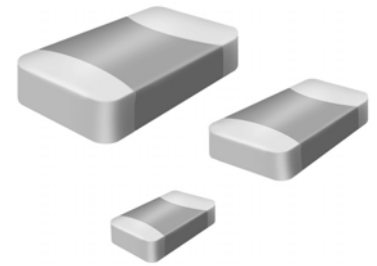


# Multilayer Ceramic Chip Capacitors Products – NPO, X7R, Y5V

## HOW TO ORDER

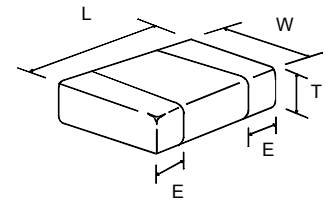
<p><b>0603</b></p> <p><b>N</b></p> <p><b>101</b></p> <p><b>J</b></p> <p><b>500</b></p> <p><b>N</b></p> <p><b>I</b></p>	<p><b>Packaging Code</b> T = 7" reel/paper tape      B = Bulk</p> <p><b>Termination</b> N = Ag/Ni/SnPb      L = Ag/Ni/Sn B = Cu/Ni/SnPb      C = Cu/Ni/Sn</p> <p><b>Voltage (VDCW)</b> 100 = 10V      500 = 50V      251 = 250V 160 = 16V      101 = 100V      501 = 500V 250 = 25V      201 = 200V      102 = 1000V</p> <p><b>Capacitance Tolerance (EIA Code)</b> B = <math>\pm 0.1\text{pF}</math>      F = <math>\pm 1\%</math>      K = <math>\pm 10\%</math> C = <math>\pm 0.25\text{pF}</math>      G = <math>\pm 2\%</math>      M = <math>\pm 20\%</math> D = <math>\pm 0.50\text{pF}</math>      J = <math>\pm 5\%</math>      Z = -20+80%</p> <p><b>Capacitance</b> Two significant digits followed by # of zeros (e.g. 101 = 100pF, 102 = 1000pF, 103 = 10nF)</p> <p><b>Dielectric</b> N = COG (NPO)      B = X7R      F = Y5V</p> <p><b>Size Code</b> 0402      0805      1210      1812 0603      1206      1804</p>
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## APPLICATIONS

- \* LC and RC tuned circuit
- \* Filtering, Timing, & Blocking
- \* Coupling & Bypassing
- \* Frequency discriminating
- \* Decoupling

## SCHEMATIC



NPO	X7R	Y5V
<ul style="list-style-type: none"> <li>* Ultra-stable</li> <li>* Low dissipation factor</li> <li>* Tight tolerance available</li> <li>* Good frequency performance</li> <li>* No aging of capacitance</li> </ul>	<ul style="list-style-type: none"> <li>* Semi-stable High K</li> <li>* High volumetric efficiency</li> <li>* Highly reliable in high temp. applications</li> <li>* High insulation resistance</li> </ul>	<ul style="list-style-type: none"> <li>* High volumetric efficiency</li> <li>* Non-polar construction</li> <li>* General purpose, High K</li> </ul>

## DIMENSIONS

Size	0402	0603	0805	1206	1210	1808	1812
Length (L)	.040 $\pm$ 0.0002 1.00 $\pm$ 0.05	0.063 $\pm$ 0.004 1.60 $\pm$ 0.10	0.080 $\pm$ 0.006 2.00 $\pm$ 0.15	0.125 $\pm$ 0.006 3.20 $\pm$ 0.15	0.125 $\pm$ 0.012 3.20 $\pm$ 0.30	0.180 $\pm$ 0.015 4.50 $\pm$ 0.40	0.180 $\pm$ 0.015 4.50 $\pm$ 0.40
Width (W)	0.020 $\pm$ 0.002 0.50 $\pm$ 0.05	0.03 $\pm$ 0.004 0.80 $\pm$ 0.07	0.050 $\pm$ 0.006 1.25 $\pm$ 0.15	0.063 $\pm$ 0.006 1.60 $\pm$ 0.15	0.100 $\pm$ 0.008 2.50 $\pm$ 0.20	0.081 $\pm$ 0.010 2.03 $\pm$ 0.25	0.125 $\pm$ 0.012 3.20 $\pm$ 0.30
Termination (E)	.010 $\pm$ .002/-0.004 0.25 $\pm$ 0.05/-0.10	0.015 $\pm$ 0.006 0.40 $\pm$ 0.15	0.020 $\pm$ 0.008 0.50 $\pm$ 0.20	0.025 $\pm$ 0.008 0.60 $\pm$ 0.20	0.030 $\pm$ 0.010 0.75 $\pm$ 0.25	0.030 $\pm$ 0.010 0.75 $\pm$ 0.25	0.030 $\pm$ 0.010 0.75 $\pm$ 0.25

