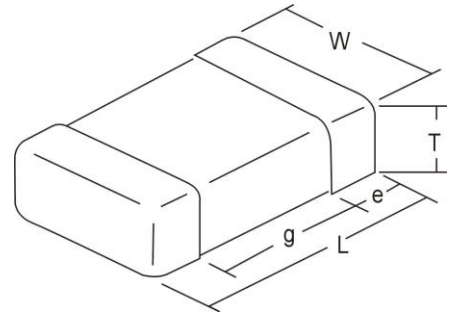
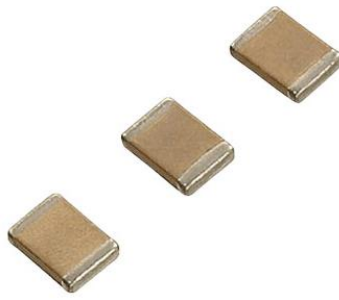


TS18



Size	Dimensions (mm)					
	L	W	e	g min	T /Code	
0201	0.60±0.03	0.30±0.03	0.1~0.2	0.2	0.30±0.3	Z
0201 ^{*2}	0.60-0.03/+0.1	0.30-0.03/+0.1	0.1~0.2	0.2	0.30-0.03/+0.1	Z
0402	1.00±0.10	0.50±0.10	0.15~0.3	0.4	0.50±0.10	A
0402 ^{*2}	1.00-0.05/+0.2	0.50-0.05/+0.2	0.15~0.3	0.4	0.50-0.05/+0.2	A
0603	1.60±0.10	0.80±0.10	0.2~0.6	0.5	0.80±0.10	C
0603 ^{*1}	1.60±0.20 ^{*1}	0.80±0.20 ^{*1}	0.2~0.6	0.5	0.80±0.20 ^{*1}	C
0603 ^{*3}	1.60-0/+0.3	0.80-0/+0.3	0.2~0.6	0.5	0.80-0/+0.3	C
0805	2.00±0.10	1.25±0.10	0.2~0.7	0.7	0.60±0.10	B
					0.85±0.10	D
					1.25±0.20	F
0805 ^{*1}	2.00±0.20 ^{*1}	1.25±0.20 ^{*1}	0.2~0.7	0.7	0.60±0.10	B
					0.85±0.20	D
					1.25±0.20	F
1206	3.20±0.20	1.60±0.20	0.3~0.8	1.6	0.85±0.10	D
					1.00±0.10	E
					1.25±0.20	F
					1.60±0.20	H
1206 ^{*1}	3.20±0.30 ^{*1}	1.60±0.30 ^{*1}	0.3~0.8	1.6	0.85±0.10	D
					1.00±0.10	E
					1.25±0.20	F
					1.60±0.30 ^{*1}	H
1210	3.20±0.30	2.5±0.20	0.3~0.8	1.6	0.85±0.10	D
					1.25±0.20	F
					1.60±0.20	H
					2.00±0.20	G
					2.50±0.30	M
1210 ^{*1}	3.20±0.40 ^{*1}	2.5±0.30 ^{*1}	0.3~0.8	1.6	0.85±0.10	D
					1.25±0.20	F
					1.60±0.30	H
					2.00±0.20	G
					2.50±0.30	M
*1 Stands for Capacitance Range: ≥1uF						
*2 Stands for Capacitance Range: ≥100nF						
*3 Stands for Capacitance Range: ≥10uF						

Please do not hesitate to contact us if you have interested in the size of 2225, 2220, 1812 and 1808.

TS18

SPECIFICATIONS	
Dielectric & Values	NPO X7R X5R X7T X7S X6S Y5V consult product pages of catalog for cap ranges and voltage rating
Terminations	Tin / Nickel
Voltage	4, 6, 6.3, 10, 25, 50 VDC
Packing	tape and reel (0402, 0603, 0805, 1206, 1210)
Capacitance	0.1pF ~ 100uF
Tolerance	±0.1pF ~ +80-20%
Operating Temperature Range	NPO, X7R, X7T, X7S: -55 ~ +125℃ ; X6S: -55 ~ +105℃ ; X5R: -55 ~ +85℃ ; Y5V: -30 ~ +85℃
Types of Capacitor and Dielectric Material	NPO: The capacitor of this kind dielectric material is considered as Class I capacitor, including general capacitor and high frequency NPO capacitor. The electrical properties of NPO capacitor are the most stable one and have little change with temperature, voltage and time. They are suited for applications where low losses and high stability are required, such as filters, oscillators, and timing circuits.
	X7R, X5R, X6S, X7T, X7S: material is a kind of material has high dielectric constant. The capacitor made of this kind material is considered as Class II capacitor whose capacitance is higher than that of class I . These capacitors are classified as having a semi stable temperature characteristic and used over a wide temperature range, such in these kinds of circuits, DC blocking, decoupling, bypassing, frequency discriminating etc.
	Y5V: The capacitor made of this kind of material is the highest dielectric constant of all ceramic capacitors. They are used over a moderate temperature range in application where high capacitance is required because of its unstable temperature coefficient, but where moderate losses and capacitance changes can be tolerated. Its capacitance and dissipation factors are sensible to measuring conditions, such as temperature and voltage, etc

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General Product Capacitance Range:

	0201																
	NPO		X7R		X5R				X6S				X7S		X7T		
Cp/VDC	50	25	50	25	25	16	10	6.3	25	16	10	6.3	50	25	16	10	6.3
0R1	Z	Z															
0R2	Z	Z															
0R3	Z	Z															
0R4	Z	Z															
0R5	Z	Z															
0R6	Z	Z															
0R7	Z	Z															
0R8	Z	Z															
0R9	Z	Z															
1R0	Z	Z															
1R1	Z	Z															
1R2	Z	Z															
1R3	Z	Z															
1R5	Z	Z															
1R6	Z	Z															
1R8	Z	Z															
2R0	Z	Z															
2R2	Z	Z															
2R4	Z	Z															
2R7	Z	Z															
3R0	Z	Z															
3R3	Z	Z															
3R6	Z	Z															
3R9	Z	Z															
4R0	Z	Z															
4R3	Z	Z															
4R7	Z	Z															
5R0	Z	Z															
5R1	Z	Z															
5R6	Z	Z															
6R0	Z	Z															
6R2	Z	Z															
6R8	Z	Z															
7R0	Z	Z															
7R5	Z	Z															
8R0	Z	Z															
8R2	Z	Z															
9R0	Z	Z															
9R1	Z	Z															
100	Z	Z															
220	Z	Z															
330	Z	Z															
390	Z	Z															

