	0.25±0.02	0.38±0.03	0.62±0.05	1.00±0.01	1.55±0.10	2.05±0.10
B	0.46±0.02	0.68±0.03	1.12±0.05	1.90±0.10	2.30±0.10	3.60±0.10
W	8.00±0.30			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		

2. Plastic Size



	0805 (2012)	1206 (3216)	1210 (3225)	1808 (4520)	1812 (4532)	2220 (5750)
P0	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10
P1	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	8.00±0.10	8.00±0.10
P2	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05
A	< 1.80	< 2.50	< 3.20	< 2.50	< 3.90	< 6.80
B	< 2.70	< 4.00	< 4.00	< 5.30	< 5.30	< 6.50
W	8.00±0.20	8.00±0.20	8.00±0.20	12.00±0.20	12.00±0.20	12.00±0.20
E	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10
F	3.5±0.05	3.5±0.05/5.50±0.05	3.5±0.05/5.50±0.05	5.50±0.05	5.50±0.05	5.50±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)	1.5 (+0.1/-0.0)	1.5 (+0.1/-0.0)
T1	2.5 max.	2.5 max.	3.5 max.	2.5 max.	3.0 max.	3.1 max.
T2	0.23±0.05	0.23±0.05/0.95±0.05	0.23±0.05	0.30±0.1	0.30±0.1	0.30±0.1

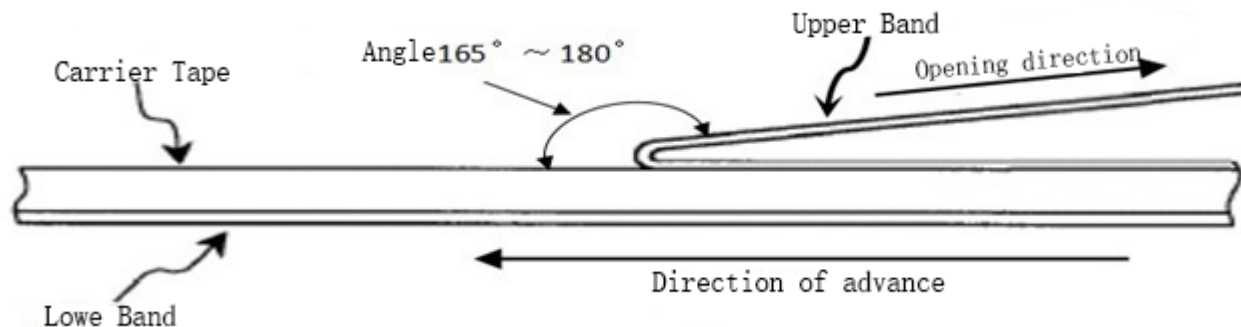
3. Disk Size



Disk Size	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	G (mm)	T (mm)
7"Reel	$\Phi 178 \pm 2.0$	2.0 ± 0.5	$\Phi 13 \pm 1.0$	$\Phi 21 \pm 0.8$	$\Phi 50$ 或更大	10 ± 1.0	13 ± 1.0

4. Instructions for use of reel tape

When the finished product is in use, the upper band (film) is at a speed of $300 \pm 10 \text{ mm/min}$, an Angle of $165^\circ \sim 180^\circ$ (as shown below), and the peeling strength is $0.1 \text{ N} \sim 0.7 \text{ N}$ ($10 \text{ g.f.} \leq \text{peeling force} \leq 70 \text{ g.f.}$).



Precautions for use

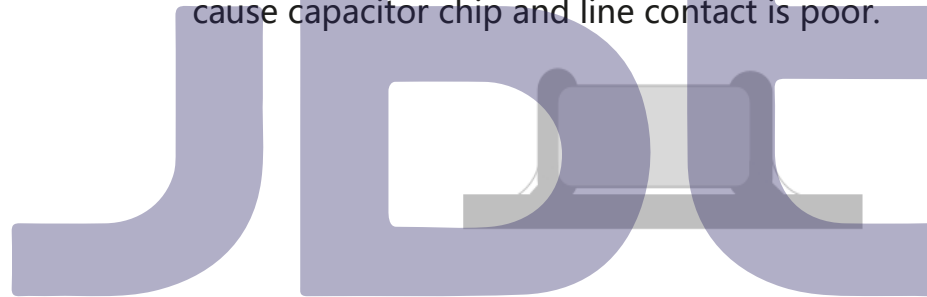
Multi-layer Ceramic Chip Capacitors (MLCC) may have short circuit or open circuit under the harsh working environment beyond the use frequency described in this letter of admission or related instructions, or under the action of external mechanical force overpressure. Or it may smoke, burn or even explode, 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.

