Data Sheet

Customer:	
Product:	**Open-Mode Design MLCC – OP Series**
Size.:	**0603/0805/1206/1210/1812**
Issued Date:	**22-Jul-25**
Edition:	**REV.A1**

RoHS Compliant

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22-Jul-25	22-Jul-25	22-Jul-25		
Mandy Chang	*Ben Chang*	*Ben Chang*		

Open-Mode Design MLCC

Feature



- There is high reliability on monolithic structure of laminated layers.
- And its character of excellent soldering ability and soldering resistance ability is suitable for reflow soldering and peak soldering.
- It includes high and stable capacitance.
- Open circuit during capacitor cracking can protect the circuit.
- This type of capacitor adopts special inner electrode designs as fig.2 and fig.3 below
- Executive Standard: GH/T 21041-2007, GH/T 21042-2007

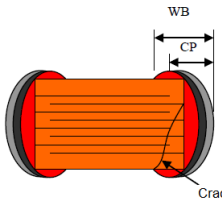


Fig.1 Normal design (CP<WB) circuit leakage during cracking.

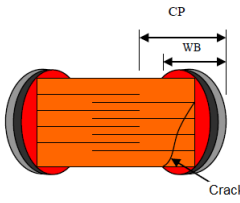


Fig.2 Open-mode design (CP>WB) circuit open during cracking.

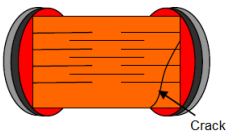
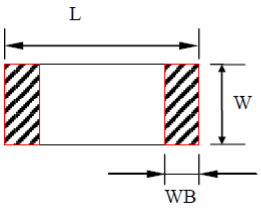
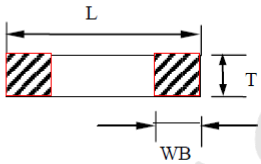


Fig.3 Floating design circuit open during cracking.

Dimensions





Type	Size (Inch)	L (mm)	W (mm)	T/Symbol (mm)		WB (mm)
03	0603	1.60±0.10	0.80±0.10	0.80±0.10	H	0.35±0.20
05	0805	2.00±0.20	1.25±0.25	0.80±0.20	B	0.50±0.20
				1.25±0.25	J	
06	1206	3.20±0.30	1.60±0.30	0.80±0.20	B	0.60±0.30
				1.25±0.25	J	
				1.60±0.30	L	
10	1210	3.20±0.30	2.50±0.30	1.25±0.25	J	0.60±0.30
				1.60±0.30	L	
				2.00±0.30	S	
12	1812	4.50±0.40	3.20±0.30	1.25±0.25	J	0.60±0.30
				1.60±0.30	L	
				2.00±0.30	S	
				2.50±0.30	O	

Temperature Coefficient /Characteristics

Dielectric	Reference Temperature Point	Temperature Coefficient	Operation Temperature Range
NPO	25°C	0±30 ppm/°C	-55°C ~125°C
X7R	25°C	±15%	-55°C ~125°C

■Part Numbering

OP	05	K	T	B	201	331
Product Type	Dimensions (L×W)	Capacitance Tolerance	Packaging	Dielectric	Voltage	Capacitance
	03: 0603 05: 0805 06: 1206 10: 1210 12: 1812	A: ±0.05pF (Cap≤10pF) B: ±0.1pF (Cap≤10pF) C: ±0.25pF (Cap≤10pF) D: ±0.5pF (Cap≤10pF) F: ±1% G: ±2% J: ±5% K: ±10% M: ±20%	T: Taping Reel	N: NPO(COG) B: X7R	6V3: 6.3V 100: 10V 101: 100V 102: 1000V	331: 330pF 102: 1000pF 222: 2200pF

■General Capacitance & Voltage

Capacitance & Voltage (NPO 50V~2000V)