TS18

General Product Capacitance Range:

	0201																
	NPO		X7R		X5R				X6S				X7S		X7T		
Cp/VDC	50	25	50	25	25	16	10	6.3	25	16	10	6.3	50	25	16	10	6.3
470	Z	Z															
680	Z	Z															
101	Z	Z															
181			Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
221			Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
241			Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
271			Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
331			Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
471			Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
681			Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
751			Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
102			Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
152			Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
222			Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
332			Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
472			Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
682			Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
103				Z	Z	Z	Z	Z	Z	Z	Z	Z		Z	Z	Z	Z
153				Z	Z	Z	Z	Z	Z	Z	Z	Z		Z	Z	Z	Z
223					Z	Z	Z	Z	Z	Z	Z	Z		Z	Z	Z	Z
473					Z	Z	Z	Z	Z	Z	Z	Z		Z	Z	Z	Z
863					Z	Z	Z	Z	Z	Z	Z	Z		Z	Z	Z	Z
104					Z	Z	Z	Z	Z	Z	Z	Z		Z	Z	Z	Z
224								Z	Z	Z	Z	Z		Z	Z	Z	Z
474								Z				Z					Z
105								Z									
	0402																
	NPO		X7R/X5R					X6S/X7S					X7T				
Cp/VDC	50	25	50	25	16	10	6	50	25	16	10	6	25	16	10	6.3	4
0R1	A	A															
0R2	A	A															
0R3	A	A															
0R4	A	A															
0R5	A	A															
0R6	A	A															
0R7	A	A															
0R8	A	A															
0R9	A	A															
1R0	A	A															
1R1	A	A															
1R2	A	A															
1R3	A	A															
1R5	A	A															

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General Product Capacitance Range:

	0402																					
	NPO		X7R/X5R					X6S					X7S					X7T				
Cp/VDC	50	25	50	25	16	10	6	50	25	16	10	6	50	25	16	10	6	25	16	10	6.3	4
1R6	A	A																				
1R8	A	A																				
2R0	A	A																				
2R2	A	A																				
2R4	A	A																				
2R7	A	A																				
3R0	A	A																				
3R3	A	A																				
3R6	A	A																				
3R9	A	A																				
4R0	A	A																				
4R3	A	A																				
4R7	A	A																				
5R0	A	A																				
5R1	A	A																				
5R6	A	A																				
6R0	A	A																				
6R2	A	A																				
6R8	A	A																				
7R0	A	A																				
7R5	A	A																				
8R0	A	A																				
8R2	A	A																				
9R0	A	A																				
9R1	A	A																				
100	A	A																				
120	A	A																				
150	A	A																				
180	A	A																				
200	A	A																				
220	A	A																				
270	A	A																				
300	A	A																				
330	A	A																				
390	A	A																				
470	A	A																				
560	A	A																				
680	A	A																				
820	A	A																				
101	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
121	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
151	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
181	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A

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General Product Capacitance Range:

	0402																										
	NPO		X7R					X6S					X5R					X7S					X7T				
Cp/VDC	50	25	50	25	16	10	6	50	25	16	10	6	50	25	16	10	6	50	25	16	10	6	25	16	10	6.3	4
201	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
221	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
271	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
331	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
391	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
471	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
561	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
681	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
821	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
102	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
152			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
182			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
222			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
272			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
332			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
472			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
562			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
682			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
103			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
153			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
183			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
223			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
273			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
333			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
393			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
473			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
563			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
683			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A
104			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
154				A	A	A	A		A	A	A	A		A	A	A	A		A	A	A	A	A	A	A	A	A
184				A	A	A	A			A	A	A			A	A	A		A	A	A	A	A	A	A	A	A
224				A	A	A	A			A	A	A			A	A	A		A	A	A	A	A	A	A	A	A
274							A			A	A	A			A	A	A					A		A	A	A	A
334							A			A	A	A			A	A	A					A		A	A	A	A
474							A			A	A	A			A	A	A					A		A	A	A	A
684							A			A	A	A				A	A					A		A	A	A	A
105							A				A	A				A	A					A			A	A	A
225												A					A										

TS18

General Product Capacitance Range:

	0603																						
	NPO		X7R					X6S/X7S					X5R					X7T					
Cp/VDC	50	25	50	25	16	10	6	50	25	16	10	6.3	50	25	16	10	6.3	50	25	16	10	6.3	4
0R2	C	C																					
0R3	C	C																					
0R4	C	C																					
0R5	C	C																					
0R6	C	C																					
0R7	C	C																					
0R8	C	C																					
0R9	C	C																					
1R0	C	C																					
1R1	C	C																					
1R2	C	C																					
1R3	C	C																					
1R5	C	C																					
1R6	C	C																					
1R8	C	C																					
2R0	C	C																					
2R2	C	C																					
2R4	C	C																					
2R7	C	C																					
3R0	C	C																					
3R3	C	C																					
3R6	C	C																					
3R9	C	C																					
4R0	C	C																					
4R3	C	C																					
4R7	C	C																					
5R0	C	C																					
5R1	C	C																					
5R6	C	C																					
6R0	C	C																					
6R2	C	C																					
6R8	C	C																					
7R0	C	C																					
7R5	C	C																					
8R0	C	C																					
8R2	C	C																					
9R0	C	C																					
9R1	C	C																					
100	C	C																					
120	C	C																					
150	C	C																					
180	C	C																					
200	C	C																					
220	C	C																					
270	C	C																					
300	C	C																					
330	C	C																					

TS18

General Product Capacitance Range:

	0603																							
	NPO		X7R					X6S/X5R					X7S					X7T						
Cp/VDC	50	25	50	25	16	10	6	50	25	16	10	6.3	50	25	16	10	6.3	50	25	16	10	6.3	4	
390	C	C																						
470	C	C																						
560	C	C																						
680	C	C																						
820	C	C																						
101	C	C																						
121	C	C																						
151	C	C																						
181	C	C																						
201	C	C																						
221	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
271	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
331	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
391	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
471	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
561	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
681	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
821	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
102	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
152	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
182	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
222	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
272	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
332	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
472	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
562		C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
682		C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
103		C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
153			C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
183			C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
223			C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
273			C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
333			C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
393			C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
473			C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	
563			C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C	

TS18

General Product Capacitance Range:

	0603																											
	NPO		X7R					X6S					X5R					X7S					X7T					
Cp/VDC	50	25	50	25	16	10	6	50	25	16	10	6.3	50	25	16	10	6.3	50	25	16	10	6.3	50	25	16	10	6.3	4
683			C	C	C	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C
104			C	C	C	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C
154			C	C	C	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C
184			C	C	C	C	C	C	C	C	C	C	C	C	C	C	C						C	C	C	C	C	C
224			C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
274			C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
334			C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
474			C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
684			C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
105			C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
225						C	C		C	C	C	C		C	C	C	C				C	C			C	C	C	C
475							C		C	C	C	C		C	C	C	C				C				C	C	C	C
106										C	C	C			C	C	C				C					C	C	C
226																C												C
	0805																											
	NPO			X7R					X6S					X5R					X7S					X7T				
Cp/VDC	50	25	16	50	25	16	10	6.3	50	25	16	10	6.3	50	25	16	10	6.3	50	25	16	10	6.3	25	16	10	6.3	4
0R2	B	B	B																									
0R3	B	B	B																									
0R4	B	B	B																									
0R5	B	B	B																									
0R6	B	B	B																									
0R7	B	B	B																									
0R8	B	B	B																									
0R9	B	B	B																									
1R0	B	B	B																									
1R1	B	B	B																									
1R2	B	B	B																									
1R3	B	B	B																									
1R5	B	B	B																									
1R6	B	B	B																									
1R8	B	B	B																									
2R0	B	B	B																									
2R2	B	B	B																									
2R4	B	B	B																									
2R7	B	B	B																									

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General Product Capacitance Range:

	0805																	
	NPO			X7R/X5R					X6S/X7S					X7T				
Cp/VDC	50	25	16	50	25	16	10	6.3	50	25	16	10	6.3	25	16	10	6.3	4
3R0	B	B	B															
3R3	B	B	B															
3R6	B	B	B															
3R9	B	B	B															
4R0	B	B	B															
4R3	B	B	B															
4R7	B	B	B															
5R0	B	B	B															
5R1	B	B	B															
5R6	B	B	B															
6R0	B	B	B															
6R2	B	B	B															
6R8	B	B	B															
7R0	B	B	B															
7R5	B	B	B															
8R0	B	B	B															
8R2	B	B	B															
9R0	B	B	B															
9R1	B	B	B															
100	B	B	B															
120	B	B	B															
150	B	B	B															
180	B	B	B															
200	B	B	B															
220	B	B	B															
270	B	B	B															
300	B	B	B															
330	B	B	B															
390	B	B	B															
470	B	B	B															
560	B	B	B															
680	B	B	B															
820	B	B	B															
101	B	B	B															
121	B	B	B															
151	B	B	B															

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General Product Capacitance Range:

	0805																						
	NPO			X7R/X5R					X6S					X7S					X7T				
Cp/VDC	50	25	16	50	25	16	10	6.3	50	25	16	10	6.3	50	25	16	10	6.3	25	16	10	6.3	4
181	B	B	B																				
201	B	B	B																				
221	B	B	B	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
271	B	B	B	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
331	B	B	B	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D						B/D	B/D	B/D	B/D	B/D
391	B	B	B	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D						B/D	B/D	B/D	B/D	B/D
471	B	B	B	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D						B/D	B/D	B/D	B/D	B/D
561	B	B	B	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D						B/D	B/D	B/D	B/D	B/D
681	B	B	B	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D						B/D	B/D	B/D	B/D	B/D
821	B	B	B	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D						B/D	B/D	B/D	B/D	B/D
102	B	B	B	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D	B/D						B/D	B/D	B/D	B/D	B/D
152	B	B	B	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
182	B	B	B	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
222	B	B	B	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
272	B	B	B	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
332	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
472	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
562	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
682	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
103	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
153	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
183	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
223	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
273	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
333	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
393	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
473	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
563	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
683	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
104	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
154	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
184	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D
224	D	D	D/F	D/F	D	D	D	D	D/F	D	F	D	D	D/F	D	D	D	D	D/F	D	D	D	D
274	D	D/F	D	D/F	D	D	D	D	D/F	D	F	D	D	D/F	D	D	D	D	D/F	D	D	D	D
334	D	D/F	D	D/F	D	D	D	D	D/F	D	F	D	D	D/F	D	D	D	D	D/F	D	D	D	D
474	D	D/F	D/F	D/F	D/F	D/F	D	D	D/F	D/F	D/F	D	D	D/F	D/F	D/F	D	D	D/F	D/F	D/F	D	D

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General Product Capacitance Range:

	0805																							
	NPO			X7R/X7S					X6S					X5R					X7T					
Cp/VDC	50	25	16	50	25	16	10	6.3	50	25	16	10	6.3	50	25	16	10	6.3	25	16	10	6.3	4	
684				D	D/F	D/F	D	D	D	D/F	D/F	D	D	D	D/F	D/F	D	D	D	D/F	D/F	D	D	
105				F	D/F	D/F	D	D	F	D/F	D/F	D	D	F	D/F	D/F	D	D	F	D/F	D/F	D	D	
225					F	F	F	F		F	F	F	F	F	F	F	F	F	F	F	F	F	F	
475					F	F	F	F		F	F	F	F	F	F	F	F	F	F	F	F	F	F	
106							F	F			F	F	F		F	F	F	F			F	F	F	
226												F	F				F	F				F	F	
	1206																							
	NPO			X7R/X7S					X6S					X5R					X7T					
Cp/VDC	50	25	16	50	25	16	10	6.3	50	25	16	10	6.3	50	25	16	10	6.3	25	16	10	6.3	4	
0R5	D	D	D																					
1R0	D	D	D																					
1R1	D	D	D																					
1R2	D	D	D																					
1R3	D	D	D																					
1R5	D	D	D																					
1R6	D	D	D																					
1R8	D	D	D																					
2R0	D	D	D																					
2R2	D	D	D																					
2R4	D	D	D																					
2R7	D	D	D																					
3R0	D	D	D																					
3R3	D	D	D																					
3R6	D	D	D																					
3R9	D	D	D																					
4R0	D	D	D																					
4R3	D	D	D																					
4R7	D	D	D																					
5R0	D	D	D																					
5R1	D	D	D																					
5R6	D	D	D																					
6R0	D	D	D																					
6R2	D	D	D																					
6R8	D	D	D																					
7R0	D	D	D																					
7R5	D	D	D																					