## ELECTRICAL RATING

Dielectric	NPO (COG)	X7R (BME)	Y5V
Capacitance Range	0.5pF ~ 10nF	100pF ~ 1 $\mu$ F	10nF ~ 10 $\mu$ F
Capacitance Tolerance	$\pm 0.1\text{pF}$ , $\pm 0.25\text{pF}$ , $\pm 0.50\text{pF}$ $\pm 1\%$ , $\pm 2\%$ , $\pm 5\%$ , $\pm 10\%$	$\pm 5\%$ , $\pm 10\%$ , $\pm 20\%$	$\pm 20\%$ , -20+80%
Dissipation Factor	>30pF, 0.1% Max	6.3V: 5.0% 10V & 16V: 3.5% 25V & 50V: 2.5%	6.3V: 5.0% 10V & 16V: 3.5% 25V & 50V: 2.5%
T.C.C.	0 $\pm$ 30ppm/ $^{\circ}$ C	0 $\pm$ 15ppm/ $^{\circ}$ C	+30%/-80%ppm/ $^{\circ}$ C
Test Parameters (@25 $^{\circ}$ C)	$\leq 100\text{pF}$ 1.0 $\pm$ 0.2Vrms, 1MHz $\pm 10\%$ >1000pF      1.0 $\pm$ 0.2Vrms, 1KHz $\pm 10\%$	1.0 $\pm$ 0.2Vrms, 1KHz $\pm 10\%$	1.0 $\pm$ 0.2Vrms, 1KHz $\pm 10\%$
Operating Temperature	-55 ~ +125 $^{\circ}$ C @ 25 $^{\circ}$ C	-55 ~ +125 $^{\circ}$ C @ 25 $^{\circ}$ C	-25 ~ +85 $^{\circ}$ C @ 20 $^{\circ}$ C
Insulation Resistance	+25 $^{\circ}$ C, 10G $\Omega$ min or 500 $\Omega$ -F min, whichever is less	+25 $^{\circ}$ C, 10G $\Omega$ min or 500 $\Omega$ -F min, whichever is less	+25 $^{\circ}$ C, 10G $\Omega$ min or 500 $\Omega$ -F min, whichever is less