Dielectric		NPO																	
EIA	Size	0603				0805						1206							
Code	VDCW	50V	100V	200V	250V	50V	100V	200V	250V	500V	1000V	50V	100V	200V	250V	500V	630V	1000V	2000V
0R1	0.1pF	H																	
0R3	0.3	H				B						B				B	J	J	
R47	0.47	H				B						B				B	J	J	
1R0	1.0	H				B						B				B	J	J	
1R2	1.2	H				B						B				B	J	J	
1R5	1.5	H				B						B				B	J	J	
1R8	1.8	H				B						B				B	J	J	
2R0	2.0	H				B						B				B	J	J	J
2R2	2.2	H				B						B				B	J	J	J
2R7	2.7	H				B						B				B	J	J	J
3R0	3.0	H				B						B				B	J	J	J
3R3	3.3	H				B						B				B	J	J	J
3R6	3.6	H				B						B				B	J	J	J
3R9	3.9	H				B						B				B	J	J	J
4R7	4.7	H				B						B				B	J	J	J
5R0	5.0	H				B						B				B	J	J	J
5R6	5.6	H				B						B				B	J	J	J
6R8	6.8	H				B					B	B				J	J	J	J
8R0	8.0	H				B					B	B				J	J	J	J
8R2	8.2	H				B					B	B				J	J	J	J
100	10pF	H				B	B				J	B				B	J	J	J
120	12	H				B	B			B	J	B				B/J*	J	J	J
150	15	H				B	B			B	J	B				J	J	J	J
180	18	H				B	B			B	J	B				J	J	J	J
220	22	H	H			B	B			B	J	B				J	J	J	J
270	27	H	H			B	B			B	J	B		B		J	J	J	J
330	33	H	H			B	B			B	J	B		B		J	J	J	J
390	39	H	H			B	B			B	J	B		B		B	J	J	J
470	47	H	H			B	B			B	J	B		B		B/J*	J	J	J
560	56	H	H			B	B			B	J	B		B		J	J	J	J
680	68	H	H			B	B			B	J	B		B	B	J	J	J	L
820	82											B		B	B	J	J	J	L
101	100pF	H	H	H		B	B	B	B	B	J	B		B	B	B	J	J	L
121	120	H	H	H		B	B	B	B	B	J	B		B	B	B	J	J	L
151	150	H	H	H		B	B	B	B	B	J	B		B	B	B/J*	J	J	L
181	180	H	H	H	H	B	B	B	B	J	J	B		B	B	B/J*	J	J	L
221	220	H	H	H	H	B	B	B	B	J		B		B	B	B/J*	J	J	L
271	270	H	H	H	H	B	B	B	B	J		B		B	B	J	J	J	
331	330	H	H	H	H	B	B	B	B	J		B	B	B	B	J	J	J	
391	390	H	H	H		B	B	B	B	J		B	B	B	B	J	J	J	
471	470	H	H	H		B	B	B	B	J		B	B	B	B	J	J	J	
561	560	H	H			B	B	B	B			B	B	B	B	J	J	L	
681	680	H	H			B	B	B	B			B	B	B	B	J/L*	J	L	
821	820											B	B	B	B	L	J		
102	1nF	H	H			B	B	B	B			B	B	B	B	L	L		
122	1.2											B	B			L			

Dielectric		NPO																	
EIA	Size	0603				0805						1206							
Code	VDCW	50V	100V	200V	250V	50V	100V	200V	250V	500V	1000V	50V	100V	200V	250V	500V	630V	1000V	2000V
152	1.5					B	B					B	B			L			
182	1.8					B	B					B	B						
222	2.2					B	B					B	B						
272	2.7											B							
332	3.3											B							

■The letter in cell is expressed the symbol of product thickness

■Add "*" as special product.

■General Capacitance & Voltage

Capacitance & Voltage (NPO 50V~2000V)

Dielectric		NPO											
EIA	Size	1210								1812			
Code	VDCW	50V	100V	200V	250V	500V	630V	1000V	2000V	50V	100V	200V	250V
100	10pF	J		J	J	J				J			
120	12	J		J	J	J				J			
150	15	J		J	J	J				J			
180	18	J		J	J	J				J			
220	22	J		J	J	J				J			
270	27	J		J	J	J				J			
330	33	J		J	J	J				J			
390	39	J		J	J	J			J	J			
470	47	J		J	J	J			J*/L	J			
560	56	J		J	J	J			J*/L	J	J		
680	68	J		J	J	J			J*/L	J	J		
820	82	J		J	J	J			J*/L	J	J		
101	100pF	J	J	J	J	J	J	J*/L	L	J	J		
121	120	J	J	J	J	J	L	S	L	J	J		
151	150	J	J	J	J	J	L	S	L	J	J		
181	180	J	J	J	J	J	L	S	L	J	J		
221	220	J	J	J	J	J	L	S	L	J	J		J
271	270	J	J	J	J	J	L	S	L	J	J		J
331	330	J	J	J	J	J	L	S	S	J	J		J
391	390	J	J	J	J	J	L	S		J	J		J
471	470	J	J	J	J	J	L	L*/S		J	J		J
561	560	J	J	J	J	J	L	L		J	J		J
681	680	J	J	J	J	J	L	L		J	J		J
821	820	J	J	J	J	J	L	L*/S		J	J		J
102	1nF	J	J	J	J	L	S	L*/S		J	J		J
152	1.5	J	J	J	J	L				J	J*/L		L
182	1.8	J	J	J	J	L				J	J*/L		L
222	2.2	J	J							J	J*/L		L
272	2.7	J	J							J	J*/L		L
332	3.3	J	J							J	J*/L		L
392	3.9	J	J							J	J*/L	L	L
472	4.7									J	J*/L	L	L
562	5.6									J			
682	6.8									J			
822	8.2									J			
103	10nF									J			

■The letter in cell is expressed the symbol of product thickness

■Add "*" as special product.