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General Product Capacitance Range:

	1206																		
	NPO			X7R/X5R/X6S					X7S					X7T					
Cp/VDC	50	25	16	50	25	16	10	6.3	50	25	16	10	6.3	50	25	16	10	6.3	4
8R0	D	D	D																
8R2	D	D	D																
9R0	D	D	D																
9R1	D	D	D																
100	D	D	D																
120	D	D	D																
150	D	D	D																
180	D	D	D																
200	D	D	D																
220	D	D	D																
270	D	D	D																
300	D	D	D																
330	D	D	D																
390	D	D	D																
470	D	D	D																
560	D	D	D																
680	D	D	D																
820	D	D	D																
101	D	D	D																
121	D	D	D																
151	D	D	D																
181	D	D	D																
201	D	D	D																
101	D	D	D																
121	D	D	D																
151	D	D	D																
181	D	D	D																
221	D	D	D	D	D	D	D	D						D	D	D	D	D	D
271	D	D	D	D	D	D	D	D						D	D	D	D	D	D
331	D	D	D	D	D	D	D	D						D	D	D	D	D	D
391	D	D	D	D	D	D	D	D						D	D	D	D	D	D
471	D	D	D	D	D	D	D	D						D	D	D	D	D	D
561	D	D	D	D	D	D	D	D						D	D	D	D	D	D
681	D	D	D	D	D	D	D	D						D	D	D	D	D	D
821	D	D	D	D	D	D	D	D						D	D	D	D	D	D
102	D	D	D	D	D	D	D	D						D	D	D	D	D	D

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General Product Capacitance Range:

	1206																													
	NPO			X7R					X6S					X5R					X7S					X7T						
Cp/VDC	50	25	16	50	25	16	10	6.3	50	25	16	10	6.3	50	25	16	10	6.3	50	25	16	10	6.3	50	25	16	10	6.3	4	
152	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
182	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
222	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
272	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
332	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
472	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
562	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
682	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
103	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
153				D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
183				D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
223				D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
273				D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
333				D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
393				D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
473				D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
563				D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
683				D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
104				D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
154				D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
184				D	D	D	D	D	D	D	D	D	D	D	D	D	D	D						D	D	D	D	D	D	
224				D	D	H	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	
274				D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	
334				D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	
474				F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	
684				F/H	F	F	F	F	F/H	F	F	F	F	F/H	F	F	F	F	F/H	F	F	F	F	F/H	F/H	F	F	F	F	F
105				F/H	F	F	F	F	F/H	F	F	F	F	F/H	F	F	F	F	F/H	F	F	F	F	F/H	F/H	F	F	F	F	F
205				F/H	E	E	E	E	E	E	E	E	E	F/H	E	E	E	E	F/H	E	E	E	E	F/H	E	E	E	E	E	E
225				H	F	F	F	F	H	F	F	F	F	H	F	F	F	F	H	F	F	F	F	H	F	F	F	F	F	F
475					H	H	H	H	H	H	H	H	H	H	H	H	H	H		H	H	H	H	H	H	H	H	H	H	H
106					H	H	H	H		H	H	H	H	H	H	H	H	H		H	H	H	H		H	H	H	H	H	H
226												H	H		H	H	H	H									H	H	H	
476													H				H	H												H

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General Product Capacitance Range:

	1210																					
	NPO	X7R/X7S					X6S					X5R					X7T					
Cp/VDC	50	50	25	16	10	6.3	50	25	16	10	6.3	50	25	16	10	6.3	50	25	16	10	6.3	4
101	D																					
121	D																					
151	D																					
181	D																					
201	D																					
221	D																					
271	D																					
331	D																					
391	D																					
471	D																					
561	D																					
681	D																					
821	D																					
102	D																					
152	D																					
182	D																					
222	D																					
272	D																					
332	D																					
472	D																					
474		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G
684		H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		H	H	H	H	H
105		H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		H	H	H	H	H
225		H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	M	H	H	H	H	H
475			H/G	H	H	H	M	H/G	H	H	H		H/G	H	H	H	M	M	H/G	H	H	H
106			M	G	M	M	M	M	G	M	M		M	G	M	M	M	M	M	G	M	M
226				M	M	M		M	M	M	M			M	M	M		M	M	M	M	M
476					M	M				M	M				M	M					M	M
107											M					M						

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Specification and Test Condition:

1. Appearance

Dielectrics	Specification	Testing Condition
NPO/X7R/X5R/X7T/X6S/X7S	1/10L < L ≤ 1/8L, 1/10W < W ≤ 1/8W, 1/10T < T ≤ 1/8T (None is acceptable All judged unqualified)	Visual inspection.

2. Dimensions

Dielectrics	Specification	Testing Condition
NPO/X7R/X5R/X7T/X6S/X7S	Within the specified dimensions	Using calipers on micrometer

3. Capacitance

Dielectrics	Specification	Testing Condition
NPO	Within the specified tolerance A: ±0.05pF; B: ±0.1pF; C: ±0.25pF; D: ±0.5pF; J: ±5%	1.0±0.2Vrms, 1MHz ±10% (C>1000 pF, 1.0±0.2Vrms, 1KHz ±10%)
X7R/X5R/X7T/X6S/X7S	Within the specified tolerance J: ±5% ; K: ±10% ; M: ±20%	1.0±0.2Vrms, 1KHz ±10% (Cp > 10uF, 0.5±0.1Vrms, 120±24Hz)

4. Dissipation Factor

Dielectrics	Specification				Testing Condition
NPO	Cp<30pF, Q≥400+20Cp; Cp≥30pF, Q≥1000				1.0±0.2Vrms, 1MHz ±10% , 25℃ (Cp>1000pF, 1.0±0.2Vrms, 1KHz ±10%)
X7R/X5R/X7T/X6S/ X7S	Type	U _R	Capacitance	DF	1.0±0.2Vrms, 1KHz ±10%, (Cp > 10uF, 0.5±0.1Vrms, 120±24Hz)
	0402	≤25V	C≤0.47uF	≤7.0%	
			C>0.47uF	≤10.0%	
		>25V	C≤0.1uF	≤7.0%	
			C>0.1uF	≤10.0%	
	0603	≤25V	C≤0.47uF	≤7.0%	
			C>0.47uF	≤10.0%	
		>25V	C≤0.1uF	≤5.0%	
			0.1uF<C≤0.22uF	≤7.0%	
	0805	≤25V	C>0.22uF	≤10.0%	
			C≤1uF	≤7.0%	
		>25V	C>1uF	≤10.0%	
			C≤0.47uF	≤7.0%	
	1206	≤25V	C>0.47uF	≤10.0%	
			C≤2.2uF	≤7.0%	
		>25V	2.2uF≤C<47uF	≤10.0%	
			C<1uF	≤7.0%	
			1uF≤C<47uF	≤10.0%	