# MLCC Products – NPO Type

## 10 Volts – 50 Volts

DIELECTRIC		NPO																							
EIA Cap Code	SIZE VDCW	0402				0603				0805				1206				1210				1812			
		10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50
0R5	0.5pF	N	N	N	N	S	S	S	S	A	A	A	A												
1R0	1	N	N	N	N	S	S	S	S	A	A	A	A												
1R2	1.2	N	N	N	N	S	S	S	S	A	A	A	A												
1R5	1.5	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
1R8	1.8	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
2R2	2.2	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
2R7	2.7	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
3R3	3.3	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
3R9	3.9	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
4R7	4.7	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
5R6	5.6	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
6R8	6.8	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
8R2	8.2	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
100	10pF	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
120	12	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
150	15	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
180	18					S	S	S	S	A	A	A	A	B	B	B	B								
220	22					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
270	27					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
330	33					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
390	39					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
470	47					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
560	56					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
680	68					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
820	82					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
101	100pF					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
121	120					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
151	150					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
181	180					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
221	220					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
271	270					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
331	330					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
391	390					S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C				
471	470					S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C				
561	560					S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C				
681	680					S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C				
821	820					S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C				
102	1000pF					S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
122	1200									B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
152	1500									B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
182	1800									B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
222	2200									B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
272	2700									D	D	D	D	B	B	B	B	C	C	C	C	D	D	D	D
332	3300									D	D	D	D	B	B	B	B	C	C	C	C	D	D	D	D
392	3900									D	D	D	D	B	B	B	B	C	C	C	C	D	D	D	D
472	4700									D	D	D	D	B	B	B	B	C	C	C	C	D	D	D	D
562	5600									D	D	D	D	B	B	B	B	C	C	C	C	D	D	D	D
682	6800									D	D	D	D	C	C	C	C	C	C	C	C	D	D	D	D
822	8200									D	D	D	D	C	C	C	C	C	C	C	C	D	D	D	D
103	.010μF									D	D	D	D	D	D	D	D					D	D	D	D
123	12000													D	D	D	D								
153	15000													D	D	D	D								
183	18000													D	D	D	D								
223	22000													D	D	D	D								
273	27000													D	D	D	D								
333	33000													D	D	D	D								
393	0.39μF													G	G	G	G								

\* Variations of size, capacitance, voltage, and 13" reel are available upon request.

# MLCC Products – NPO Type

## 100 Volts – 3000 Volts

DIELECTRIC		NPO																											
EIA CODE	SIZE	0603					0805					1206					1210					1812					1808		
	VDCW	100	100	200	250	500	100	200	250	500	1000	2000	100	200	250	500	1000	2000	100	200	250	500	1000	2000	3000	1000	2000	3000	
0R5	0.5pF	S	A	A	A	A	B	B	B	B	B	B																	
1R0	1	S	A	A	A	A	B	B	B	B	B	B																	
1R2	1.2	S	A	A	A	A	B	B	B	B	B	B																	
1R5	1.5	S	A	A	A	A	B	B	B	B	B	B																	
1R8	1.8	S	A	A	A	A	B	B	B	B	B	B																	
2R2	2.2	S	A	A	A	A	B	B	B	B	B	B																	
2R7	2.7	S	A	A	A	A	B	B	B	B	B	B																	
3R3	3.3	S	A	A	A	A	B	B	B	B	B	B																	
3R9	3.9	S	A	A	A	A	B	B	B	B	B	B																	
4R7	4.7	S	A	A	A	A	B	B	B	B	B	B																	
5R6	5.6	S	A	A	A	A	B	B	B	B	B	B																	
6R8	6.8	S	A	A	A	A	B	B	B	B	B	B																	
8R2	8.2	S	A	A	A	A	B	B	B	B	B	B																	
100	10pF	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D		C	C	C	
120	12	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D		C	C	C	
150	15	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D		C	C	C	
180	18	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D		C	C	C	
220	22	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D		C	C	C	
270	27	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D		C	C	C	
330	33	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D		C	C	C	
390	39	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D		C	C	C	
470	47	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D		C	C	C	
560	56	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D		C	C	C	
680	68	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D		C	C	C	
820	82	S	A	A	A	A	B	B	B	B	B	B		C	C	C	C	C	D	D	D	D	D	D		C	K	C	
101	100pF	S	A	A	A	A	C	B	B	B	B	C		C	C	C	C	C	D	D	D	D	D	D	D	C	K	C	
121	120	S	A	C	C	C	C	B	B	B	B	C		C	C	C	C	C	D	D	D	D	D	D	D	D	K	K	C
151	150	S	A	C	C	C	D	B	B	B	B			C	C	C	C	C	D	D	D	D	D	D	D	D	K	K	
181	180	S	A	D	D			B	B	B	B			C	C	C	C	C	D	D	D	D	D	D	D	D	K	K	
221	220	S	A					B	B	B	B			C	C	C	C	C	D	D	D	D	D	D	D	D	K		
271	270	S	A					B	B	B	C			C	C	C	C	C		D	D	D	D	D	D	D	K		
331	330	S	A					B	B	B	C			C	C	C	C	D		D	D	D	D	D	D	D	K		
391	390		B					B	B	B	C			C	C	C	C	D		D	D	D	D	D	D	D			
471	470		B					B	C	C				C	C	C	C	D		D	D	D	D	D	D	D			
561	560		B					B						C	C	C	C			D	D	D	D	D	D	D			
681	680							B						C	C	C	C			D	D	D	D	D	D	D			
821	820							B						C	C	C	C			D	D	D	D	D	D	D			
102	1000pF							B						C	C	C	C			D	D	D	D	D	D	D			
122	1200							B						C	D	D				D	D	D	D	D	D	D			
152	1500							C						C	D	D				D	D	D	D	D	D	D			
182	1800							C						C	D	D				D	D	D	D	D	D	D			
222	2200													C	D	D				D	D	D	D	D	D	D			
272	2700													C	D	D				D	D	D	D	D	D	D			
332	3300													C						D									
392	3900																			D									
472	4700																			D									
562	5600																												
682	6800																												
822	8200																												
103	.010μF																												