■General Capacitance & Voltage

Capacitance & Voltage (X7R 6.3V~500V)

Dielectric		X7R																
EIA	Size	0603								0805								
Code	VDCW	≤6.3V	10V	16V	25V	50V	100V	200V	250V	≤6.3V	10V	16V	25V	50V	100V	200V	250V	500V
101	100pF	H	H	H	H	H	H	H										
121	120	H	H	H	H	H	H	H										
151	150	H	H	H	H	H	H	H										
181	180	H	H	H	H	H	H	H										
201	200									B	B	B	B	B	B	B	J	B
221	220	H	H	H	H	H	H	H		B	B	B	B	B	B	B	J	B
271	270	H	H	H	H	H	H	H		B	B	B	B	B	B	B	J	B
331	330	H	H	H	H	H	H	H		B	B	B	B	B	B	B	J	B
391	390	H	H	H	H	H	H	H		B	B	B	B	B	B	B	J	B
471	470	H	H	H	H	H	H	H		B	B	B	B	B	B	B	J	B
561	560	H	H	H	H	H	H	H		B	B	B	B	B	B	B	J	B
681	680	H	H	H	H	H	H	H		B	B	B	B	B	B	B	J	B
821	820	H	H	H	H	H	H	H		B	B	B	B	B	B	B	J	B
102	1nF	H	H	H	H	H	H	H		B	B	B	B	B	B	B	J	J
122	1.2	H	H	H	H	H	H	H		B	B	B	B	B	B	B	J	J
152	1.5	H	H	H	H	H	H	H		B	B	B	B	B	B	B	J	J
182	1.8	H	H	H	H	H	H	H		B	B	B	B	B	B	B	J	J
222	2.2	H	H	H	H	H	H	H		B	B	B	B	B	B	B	J	J
272	2.7	H	H	H	H	H	H	H		B	B	B	B	B	B	B	J	J
332	3.3	H	H	H	H	H	H	H	H	B	B	B	B	B	B	B	J	J
392	3.9	H	H	H	H	H	H	H	H	B	B	B	B	B	B	B	J	J
472	4.7	H	H	H	H	H	H	H	H	B	B	B	B	B	B	B	J	J
562	5.6	H	H	H	H	H	H	H	H	B	B	B	B	B	B	B	J	J
682	6.8	H	H	H	H	H	H	H	H	B	B	B	B	B	B	B	J	J
822	8.2	H	H	H	H	H	H	H	H	B	B	B	B	B	B	B	J	J
103	10nF	H	H	H	H	H	H	H	H	B	B	B	B	B	B	J	J	J
123	12	H	H	H	H	H	H			B	B	B	B	B	B	J	J	
153	15	H	H	H	H	H	H			B	B	B	B	B	B	J	J	
183	18	H	H	H	H	H				B	B	B	B	B	B	J	J	
223	22	H	H	H	H	H				B	B	B	B	B	B	J	J	
273	27	H	H	H	H	H				B	B	B	B	B	B	J	J	
333	33	H	H	H	H	H				B	B	B	B	B	J	J	J	
393	39	H	H	H	H	H				B	B	B	B	B	J			
473	47	H	H	H	H	H				B	B	B	B	B	J			
563	56	H	H	H	H	H				B	B	B	B	B	J			
683	68	H	H	H	H	H				B	B	B	B	B	J			
823	82	H	H	H	H	H				B	B	B	B	B	J			
104	100nF	H	H	H	H	H				B	B	B	B	B	J			
124	120	H																
154	150	H																
184	180	H																
224	220	H								B	B	B						
274	270	H								B	B							
334	330	H								B	B							
394	390	H								B	B							
474	470	H								J	J							
564	560									J								
684	680									J								
824	820									J								
105	1uF									J								

■The letter in cell is expressed the symbol of product thickness

■General Capacitance & Voltage

Capacitance & Voltage (X7R 10V~2000V)

