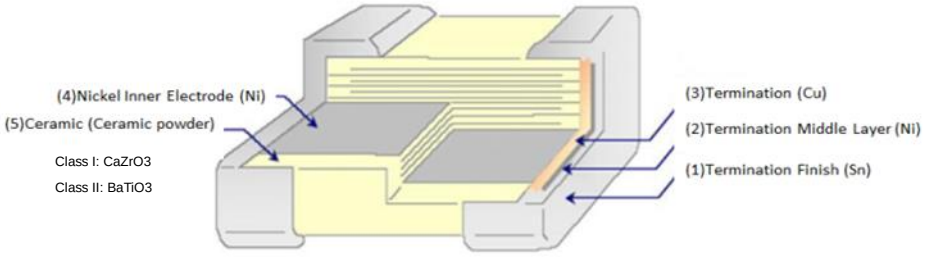
CONTENT (MLCC)

E Standard Number

E3	1.0				2.2				4.7			
E6	1.0		1.5		2.2		3.3		4.7		6.8	
E12	1.0	1.2	1.5	1.8	2.2	2.7	3.3	3.9	4.7	5.6	6.8	8.2
E24	1.0	1.1	1.2	1.3	1.5	1.6	1.8	2.0	2.2	2.4	2.7	3.0	3.3	3.6	3.9	4.3	4.7	5.1	5.6	6.2	6.8	7.5	8.2	9.1

Structure



Ordering Code

C 2012 NP0 100 J G T A △

PRODUCT CODE

C = MLCC

SIZE in mm (EIA CODE, in inch)

0402(01005) 0603(0201) 1005 (0402) 1608 (0603) 2012 (0805)
3216 (1206) 3225(1210) 4520 (1808) 4532 (1812)

T. C.

NP0: 0 ± 30ppm/℃ -55℃ to +125℃
X7R: ±15% -55℃ to +125℃ X6S: ±22% -55℃ to +105℃
X5R: ±15% -55℃ to +85℃ Y5V: +22%/-82% -30℃ to +85℃

CAPACITANCE CODE

Expressed in pico-farads and identified by a three-digit number.
First two digits represent significant figures.
Last digit specifies the number of zeros.
(Use 9 for 1.0 through 9.9pF； Use 8 for 0.20 through 0.99pF)

Examples:

Code	Cap (pF)
478	0.47
229	2.2
101	100
102	1000

TOLERANCE CODE

A: ± 0.05pF B: ± 0.1pF C: ± 0.25pF D: ± 0.5pF F: ±1% G: ±2%
J: ±5% K: ±10% M: ±20% Z: +80/-20%

VOLTAGE CODE

B: 4V C: 6.3V D: 10V E: 16V F: 25V N: 35V G: 50V H: 100V
J: 200V K: 250V L: 500V M: 630V P: 1KV Q: 2KV R: 3KV S: 4KV

PACKAGING CODE

T: Paper tape reel Ø180mm (7”)
N: Paper tape reel Ø250mm (10”)
A: Paper tape reel Ø330mm (13”)
W: Special Packing
P: Embossed tape reel Ø180mm (7”)
D: Embossed tape reel Ø250mm (10”)
E: Embossed tape reel Ø330mm (13”)

Application Code

S: Standard Q: High Q/Low ESR F: Microwave A: Automotive Infotainment with AEC-Q200

Thickness Code

Code	Thick (mm)	Code	Thick(mm)	Code	Thick (mm)
(blank)	Standard Thick	**M**	0.70	**H**	1.50
Z	0.20	**D**	0.80	**L**	1.60
A	0.30	**E**	0.85	**N**	2.00
Q	0.45	**I**	0.95	**P**	2.50
B	0.50	**F**	1.15	**R**	3.20
C	0.60	**G**	1.25		

Automotive Application (AEC-Q200 compliant)

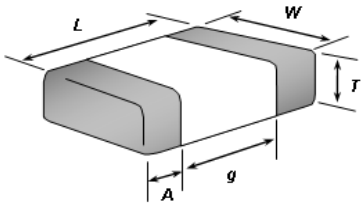
■ Feature

1. Monolithic structure ensures high reliability and mechanical strength.
2. RoHS compliant
3. AEC-Q200 compliant
4. Halogen Free

■ Application

1. Automotive comfort & infotainment systems
2. Bluetooth & wireless communication systems
3. Navigation & audio systems
4. Automotive after-market electronics

■ Standard External Dimensions



TYPE		Dimension (mm)				
Size (EIA Size)	Kind	L (Length)	W (Width)	T (Max.)	g (Min)	A (Min/Max)
C0603 (0201)	Standard	0.6 ± 0.03	0.30 ± 0.03	0.33	0.15	0.10 / 0.20
	Special (1)	0.6 ± 0.05	0.30 ± 0.05	0.35		
	Special (2)	0.6 ± 0.09	0.30 ± 0.09	0.39		0.10 / 0.25
C1005 (0402)	Standard	1.0 ± 0.05	0.50 ± 0.05	0.55	0.30	0.15 / 0.35
	Special (1)	1.0 ± 0.10	0.50 ± 0.10	0.60		
	Special (2)	1.0 ± 0.15	0.50 ± 0.15	0.65		
	Special (3)	1.0 ± 0.20	0.50 ± 0.20	0.70		
C1608 (0603)	Standard	1.6 ± 0.10	0.80 ± 0.10	0.90	0.50	0.25 / 0.65
	Special (1)	1.6 ± 0.15	0.80 ± 0.15	0.95		
	Special (2)	1.6 ± 0.20	0.80 ± 0.20	1.00		
	Special (3)	1.6 ± 0.25	0.80 ± 0.25	1.05		
C2012 (0805)	Standard	2.0 ± 0.15	1.25 ± 0.15	1.45	0.70	0.25 / 0.75
	Special (1)	2.0 ± 0.20	1.25 ± 0.20	1.45		
C3216 (1206)	Standard	3.2 ± 0.15	1.60 ±0.15	1.80	1.50	0.25 / 0.75
	Special (1)	3.2 ± 0.20	1.60 ±0.20	1.90		
	Special (2)	3.2 ± 0.30	1.60 ±0.30	1.90		
	Special (1)	3.2 ± 0.40	2.50 ± 0.30	2.80		

For some special parts, please see the “Part Number & Characteristic” for detail specification.

■ Part Number & Characteristic

■ NP0 Series

● C1005NP0_A Series (EIA0402)

RV	AXIOM P/N	Measuring Condition	Capacitance		Available Tolerance	Thick. (mm)	Tolerance(mm)		DF (max.)	Standard Packing
			Value	Unit			L/W	Thick.		
50V	C1005NP0508□GTA	1V, 1MHz	0.50	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.24%	Paper, 10Kpcs
	C1005NP0608□GTA	1V, 1MHz	0.60	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.24%	
	C1005NP0688□GTA	1V, 1MHz	0.68	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.24%	
	C1005NP0708□GTA	1V, 1MHz	0.70	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.24%	
	C1005NP0808□GTA	1V, 1MHz	0.80	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.24%	
	C1005NP0828□GTA	1V, 1MHz	0.82	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.24%	
	C1005NP0908□GTA	1V, 1MHz	0.90	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.24%	
	C1005NP0109□GTA	1V, 1MHz	1.0	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.24%	
	C1005NP0119□GTA	1V, 1MHz	1.1	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.24%	
	C1005NP0129□GTA	1V, 1MHz	1.2	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.24%	
	C1005NP0139□GTA	1V, 1MHz	1.3	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.23%	
	C1005NP0149□GTA	1V, 1MHz	1.4	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.23%	
	C1005NP0159□GTA	1V, 1MHz	1.5	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.23%	
	C1005NP0189□GTA	1V, 1MHz	1.8	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.23%	
	C1005NP0209□GTA	1V, 1MHz	2.0	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.23%	
	C1005NP0229□GTA	1V, 1MHz	2.2	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.23%	
	C1005NP0249□GTA	1V, 1MHz	2.4	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.22%	
	C1005NP0279□GTA	1V, 1MHz	2.7	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.22%	
	C1005NP0309□GTA	1V, 1MHz	3.0	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.22%	
	C1005NP0339□GTA	1V, 1MHz	3.3	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.21%	
	C1005NP0399□GTA	1V, 1MHz	3.9	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.21%	
	C1005NP0409□GTA	1V, 1MHz	4.0	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.21%	
	C1005NP0479□GTA	1V, 1MHz	4.7	pF	±0.25pF,±0.1pF	0.50	±0.05	±0.05	0.20%	
	C1005NP0509□GTA	1V, 1MHz	5.0	pF	±0.5pF,±0.25pF	0.50	±0.05	±0.05	0.20%	
	C1005NP0569□GTA	1V, 1MHz	5.6	pF	±0.5pF,±0.25pF	0.50	±0.05	±0.05	0.20%	
	C1005NP0609□GTA	1V, 1MHz	6.0	pF	±0.5pF,±0.25pF	0.50	±0.05	±0.05	0.19%	
	C1005NP0629□GTA	1V, 1MHz	6.2	pF	±0.5pF,±0.25pF	0.50	±0.05	±0.05	0.19%	
	C1005NP0689□GTA	1V, 1MHz	6.8	pF	±0.5pF,±0.25pF	0.50	±0.05	±0.05	0.19%	
	C1005NP0709□GTA	1V, 1MHz	7.0	pF	±0.5pF,±0.25pF	0.50	±0.05	±0.05	0.19%	
	C1005NP0759□GTA	1V, 1MHz	7.5	pF	±0.5pF,±0.25pF	0.50	±0.05	±0.05	0.18%	
	C1005NP0809□GTA	1V, 1MHz	8.0	pF	±0.5pF,±0.25pF	0.50	±0.05	±0.05	0.18%	
	C1005NP0829□GTA	1V, 1MHz	8.2	pF	±0.5pF,±0.25pF	0.50	±0.05	±0.05	0.18%	
	C1005NP0909□GTA	1V, 1MHz	9.0	pF	±0.5pF,±0.25pF	0.50	±0.05	±0.05	0.17%	
	C1005NP0919□GTA	1V, 1MHz	9.1	pF	±0.5pF,±0.25pF	0.50	±0.05	±0.05	0.17%	
	C1005NP0100□GTA	1V, 1MHz	10	pF	±5%,±2%	0.50	±0.05	±0.05	0.17%	
	C1005NP0120□GTA	1V, 1MHz	12	pF	±5%,±2%,±1%	0.50	±0.05	±0.05	0.16%	
	C1005NP0150□GTA	1V, 1MHz	15	pF	±5%,±2%	0.50	±0.05	±0.05	0.14%	
	C1005NP0160□GTA	1V, 1MHz	16	pF	±5%,±2%	0.50	±0.05	±0.05	0.14%	
	C1005NP0180□GTA	1V, 1MHz	18	pF	±5%,±2%	0.50	±0.05	±0.05	0.13%	
	C1005NP0220□GTA	1V, 1MHz	22	pF	±5%,±2%	0.50	±0.05	±0.05	0.12%	
	C1005NP0240□GTA	1V, 1MHz	24	pF	±5%,±2%	0.50	±0.05	±0.05	0.11%	
	C1005NP0270□GTA	1V, 1MHz	27	pF	±5%,±2%	0.50	±0.05	±0.05	0.11%	
	C1005NP0330□GTA	1V, 1MHz	33	pF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0390□GTA	1V, 1MHz	39	pF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0470□GTA	1V, 1MHz	47	pF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0560□GTA	1V, 1MHz	56	pF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0680□GTA	1V, 1MHz	68	pF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0750□GTA	1V, 1MHz	75	pF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0820□GTA	1V, 1MHz	82	pF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0101□GTA	1V, 1MHz	100	pF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0121□GTA	1V, 1MHz	120	pF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0151□GTA	1V, 1MHz	150	pF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0181□GTA	1V, 1MHz	180	pF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0221□GTA	1V, 1MHz	220	pF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0331□GTA	1V, 1MHz	330	pF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0471□GTA	1V, 1MHz	470	pF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0681□GTA	1V, 1MHz	680	pF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0102□GTA	1V, 1MHz	1.0	nF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
	C1005NP0152□GTA	1V, 1kHz	1.5	nF	±5%,±2%	0.50	±0.05	±0.05	0.10%	
16V	C1005NP0680JETA	1V, 1MHz	68	pF	±5%	0.50	±0.05	±0.05	0.10%	Paper, 10Kpcs

- C1608NP0_A Series (EIA0603)