\* Variations of size, capacitance, voltage, and 13" reel are available upon request.

### TAPE/REEL PACKAGE TYPE, QUANTITY, AND AVAILABILITY

Thickness in mm	0402		0603		0805		1206		1210		1808		1812	
	Type	Qty	Type	Qty	Type	Qty	Type	Qty	Type	Qty	Type	Qty	Type	Qty
A = 0.65 + 0.05/-0.15	-	-	-	-	Paper	4K	Paper	4K			-	-	-	-
B = 0.85 + 0.5/-0.15	-	-	-	-	Paper	4K	Paper	4K			-	-	-	-
C = 1.00 + 0.05/-0.15	-	-	-	-	Plastic	3K	Plastic	3K	Plastic	3K	Plastic	2K	-	-
D = 1.2 + 0.15	-	-	-	-	Plastic	3K	Plastic	3K	Plastic	3K	Plastic	2K	Plastic	1K
G = 1.60 + 0.05/-0.15	-	-	-	-	-	-	Plastic	2K	Plastic	2K	Plastic	1K	Plastic	1K
K = 2.00 + 0.2	-	-	-	-	-	-	-	-	Plastic	2K	Plastic	1K	Plastic	1K
M = 2.5 + 0.3	-	-	-	-	-	-	-	-	Plastic	1K	-	-	Plastic	1K
N = 0.5 + 0.05	Paper	10K	-	-	-	-	-	-	-	-	-	-	-	-
S = 0.8 + 0.07	-	-	Paper	4K	-	-	-	-	-	-	-	-	-	-



570 West Lambert Road, Suite M, Brea, CA 92821  
 TEL: 714-255-9186 ♦ FAX: 714-255-9291

# MLCC Products – X7R Type

## 10 Volts – 50 Volts

DIELECTRIC		X7R																							
EIA Cap Code	SIZE VDCW	0402				0603				0805				1206				1210				1812			
		10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50
101	100pF	N	N	N	N	S	S	S	S	B	B	B	B												
121	120	N	N	N	N	S	S	S	S	B	B	B	B												
151	150	N	N	N	N	S	S	S	S	B	B	B	B												
181	180	N	N	N	N	S	S	S	S	B	B	B	B												
221	220	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B								
271	270	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B								
331	330	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B								
391	390	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B								
471	470	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B								
561	560	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B								
681	680	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B								
821	820	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
102	1000pF	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
122	1200	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
152	1500	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
182	1800	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
222	2200	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
272	2700	N	N	N		S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
332	3300	N	N	N		S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
392	3900	N	N	N		S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
472	4700	N	N			S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
562	5600	N	N			S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
682	6800	N	N			S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
822	8200	N	N			S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
103	.010μF	N	N			S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
123	.012	N	N			S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
153	.015	N	N			S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
183	.018					S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
223	.022					S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
273	.027					S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
333	.033					S	S	S		B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
393	.039					S	S	S		B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
473	.047					S	S	S		B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
563	.056					S	S	S		B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
683	.068					S	S	S		B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
823	.082					S	S			B	B	B	D	B	B	B	B	C	C	C	C	D	D	D	D
104	.100μF					S	S			B	B	B	D	B	B	B	B	C	C	C	C	D	D	D	D
154	.150									D	D	D		C	C	C	C	C	C	C	D	D	D	D	
184	.180									D	D	D		C	C	C	C	C	C	C	D	D	D	D	
224	.220									D	D	D		C	C	C	C	C	C	C	D	D	D	D	
334	.330													C	C	C		C	C	C	C	D	D	D	D
474	.470																C	C	C		D	D	D	D	
684	.680																				D	D	D	D	
824	.820																				D	D	D	D	
105	1.00μF																				D	D	D	D	