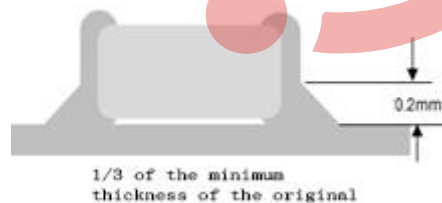


B. Too little solder fixed force is insufficient, may cause capacitor chip and line contact is poor.

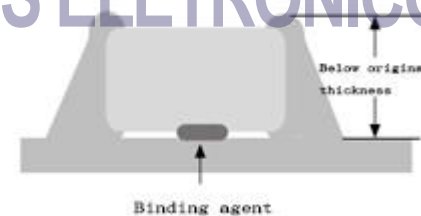


2. Recommended amount of solder:

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

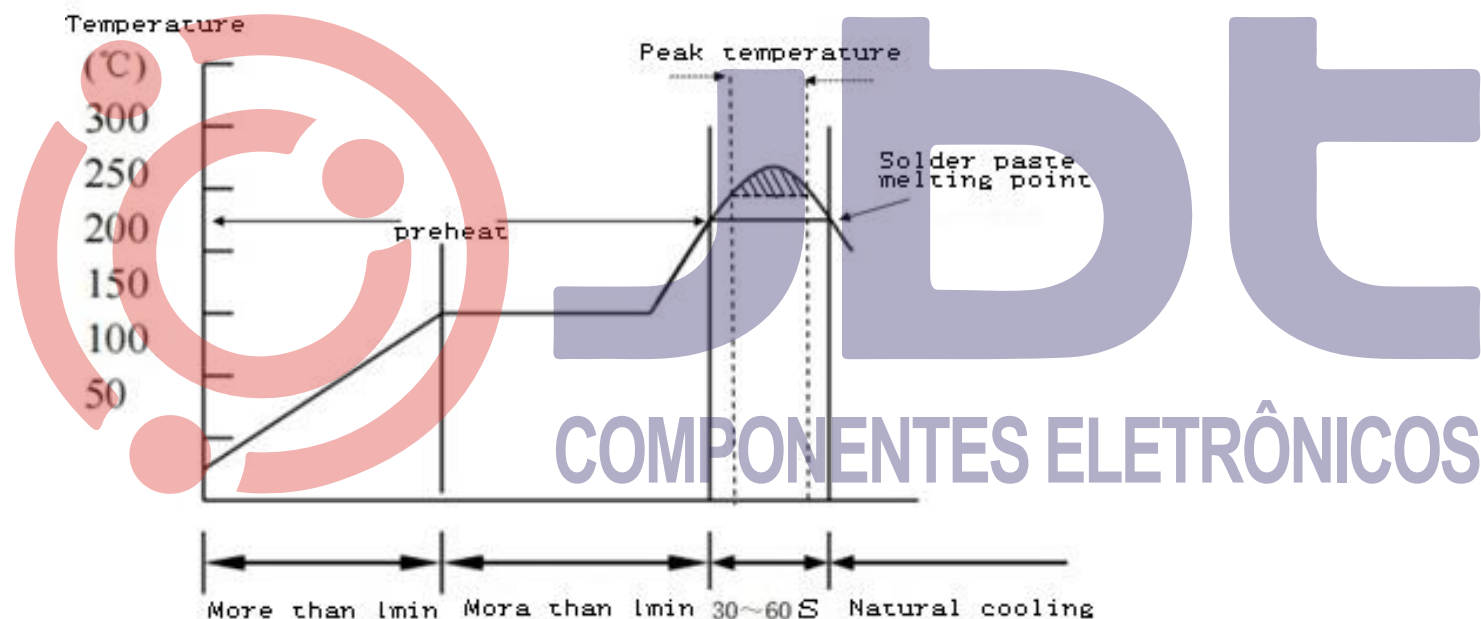




3. Recommended welding temperature curve:

Welding mode	≤0402	0603	0805	1206	≥1210
Reflow welding	All specifications	> 1.0 μF	> 2.2 μF	> 4.7 μF	All specifications
Reflow/Wave welding		≤ 1.0 μF	≤ 2.2 μF	≤ 4.7 μF	