RV	AXIOM P/N	Measuring Condition	Capacitance		Available Tolerance	Thick. (mm)	Tolerance(mm)		DF (max.)	Standard Packing
			Value	Unit			L/W	Thick.		
100V	C1608NP0508□HTA	1V, 1MHz	0.50	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.24%	Paper, 4Kpcs
	C1608NP0758□HTA	1V, 1MHz	0.75	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.24%	
	C1608NP0109□HTA	1V, 1MHz	1.0	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.24%	
	C1608NP0129□HTA	1V, 1MHz	1.2	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.24%	
	C1608NP0159□HTA	1V, 1MHz	1.5	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.23%	
	C1608NP0189□HTA	1V, 1MHz	1.8	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.23%	
	C1608NP0209□HTA	1V, 1MHz	2.0	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.23%	
	C1608NP0229□HTA	1V, 1MHz	2.2	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.23%	
	C1608NP0249□HTA	1V, 1MHz	2.4	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.22%	
	C1608NP0279□HTA	1V, 1MHz	2.7	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.22%	
	C1608NP0309□HTA	1V, 1MHz	3.0	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.22%	
	C1608NP0339□HTA	1V, 1MHz	3.3	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.21%	
	C1608NP0399□HTA	1V, 1MHz	3.9	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.21%	
	C1608NP0409□HTA	1V, 1MHz	4.0	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.21%	
	C1608NP0479□HTA	1V, 1MHz	4.7	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.20%	
	C1608NP0509□HTA	1V, 1MHz	5.0	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.20%	
	C1608NP0569□HTA	1V, 1MHz	5.6	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.20%	
	C1608NP0609□HTA	1V, 1MHz	6.0	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.19%	
	C1608NP0629□HTA	1V, 1MHz	6.2	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.19%	
	C1608NP0689□HTA	1V, 1MHz	6.8	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.19%	
	C1608NP0709□HTA	1V, 1MHz	7.0	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.19%	
	C1608NP0829□HTA	1V, 1MHz	8.2	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.18%	
	C1608NP0909□HTA	1V, 1MHz	9.0	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.17%	
	C1608NP0100□HTA	1V, 1MHz	10	pF	±5%,±2%	0.80	±0.10	±0.10	0.17%	
	C1608NP0110□HTA	1V, 1MHz	11	pF	±5%,±2%	0.80	±0.10	±0.10	0.16%	
	C1608NP0120□HTA	1V, 1MHz	12	pF	±5%,±2%	0.80	±0.10	±0.10	0.16%	
	C1608NP0150□HTA	1V, 1MHz	15	pF	±5%,±2%	0.80	±0.10	±0.10	0.14%	
	C1608NP0180□HTA	1V, 1MHz	18	pF	±5%,±2%	0.80	±0.10	±0.10	0.13%	
	C1608NP0200□HTA	1V, 1MHz	20	pF	±5%,±2%	0.80	±0.10	±0.10	0.13%	
	C1608NP0220□HTA	1V, 1MHz	22	pF	±5%,±2%	0.80	±0.10	±0.10	0.12%	
	C1608NP0240□HTA	1V, 1MHz	24	pF	±5%,±2%	0.80	±0.10	±0.10	0.11%	
	C1608NP0270□HTA	1V, 1MHz	27	pF	±5%,±2%	0.80	±0.10	±0.10	0.11%	
	C1608NP0300□HTA	1V, 1MHz	30	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0330□HTA	1V, 1MHz	33	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0360□HTA	1V, 1MHz	36	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0390□HTA	1V, 1MHz	39	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0430□HTA	1V, 1MHz	43	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0470□HTA	1V, 1MHz	47	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0560□HTA	1V, 1MHz	56	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0620□HTA	1V, 1MHz	62	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0680□HTA	1V, 1MHz	68	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0750□HTA	1V, 1MHz	75	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0820□HTA	1V, 1MHz	82	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0910□HTA	1V, 1MHz	91	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0101□HTA	1V, 1MHz	100	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0121□HTA	1V, 1MHz	120	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0151□HTA	1V, 1MHz	150	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0181□HTA	1V, 1MHz	180	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0201□HTA	1V, 1MHz	200	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0221□HTA	1V, 1MHz	220	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0271□HTA	1V, 1MHz	270	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0331□HTA	1V, 1MHz	330	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0391□HTA	1V, 1MHz	390	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0471□HTA	1V, 1MHz	470	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0561□HTA	1V, 1MHz	560	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0681□HTA	1V, 1MHz	680	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0821□HTA	1V, 1MHz	820	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0102□HTA	1V, 1MHz	1.0	nF	±5%,±2%	0.80	±0.10	±0.10	0.10%	

□ Tolerance Code: B=±0.1pF, C=±0.25pF ,D=±0.5pF, G=±2%, J=±5%; Special tolerance on the request.

RV	AXIOM P/N	Measuring Condition	Capacitance		Available Tolerance	Thick. (mm)	Tolerance(mm)		DF (max.)	Standard Packing
			Value	Unit			L/W	Thick.		
50V	C1608NP0508□GTA	1V, 1MHz	0.50	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.24%	Paper, 4Kpcs
	C1608NP0758□GTA	1V, 1MHz	0.75	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.24%	
	C1608NP0109□GTA	1V, 1MHz	1.0	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.24%	
	C1608NP0129□GTA	1V, 1MHz	1.2	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.24%	
	C1608NP0159□GTA	1V, 1MHz	1.5	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.23%	
	C1608NP0189□GTA	1V, 1MHz	1.8	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.23%	
	C1608NP0209□GTA	1V, 1MHz	2.0	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.23%	
	C1608NP0229□GTA	1V, 1MHz	2.2	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.23%	
	C1608NP0249□GTA	1V, 1MHz	2.4	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.22%	
	C1608NP0279□GTA	1V, 1MHz	2.7	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.22%	
	C1608NP0309□GTA	1V, 1MHz	3.0	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.22%	
	C1608NP0339□GTA	1V, 1MHz	3.3	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.21%	
	C1608NP0399□GTA	1V, 1MHz	3.9	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.21%	
	C1608NP0409□GTA	1V, 1MHz	4.0	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.21%	
	C1608NP0479□GTA	1V, 1MHz	4.7	pF	±0.25pF,±0.1pF	0.80	±0.10	±0.10	0.20%	
	C1608NP0509□GTA	1V, 1MHz	5.0	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.20%	
	C1608NP0569□GTA	1V, 1MHz	5.6	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.20%	
	C1608NP0609□GTA	1V, 1MHz	6.0	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.19%	
	C1608NP0629□GTA	1V, 1MHz	6.2	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.19%	
	C1608NP0689□GTA	1V, 1MHz	6.8	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.19%	
	C1608NP0709□GTA	1V, 1MHz	7.0	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.19%	
	C1608NP0829□GTA	1V, 1MHz	8.2	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.18%	
	C1608NP0909□GTA	1V, 1MHz	9.0	pF	±0.5pF,±0.25pF	0.80	±0.10	±0.10	0.17%	
	C1608NP0100□GTA	1V, 1MHz	10	pF	±5%,±2%	0.80	±0.10	±0.10	0.17%	
	C1608NP0120□GTA	1V, 1MHz	12	pF	±5%,±2%	0.80	±0.10	±0.10	0.16%	
	C1608NP0150□GTA	1V, 1MHz	15	pF	±5%,±2%	0.80	±0.10	±0.10	0.14%	
	C1608NP0180□GTA	1V, 1MHz	18	pF	±5%,±2%	0.80	±0.10	±0.10	0.13%	
	C1608NP0220□GTA	1V, 1MHz	22	pF	±5%,±2%	0.80	±0.10	±0.10	0.12%	
	C1608NP0270□GTA	1V, 1MHz	27	pF	±5%,±2%	0.80	±0.10	±0.10	0.11%	
	C1608NP0330□GTA	1V, 1MHz	33	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0390□GTA	1V, 1MHz	39	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0470□GTA	1V, 1MHz	47	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0560□GTA	1V, 1MHz	56	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0620□GTA	1V, 1MHz	62	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0680□GTA	1V, 1MHz	68	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0820□GTA	1V, 1MHz	82	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0101□GTA	1V, 1MHz	100	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0121□GTA	1V, 1MHz	120	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0151□GTA	1V, 1MHz	150	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0181□GTA	1V, 1MHz	180	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0201□GTA	1V, 1MHz	200	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0221□GTA	1V, 1MHz	220	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0271□GTA	1V, 1MHz	270	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0331□GTA	1V, 1MHz	330	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0391□GTA	1V, 1MHz	390	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0471□GTA	1V, 1MHz	470	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0561□GTA	1V, 1MHz	560	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0681□GTA	1V, 1MHz	680	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0821□GTA	1V, 1MHz	820	pF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0102□GTA	1V, 1MHz	1.0	nF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0152□GTA	1V, 1kHz	1.5	nF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0222□GTA	1V, 1kHz	2.2	nF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0332□GTA	1V, 1kHz	3.3	nF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0472□GTA	1V, 1kHz	4.7	nF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0682□GTA	1V, 1kHz	6.8	nF	±5%,±2%	0.80	±0.10	±0.10	0.10%	
	C1608NP0103□GTA	1V, 1kHz	10	nF	±5%,±2%	0.80	±0.10	±0.10	0.10%	

□ Tolerance Code: B=±0.1pF, C=±0.25pF ,D=±0.5pF,G=±2%, J=±5%; Special tolerance on the request.

C2012NP0_A Series (EIA0805)

RV	AXIOM P/N	Measuring Condition	Capacitance		Available Tolerance	Thick. (mm)	Tolerance(mm)		DF (max.)	Standard Packing
			Value	Unit			L/W	Thick.		
100V	C2012NP0100□HTA	1V, 1MHz	10	pF	±5%,±2%	0.60	±0.20	±0.10	0.17%	Paper, 4Kpcs
	C2012NP0120□HTA	1V, 1MHz	12	pF	±5%,±2%	0.60	±0.20	±0.10	0.16%	
	C2012NP0150□HTA	1V, 1MHz	15	pF	±5%,±2%	0.60	±0.20	±0.10	0.14%	
	C2012NP0180□HTA	1V, 1MHz	18	pF	±5%,±2%	0.60	±0.20	±0.10	0.13%	
	C2012NP0220□HTA	1V, 1MHz	22	pF	±5%,±2%	0.60	±0.20	±0.10	0.12%	
	C2012NP0240□HTA	1V, 1MHz	24	pF	±5%,±2%	0.60	±0.20	±0.10	0.11%	
	C2012NP0270□HTA	1V, 1MHz	27	pF	±5%,±2%	0.60	±0.20	±0.10	0.11%	
	C2012NP0300□HTA	1V, 1MHz	30	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0330□HTA	1V, 1MHz	33	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0390□HTA	1V, 1MHz	39	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0430□HTA	1V, 1MHz	43	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0470□HTA	1V, 1MHz	47	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0560□HTA	1V, 1MHz	56	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0620□HTA	1V, 1MHz	62	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0680□HTA	1V, 1MHz	68	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0750□HTA	1V, 1MHz	75	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0820□HTA	1V, 1MHz	82	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0101□HTA	1V, 1MHz	100	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0121□HTA	1V, 1MHz	120	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0151□HTA	1V, 1MHz	150	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0181□HTA	1V, 1MHz	180	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0221□HTA	1V, 1MHz	220	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0271□HTA	1V, 1MHz	270	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0331□HTA	1V, 1MHz	330	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0391□HTA	1V, 1MHz	390	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0471□HTA	1V, 1MHz	470	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0561□HTA	1V, 1MHz	560	pF	±5%,±2%	0.85	±0.20	±0.10	0.10%	
	C2012NP0681□HTA	1V, 1MHz	680	pF	±5%,±2%	0.85	±0.20	±0.10	0.10%	
	C2012NP0821□HTA	1V, 1MHz	820	pF	±5%,±2%	0.85	±0.20	±0.10	0.10%	
	C2012NP0102□HTA	1V, 1MHz	1.0	nF	±5%,±2%	0.85	±0.20	±0.10	0.10%	
50V	C2012NP0100□GTA	1V, 1MHz	10	pF	±5%,±2%	0.60	±0.20	±0.10	0.17%	Paper, 4Kpcs
	C2012NP0120□GTA	1V, 1MHz	12	pF	±5%,±2%	0.60	±0.20	±0.10	0.16%	
	C2012NP0150□GTA	1V, 1MHz	15	pF	±5%,±2%	0.60	±0.20	±0.10	0.14%	
	C2012NP0180□GTA	1V, 1MHz	18	pF	±5%,±2%	0.60	±0.20	±0.10	0.13%	
	C2012NP0220□GTA	1V, 1MHz	22	pF	±5%,±2%	0.60	±0.20	±0.10	0.12%	
	C2012NP0240□GTA	1V, 1MHz	24	pF	±5%,±2%	0.60	±0.20	±0.10	0.11%	
	C2012NP0270□GTA	1V, 1MHz	27	pF	±5%,±2%	0.60	±0.20	±0.10	0.11%	
	C2012NP0330□GTA	1V, 1MHz	33	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0360□GTA	1V, 1MHz	36	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0390□GTA	1V, 1MHz	39	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0430□GTA	1V, 1MHz	43	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0470□GTA	1V, 1MHz	47	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0560□GTA	1V, 1MHz	56	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0680□GTA	1V, 1MHz	68	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0750□GTA	1V, 1MHz	75	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0820□GTA	1V, 1MHz	82	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0101□GTA	1V, 1MHz	100	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0121□GTA	1V, 1MHz	120	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0151□GTA	1V, 1MHz	150	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0181□GTA	1V, 1MHz	180	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0221□GTA	1V, 1MHz	220	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0271□GTA	1V, 1MHz	270	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0331□GTA	1V, 1MHz	330	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0391□GTA	1V, 1MHz	390	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0471□GTA	1V, 1MHz	470	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0561□GTA	1V, 1MHz	560	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0681□GTA	1V, 1MHz	680	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0821□GTA	1V, 1MHz	820	pF	±5%,±2%	0.60	±0.20	±0.10	0.10%	
	C2012NP0102□GTA	1V, 1MHz	1.0	nF	±5%,±2%	0.60	±0.20	±0.10	0.10%	

□ Tolerance Code: G=±2%, J=±5%; Special tolerance on the request.