Dielectric		X7R										
EIA	Size	1206										
Code	VDCW	≤10V	16V	25V	50V	100V	200V	250V	500V	630V	1000V	2000V
201	200pF	B	B	B	B	B	B	B	B	B	J	J
221	220	B	B	B	B	B	B	B	B	B	B*/J	J
271	270	B	B	B	B	B	B	B	B	B	J	J
331	330	B	B	B	B	B	B	B	B	B	B*/J	J
391	390	B	B	B	B	B	B	B	B	B	J	J
471	470	B	B	B	B	B	B	B	B	B	B*/J	J
561	560	B	B	B	B	B	B	B	B	B	J	J
681	680	B	B	B	B	B	B	B	B	B	B*/J	J
821	820	B	B	B	B	B	B	B	B	B	J	J
102	1nF	B	B	B	B	B	B	B	B	B	B*/J	J
122	1.2	B	B	B	B	B	B	B	B	B	J	J
152	1.5	B	B	B	B	B	B	B	B	B	J	J
182	1.8	B	B	B	B	B	B	B	B	B	J	J
222	2.2	B	B	B	B	B	B	B	B	B	J	J
272	2.7	B	B	B	B	B	B	B	B*/J	B*/J	J	J
332	3.3	B	B	B	B	B	B	B	B*/J	B*/J	J	J
472	4.7	B	B	B	B	B	B	B	J	J	J	
562	5.6	B	B	B	B	B	B	B	J	J	J	
682	6.8	B	B	B	B	B	B	B	J	J	J*/L	
822	8.2	B	B	B	B	B	B	B	J	J	J	
103	10nF	B	B	B	B	B	B	B	J	J	J	
123	12	B	B	B	B	B	B	B	J	J		
153	15	B	B	B	B	B	B	B	J	J		
183	18	B	B	B	B	B	B	B	J	J		
223	22	B	B	B	B	B	B/J*	B/J*	J	J		
333	33	B	B	B	B	B/J*	J	J	J	J		
473	47	B	B	B	B	B/J*	J	J	J	J		
563	56	B	B	B	B							
683	68	B	B	B	B							
823	82	B	B	B	B							
104	100nF	B	B	B	B							
224	220	B	B	B	B							
334	330	J	J	J	J							
474	470	J	J	J	J							
684	680	J	J	J	J							
824	820	J	J	J	J							
105	1uF	L	L	L	L							
125	1.2	L										
155	1.5	L										
185	1.8	L										
225	2.2	L										
335	3.3	L										
475	4.7	L										
565	5.6	L										
685	6.8	L										
825	8.2	L										
106	10uF	L										
126	12	L										
156	15	L										
186	18	L										
226	22	L										

■The letter in cell is expressed the symbol of product thickness

■Add "*" as special product.

■General Capacitance & Voltage

Capacitance & Voltage (X7R 16V~2000V)

Dielectric		X7R									
EIA	Size	1210									
Code	VDCW	≤16V	25V	50V	100V	200V	250V	500V	630V	1000V	2000V
221	220pF	J	J	J						J	J
271	270	J	J	J						J	L
331	330	J	J	J						J	L
391	390	J	J	J						J	L
471	470	J	J	J						J	L
561	560	J	J	J						J	L
681	680	J	J	J					J	J	L
821	820	J	J	J					J	J	L
102	1nF	J	J	J			J		J	J	L
122	1.2	J	J	J			J		J	J	L
152	1.5	J	J	J			J		J	J	L
182	1.8	J	J	J			J		J	J	L
222	2.2	J	J	J			J		J	J	L
272	2.7	J	J	J			J		J	J	L
332	3.3	J	J	J			J	J	J	J	J
392	3.9	J	J	J			J	J	J	J	J
472	4.7	J	J	J	J		J	J	J	J/L*	L
562	5.6	J	J	J	J		J	J	J	J/L*	L
682	6.8	J	J	J	J		J	J	J	J*/L	L
822	8.2	J	J	J	J		J	J	J	J*/L	L
103	10nF	J	J	J	J		J	J	J	J*/L	L
123	12	J	J	J	J		J	J	J	L	
153	15	J	J	J	J		J	J	J	L	
183	18	J	J	J	J		J	J	J	L	
223	22	J	J	J	J		J	J	J	L	
273	27	J	J	J	J		J	J	J		
333	33	J	J	J	J		J	J/L*	J/L		
393	39	J	J	J	J		J	J/L*	J/L*		
473	47	J	J	J	J	J	J				
563	56	J	J	J	J						
683	68	J	J	J	J						
823	82	J	J	J	J						
104	100nF	J	J	J	J						
124	120	J	J	J	J						
154	150	J	J	J	J						
184	180	J	J	J	J						
224	220	L	L	L	L						
274	270	S	S	S							
334	330	S	S	S							
394	390	S	S	S							
474	470	S	S	S							
564	560	S	S	S							
684	680	S	S	S							
824	820	S	S	S							
105	1uF	S	S	S							
125	1.2	S	S	S							
155	1.5	S	S	S							
185	1.8	S	S	S							
225	2.2	S	S	S							
335	3.3	S	S	S							
475	4.7	S	S	S							

■The letter in cell is expressed the symbol of product thickness

■Add "*" as special product.