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5. Insulation Resistance

Dielectrics	Specification	Testing Condition
NPO /X7R/ X5R/X7T/X6S/X7S	$U_R \leq 50V$, More than 10 G Ω or 100 $\Omega \cdot F/CR$, whichever is smaller.	$U_R \leq 50V$ $U_{Test} = U_R$; Charge Time: 60 $\pm$ 5 sec; Temperature: 25 $^{\circ}C$
NPO /X7R/X7T/X6S/ X7S	$U_R > 50V$, More than 4 G Ω or 100 $\Omega \cdot F/CR$, whichever is smaller.	$U_R \leq 400V$ $U_{Test} = U_R$; $U_R > 400V$ $U_{Test} = 400V$; Charge Time: 60 $\pm$ 5 sec; Temperature: 25 $^{\circ}C$
Test Temperature: 25 $^{\circ}C \pm 3^{\circ}C$; Test Humidity: <70%RH.		

6. Dielectric Strength

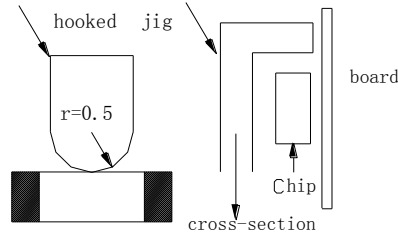
Dielectrics	Rated voltage range	Measuring Method
NPO	$U_R \leq 50V$	Force 300%Rated voltage for 5second. Max..current should not exceed 50mA.
X7R/X5R/X7T/X6S/X7S	$U_R \leq 50V$	Force 250%Rated voltage for 5second. Max..current should not exceed 50mA.
NPO /X7R/X7T/X7S	$100V \leq U_R < 500V$	Force 200%Rated voltage for 5second. Max..current should not exceed 50mA.
	$500V \leq U_R < 1000V$	Force 150%Rated voltage for 5second. Max..current should not exceed 50mA.
	$1000V \leq U_R < 2000V$	Force 150%Rated voltage for 5second. Max..current should not exceed 50mA.
	$U_R \geq 2000V$	Force 120%Rated voltage for 5second. Max..current should not exceed 50mA.

7. Temperature Coefficient of Capacitance

Dielectrics	Specification	Testing Condition
NPO	Temperature coefficient within $\pm 30ppm/^{\circ}C$ Cp drift within $\pm 0.2\%$ or $\pm 0.05pF$	Measure capacitance under follow table list STEP NPO, X7R, X6S X5R X7S X7T
X7R/X5R	Capacitance change within $\pm 15\%$	1 25 ± 2 25 ± 2 25 ± 2 25 ± 2
		2 -55 ± 3 -55 ± 3 -55 ± 3 -55 ± 3
		3 25 ± 2 25 ± 2 25 ± 2 25 ± 2
X7T	Capacitance change within $\pm 22\%$, -33%	4 125 ± 3 105 ± 3 85 ± 3 125 ± 3
		5 25 ± 2 25 ± 2 25 ± 2 25 ± 2
		1) NPO The capacitance drift is calculated by dividing the differences between the maximum and minimum measured values in the step 1, 3 and 5. The temperature coefficient is determined using the Capacitance measured in step 3 as a reference.
X6S/X7S	Capacitance change within $\pm 22\%$	2) X7R, X5R, X7T, X6S and X7S The ranges of capacitance change compared within the above 25 $^{\circ}C$ value over the temperature ranges shall be within the specified ranges.

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8. Adhesion

Dielectrics	Specification	Testing Condition
NPO/X7R/X5R/ X7T/X6S/X7S	No removal of the terminations or other defect shall occur.	The pressurizing force shall be 6N (=600g*f) and the duration of application shall be 10 ±1sec. 

9. Solderability of Termination

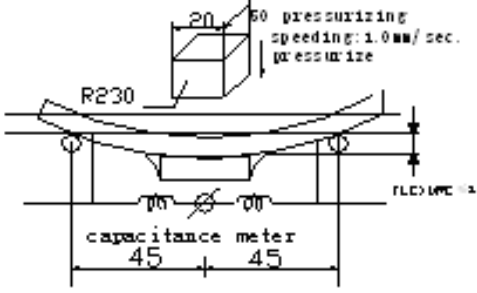
Dielectrics	Specification	Testing Condition
NPO/X7R/X5R/ X7T/X6S/X7S	95% min. coverage of both terminal electrodes and less than 5% have pin holes or rough spots.	Solder temperature: 245 ±5°C Dipping time: 2 ±1 seconds. Completely soak both terminal electrodes in solder

10. Resistance to leaching

Dielectrics	Specification	Testing Condition
NPO/X7R/X5R/ X7T/X6S/X7S	95% min. coverage of both terminal electrodes and less than 5% have pin holes or rough spots. No remarkable visual damage.	Solder temperature: 270 ±5°C Preheated: 120°C~150°C/60sec Dipping time: 10 ±1 seconds. Completely soak both terminal electrodes in solder

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11. Bending

Dielectrics	Specification	Testing Condition
NPO	No remarkable visual damage Cp change $\leq \pm 5\%$ or $\pm 0.5\text{pF}$, whichever is larger.	Solder the capacitor on testing substrate and put it on testing stand. The middle part of substrate shall successively be pressurized by pressuring rod at a rated of about 1.0mm/sec. Until the deflection become means of the 1.0mm.
X7R/X5R/X7T /X6S/X7S	No remarkable visual damage Cp change $\leq \pm 10\%$	

12. Resistance to Soldering Heat

Dielectrics	Specification	Testing Condition
NPO	No remarkable visual damage Cp change within $\pm 2.5\%$ or $\pm 0.25\text{pF}$, whichever is larger. DF meets initial standard value. IR meets initial standard value.	Soldering temperature: $270 \pm 5^\circ\text{C}$ Preheating: $120 \sim 150^\circ\text{C}$ 60sec. Dipping time: 10 ± 1 seconds. Measurement to be made after being kept at room temperature for 24 ± 2 (NPO) or 48 ± 4 (X7R, X5R, X7S, X7T, X6S) hours. Recovery for the following period under the standard condition after test.
X7R/X5R/X7T /X6S/X7S	No remarkable visual damage Cp change within $\pm 7.5\%$ DF meets initial standard value. IR meets initial standard value.	*Initial measurement for high dielectric constant type Perform a heat treatment at $140 \sim 150^\circ\text{C}$ for 1hr and let sit for 48 ± 4 hrs at room temperature. Perform the initial measurement.