- X7R Series
- C0603X7R_A Series (EIA0201)

RV	AXIOM P/N	Measuring Condition	Capacitance		Available Tolerance	Thick. (mm)	Tolerance(mm)		DF (max.)	Standard Packing
			Value	Unit			L/W	Thick.		
25V	C0603X7R222KFTA	1V , 1kHz	2.2	nF	±10%	0.30	± 0.03	± 0.03	3.5%	Paper, 15Kpcs
16V	C0603X7R472KETA	1V , 1kHz	4.7	nF	±10%	0.30	± 0.03	± 0.03	5.0%	Paper, 15Kpcs
10V	C0603X7R103KDTA	1V , 1kHz	10	nF	±10%	0.30	± 0.03	± 0.03	5.0%	Paper, 15Kpcs

- C1005X7R_A Series (EIA0402)

RV	AXIOM P/N	Measuring Condition	Capacitance		Available Tolerance	Thick. (mm)	Tolerance(mm)		DF (max.)	Standard Packing
			Value	Unit			L/W	Thick.		
50V	C1005X7R101KGTA	1V , 1kHz	100	pF	±10%	0.50	±0.05	±0.05	3.0%	Paper, 10Kpcs
	C1005X7R151KGTA	1V , 1kHz	151	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R221KGTA	1V , 1kHz	220	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R271KGTA	1V , 1kHz	270	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R331KGTA	1V , 1kHz	330	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R391KGTA	1V , 1kHz	390	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R471KGTA	1V , 1kHz	470	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R561KGTA	1V , 1kHz	560	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R681KGTA	1V , 1kHz	680	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R751KGTA	1V , 1kHz	750	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R821KGTA	1V , 1kHz	820	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R102KGTA	1V , 1kHz	1.0	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R122KGTA	1V , 1kHz	1.2	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R152KGTA	1V , 1kHz	1.5	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R182KGTA	1V , 1kHz	1.8	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R222KGTA	1V , 1kHz	2.2	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R272KGTA	1V , 1kHz	2.7	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R332KGTA	1V , 1kHz	3.3	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R392KGTA	1V , 1kHz	3.9	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R472KGTA	1V , 1kHz	4.7	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R562KGTA	1V , 1kHz	5.6	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R682KGTA	1V , 1kHz	6.8	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R822KGTA	1V , 1kHz	8.2	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R103KGTA	1V , 1kHz	10	nF	±10%	0.50	±0.05	±0.05	3.0%	
25V	C1005X7R221KFTA	1V , 1kHz	220	pF	±10%	0.50	±0.05	±0.05	3.0%	Paper, 10Kpcs
	C1005X7R271KFTA	1V , 1kHz	270	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R331KFTA	1V , 1kHz	330	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R391KFTA	1V , 1kHz	390	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R471KFTA	1V , 1kHz	470	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R561KFTA	1V , 1kHz	560	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R681KFTA	1V , 1kHz	680	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R821KFTA	1V , 1kHz	820	pF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R102KFTA	1V , 1kHz	1.0	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R122KFTA	1V , 1kHz	1.2	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R152KFTA	1V , 1kHz	1.5	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R182KFTA	1V , 1kHz	1.8	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R222KFTA	1V , 1kHz	2.2	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R272KFTA	1V , 1kHz	2.7	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R332KFTA	1V , 1kHz	3.3	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R392KFTA	1V , 1kHz	3.9	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R472KFTA	1V , 1kHz	4.7	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R562KFTA	1V , 1kHz	5.6	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R682KFTA	1V , 1kHz	6.8	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R822KFTA	1V , 1kHz	8.2	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R103KFTA	1V , 1kHz	10	nF	±10%	0.50	±0.05	±0.05	3.0%	
	C1005X7R123KFTA	1V , 1kHz	12	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R153KFTA	1V , 1kHz	15	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R183KFTA	1V , 1kHz	18	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R223KFTA	1V , 1kHz	22	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R273KFTA	1V , 1kHz	27	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R333KFTA	1V , 1kHz	33	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R473KFTA	1V , 1kHz	47	nF	±10%	0.50	±0.05	±0.05	3.5%	

RV	AXIOM P/N	Measuring Condition	Capacitance		Available Tolerance	Thick. (mm)	Tolerance(mm)		DF (max.)	Standard Packing
			Value	Unit			L/W	Thick.		
16V	C1005X7R221KETA	1V , 1kHz	220	pF	±10%	0.50	±0.05	±0.05	3.5%	Paper, 10Kpcs
	C1005X7R271KETA	1V , 1kHz	270	pF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R331KETA	1V , 1kHz	330	pF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R391KETA	1V , 1kHz	390	pF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R471KETA	1V , 1kHz	470	pF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R561KETA	1V , 1kHz	560	pF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R681KETA	1V , 1kHz	680	pF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R821KETA	1V , 1kHz	820	pF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R102KETA	1V , 1kHz	1.0	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R122KETA	1V , 1kHz	1.2	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R152KETA	1V , 1kHz	1.5	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R182KETA	1V , 1kHz	1.8	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R222KETA	1V , 1kHz	2.2	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R272KETA	1V , 1kHz	2.7	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R332KETA	1V , 1kHz	3.3	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R392KETA	1V , 1kHz	3.9	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R472KETA	1V , 1kHz	4.7	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R562KETA	1V , 1kHz	5.6	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R682KETA	1V , 1kHz	6.8	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R822KETA	1V , 1kHz	8.2	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R103KETA	1V , 1kHz	10	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R123KETA	1V , 1kHz	12	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R153KETA	1V , 1kHz	15	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R183KETA	1V , 1kHz	18	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R223KETA	1V , 1kHz	22	nF	±10%	0.50	±0.05	±0.05	3.5%	
	C1005X7R273KETA	1V , 1kHz	27	nF	±10%	0.50	±0.05	±0.05	5.0%	
	C1005X7R333KETA	1V , 1kHz	33	nF	±10%	0.50	±0.05	±0.05	5.0%	
	C1005X7R473KETA	1V , 1kHz	47	nF	±10%	0.50	±0.05	±0.05	5.0%	
	C1005X7R563KETA	1V , 1kHz	56	nF	±10%	0.50	±0.05	±0.05	5.0%	
	C1005X7R683KETA	1V , 1kHz	68	nF	±10%	0.50	±0.05	±0.05	5.0%	
	C1005X7R823KETA	1V , 1kHz	82	nF	±10%	0.50	±0.05	±0.05	5.0%	
	C1005X7R104KETA	1V , 1kHz	100	nF	±10%	0.50	±0.10	±0.10	5.0%	
10V	C1005X7R103KDTA	1V , 1kHz	10	nF	±10%	0.50	±0.05	±0.05	3.5%	Paper, 10Kpcs
	C1005X7R104KDTA	1V , 1kHz	100	nF	±10%	0.50	±0.10	±0.10	5.0%	
	C1005X7R224KDTA	1V , 1kHz	220	nF	±10%	0.50	±0.10	±0.10	10.0%	

- C1608X7R_A Series (EIA0603)

RV	AXIOM P/N	Measuring Condition	Capacitance		Available Tolerance	Thick. (mm)	Tolerance(mm)		DF (max.)	Standard Packing
			Value	Unit			L/W	Thick.		
100V	C1608X7R102KHTA	1V , 1kHz	1.0	nF	±10%	0.80	±0.10	±0.10	3.0%	Paper, 4Kpcs
	C1608X7R122KHTA	1V , 1kHz	1.2	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R152KHTA	1V , 1kHz	1.5	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R182KHTA	1V , 1kHz	1.8	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R222KHTA	1V , 1kHz	2.2	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R272KHTA	1V , 1kHz	2.7	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R332KHTA	1V , 1kHz	3.3	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R392KHTA	1V , 1kHz	3.9	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R472KHTA	1V , 1kHz	4.7	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R562KHTA	1V , 1kHz	5.6	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R682KHTA	1V , 1kHz	6.8	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R822KHTA	1V , 1kHz	8.2	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R103KHTA	1V , 1kHz	10	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R223KHTA	1V , 1kHz	22	nF	±10%	0.80	±0.10	±0.10	5.0%	
	C1608X7R473KHTA	1V , 1kHz	47	nF	±10%	0.80	±0.15	±0.15	5.0%	

RV	AXIOM P/N	Measuring Condition	Capacitance		Available Tolerance	Thick. (mm)	Tolerance(mm)		DF (max.)	Standard Packing
			Value	Unit			L/W	Thick.		
50V	C1608X7R102KGTA	1V , 1kHz	1.0	nF	±10%	0.80	±0.10	±0.10	3.0%	Paper, 4Kpcs
	C1608X7R122KGTA	1V , 1kHz	1.2	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R152KGTA	1V , 1kHz	1.5	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R182KGTA	1V , 1kHz	1.8	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R222KGTA	1V , 1kHz	2.2	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R272KGTA	1V , 1kHz	2.7	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R332KGTA	1V , 1kHz	3.3	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R392KGTA	1V , 1kHz	3.9	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R472KGTA	1V , 1kHz	4.7	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R562KGTA	1V , 1kHz	5.6	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R682KGTA	1V , 1kHz	6.8	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R822KGTA	1V , 1kHz	8.2	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R103KGTA	1V , 1kHz	10	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R223KGTA	1V , 1kHz	22	nF	±10%	0.80	±0.10	±0.10	3.0%	
	C1608X7R273KGTA	1V , 1kHz	27	nF	±10%	0.80	±0.15	±0.15	3.5%	
	C1608X7R393KGTA	1V , 1kHz	39	nF	±10%	0.80	±0.15	±0.15	3.5%	
	C1608X7R473KGTA	1V , 1kHz	47	nF	±10%	0.80	±0.15	±0.15	3.5%	
	C1608X7R563KGTA	1V , 1kHz	56	nF	±10%	0.80	±0.15	±0.15	3.5%	
	C1608X7R683KGTA	1V , 1kHz	68	nF	±10%	0.80	±0.15	±0.15	3.5%	
	C1608X7R823KGTA	1V , 1kHz	82	nF	±10%	0.80	±0.15	±0.15	3.5%	
	C1608X7R104KGTA	1V , 1kHz	100	nF	±10%	0.80	±0.15	±0.15	3.5%	
25V	C1608X7R682KFTA	1V , 1kHz	6.8	nF	±10%	0.80	±0.10	±0.10	3.0%	Paper, 4Kpcs
	C1608X7R273KFTA	1V , 1kHz	27	nF	±10%	0.80	±0.15	±0.15	3.5%	
	C1608X7R393KFTA	1V , 1kHz	39	nF	±10%	0.80	±0.15	±0.15	3.5%	
16V	C1608X7R102KETA	1V , 1kHz	1.0	nF	±10%	0.80	±0.10	±0.10	3.5%	Paper, 4Kpcs
	C1608X7R122KETA	1V , 1kHz	1.2	nF	±10%	0.80	±0.10	±0.10	3.5%	
	C1608X7R152KETA	1V , 1kHz	1.5	nF	±10%	0.80	±0.10	±0.10	3.5%	
	C1608X7R182KETA	1V , 1kHz	1.8	nF	±10%	0.80	±0.10	±0.10	3.5%	
	C1608X7R222KETA	1V , 1kHz	2.2	nF	±10%	0.80	±0.10	±0.10	3.5%	
	C1608X7R272KETA	1V , 1kHz	2.7	nF	±10%	0.80	±0.10	±0.10	3.5%	
	C1608X7R332KETA	1V , 1kHz	3.3	nF	±10%	0.80	±0.10	±0.10	3.5%	
	C1608X7R392KETA	1V , 1kHz	3.9	nF	±10%	0.80	±0.10	±0.10	3.5%	
	C1608X7R472KETA	1V , 1kHz	4.7	nF	±10%	0.80	±0.10	±0.10	3.5%	
	C1608X7R562KETA	1V , 1kHz	5.6	nF	±10%	0.80	±0.10	±0.10	3.5%	
	C1608X7R682KETA	1V , 1kHz	6.8	nF	±10%	0.80	±0.10	±0.10	3.5%	
	C1608X7R822KETA	1V , 1kHz	8.2	nF	±10%	0.80	±0.10	±0.10	3.5%	
	C1608X7R103KETA	1V , 1kHz	10	nF	±10%	0.80	±0.10	±0.10	3.5%	
	C1608X7R223KETA	1V , 1kHz	22	nF	±10%	0.80	±0.10	±0.10	3.5%	
	C1608X7R273KETA	1V , 1kHz	27	nF	±10%	0.80	±0.15	±0.15	3.5%	
	C1608X7R393KETA	1V , 1kHz	39	nF	±10%	0.80	±0.15	±0.15	3.5%	
	C1608X7R473KETA	1V , 1kHz	47	nF	±10%	0.80	±0.15	±0.15	3.5%	
	C1608X7R563KETA	1V , 1kHz	56	nF	±10%	0.80	±0.15	±0.15	3.5%	
	C1608X7R683KETA	1V , 1kHz	68	nF	±10%	0.80	±0.15	±0.15	3.5%	
	C1608X7R823KETA	1V , 1kHz	82	nF	±10%	0.80	±0.15	±0.15	3.5%	
	C1608X7R104KETA	1V , 1kHz	100	nF	±10%	0.80	±0.15	±0.15	3.5%	
	C1608X7R154KETA	1V , 1kHz	150	nF	±10%	0.80	±0.15	±0.15	3.5%	
	C1608X7R224KETA	1V , 1kHz	220	nF	±10%	0.80	±0.15	±0.15	3.5%	