\* Variations of size, capacitance, voltage, and 13" reel are available upon request.

### TAPE/REEL PACKAGE TYPE, QUANTITY, AND AVAILABILITY

Thickness in mm	0402 – 0603		0805 – 1206		1210		1808		1812	
	Type	Quantity	Type	Quantity	Type	Quantity	Type	Quantity	Type	Quantity
A = 0.65 + 0.05/-0.15			Paper	4K/Reel						
B = 0.85 + 0.5/-0.15			Paper	4K/Reel						
C = 1.00 + 0.05/-0.15			Plastic	3K/Reel	Plastic	3K/Reel	Plastic	3K/Reel		
D = 1.2 ± 0.15			Plastic	3K/Reel	Plastic	3K/Reel	Plastic	3K/Reel	Plastic	1K/Reel
F = 1.40 + 0.05/-0.15			Plastic	2K/Reel	Plastic	2K/Reel	Plastic	1K/Reel	Plastic	1K/Reel
G = 1.60 + 0.05/-0.15			Plastic	2K/Reel	Plastic	2K/Reel	Plastic	1K/Reel	Plastic	1K/Reel
S = 0.8 ± 0.07	Paper	4K/Reel								
N = 0.5 ± 0.05	Paper	10K/Reel								

# MLCC Products – X7R Type

## 100 Volts – 3000 Volts

DIELECTRIC		X7R																												
EIA	SIZE	0603					0805					1206					1210					1812					1808			
CODE	VDCW	100	100	200	250	500	100	200	250	500	1000	1000	2000	100	200	250	500	1000	100	200	250	500	1000	2000	1000	1500	3000			
101	100pF	S	B	B	B	B																								
121	120	S	B	B	B	B																								
151	150	S	B	B	B	B																								
181	180	S	B	B	B	B	B	B	B	B	B	B	B																	
221	220	S	B	B	B	B	B	B	B	B	B	B	B																	
271	270	S	B	B	B	B	B	B	B	B	B	B	B																	
331	330	S	B	B	B	B	B	B	B	B	B	B	B																	
391	390	S	B	B	B	B	B	B	B	B	B	B	B																	
471	470	S	B	B	B	B	B	B	B	B	B	B	B												D	D	C	C	C	
561	560	S	B	B	B	B	B	B	B	B	B	B	B	C												D	D	C	C	C
681	680	S	B	B	B	B	B	B	B	B	B	B	B	C												D	D	C	C	C
821	820	S	B	B	B	B	B	B	B	B	B	B	G	G												D	D	C	C	C
102	1000pF	S	B	B	B	B	B	B	B	B	B	G	G	C	C	C	C	C	D	D	D	D	D	D	D	C	C	K		
122	1200	S	B	B	B	B	B	B	B	B	B	G	G	C	C	C	C	C	D	D	D	D	D	D	D	C	C	K		
152	1500	S	B	B	B	B	B	B	B	B	B	G		C	C	C	C	C	D	D	D	D	D	D	D	C	C			
182	1800	S	B	B	B	B	B	B	B	B	B	G		C	C	C	C	C	D	D	D	D	D	D	D	C	C			
222	2200	S	B	B	B	B	B	B	B	B	B	C	G	C	C	C	C	C	D	D	D	D	D	D	D	C	C			
272	2700	S	B	B	B		B	B	B	B	D	G		C	C	C	C	C	D	D	D	D	D	D	D	C	D			
332	3300	S	B	B	B		B	B	B	B	G	G		C	C	C	C	D	D	D	D	D	D	D	D	C	D			
392	3900	S	B	B	B		B	B	B	B	G	G		C	C	C	C		D	D	D	D	D	D	D	C				
472	4700	S	B	B	B		B	B	B	B	G	G		C	C	C	C		D	D	D	D	D	D	D	C				
562	5600	S	B				B	B	B	B	G			C	C	C	C		D	D	D	D	D	D	D	C				