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13. Temperature Cycle

Dielectrics	Specification	Testing Condition															
NPO	No remarkable visual damage Cp change within $\pm 2.5\%$ or $\pm 0.25\text{pF}$, whichever is larger.	To perform 5 cycles of the stated environment: <table> <tr> <th>Step</th><th>Temperature</th><th>Time</th></tr> <tr> <td>1</td><td>Min. operating Temp. $+0/-3^{\circ}\text{C}$</td><td>30min</td></tr> <tr> <td>2</td><td>25°C</td><td>2~3 min</td></tr> <tr> <td>3</td><td>Max. operating Temp. $+3/-0^{\circ}\text{C}$</td><td>30 min</td></tr> <tr> <td>4</td><td>25°C</td><td>2~3 min</td></tr> </table>	Step	Temperature	Time	1	Min. operating Temp. $+0/-3^{\circ}\text{C}$	30min	2	25°C	2~3 min	3	Max. operating Temp. $+3/-0^{\circ}\text{C}$	30 min	4	25°C	2~3 min
Step	Temperature	Time															
1	Min. operating Temp. $+0/-3^{\circ}\text{C}$	30min															
2	25°C	2~3 min															
3	Max. operating Temp. $+3/-0^{\circ}\text{C}$	30 min															
4	25°C	2~3 min															
X7R/X5R/X7T /X6S/X7S	No remarkable visual damage Cp change within $\pm 7.5\%$	Measurement to be made after being kept at room temperature for $24 \pm 2\text{hrs}$ (NPO) or $48 \pm 4\text{hrs}$ (X7R, X5R, X7S, X7T, X6S) at room temperature, then measure. *Initial measurement for high dielectric constant type Perform a heat treatment at $140 \sim 150^{\circ}\text{C}$ for 1hr and let sit for $48 \pm 4\text{hrs}$ at room temperature. Perform the initial measurement.															

14. Moisture Resistance, steady state

Dielectrics	Specification	Testing Condition
NPO	No remarkable visual damage Cp change within $\pm 5\%$ or $\pm 0.5\text{pF}$, whichever is larger. Cp $< 10\text{pF}$, Q $\geq 200 + 10\text{Cp}$; $10 \leq \text{Cp} < 30\text{pF}$, Q $\geq 275 + 2.5\text{Cp}$ Cp $\geq 30\text{pF}$, Q ≥ 350 $R \cdot C \geq 1000\text{M}\Omega$ or $10\Omega \cdot \text{F}$, whichever is smaller	Test temperature: $40 \pm 2^{\circ}\text{C}$ Humidity: 90~95% RH Testing time: 500 $\pm 12\text{hrs}$ Measurement to be made after being kept at room temperature for $24 \pm 2\text{hrs}$ (NPO) or $48 \pm 4\text{hrs}$ (X7R, X5R, X7S, X7T, X6S)
X7R/X5R/X7T /X6S/X7S	Cp change within $\pm 12.5\%$ DF: Not more than 2 times of initial value $R \cdot C \geq 1000\text{M}\Omega$ or $10\Omega \cdot \text{F}$, whichever is smaller	*Initial measurement for high dielectric constant type Perform a heat treatment at $140 \sim 150^{\circ}\text{C}$ for 1hr and let sit for $48 \pm 4\text{hrs}$ at room temperature. Perform the initial measurement.

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15. Damp heat with load

Dielectrics	Specification	Testing Condition
NPO	No remarkable visual damage Cp change $\leq \pm 7.5\%$ or $\pm 0.75\text{pF}$, whichever is larger. Cp < 30pF, Q $\geq 100 + 10/3 \cdot \text{Cp}$ Cp $\geq 30\text{pF}$, Q ≥ 200 R * C $\geq 500\text{M}\Omega$ or $5\Omega \cdot \text{F}$, whichever is smaller	Test temperature: $40 \pm 2^\circ\text{C}$ Humidity: 90~95% RH Voltage: 100% of the rated voltage Testing time: 500 ± 12 hrs Measurement to be made after being kept at room temperature for 24 ± 2 hrs (NPO) or 48 ± 4 hrs (X7R, X5R, X7S, X7T, X6S)
X7R/X5R/X7T /X6S/X7S	No remarkable visual damage Cp change $\leq \pm 12.5\%$ DF: Not more than 2 times of initial value R * C $\geq 500\text{M}\Omega$ or $5\Omega \cdot \text{F}$, whichever is smaller	*Apply the rated DC voltage for 1 hour at $40 \pm 2^\circ\text{C}$. Remove and let sit for 48 ± 4 hrs at room temperature. Perform the initial measurement.