RV	AXIOM P/N	Measuring Condition	Capacitance		Available Tolerance	Thick. (mm)	Tolerance(mm)		DF (max.)	Standard Packing
			Value	Unit			L/W	Thick.		
10V	C1608X7R102KDTA	1V , 1kHz	1.0	nF	±10%	0.80	±0.10	±0.10	5.0%	Paper, 4Kpcs
	C1608X7R122KDTA	1V , 1kHz	1.2	nF	±10%	0.80	±0.10	±0.10	5.0%	
	C1608X7R152KDTA	1V , 1kHz	1.5	nF	±10%	0.80	±0.10	±0.10	5.0%	
	C1608X7R182KDTA	1V , 1kHz	1.8	nF	±10%	0.80	±0.10	±0.10	5.0%	
	C1608X7R222KDTA	1V , 1kHz	2.2	nF	±10%	0.80	±0.10	±0.10	5.0%	
	C1608X7R272KDTA	1V , 1kHz	2.7	nF	±10%	0.80	±0.10	±0.10	5.0%	
	C1608X7R332KDTA	1V , 1kHz	3.3	nF	±10%	0.80	±0.10	±0.10	5.0%	
	C1608X7R392KDTA	1V , 1kHz	3.9	nF	±10%	0.80	±0.10	±0.10	5.0%	
	C1608X7R472KDTA	1V , 1kHz	4.7	nF	±10%	0.80	±0.10	±0.10	5.0%	
	C1608X7R562KDTA	1V , 1kHz	5.6	nF	±10%	0.80	±0.10	±0.10	5.0%	
	C1608X7R682KDTA	1V , 1kHz	6.8	nF	±10%	0.80	±0.10	±0.10	5.0%	
	C1608X7R822KDTA	1V , 1kHz	8.2	nF	±10%	0.80	±0.10	±0.10	5.0%	
	C1608X7R103KDTA	1V , 1kHz	10	nF	±10%	0.80	±0.10	±0.10	5.0%	
	C1608X7R223KDTA	1V , 1kHz	22	nF	±10%	0.80	±0.10	±0.10	5.0%	
	C1608X7R273KDTA	1V , 1kHz	27	nF	±10%	0.80	±0.15	±0.15	5.0%	
	C1608X7R393KDTA	1V , 1kHz	39	nF	±10%	0.80	±0.15	±0.15	5.0%	
	C1608X7R473KDTA	1V , 1kHz	47	nF	±10%	0.80	±0.15	±0.15	5.0%	
	C1608X7R563KDTA	1V , 1kHz	56	nF	±10%	0.80	±0.15	±0.15	5.0%	
	C1608X7R683KDTA	1V , 1kHz	68	nF	±10%	0.80	±0.15	±0.15	5.0%	
	C1608X7R823KDTA	1V , 1kHz	82	nF	±10%	0.80	±0.15	±0.15	5.0%	
	C1608X7R104KDTA	1V , 1kHz	100	nF	±10%	0.80	±0.15	±0.15	5.0%	
	C1608X7R154KDTA	1V , 1kHz	150	nF	±10%	0.80	±0.15	±0.15	5.0%	
	C1608X7R224KDTA	1V , 1kHz	220	nF	±10%	0.80	±0.15	±0.15	5.0%	

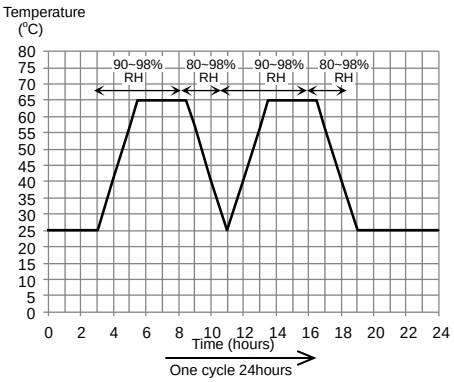
- C2012X7R_A Series (EIA0805)

RV	AXIOM P/N	Measuring Condition	Capacitance		Available Tolerance	Thick. (mm)	Tolerance(mm)		DF (max.)	Standard Packing
			Value	Unit			L/W	Thick.		
100V	C2012X7R102KHTAE	1V , 1kHz	1.0	nF	±10%	0.85	±0.20	±0.10	3.0%	Paper, 4Kpcs
	C2012X7R122KHTAE	1V , 1kHz	1.2	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R152KHTAE	1V , 1kHz	1.5	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R182KHTAE	1V , 1kHz	1.8	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R222KHTAE	1V , 1kHz	2.2	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R272KHTAE	1V , 1kHz	2.7	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R332KHTAE	1V , 1kHz	3.3	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R392KHTAE	1V , 1kHz	3.9	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R472KHTAE	1V , 1kHz	4.7	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R562KHTAE	1V , 1kHz	5.6	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R682KHTAE	1V , 1kHz	6.8	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R822KHTAE	1V , 1kHz	8.2	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R103KHTAE	1V , 1kHz	10	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R123KHTAE	1V , 1kHz	12	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R153KHTAE	1V , 1kHz	15	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R183KHTAE	1V , 1kHz	18	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R223KHTAE	1V , 1kHz	22	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R333KHPAG	1V , 1kHz	33	nF	±10%	1.25	±0.20	±0.20	2.5%	Embossed, 3Kpcs
	C2012X7R473KHPAG	1V , 1kHz	47	nF	±10%	1.25	±0.20	±0.20	2.5%	
	C2012X7R563KHPAG	1V , 1kHz	56	nF	±10%	1.25	±0.20	±0.20	2.5%	
	C2012X7R683KHPAG	1V , 1kHz	68	nF	±10%	1.25	±0.20	±0.20	2.5%	
	C2012X7R823KHPAG	1V , 1kHz	82	nF	±10%	1.25	±0.20	±0.20	2.5%	
	C2012X7R104KHPAG	1V , 1kHz	100	nF	±10%	1.25	±0.20	±0.20	5.0%	
50V	C2012X7R102KGTAE	1V , 1kHz	1.0	nF	±10%	0.85	±0.20	±0.10	3.0%	Paper, 4Kpcs
	C2012X7R122KGTAE	1V , 1kHz	1.2	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R152KGTAE	1V , 1kHz	1.5	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R182KGTAE	1V , 1kHz	1.8	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R222KGTAE	1V , 1kHz	2.2	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R272KGTAE	1V , 1kHz	2.7	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R332KGTAE	1V , 1kHz	3.3	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R392KGTAE	1V , 1kHz	3.9	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R472KGTAE	1V , 1kHz	4.7	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R562KGTAE	1V , 1kHz	5.6	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R682KGTAE	1V , 1kHz	6.8	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R822KGTAE	1V , 1kHz	8.2	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R103KGTAE	1V , 1kHz	10	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R123KGTAE	1V , 1kHz	12	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R153KGTAE	1V , 1kHz	15	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R183KGTAE	1V , 1kHz	18	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R223KGTAE	1V , 1kHz	22	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R273KGTAE	1V , 1kHz	27	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R333KGTAE	1V , 1kHz	33	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R393KGTAE	1V , 1kHz	39	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R473KGTAE	1V , 1kHz	47	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R563KGTAE	1V , 1kHz	56	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R683KGTAE	1V , 1kHz	68	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R683KGPAG	1V , 1kHz	68	nF	±10%	1.25	±0.20	±0.20	3.0%	Embossed, 3Kpcs
	C2012X7R823KGTAE	1V , 1kHz	82	nF	±10%	0.85	±0.20	±0.10	3.0%	Paper, 4Kpcs
	C2012X7R823KGPAG	1V , 1kHz	82	nF	±10%	1.25	±0.20	±0.20	3.0%	Embossed, 3Kpcs
	C2012X7R104KGTAE	1V , 1kHz	100	nF	±10%	0.85	±0.20	±0.10	3.0%	Paper, 4Kpcs
	C2012X7R104KGPAG	1V , 1kHz	100	nF	±10%	1.25	±0.20	±0.20	3.0%	Embossed, 3Kpcs
	C2012X7R154KGTAE	1V , 1kHz	150	nF	±10%	0.85	±0.20	±0.10	3.0%	Paper, 4Kpcs
	C2012X7R224KGPAG	1V , 1kHz	220	nF	±10%	1.25	±0.20	±0.20	3.5%	Embossed, 3Kpcs

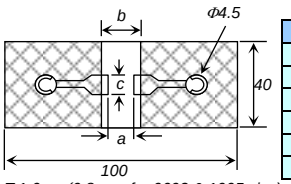
RV	AXIOM P/N	Measuring Condition	Capacitance		Available Tolerance	Thick. (mm)	Tolerance(mm)		DF (max.)	Standard Packing
			Value	Unit			L/W	Thick.		
25V	C2012X7R102KFTAE	1V , 1kHz	1.0	nF	±10%	0.85	±0.20	±0.10	3.0%	Paper, 4Kpcs
	C2012X7R122KFTAE	1V , 1kHz	1.2	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R152KFTAE	1V , 1kHz	1.5	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R182KFTAE	1V , 1kHz	1.8	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R222KFTAE	1V , 1kHz	2.2	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R272KFTAE	1V , 1kHz	2.7	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R332KFTAE	1V , 1kHz	3.3	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R392KFTAE	1V , 1kHz	3.9	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R472KFTAE	1V , 1kHz	4.7	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R562KFTAE	1V , 1kHz	5.6	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R682KFTAE	1V , 1kHz	6.8	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R822KFTAE	1V , 1kHz	8.2	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R103KFTAE	1V , 1kHz	10	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R123KFTAE	1V , 1kHz	12	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R153KFTAE	1V , 1kHz	15	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R183KFTAE	1V , 1kHz	18	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R223KFTAE	1V , 1kHz	22	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R273KFTAE	1V , 1kHz	27	nF	±10%	0.85	±0.20	±0.10	2.5%	
	C2012X7R333KFTAE	1V , 1kHz	33	nF	±10%	0.85	±0.20	±0.10	2.5%	
	C2012X7R393KFTAE	1V , 1kHz	39	nF	±10%	0.85	±0.20	±0.10	2.5%	
	C2012X7R473KFTAE	1V , 1kHz	47	nF	±10%	0.85	±0.20	±0.10	2.5%	
	C2012X7R563KFTAE	1V , 1kHz	56	nF	±10%	0.85	±0.20	±0.10	2.5%	
	C2012X7R683KFTAE	1V , 1kHz	68	nF	±10%	0.85	±0.20	±0.10	2.5%	
	C2012X7R823KFTAE	1V , 1kHz	82	nF	±10%	0.85	±0.20	±0.10	2.5%	
	C2012X7R104KFTAE	1V , 1kHz	100	nF	±10%	0.85	±0.20	±0.10	2.5%	
	C2012X7R124KFTAE	1V , 1kHz	120	nF	±10%	0.85	±0.20	±0.10	2.5%	
	C2012X7R154KFTAE	1V , 1kHz	150	nF	±10%	0.85	±0.20	±0.10	2.5%	
	C2012X7R184KFTAE	1V , 1kHz	180	nF	±10%	0.85	±0.20	±0.10	3.0%	
	C2012X7R224KFTAE	1V , 1kHz	220	nF	±10%	0.85	±0.20	±0.10	3.5%	
	C2012X7R334KFPAG	1V , 1kHz	330	nF	±10%	1.25	±0.20	±0.20	5.0%	Embossed, 3Kpcs
	C2012X7R474KFPAG	1V , 1kHz	470	nF	±10%	1.25	±0.20	±0.20	5.0%	
	C2012X7R105KFPAG	1V , 1kHz	1.0	uF	±10%	1.25	±0.20	±0.20	5.0%	
10V	C2012X7R102KDTAE	1V , 1kHz	1.0	nF	±10%	0.85	±0.20	±0.10	5.0%	Paper, 4Kpcs
	C2012X7R122KDTAE	1V , 1kHz	1.2	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R152KDTAE	1V , 1kHz	1.5	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R182KDTAE	1V , 1kHz	1.8	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R222KDTAE	1V , 1kHz	2.2	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R272KDTAE	1V , 1kHz	2.7	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R332KDTAE	1V , 1kHz	3.3	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R392KDTAE	1V , 1kHz	3.9	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R472KDTAE	1V , 1kHz	4.7	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R562KDTAE	1V , 1kHz	5.6	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R682KDTAE	1V , 1kHz	6.8	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R822KDTAE	1V , 1kHz	8.2	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R103KDTAE	1V , 1kHz	10	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R123KDTAE	1V , 1kHz	12	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R153KDTAE	1V , 1kHz	15	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R183KDTAE	1V , 1kHz	18	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R223KDTAE	1V , 1kHz	22	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R273KDTAE	1V , 1kHz	27	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R333KDTAE	1V , 1kHz	33	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R393KDTAE	1V , 1kHz	39	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R473KDTAE	1V , 1kHz	47	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R563KDTAE	1V , 1kHz	56	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R683KDTAE	1V , 1kHz	68	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R823KDTAE	1V , 1kHz	82	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R104KDTAE	1V , 1kHz	100	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R124KDTAE	1V , 1kHz	120	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R154KDTAE	1V , 1kHz	150	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R184KDTAE	1V , 1kHz	180	nF	±10%	0.85	±0.20	±0.10	5.0%	
	C2012X7R224KDTAE	1V , 1kHz	220	nF	±10%	0.85	±0.20	±0.10	5.0%	

RV	AXIOM P/N	Measuring Condition	Capacitance		Available Tolerance	Thick. (mm)	Tolerance(mm)		DF (max.)	Standard Packing
			Value	Unit			L/W	Thick.		
10V	C2012X7R334KDPAG	1V , 1kHz	330	nF	±10%	1.25	±0.20	±0.20	5.0%	Embossed, 3Kpcs
	C2012X7R474KDPAG	1V , 1kHz	470	nF	±10%	1.25	±0.20	±0.20	5.0%	
	C2012X7R105KDPAG	1V , 1kHz	1.0	uF	±10%	1.25	±0.20	±0.20	5.0%	

Test Spec.