■General Capacitance & Voltage

Capacitance & Voltage (X7R 100V~5000V)

Dielectric		X7R									
EIA	Size	1812									
Code	VDCW	100V	200V	250V	500V	630V	1000V	2000V	3000V	4000V	5000V
471	470pF						L	L	L	L	
561	560						L	L	L	L	
681	680			L			L	L	L	L	
821	820			L			L	L	L	L	
102	1nF		L	L			L	L	L	L	
122	1.2		L	L			L	L	L	L	
152	1.5		L	L			L	L	L	L	
182	1.8		L	L	L		L	L	L	L	
222	2.2		L	L	L		L	L	L/S*	L	L/S*
272	2.7		L	L	L		L	L	L	L	
332	3.3		L	L	L		L	L	L	L	
472	4.7		L	L	L		L	L	L		
562	5.6		L	L	L		L	L	L/O*		
682	6.8		L	L	L		L	L	L/O*		
822	8.2		L	L	L		L	L	L/O*		
103	10nF	J	L	L	L		L	L	O		
123	12	J	L	L	L		L	L			
153	15	J	L	L	L		L	L			
183	18	J	L	L	L		L	O			
223	22	J	L	L	L	L	L				
273	27	J	L	L	J	L	L				
333	33	J	L	L	J	L	L				
473	47	J	L	L	L	L	L				
563	56	J	L	L	L	L	O				
683	68	J	L	L	L	L					
823	82	J	L	L	L	L					
104	100nF	J	L	L	L	L					
124	120	J	L	L	L	S					
154	150	J	L	L	S	S					
184	180	J	L	L	S	S					
224	220	J	L/S*	L/S*							
274	270	J	L/S*	L/S*							
334	330	J	S	S							
394	390	J	S	O							
474	470	J	S*/O	S*/O							
564	560	J									
684	680	S									
824	820	S									
105	1uF	S									

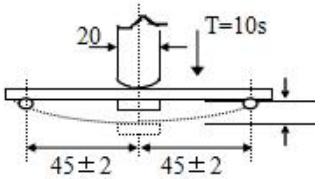
■The letter in cell is expressed the symbol of product thickness

■Add "*" as special product

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■Environmental Characteristics