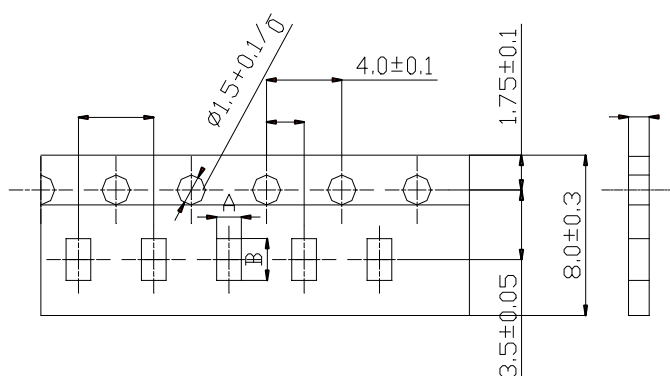
16. Life Test

Dielectrics	Specification	Testing Condition
NPO	No remarkable visual damage Cp change $\leq \pm 3\%$ or $\pm 0.3\text{pF}$, whichever is larger. Q ≥ 350 (Cp $\geq 30\text{pF}$) Q $\geq 275 + (2.5 \cdot \text{Cp})$ ($10\text{pF} \leq \text{Cp} < 30\text{pF}$) Q $\geq 200 + 10 \cdot \text{Cp}$ (Cp < 10pF) R * C $\geq 1000\text{M}\Omega$ or $50\Omega \cdot \text{F}$, whichever is smaller	Test temperature: Max. Operating Temp. $\pm 3^\circ\text{C}$ Voltage: U _R < 100V 150% of the rated voltage (*Remarks) Testing time: 1000 hrs
X7R/X5R/X7T /X6S/X7S	No remarkable visual damage Cp change $\leq \pm 12.5\%$ DF: Not more than 2 times of initial value R * C $\geq 1000\text{M}\Omega$ or $5\Omega \cdot \text{F}$, whichever is smaller	Measurement to be made after being kept at room temperature for 24 ± 2 hrs (NPO) or 48 ± 4 hrs (X7R, X5R, X7S, X7T, X6S) *Initial measurement for high dielectric constant type Apply 150% of the rated DC voltage for one hour at the maximum operating temperature $\pm 3^\circ\text{C}$. Remove and let sit for 48 ± 4 hrs at room temperature. Perform the initial measurement

TS18

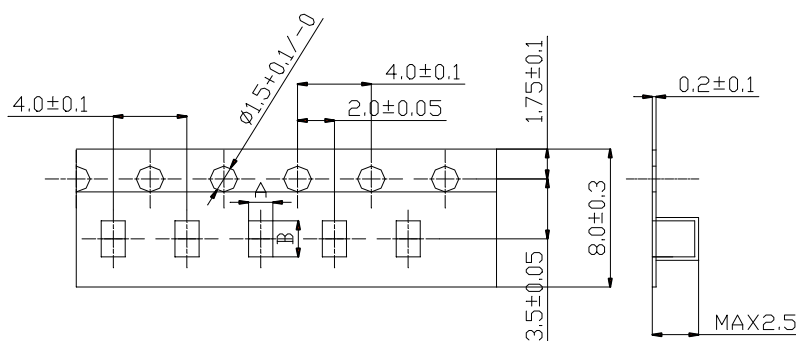
Packing

1. Dimensions of Packing Paper: (Unit: mm)



Type	A	B	C	D	T
0402	0.65±0.10	1.15±0.10	2.0±0.05	2.0±0.05	0.8max
0603	1.05±0.10	1.85±0.10	4.0±0.10	2.0±0.10	1.1max
0805	1.55±0.15	2.3±0.15	4.0±0.10	2.0±0.10	1.1max
1206	1.95±0.15	3.5±0.15	4.0±0.10	2.0±0.10	1.1max

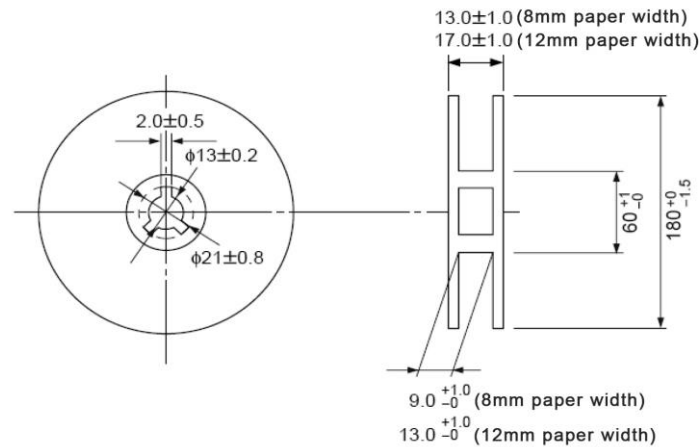
2. Dimensions of Embossed Packing



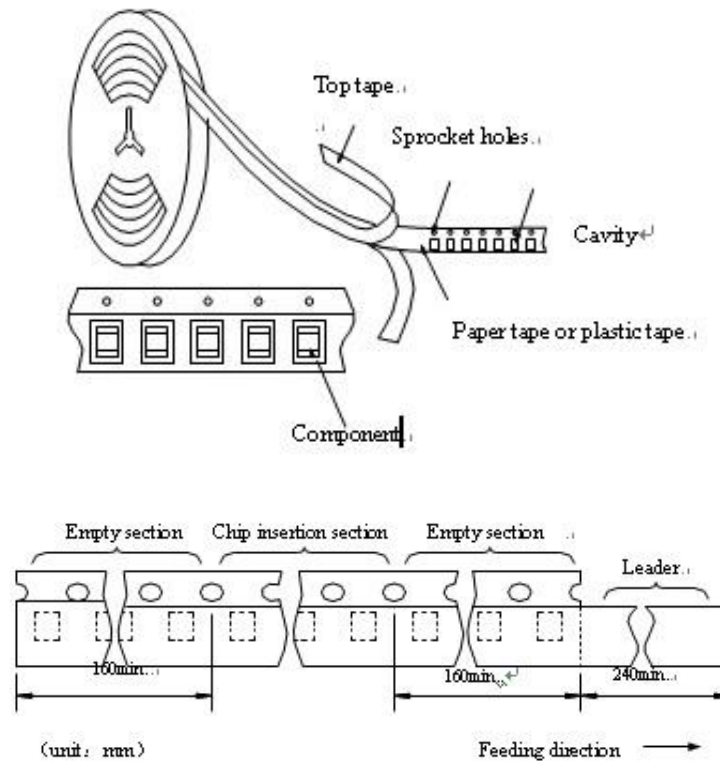
A : 1.45±0.20 B : 2.25±0.20 (0805)
 A : 1.95±0.20 B : 3.50±0.20 (1206)

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3. Dimensions of Reel:



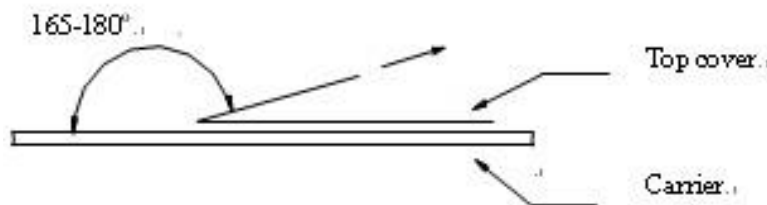
4. Taping Figure



TS18

5. Taping Method

- ① Tapes for capacitors are wound clockwise. The sprocket holes are to the right as the tape is pulled toward the user.
- ② The top tape and base tape are not attached at the end of the tape for a minimum of 5 pitches.
- ③ Part of the leader and part of the empty tape shall be attached to the end of the tape as follows.
- ④ Missing capacitors number within 0.1% of the number per reel or 1pc, whichever is greater, and are not continuous.
- ⑤ The top tape and bottom tape shall not protrude beyond the edges of the tape and shall not cover sprocket holes.
- ⑥ Cumulative tolerance of sprocket holes, 10 pitches: $\pm 0.3\text{mm}$.
- ⑦ Peeling off force: 0.1 to 0.6N in the direction shown down.