No	AEC-Q200 Test Item		Specification: Temp. compensation type	Specification: High dielectric constant type	AEC-Q200 Test Method
1	Pre- and Post-Stress Electrical Test		---		---
2	High Temperature Exposure (Storage)	Appearance	No marking defects		Set the capacitor at max. operating temperature for 1000±12 hours, let sit for 24±2 hours at room temperature, then measure.
		Cap. Change	NP0 within ±2.5% or 0.25pF (whichever is larger)	X7R within ±10.0%	
		Q/D.F.	If C≦30pF, DF≦1/(400+20C) If C >30pF, DF≦0.1%	X7R: To satisfy the specified initial spec.	
		I.R.	I.R.≧10,000MΩ or R_iC_R≧500Ω-F. (whichever is smaller)		
3	Temperature Cycle (Thermal shock)	Appearance	No marking defects		Solder the capacitor to supporting jig (Glass epoxy board) and perform 1000 cycles according to the four heat treatments listed in the following table. Let sit for 24±2hrs at room temperature, then measure. Step 1: Minimum operating temperature 15±3min Step 2: Room temperature 1 min Step 3: Maximum operating temperature 15±3min Step 4: Room temperature 1 min *High dielectric constant type: Initial measurement: perform a heat treatment at 150±10℃ for one hour and then let sit for 24±2 hours at room temp. Perform the initial measurement.
		Cap. Change	NP0 within ±2.5% or 0.25pF (whichever is larger)	X7R within ±10.0%	
		Q/D.F.	If C≦30pF, DF≦1/(400+20C) If C >30pF, DF≦0.1%	X7R: To satisfy the specified initial spec	
		I.R.	I.R.≧10,000MΩ or R_iC_R≧500Ω-F. (whichever is smaller)		
4	Destructive Physical Analysis		No defects or abnormalities		Per EIA-469
5	Moisture Resistance	Appearance	No marking defects		Perform 10 cycles of the 24-hour heat (25 to 65℃) and humidity (80 to 98%) treatments as shown below. Let sit for 24±2hrs at room temperature, then measure.  Initial measurement: perform a heat treatment at 150±10℃ for one hour and then let sit for 24±2 hours at room temp. Perform the initial measurement.
		Cap. Change	NP0 within ±3.0% or 0.30pF (whichever is larger)	X7R within ±12.5%	
		Q/D.F.	If C<10pF, DF≦1/(200+10C) If 10pF≦C≦30pF, DF≦1/(275+5C/2) If C >30pF, DF≦0.285%	X7R: To satisfy the specified initial spec	
		I.R.	I.R.≧10,000MΩ or R_iC_R≧500Ω-F. (whichever is smaller)		
6	Biased Humidity	Appearance	No marking defects		Apply 100% of the rated voltage and 1.3 to 1.5 volts (add 100 Kohm resistor.) at 85±3℃ and 80 to 85% humidity for 1000±12 hours. The charge / discharge current is less than 50mA. [Temperature compensation type] Remove and let sit for 24±2 hours at room temperature, then measure. [High dielectric constant type] *Initial measurement Perform a heat treatment at 150+0/-10°C for one hour and then let sit for 24±2 hours at room temperature. Perform the initial measurement.
		Cap. Change	NP0 within ±3.0% or 0.30pF (whichever is larger)	X7R within ±12.5%	
		Q/D.F.	If C≦30pF,DF≦1/(100+10C/3) If C >30pF, DF≦0.5%	X7R: 200% max of initial spec.	
		I.R.	I.R.≧500MΩ or R_iC_R≧25Ω-F. (whichever is smaller)		

AEC-Q200 Test Item			Specification		Test Method
			Temp. compensation type	High dielectric constant type	
7	Operational Life	Appearance	No marking defects		Apply 100% of the rated voltage for 1000±12 hours at the maximum operating temperature ± 3℃. The charge / discharge current is less than 50mA. **[Temperature compensation type]** Remove and let sit for 24±2 hours at room temperature, then measure.
		Cap. Change	NP0 within ±3.0% or 0.30pF (whichever is larger)	X7R within ±12.5%	
		Q/D.F.	If C<10pF, DF≦1/(200+10C) If 10pF≦C≦30pF, DF≦1/(275+5C/2) If C >30pF, DF≦0.285%	X7R: 200% max of initial spec.	
		I.R.	I.R.≧1,000MΩ or R_iC_R≧50Ω-F. (whichever is smaller)		
8	External Visual		No defects or abnormalities		Visual inspection
9	Physical Dimension		Within the specified dimensions		Using calipers
10	Resistance to Solvents	Appearance	No marking defects		Per MIL-STD-202 Method 215 Solvent 1: 1 part (by volume) of isopropyl alcohol 3 parts (by volume) of mineral spirits Solvent 2: Terpene defluxer Solvent 3: 42 parts (by volume) of water 1 part (by volume) of propylene glycol monomethylether 1 part (by volume) of monoethanolomine
		Cap. Change	Within the specified tolerance		
		Q/D.F.	If C≦30pF, DF≦1/(400+20C) If C >30pF, DF≦0.1%	X7R: To satisfy the specified initial spec	
		I.R.	I.R.≧10,000MΩ or R_iC_R≧500Ω-F. (whichever is smaller)		
11	Mechanical Shock	Appearance	No marking defects		Three shocks in each direction should be applied along 3 mutually perpendicular axes of the test specimen (18 shocks). The specified test pulse should be Half-sine and should have a duration: 0.5ms, peak value: 1500g and velocity change: 4.7m/s.
		Cap. Change	Within the specified tolerance		
		Q/D.F.	If C≦30pF, DF≦1/(400+20C) If C >30pF, DF≦0.1%	X7R: To satisfy the specified initial spec	
		I.R.	I.R.≧10,000MΩ or R_iC_R≧500Ω-F. (whichever is smaller)		
12	Vibration	Appearance	No marking defects		Solder the capacitor to supporting jig (Glass epoxy board). The capacitor should be subjected to a simple harmonic motion having a total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 2000Hz. The frequency range, from 10 to 2000Hz and return to 10Hz, should be traversed in approximately 20 minutes. This motion should be applied for 12 items in each 3 mutually perpendicular directions (total 36 times).
		Cap. Change	Within the specified tolerance		
		Q/D.F.	If C≦30pF, DF≦1/(400+20C) If C >30pF, DF≦0.1%	X7R: To satisfy the specified initial spec	
		I.R.	I.R.≧10,000MΩ or R_iC_R≧500Ω-F. (whichever is smaller)		
13	Resistance to Soldering Heat	Appearance	No marking defects		*Preheat the capacitor at 120 to 150℃ for 1 minute. Immerse the capacitor in a SAC305(Sn96.5Ag3.0Cu0.5) solder solution at 260±5℃ for 10±1 seconds. Let sit at room temperature for 24±2 hours, then measure. * Preheat 150 to 200℃ for size≧3216. *High dielectric constant type: Initial measurement : perform a heat treatment at 150+0/-10℃ for one hour and then let sit for 24±2 hours at room temperature. Perform the initial measurement.
		Cap. Change	NP0 within ±3.0% or 0.30pF (whichever is larger)	X7R within ±12.5%	
		Q/D.F.	If C≦30pF, DF≦1/(400+20C) If C >30pF, DF≦0.1%	X7R: To satisfy the specified initial spec	
		I.R.	I.R.≧10,000MΩ or R_iC_R≧500Ω-F. (whichever is smaller)		

<table>
<tr><th colspan="3" rowspan="2">AEC-Q200
Test Item</th><th colspan="2">Specification</th><th rowspan="2">Test Method</th></tr>
<tr><th>Temp. compensation type</th><th>High dielectric constant type</th></tr>
<tr><td rowspan="4">14</td><td rowspan="4">ESD</td><td>Appearance</td><td colspan="2">No marking defects</td><td rowspan="4">Per AEC-Q200-002</td></tr>
<tr><td>Cap. Change</td><td colspan="2">Within the specified tolerance</td></tr>
<tr><td>Q/D.F.</td><td>If C≦30pF, DF≦1/(400+20C)
If C >30pF, DF≦0.1%</td><td>X7R:
To satisfy the specified initial spec</td></tr>
<tr><td>I.R.</td><td colspan="2">I.R.≧10,000MΩ or R_iC_R≧500Ω-F.
(whichever is smaller)</td></tr>
<tr><td>15</td><td colspan="2">Solderability of Termination</td><td colspan="2">95% of the terminations are to be soldered evenly and continuously.</td><td>(a) Preheat at 155℃ for 4 hours. After preheating, immerse the capacitor in a solution of ethanol (JIS-K-8101) and rosin (JIS-K-5902) (25% rosin in weight proportion). Immerse in SAC305 solder solution for 5+0/-0.5 seconds at 245±5℃.
(b) Should be placed into steam aging for 8 hours±15 minutes. After preheating, immerse the capacitor in a solution of ethanol (JIS-K-8101) and rosin (JIS-K-5902) (25% rosin in weight proportion). Immerse in SAC305 solder solution for 5+0/-0.5 seconds at 245±5℃
(c) Should be placed into steam aging for 8 hours±15 minutes. After preheating, immerse the capacitor in a solution of ethanol (JIS-K-8101) and rosin (JIS-K-5902) (25% rosin in weight proportion). Immerse in SAC305 solder solution for 120±5 seconds at 260±5℃</td></tr>
<tr><td rowspan="4">16</td><td rowspan="4">Electrical Characterization</td><td>Appearance</td><td colspan="2">No marking defects</td><td rowspan="3">The capacitance / D.F. shall be measured at 25℃ at the frequency and voltage shown in the table of “Part Number & Characteristic”.</td></tr>
<tr><td>Cap. Change</td><td colspan="2">Within the specified tolerance</td></tr>
<tr><td>Q/D.F.</td><td>If C≦30pF, DF≦1/(400+20C)
If C >30pF, DF≦0.1%</td><td>X7R:
To satisfy the specified initial spec</td></tr>
<tr><td>I.R. 25℃</td><td>I.R.≧10,000MΩ or R_iC_R≧500Ω-F.
(whichever is smaller)</td><td>I.R.≧10,000MΩ or R_iC_R≧500Ω-F.
(whichever is smaller)</td><td>The insulation resistance shall be measured with a DC voltage not exceeding the rated voltage at 25℃ and 125℃, within 1 minute of charging.</td></tr>
<tr><td>Dielectric Strength</td><td colspan="2">No failure</td><td>No failure shall be observed when 250% of the rated voltage is applied between the terminations for 1 to 5 seconds. The charge and discharge current is less than 50mA.</td></tr>
<tr><td rowspan="5">17</td><td rowspan="5">Board Flex</td><td>Appearance</td><td colspan="2">No marking defects</td><td rowspan="5">Solder the capacitor to the test jig (glass epoxy boards) shown in Fig.a using a SAC305(Sn96.5Ag3.0Cu0.5) solder (then let sit for 24±2 hours for X7R).
Then apply a force in the direction shown in Fig.b for 5±1sec. The soldering shall be done with the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock.</td></tr>
<tr><td>Cap. Change</td><td>NP0 within ±5.0% or 0.5pF (whichever is larger)</td><td>X7R within ±10.0%</td></tr>
<tr><td>Q/D.F.</td><td>If C≦30pF, DF≦1/(400+20C)
If C >30pF, DF≦0.1%</td><td>X7R:
To satisfy the specified initial spec</td></tr>
<tr><td rowspan="2">I.R.</td><td colspan="2">I.R.≧10,000MΩ or R_iC_R≧500Ω-F.
(whichever is smaller)</td></tr>
<tr><td colspan="3"> 