<table>
<tr><th>Item</th><th colspan="2">Requirement</th><th colspan="3">Test Method</th></tr>
<tr><td rowspan="4">Capacitance</td><td rowspan="2">NPO</td><td rowspan="3">Should be within the specified tolerance</td><td>Capacitance</td><td>Measuring Frequency</td><td>Measuring Voltage</td></tr>
<tr><td>≤1000pF
＞1000pF</td><td>1MHZ±10%</td><td>1.0±0.2Vrms</td></tr>
<tr><td>X7R</td><td colspan="3">Test Temperature: 25℃±3℃
Test Frequency: 1KHZ±10%
Test Voltage: 1.0±0.2Vrms</td></tr>
<tr><td rowspan="4">(DF, tanδ)
Dissipation Factor</td><td rowspan="3">NPO</td><td>DF</td><td>Capacitance</td><td>Measuring Frequency</td><td>Measuring Voltage</td></tr>
<tr><td>≤1/（400+20C）
≤0.1%</td><td>C＜30 pF
C≥30pF</td><td>1MHZ±10%</td><td>1.0±0.2Vrms</td></tr>
<tr><td>X7R</td><td>＜50V: ≤5%
≥50V: ≤2.5%</td><td colspan="3">Test Frequency: 1KHZ±10%Test ≥50V Voltage: 1.0±0.2Vrms</td></tr>
<tr><td rowspan="2">Insulation
Resistance(IR)</td><td>NPO</td><td>C≤10 nF, Ri≥50000MΩ
C＞10 nF, Ri•CR≥500S</td><td colspan="3" rowspan="2">Measuring Voltage: Rated Voltage（Max 500V）
Duration: 60±5s
Test Humidity: ≤75%
Test Temperature: 25℃±3℃
Test Current: ≤50mA</td></tr>
<tr><td>X7R</td><td>C≤25 nF, Ri≥ 10000MΩ
C＞25 nF, Ri・CR＞100S</td></tr>
<tr><td>Dielectric
Withstanding
Voltage(DWV)</td><td colspan="2">No breakdown or damage.</td><td colspan="3"><table><tr><td>Ur＜100V</td><td>Measuring Voltage:
I class:300% Ur
II class :250% Ur
Duration: 1~5s
Charge/ Discharge Current: 50mA max.</td></tr><tr><td>100V≤Ur＜500V</td><td>Force 200%Rated Voltage for 5 second.
Max..current should
not exceed 50 mA.</td></tr><tr><td>500V≤Ur≤1000V</td><td>Force 150%Rated Voltage for 5 second.
Max..current should not exceed 50 mA.</td></tr><tr><td>1000V＜Ur≤2000V</td><td>Force 120%Rated Voltage for 5 seconds.
Max..current should
not exceed 50 mA.</td></tr><tr><td>2000V＜Ur≤5000V</td><td>Force 120%Rated Voltage for 5 seconds.
Max..current should
not exceed 10 mA.</td></tr></table></td></tr>
<tr><td>Solderability</td><td colspan="2">At least 95% of the terminal electrode is covered by new solder.
Visual Appearance: No visible damage.</td><td colspan="3">Preheating conditions:80 to 120℃; 10~30s.
Lead-free soldering
Solder Temperature: 245±5℃
Duration: 2±0.5s</td></tr>
<tr><td>Resistance to
Soldering Heat</td><td colspan="2"><table><tr><td>Item</td><td>NPO</td><td>X7R</td></tr><tr><td>ΔC/C</td><td>≤±2.5% or ±0.25PF，whichever is larger</td><td>±15%</td></tr><tr><td>DF</td><td colspan="2">Same to initial value</td></tr><tr><td>IR</td><td colspan="2">Same to initial value</td></tr></table>Appearance：No visible damage. At least 95% of
the terminal electrode is covered by new solder.</td><td colspan="3">Preheating conditions: 100 to 200℃; 60-120S.
Solder Temperature: 265±5℃
Duration: 10±1s
Clean the capacitor with solvent and examine it with a 10X(min.) microscope.
Recovery Time: 24±2h
Recovery condition: Room temperature</td></tr>
<tr><td>Resistance to
Flexure of Substrate
(Bending Strength)</td><td colspan="2">Appearance: No visible damage.
ΔC/C:
Class Ⅰ (NPO): ≤±5% or ±0.5pF,whichever is larger.
Class Ⅱ (X7R): ≤±10%</td><td colspan="3">Test Board: PCB Warp: 1mm
Speed: 1mm/sec. Unit: mm
The measurement should be made with the board in the bending position.
</td></tr>
<tr><td>Termination
Adhesion</td><td colspan="2">No visible damage</td><td colspan="3">Applied Force: 5N
Duration: 10±1S</td></tr>
<tr><td>Temperature
Cycle</td><td colspan="2">ΔC/C:
Class Ⅰ (NPO): ≤±1% or ±1pF, whichever is larger.
Class Ⅱ (X7R): -15% ~+15%
Appearance：No visible damage</td><td colspan="3">Initial Measurement
Cycling Times: 5 times, 1 cycle, 4 steps:<table><tr><th>Step</th><th>Temperature（℃）</th><th>Time (min.)</th></tr><tr><td>1</td><td>Low- category temp.: -55</td><td>30</td></tr><tr><td>2</td><td>Normal temp.: +20</td><td>2～3</td></tr><tr><td>3</td><td>Up- category temp.: +125</td><td>30</td></tr><tr><td>4</td><td>Normal temp.: +20</td><td>2～3</td></tr></table>Recovery time after test: 24±2h</td></tr>
</table>

Item	Requirement		Test Method
Humidity load	ΔC/C	NPO: ±7.5% or ±0.75pF, whichever is larger. X7R: ≤±12.5%	Tretreatment (Class II) : After preheating at 140℃~150℃ for 1h±10min, place at room temperature for 24±2h. Temperature: 40±2℃ Humidity: 90~95%RH Voltage: Rated Voltage Duration: 500hs Recovery conditions: Room temperature Recovery Time：:24h±2h
	DF	Not more than twice of initial value.	
	IR	Class Ⅰ:Ri≥2500MΩ or Ri•CR≥25S whichever is smaller Class Ⅱ:Ri≥1000MΩ or Ri•CR≥10S whichever is smaller	
	Appearance: No visible damage		
Life Test	ΔC/C	Class Ⅰ: ≤±3% or ±0.3pF, whichever is larger. X7R: ≤±20%	Temperature:125℃ (NPO、X7R)、Time:1000h Charge/Discharge: Current:50mA max. Applied Voltage:1.Low Voltage products (< 100V) 2 times rated operating Voltage 2. Medium and high pressure products: 100V≤Rated Voltage≤200V： 1.5 Multiple 200V<Rated Voltage≤500V： 1.3 Multiple 500V<Rated Voltage： 1.2 Multiple Recovery Conditions: Room Temperature Recovery Time：:24h±2h
	DF	Not more than twice of initial value	
	IR	Class Ⅰ: Ri≥4000MΩ orRi•CR≥40S whichever is smaller. Class Ⅱ: Ri≥2000MΩ or Ri•CR≥50S whichever is smaller.	
	Visual Appearance: No visible damage		