Note: Specification are subject to change without notice. For more detail and update, please visit our website.

PART NUMBER SYSTEM

Series

TSD131

Sub-Series

G

Voltage

2A

Capacitance

220

Tolerance

M

Size

S

Packing

B

Material/
Terminal
Options

0

Lead Space

0

Lead Length

0

Remark

R

Refer to Index

0

Standard

0

Standard

1

TS14

Voltage

Code	Voltage
0E	-2.5V
0G	-4V
0J	-6.3V
1A	-10V
1C	-16V
1D	-20V
1E	-25V
1V	-35V
1G	-40V
1H	-50V
1J	-63V
1M	-70V
1U	-75V
1K	-80V
2A	-100V
2B	-125V
2N	-150V
2C	-160V
2D	-200V
2E	-250V
2L	-300V
2F	-315V
2U	-330V
2V	-350V
2Z	-360V
2R	-370V
2G	-400V
2W	-450V
2H	-500V
2J	-630V
2I	-650V
2K	-800V
3A	-1,000V
3L	-1,200V
3B	-1,250V
3N	-1,500V
3C	-1,600V
3D	-2,000V
3E	-2,500V
3F	-3,000V
3G	-4,000V
3H	-5,000V
3I	-6,000V
3J	-6,300V
3U	-7,500V
3K	-8,000V
4A	-10,000V
4L	-12,000V
4C	-15,000V
4I	-18,000V
4D	-20,000V
4E	-25,000V
4F	-30,000V
5V	-35,000V
4G	-40,000V
4H	-50,000V
2Q	-125VAC
2T	-250VAC
2S	-275VAC
2X	-280VAC
22	-300VAC
10	-305VAC
A9	-310VAC
L0	-330VAC
2Y	-400VAC
P0	-440VAC
Q0	-450VAC
V0	-630VAC

Capacitance

Code	Capacitance
2R2	2.2pF
100	10pF
101	100pF
102	1000pF
223	22,000pF
154	150,000pF
105	1,000,000pF
155	1,500,000pF
106	10,000,000pF
107	100,000,000pF

For TS12-R1

Code	Capacity
104	0.1F
105	1F
106	10F
107	100F
108	1000F

For TS13, TS13C, TS13D, TS14 & TS19, TS20

Code	Capacitance
0R1	0.1uF
R47	0.47uF
010	1uF
2R2	2.2uF
220	22uF
102	1000uF
223	22000uF

Tolerance

Code	Tolerance
C	+/-0.25pF
D	+/-0.5pF
F	+/-1%
G	+/-2%
H	+/-2.5%
J	+/-5%
K	+/-10%
L	+/-15%
M	+/-20%
R	+20-0%
V	+20-10%
W	+30-0%
X	+30-10%
Z	+80-20%

For TS05, TS08

Code	Size
A	Standard
B	Mini
8	refer TS08 spec

For TS08S

Code	Size
A/S	Standard
B	Mini

For TS13C

Code	Size
A	4x5.4
B	4x5.8
C	5x5.4
D	5x5.8
E	6.3x5.4
F	6.3x5.8
G	6.3x7.7
H	8x6.2
Z	8x6.5
I	8x12.5
J	8x10.5
T	10x7.7
K	10x10.5
L	10x13.5
M	12.5x13.5
N	12.5x16
P	16x16.5
Q	16x21.5

For TS13CP

Code	Size
A	5x7
B	5x8
C	5x10
D	6.3x7.4
E	6.3x9
F	6.3x12
G	8x8
H	8x9
J	8x10
K	8x12
L	10x12
M	10x12.5

Size

Code	Size
S	Standard
M	Ministure

For TS17/TS18 / TS18H

Code	Size
1	1210 size
2	1206 size
3	1808 size
4	0402 size
5	1812 size
6	0603 size
7	2220 size
8	0805 size
9	2225 size
A	2211 size
B	0201 size
C	3035 size
S	TS17R 0805 size

For TS20

Code	Size
A	A case
B	B case
C	C case
D	D case
E	E case

For TS23

Code	Size
1	DM5
2	DM10
3	DM15
4	DM19
5	DM20
6	DM30
7	DM42

For TS15

Code	Size
6	Dia6mm
A	Dia6.5mm
7	Dia7mm
9	Dia9mm
4	Dia4mm
5	Dia5mm
F	Dia13mm
L	Dia18mm

Material

Code	Material
0	Standard

Material
For Ceramic

N	NPO
S	SL
B	X7R
E	Z5U
F	Y5V
U	Y5U
P	Y5P
V	Z5V
X	X5R
C	X6S
A	X7S
T	Y5T
D	N4700
L	DL
J	UJ
Y	YL

Terminal Options
For TS12-R1

Code	Terminal Options
R	Radial
S	Snap-in
G	Screw

Lead Space

Code	Lead Space
0	Standard
1	1.5mm
3	2mm
4	3.5mm
5	6.3mm
6	12.5mm
7	17.5mm
8	18.5mm
9	31.5mm
A	2.54mm
B	5.08mm
C	7.5mm
D	10mm
E	15mm
F	20mm
G	22.5mm
H	25mm
I	27.5mm
J	32.5mm
K	35mm
L	37mm
M	26mm
N	8mm
O	11.5mm
P	31mm
Q	4mm
R	4.5mm
S	41mm
T	14mm
U	9.5mm
V	51.5mm
Z	Refer TS13AT

Lead Length

Code	Lead Length
0	Standard
2	12mm
3	16mm
4	20mm
5	18.5mm
6	15mm
K	26mm
L	25mm
F	27mm
Z	28mm
G	30mm
H	31mm
J	35mm
X	45mm
M	10mm
N	50mm
P	8mm
R	6mm
S	5mm
T	4mm
B	2mm
U	13.5mm
V	3.5mm
W	4.5mm
Y	70mm

Remark

Code	Remark
F	Lead Free
R	RoHS

For TS12-R1

Code	Voltage
27	2.7V
30	3.0V

Code	Voltage
27	2.7V
30	3.0V