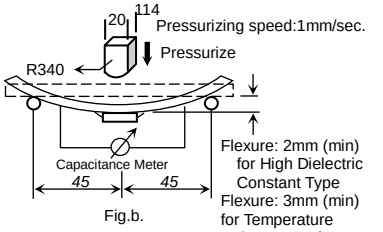
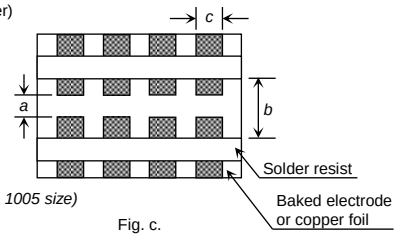
T:1.6mm(0.8 mm for 0603 & 1005 size)
Fig. a.
<table>
<tr><th>Size</th><th>a</th><th>b</th><th>c</th></tr>
<tr><td>0603</td><td>0.3</td><td>0.9</td><td>0.3</td></tr>
<tr><td>1005</td><td>0.5</td><td>1.5</td><td>0.6</td></tr>
<tr><td>1608</td><td>0.6</td><td>2.2</td><td>0.9</td></tr>
<tr><td>2012</td><td>0.8</td><td>3.0</td><td>1.3</td></tr>
<tr><td>3216</td><td>2.0</td><td>4.4</td><td>1.7</td></tr>
<tr><td>3225</td><td>2.0</td><td>4.4</td><td>2.6</td></tr>
</table>
(Unit in mm)


Fig.b.</td></tr>
</table>

<table>
<tr><th colspan="3" rowspan="2">AEC-Q200
Test Item</th><th colspan="2">Specification</th><th rowspan="2">Test Method</th></tr>
<tr><th>Temp. compensation type</th><th>High dielectric constant type</th></tr>
<tr><td rowspan="4">18</td><td rowspan="4">Terminal Strength</td><td>Appearance</td><td colspan="2">No marking defects</td><td rowspan="4">Solder the capacitor to the test jig (glass epoxy boards) shown in Fig.c using a SAC305(Sn96.5Ag3.0Cu0.5) solder (then let sit for 24±2 hours for X7R).
Then apply *18N force in the direction parallel to the testing jig for 60sec. The soldering shall be done with the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock.
*2N for 0603 & 1005 size
Size | a | b | C
0603 | 0.3 | 0.9 | 0.3
1005 | 0.4 | 1.5 | 0.5
1608 | 1.0 | 3.0 | 1.2
2012 | 1.2 | 4.0 | 1.65
3216 | 2.2 | 5.0 | 2.0
3225 | 2.2 | 5.0 | 2.9
(Unit in mm)</td></tr>
<tr><td>Cap. Change</td><td colspan="2">Within the specified tolerance</td></tr>
<tr><td>Q/D.F.</td><td>If C≦30pF, DF≦1/(400+20C)
If C >30pF, DF≦0.1%</td><td>X7R:
To satisfy the specified initial spec</td></tr>
<tr><td>I.R.</td><td colspan="2">I.R.≧10,000MΩ or R_iC_R≧500Ω-F.
(whichever is smaller)
 

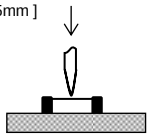
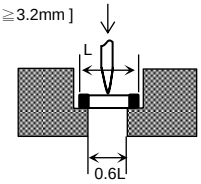
T:1.6mm
(0.8 mm for 0603 & 1005 size)
Fig. c.</td></tr>
<tr><td>19</td><td colspan="2">Beam Load Test</td><td colspan="2">Destruction value should exceed the following:
[Chip L dimension ≦2.5mm]
Chip T thickness > 0.5mm: 20N
Chip T thickness≦0.5mm: 8N
[Chip L dimension ≧3.2mm]
Chip T thickness≧1.25mm: 54.5N
Chip T thickness < 1.25mm: 15N</td><td>Place the capacitor in the beam load fixture as Fig. d and apply a force.
[Chip L dimension ≦2.5mm]
 
[Chip L dimension ≧3.2mm]
 

Fig. d.
Speed supplied the Stress Load: *0.5mm/sec.
*0.1mm/sec. for 0603 size</td></tr>
<tr><td>20</td><td colspan="2">Capacitance Temperature Characteristics</td><td>Capacitance change
NP0 within 0±30ppm/℃ under operating temperature range.</td><td>Capacitance change
X7R within ±15%</td><td>1.Temperature compensation type:
The capacitance value at 25℃ and 85℃ shall be measured and calculated from the formula given below.
T.C.=(C_{85}-C_{25})/C_{25}*ΔT*10^6(PPM/℃)
2.High dielectric constant type:
The ranges of capacitance change compared with the 25℃ value over the temperature ranges shall be within the specified ranges.</td></tr>
</table>

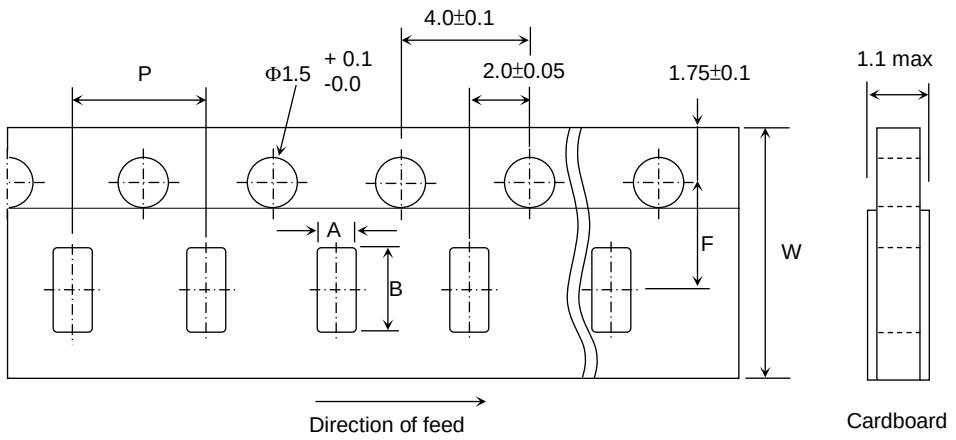
Package

- **Tape and reel packaging**

  Tape and reel packaging is currently the most promising system for high-speed production. A typical 180mm (7 inch) diameter reel contains 1,500 to 15,000 capacitors, 250mm (10 inch) contains 10,000 capacitors, and 330mm (13 inch) contains 10,000 to 50,000 capacitors. Three standard sizes are available in taped and reeled package either with paper carrier tapes or embossed tapes.

【Paper tape specifications】

2mm and 4mm pitch tape

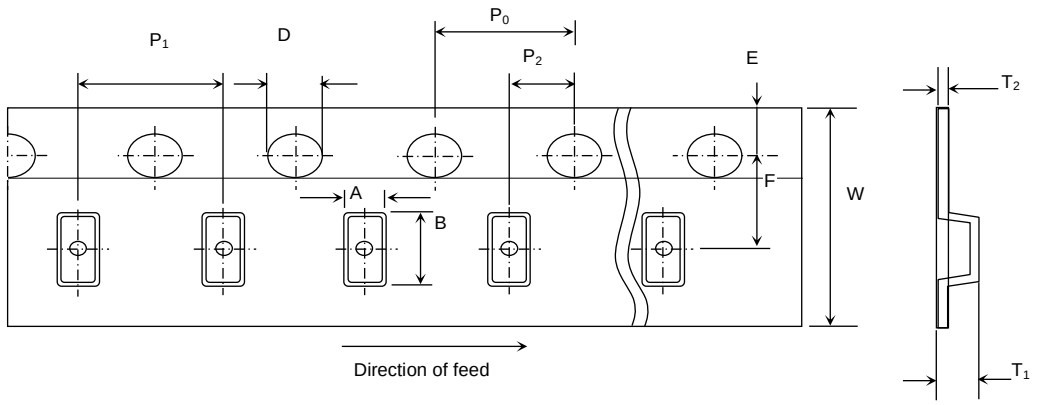


SYMBOL	PRODUCT SIZE CODE										UNIT
	C0603(0201)		C1005(0402) Standard		C1005(0402) Special (1)		C1005(0402) Special (2)		C1005(0402) Special (3)		
	SIZE	TOL.	SIZE	TOL.	SIZE	TOL.	SIZE	TOL.	SIZE	TOL.	
A	0.38	± 0.04	0.65	± 0.10	0.70	± 0.10	0.72	± 0.10	0.80	± 0.10	mm
B	0.68	± 0.04	1.15	± 0.10	1.19	± 0.10	1.25	± 0.10	1.35	± 0.10	mm
F	3.5	± 0.05	3.5	± 0.05	3.5	± 0.05	3.5	± 0.05	3.5	± 0.05	mm
P	2	± 0.10	2	± 0.10	2	± 0.10	2	± 0.10	2	± 0.10	mm
W	8	± 0.20	8	± 0.20	8	± 0.20	8	± 0.20	8	± 0.20	mm

SYMBOL	PRODUCT SIZE CODE (EIA)										UNIT
	C1608(0603) Standard		C1608 (0603) Special (1)		C1608 (0603) Special (2/3)		C2012 (0805)		C3216 (1206)		
	SIZE	TOL.	SIZE	TOL.	SIZE	TOL.	SIZE	TOL.	SIZE	TOL.	
A	1.0	±0.2	1.0	±0.2	1.1	±0.2	1.5	±0.2	1.9	±0.2	mm
B	1.8	±0.2	1.8	±0.2	1.9	±0.2	2.3	±0.2	3.6	±0.2	mm
F	3.5	±0.05	3.5	±0.05	3.5	±0.05	3.5	±0.05	3.5	±0.05	mm
P	4	±0.1	4	±0.1	4	±0.1	4	±0.1	4	±0.1	mm
W	8	±0.2	8	±0.2	8	±0.2	8	±0.2	8	±0.2	mm

【Embossed tape specifications】

1mm and 4mm and 8mm pitch tape

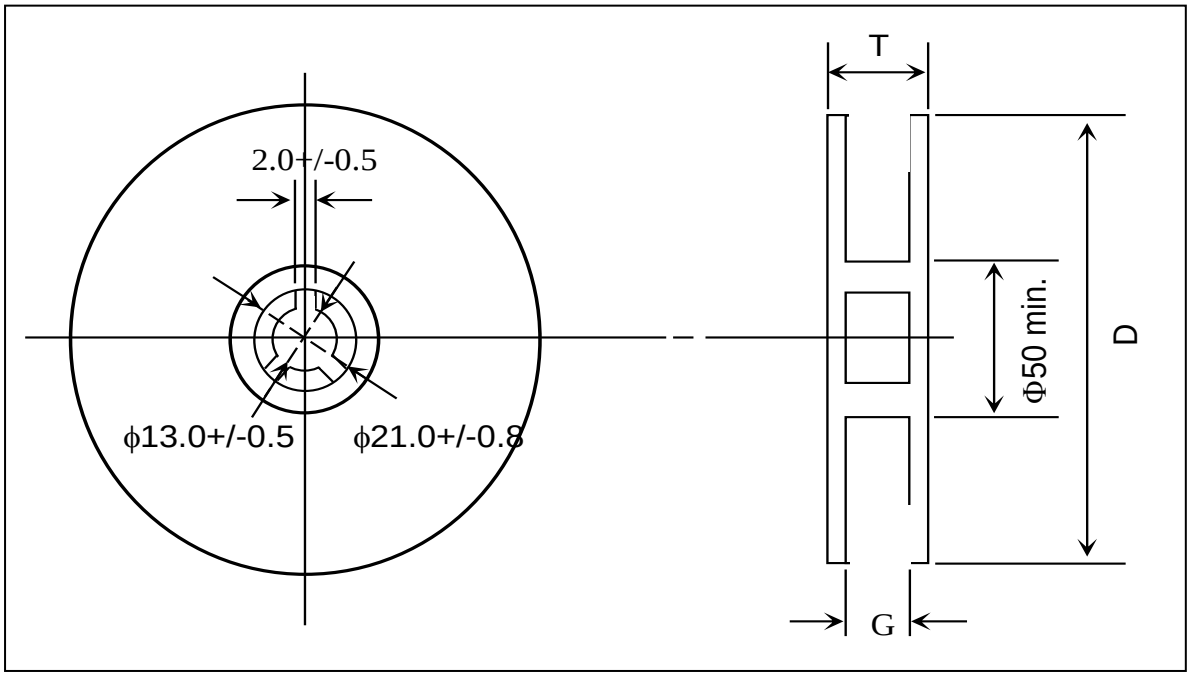


For W= 8mm: T_1=2.5mm max.