■Storage Temperature: 5~40℃; Humidity: 20~70%RH

■If it has been over six months since delivery, check the packaging and appearance before use. If it has been over a year, check the solderability before use.

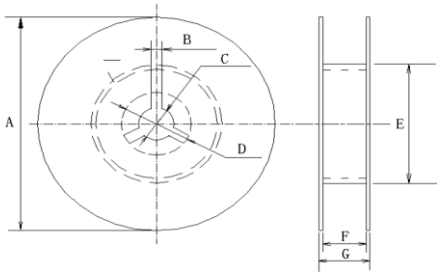
■Packaging

Packaging Quantity

Type	Thickness	Packaging (7" Reel)	
		Paper tape	Plastic tape
0603	0.80±0.10	4K	-
0805	0.80±0.20	4K	-
	1.25±0.25	-	T≤1.35mm 3K T>1.35mm 2K
1206	0.80±0.20	4K	
	1.25±0.25	-	T≤1.35mm 3K T>1.35mm 2K
	1.60±0.30	-	2K
1210	1.25±0.25	-	2K
	1.60±0.30	-	1K
	2.00±0.30	-	1K
1812	1.25±0.25	-	1K
	1.60±0.30	-	0.5K
	2.00±0.30	-	0.5K
	2.50±0.30	-	0.5K

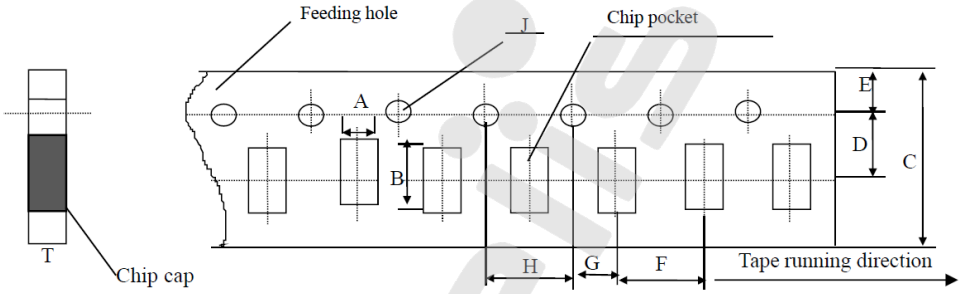
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Tape and Reel



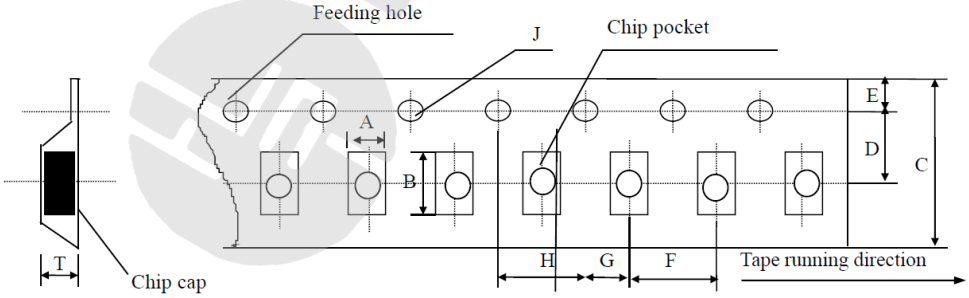
Type	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
0603	178±2.0(7")	3.0	13.0±0.5	21.0±0.8	50 or more	10.0±1.5	12 max
0805	178±2.0(7")	3.0	13.0±0.5	21.0±0.8	50 or more	10.0±1.5	12 max
1206	178±2.0(7")	3.0	13.0±0.5	21.0±0.8	50 or more	10.0±1.5	12 max
1210	178±2.0(7")	3.0	13.0±0.5	21.0±0.8	50 or more	10.0±1.5	12 max
1812	178±2.0(7")	3.0	13.0±0.5	21.0±0.8	50 or more	10.0±1.5	12 max