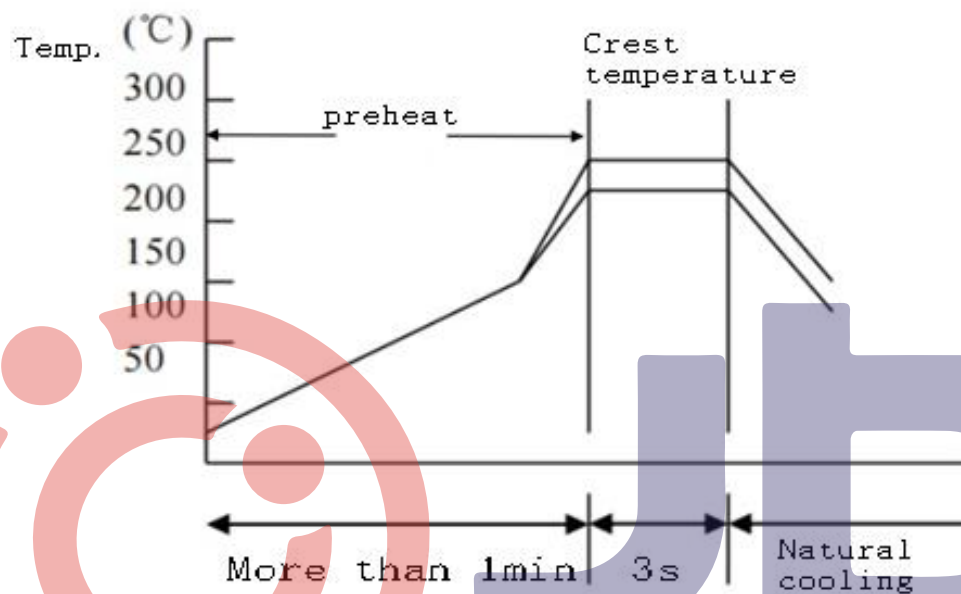
Reflow welding



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



Wave soldering

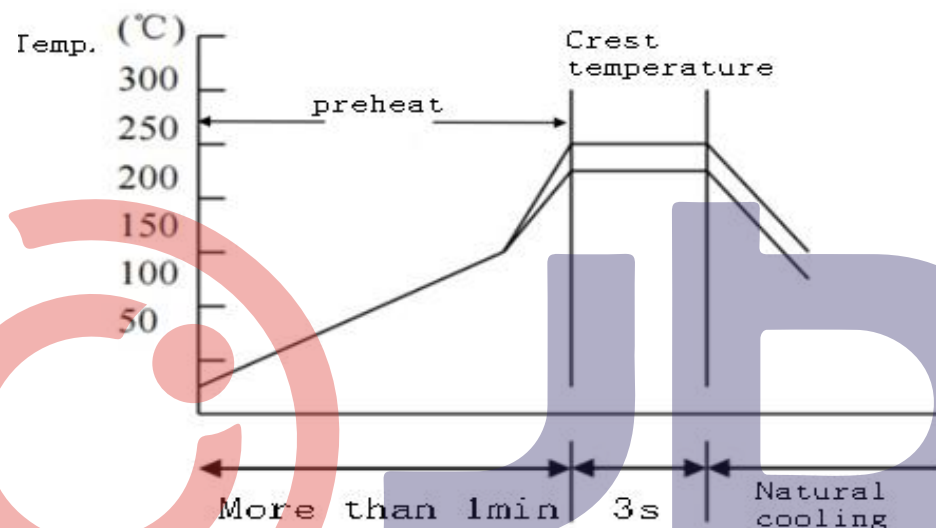


Solder type	Pb-Sn welding	Lead-free welding
Peak temperature	230°C ~ 260°C	240°C ~ 270°C
Peak time	Within 3s	Within 3s



Hand welding

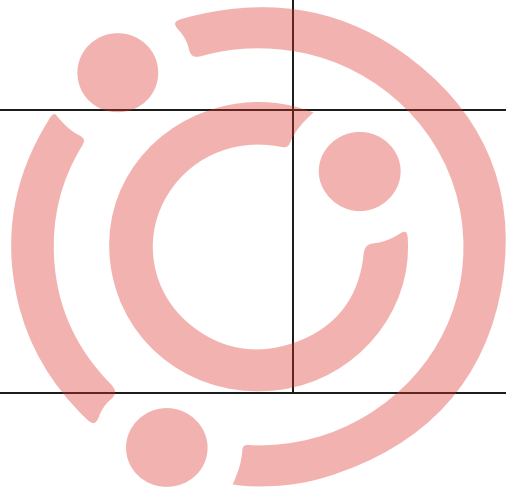
Manual welding is easy to cause micro-cracking or partial cracking of porcelain because of uneven local heating of capacitor. Therefore, the use of electric iron manual welding should be carefully operated, and the choice of the tip of the electric



Preheat	Temp.	Power	Diameter	Time	Tin paste	Notice
$\Delta \leq 130^{\circ}\text{C}$	$\leq 350^{\circ}\text{C}$	$\leq 20\text{W}$	Recommended 1mm	$\leq 3\text{s}$	$\leq 1/2$ Capacitance height	Do not contact the iron head directly with the ceramic body



Edition	Revision date	Revised content statement
CSA-S 01	2023/2/24	Initial issue
CSA-S 02	2023/6/09	1. Update the tolerance range 2. Update the packaging quantity
CSA-S 03	2023/12/01	1. Update the tolerance range graph 2. Added M3L test specifications 3. New welding mode tolerance table [P19]



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