For W= 12mm: T_1= 4.5mm

DIMENSION (mm)	PRODUCT SIZE CODE					
	4 mm tape				8 mm tape	
	1608 (0603)	2012 (0805)	3216 (1206)	3225 (1210)	4520 (1808)	4532 (1812)
P_1	4±0.1	4±0.1	4±0.1	4±0.1	8±0.1	8±0.1
P_0	4±0.1	4±0.1	4±0.1	4±0.1	4±0.1	4±0.1
P_2	2±0.05	2±0.05	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	2.3±0.2	3.6±0.2
B	2.0±0.2	2.3±0.2	3.5±0.2	3.6±0.2	4.9±0.2	4.9±0.2
W	8±0.3	8±0.2	8±0.2	8±0.2	12±0.2	12±0.2
E	1.75±0.1	1.75±0.1	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	5.5±0.05	5.5±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)	1.5 (+0.1/-0.0)	1.5 (+0.1/-0.0)
T_1	1.4 max.	2.5 max.	2.5 max.	2.5 max.	4.5	4.5
T_2	0.25±0.1	0.305±0.1	0.30±0.1	0.30±0.1	0.30±0.1	0.30±0.1

【Reel specifications】



TAPE WIDTH (mm)	G (mm)	T max. (mm)	D (mm)
4	5.0 ± 1.5	8.0	180
8	10.0 ± 1.5	14.5	180
8	10.0 ± 1.5	14.5	250
8	10.0 ± 1.5	14.5	330
12	14.0 ± 1.5	18.5	180

【Thickness and Packing Amount】

Thickness			Amount per reel			
			180 mm (7")		330 mm (13")	
Code	Spec.(mm)	Size (EIA)	Paper	Embossed	Paper	Embossed
A	0.30	0603 (0201)	15K		50K	
		1005 (0402)	15K		50K	
B	0.50	1005 (0402)	10K		50K	
Q	0.45	1005 (0402)	10K		50K	
		1608 (0603)	4K		15K	
C	0.60	2012 (0805)	4K		15K	
		3216 (1206)	4K		15K	
D	0.80	1608 (0603)	4K	4K	15K	
E	0.85	2012 (0805)	4K		15K	
		3216 (1206)	4K		15K	
		3225 (1210)		3K		10K
		4532 (1812)		1K		
I	0.95	2012 (0805)		3K		
		3216 (1206)		3K		
F	1.15	3216 (1206)		3K		10K
		4520 (1808)		3K		
G	1.25	2012 (0805)		2K/3K		10K
		3216 (1206)		3K		10K
		3225 (1210)		3K		
		4520 (1808)		2K/3K		
		4532 (1812)		1K		
		3225 (1210)		3K		
L	1.60	3216 (1206)		2K		
		3225 (1210)		2K		
		4520 (1808)		2K		
		4532 (1812)		1K		

#1: 4mm width 1mm pitch Embossed Taping

【Packing Rule】

EIA SIZE	Tape	Reel Size	Reels/Box	Boxes/ Carton
0201	Paper	7"	5	12
0402	Paper	7"	5	12
0603	Paper/Emboss	7"	5	12
0805	Paper/Emboss	7"	5	12
1206	Paper/Emboss	7"	5	12

Others

【Storage】

1. The chip capacitors shall be packaged in carrier tapes or bulk cases.
2. Keep storage place temperatures from +5℃ to +35℃, humidity from 45 to 70% RH.
3. The storage atmosphere must be free of gas containing sulfur and chlorine. Also, avoid exposing the product to saline moisture. If the product is exposed to such atmospheres, the terminations will oxidize and solderability will be affected.
4. The solderability is assured for 12 months from our final inspection date if the above storage condition is followed.

【Circuit Design】

1. Once application and assembly environments have been checked, the capacitor may be used in conformance with the rating and performance, which are provided in both the catalog and the specifications. Exceeding the specifications listed may result in inferior performance. It may also cause a short, open, smoking, or flaming to occur, etc.
2. Please use the capacitors in conformance with the operating temperature provided in both the catalog and the specifications. Be especially cautious not to exceed the maximum temperature. In the situation the maximum temperature set forth in both the catalog and specifications is exceeded, the capacitor's insulation resistance may deteriorate, power may suddenly surge and short-circuit may occur. The loss of capacitance will occur, and may self-heat due to equivalent series resistance when alternating electric current is passed through. As this effect becomes critical in high frequency circuits, please exercise with caution. When using the capacitor in a (self-heating) circuit, please make sure the surface of the capacitor remains under the maximum temperature for usage. Also, please make certain temperature rise remain below 20℃.
3. Please keep voltage under the rated voltage, which is applied to the capacitor. Also, please make certain the peak voltage remains below the rated voltage when AC voltage is super-imposed to the DC voltage. In the situation where AC or pulse voltage is employed, ensure average peak voltage does not exceed the rated voltage. Exceeding the rated voltage provided in both catalog and specifications may lead to defective withstanding voltage or, in worse case situations, may cause the capacitor to burn out.
4. It's is a common phenomenon of high-dielectric products to have a deteriorated amount of static electricity due to the application of DC voltage.

【Handling】

Chip capacitors should be handled with care to avoid contamination or damage. The use of vacuum pick-up or plastic tweezers is recommended for manual placement. Tape and reeled packages are suitable for automatic pick and placement machine.

【Flux】

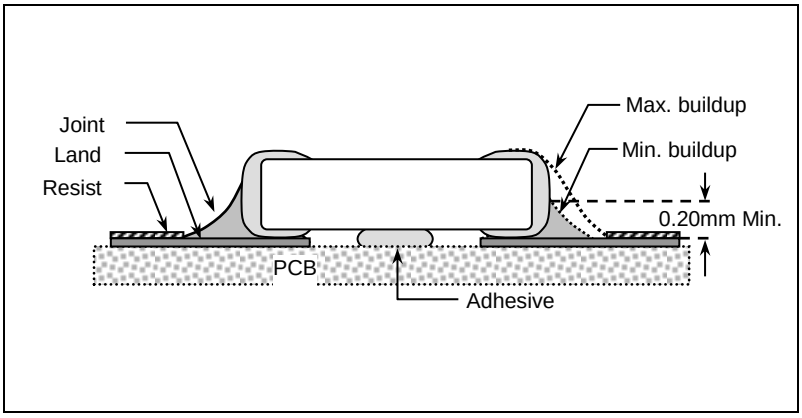
1. An excessive amount of flux or too rapid temperature rise can causes solvent burst, solder can generate a large quantity of gas. The gas can spreads small solder particles to cause solder balling effect or bridging problem.
2. Flux containing too high of a percentage of halide may cause corrosion of termination unless sufficient cleaning is applied.
3. Use rosin-type flux. Highly acidic flux (halide content less than 0.2wt%) is not recommended.
4. The water soluble flux causes deteriorated insulation resistance between outer terminations unless sufficiently cleaned.

【Component Spacing】

For wave soldering components, the spacing must be sufficient far apart to prevent bridging or shadowing. This is not so important for reflow process but enough space for rework should be considered. The suggested spacing for reflow soldering and wave soldering is 0.5mm and 1.0mm, respectively.

【Solder Fillet】

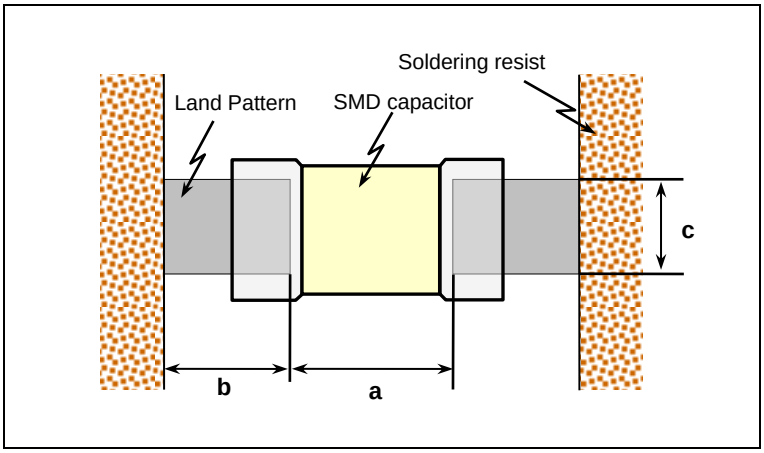
Too much solder amount may increase solder stress and cause crack risk. Insufficient solder amount may reduce adhesive Strength and cause parts falling off PCB. When soldering, confirm that the solder is placed over 0.2mm of the surface of the terminations.



【Recommended Land Pattern Dimensions】

When mounting the capacitor to substrate, it's important to consider that the amount of solder (size of fillet) used has a direct effect upon the capacitor once it's mounted.

1. The greater the amount of solder, the greater the stress to the elements, as this may cause the substrate to break or crack.
2. In the situation where two or more devices are mounted onto a common land, separate the device into exclusive pads by using soldering resist.
3. Land width equal to or less than component. It is permissible to reduce land width to 80% of component width.



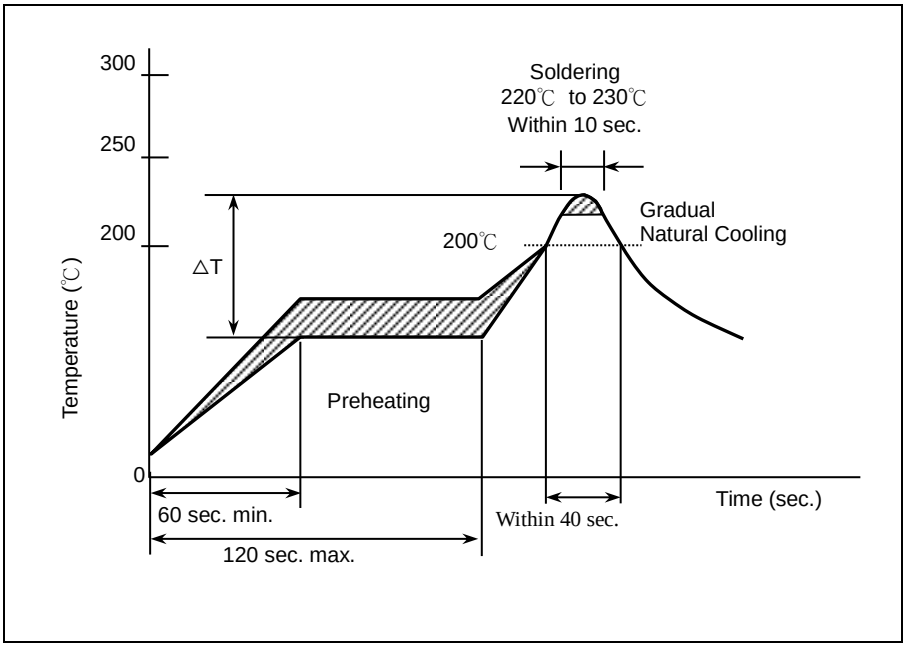
Size mm (EIA)	L x W (mm) (Dimension tolerance)	a (mm)	b (mm)	c (mm)
0603 (0201)	0.6*0.3	0.15 to 0.35	0.2 to 0.3	0.25 to 0.3
1005 (0402)	1.0*0.5 (within±0.10)	0.3 to 0.5	0.35 to 0.45	0.4 to 0.5
	1.0*0.5 (±0.15 or ±0.20)	0.4 to 0.6	0.4 to 0.5	0.5 to 0.6
1608 (0603)	1.6*0.8 (within±0.10)	0.7 to 1.0	0.6 to 0.8	0.7 to 0.8
	1.6*0.8 (±0.15 or ±0.20)	0.8 to 1.1	0.7 to 0.9	0.8 to 0.9
2012 (0805)	2.0*1.25	1.0 to 1.3	0.7 to 0.9	1.0 to 1.2
3216 (1206)	3.2*1.6	2.1 to 2.5	1.0 to 1.2	1.3 to 1.6
3225 (1210)	3.2*2.5	2.1 to 2.5	1.0 to 1.2	2.0 to 2.5
4520 (1808)	4.5*2.0	3.2 to 3.8	1.2 to 1.4	1.7 to 2.0
4532 (1812)	4.5*3.2	3.2 to 3.8	1.2 to 1.4	2.7 to 3.2

【Resin Mold】

If a large amount of resin is used for molding the chip, cracks may occur due to contraction stress during curing. To avoid such cracks, use a low shrinkage resin. The insulation resistance of the chip will degrade due to moisture absorption. Use a low moisture absorption resin. Check carefully that the resin does not generate a decomposition gas or reaction gas during the curing process or during normal storage. Such gases may crack the chip capacitor or damage the device itself.

【Soldering Profile for SMT Process with SnPb Solder Paste】

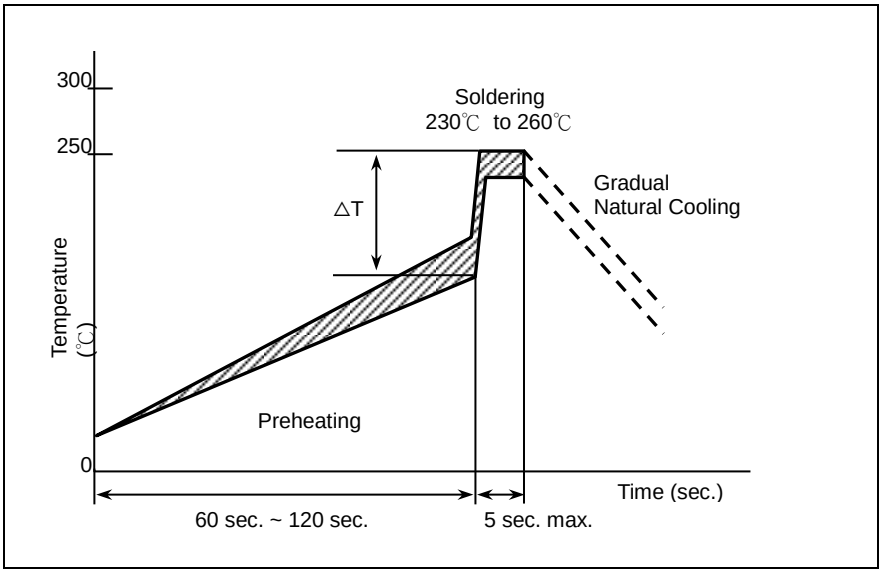
Reflow Soldering



The difference between solder and chip surface should be controlled as following table. The rate of preheat should not exceed 4℃/sec and a target of 2℃/sec is preferred.