Paper Tape Size Specification



Type	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	J (mm)	T (mm)
0603	1.10±0.10	1.90±0.10	8.00±0.10	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.10	4.00±0.10	1.55-0/+0.05	1.10 max
0805	1.45±0.15	2.30±0.15	8.00±0.15	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.10	4.00±0.10	1.55-0/+0.05	1.10 max
1206	1.80±0.20	3.40±0.20	8.00±0.20	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.10	4.00±0.10	1.55-0/+0.05	1.10 max

Plastic Tape Size Specification



Type	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	J (mm)	T (mm)
0805	1.55±0.20	2.35±0.20	8.00±0.20	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.10	4.00±0.10	1.55-0/+0.05	1.50 Max
1206	1.95±0.20	3.60±0.20	8.00±0.20	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.10	4.00±0.10	1.55-0/+0.05	1.85 Max
1210	2.70±0.10	3.42±0.10	8.00±0.10	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.55-0/+0.05	3.20 Max
1812	3.66±0.10	4.95±0.10	12.00±0.10	5.50±0.05	1.75±0.10	8.00±0.10	2.00±0.05	4.00±0.10	1.55-0/+0.05	4.00 Max

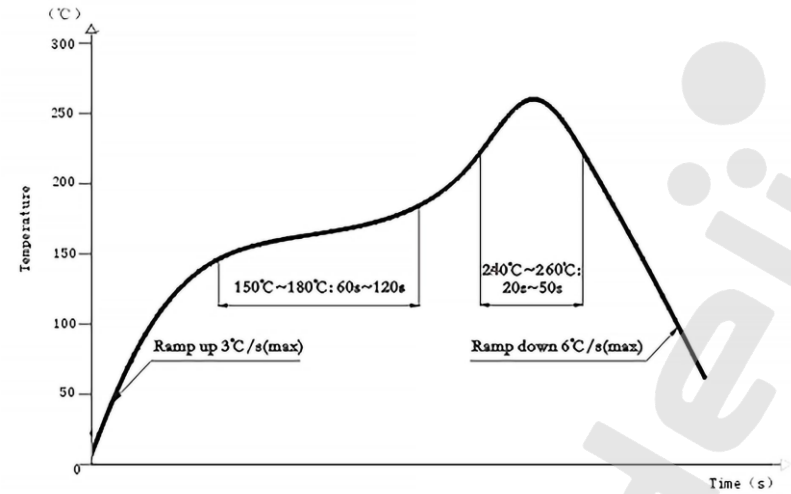
■Recommended Soldering Method

Type	Dielectric	Capacitance	Soldering Method
0603	NPO	---	R / W
	X7R	C≧1uF	R
		C<1uF	R / W
0805	NPO	---	R / W
	X7R	C≧4.7uF	R
		C<4.7uF	R / W
1206	NPO	---	R / W
	X7R	C≧10uF	R
		C<10uF	R / W
≧1210	NPO	---	R
	X7R	---	R

Soldering method：R – Reflow Soldering ; W – Wave Soldering

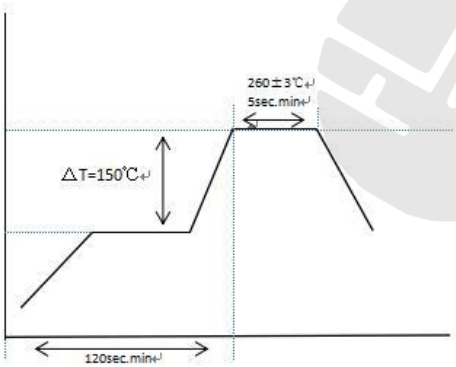
■The Temperature Profile for Soldering

Re-flow Soldering



■While in preheating, please keep the temperature difference between soldering temperature and surface temperature of chips as: T≦150℃.

Wave Soldering



■While in preheating, please keep the temperature difference between soldering temperature and surface temperature of chips as: T≦150℃.

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version A	Jul 22,2022		-Release
Version A1	Jul 22,2025		-Modify the description of the Features -Modify the size specifications for 0603/0805/1206/1210/1812 -Remove the specifications for Dielectric X5R/Y5V -Modify the capacitance specifications for NPO and X7R in 0603/0805/1206/1210/1812 -Modify the Environmental Characteristics contents -Modify the packaging specifications for 0603/0805/1206/1210/1812 -Modify the Recommended Soldering Method -Modify the Recommended soldering temperature profile chart -Add Temperature Coefficient / Characteristics