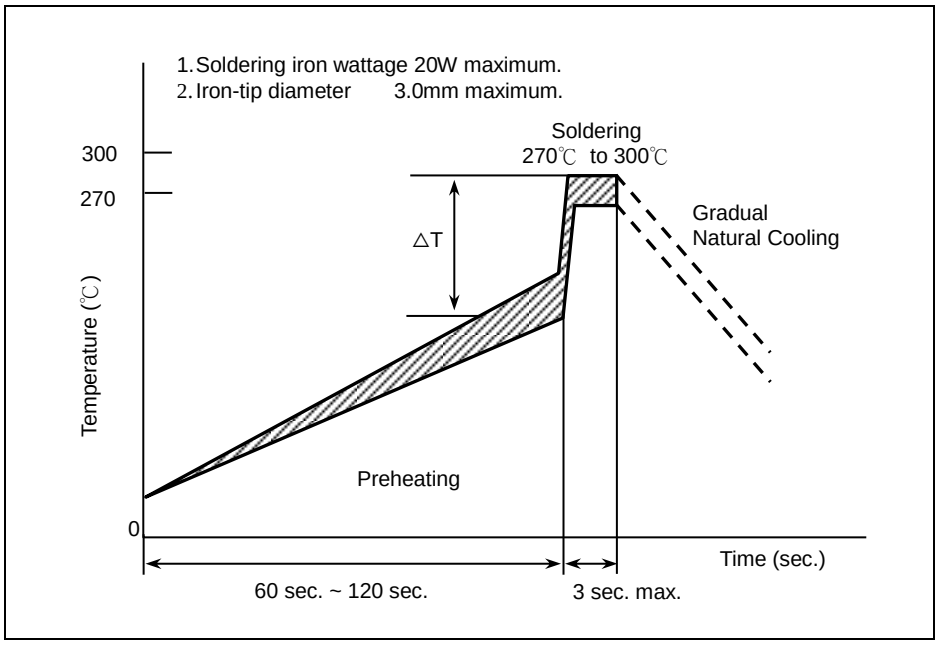
Chip Size	3216 and smaller	3225 and above
Preheating	△T≦150℃	△T≦130℃

Wave Soldering



Chip Size	1608/2012/3216	3225 and above
Preheating	△T≦150℃	-

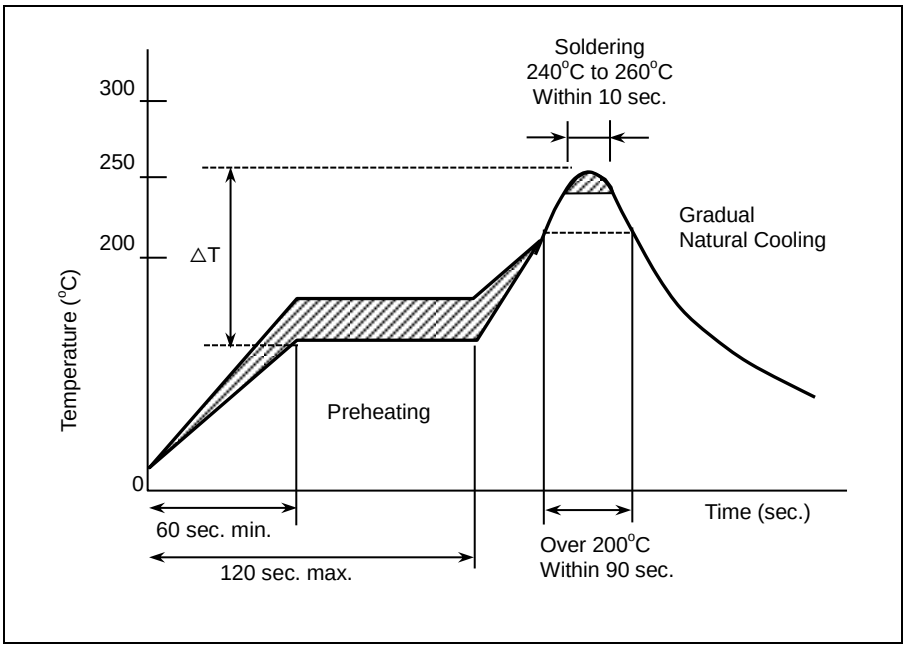
Soldering Iron



Chip Size	3216 and smaller	3225 and above
Preheating	△T≦190℃	△T≦130℃

【Soldering】

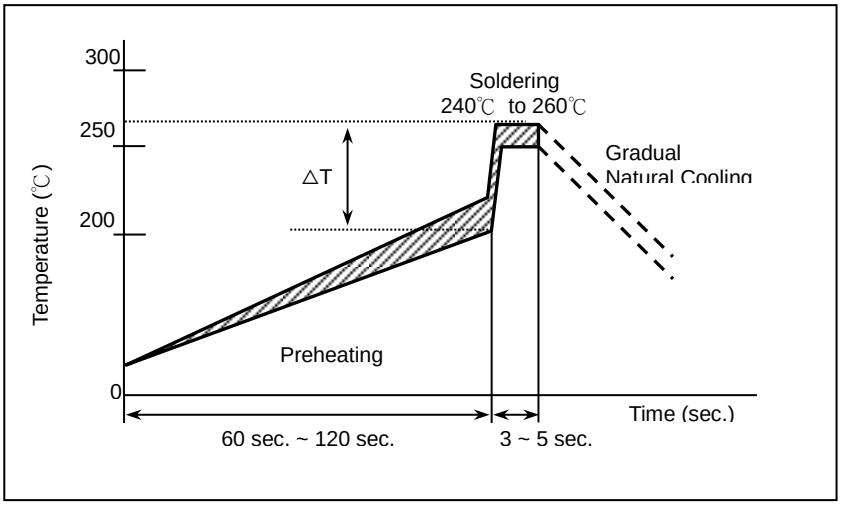
Reflow Soldering for Lead free Termination



The difference between solder and chip surface should be controlled as following table. The rate of preheat should not exceed 4℃/sec and a target of 2℃/sec is preferred.

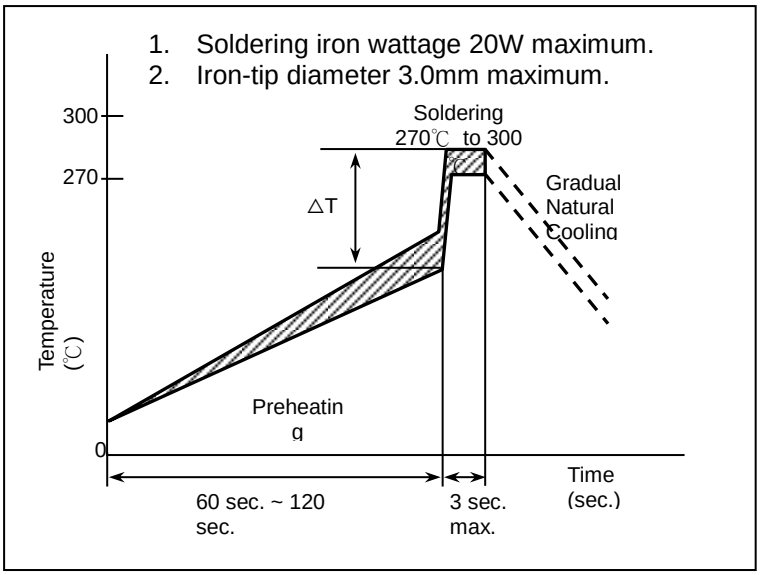
Chip Size	3216 and smaller	3225 and above
Preheating	△T≦150℃	△T≦130℃

Flow Soldering for Lead free Termination



Chip Size	1608/2012/3216	3225 and above
Preheating	△T≦150℃	-

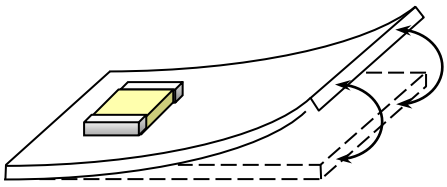
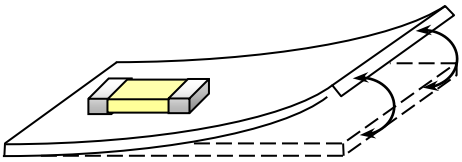
Soldering Iron



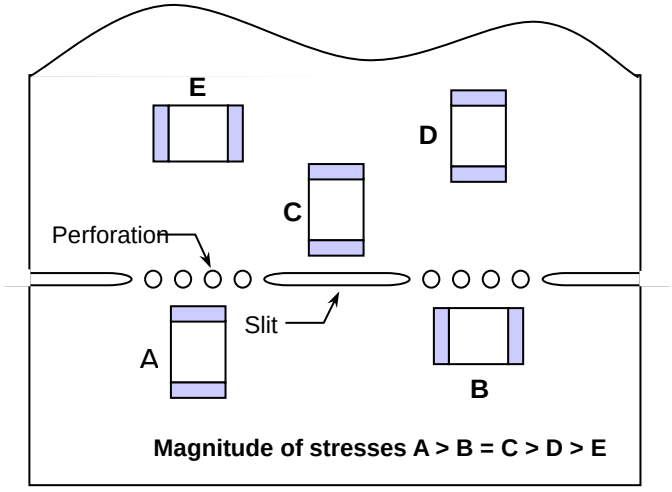
Chip Size	3216 and smaller	3225 and above
Preheating	△T≦190℃	△T≦130℃

【Chip Layout and Breaking PCB】

1. To layout the SMD capacitors for reducing bend stress from board deflection of PCB. The following are examples of Hood and bad layout.

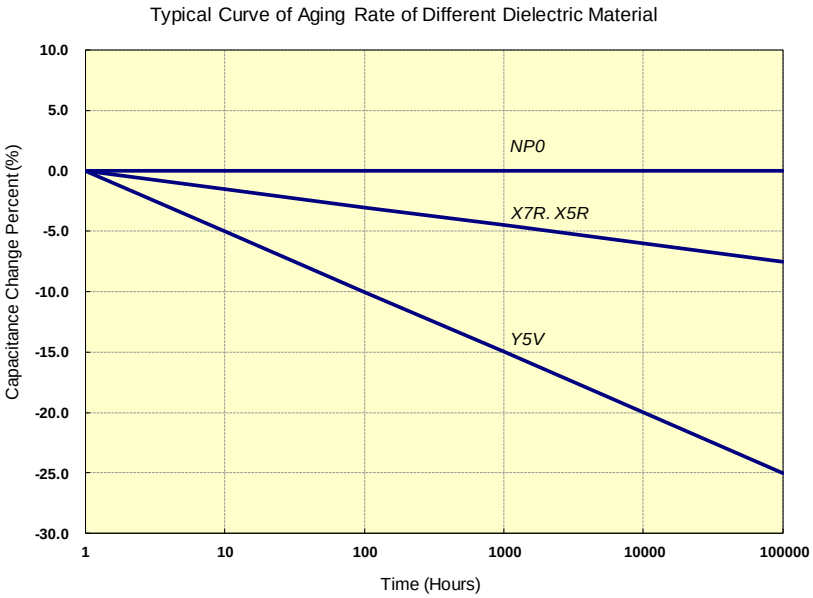
Recommended	Not Recommended
	

2. When breaking PCB, the layout should be noted that the mechanical stresses are depending on the position of capacitors. The following example shows recommendation for better design.



【Aging Rate】

The capacitance and dissipation factor of class 2 capacitors decreases with time. It is known as 'aging' that follows a logarithmic low and expressed in terms of an aging constant. Aging is caused by a gradual re-alignment of the crystalline structure of the ceramic. The aging constant is defined as the percentage loss of capacitance at a 'time decade'. The law of capacitance aging is expressed as following equation:



$C_{t2} = C_{t1} \times (1 - k \times \log_{10}(t_2/t_1))$

C_{t1}: *Capacitance after t1 hours of start aging.*

C_{t2}: *Capacitance after t2 hours of start aging.*

k: aging constant (capacitance decrease per decade)

t1, t2: time in hours from start of aging.

A typical curve of aging rate is shown in following figure.

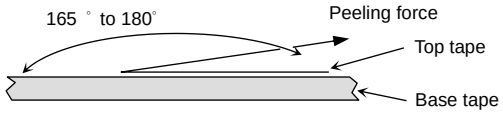
When heating the capacitors above Curie temperature (130℃~150℃) the capacitance can be re-new. So capacitance of class 2 capacitors will be complete de-aged by soldering process; subsequently a new aging process begins.

Because of aging, it is specified an age for measurement to meet the prescribed tolerance for class 2 capacitors. Normally, 1000 hours (t_2=1000 hrs) is defined.

【Peeling Off Force】

Peeling off force: 0.1N to 1.0 N* in the direction shown as below.

The peeling speed: 300±10 mm/min



1. The taped tape on reel is wound clockwise. The sprocket holes are to the right as the tape is pulled toward the user.
2. There are minimum 150 mm as the leader and minimum 40 mm empty tape as the tail is attached to the end of the tape.