682	6800	S	B				B	B	B	B	G			C	C	C	C		D	D	D	D	D	D	D	C				
822	8200	S	B				B	B	B	C				C	C	C	C		D	D	D	D	D	D	D					
103	.010μF	S	B				B	B	B	C				C	C	C	C		D	D	D	D	D	D	D					
123	.012	S	B				B	B	B					C	C	C	C		D	D	D	D								
153	.015	S	B				B	C	C					C	C	C	C		D	D	D	D								
183	.018		B				B	C	C					C	C	C	C		D	D	D	D								
223	.022						B	C	C					C	C	C	D		D	D	D	D								
273	.027						B	C	C					C	C	C			D	D	D	D								
333	.033						B							C	C	C			D	D	D	D								
393	0.39						B							C	C	C			D	D	D	D								
473	.047						B							C	D	D			D	D	D	D								
563	.056						B							C					D	D	D									
683	.068						C							C					D	D	D									
823	.082						C							C					D	D	D									
104	.100μF						D							C					D	D	D									
124	.120						D							C					D	D	D									
154	.150													C					D											
184	.180													C					D											
224	.220													C					D											
334	.330																		D											
474	.470																		D											
684	.680																													
824	.820																													
105	1.00μF																													

\* Variations of size, capacitance, voltage, and 13" reel are available upon request.

### TAPE/REEL PACKAGE TYPE, QUANTITY, AND AVAILABILITY

Thickness in mm	0603-0805-1206		1210		1808		1812	
	Type	Quantity	Type	Quantity	Type	Quantity	Type	Quantity
A = 0.65 + 0.05/-0.15	Paper	4K/Reel						
B = 0.85 + 0.5/-0.15	Paper	4K/Reel						
C = 1.00 + 0.05/-0.15	Plastic	3K/Reel	Plastic	3K/Reel	Plastic	3K/Reel		
D = 1.2 + 0.15	Plastic	3K/Reel	Plastic	3K/Reel	Plastic	3K/Reel	Plastic	1K/Reel
F = 1.40 + 0.05/-0.15	Plastic	2K/Reel	Plastic	2K/Reel	Plastic	1K/Reel	Plastic	1K/Reel
G = 1.60 + 0.05/-0.15	Plastic	2K/Reel	Plastic	2K/Reel	Plastic	1K/Reel	Plastic	1K/Reel
K = 2.00 ± 0.2					Plastic	1K/Reel	Plastic	1K/Reel
S = 0.8 ± 0.07								
N = 0.5 ± 0.05								

# MLCC Products – Y5V Type

## 10 Volts – 50 Volts

DIELECTRIC		Y5V																							
EIA Cap Code	SIZE	0402				0603				0805				1206				1210				1812			
	VDCW	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50
103	.010µF	N	N	N		S	S	S	S	A	A	A	A	B	B	B	B								
123	.012	N	N	N		S	S	S	S	A	A	A	A	B	B	B	B								
153	.015	N	N	N		S	S	S	S	A	A	A	A	B	B	B	B								
183	.018	N	N	N		S	S	S	S	A	A	A	A	B	B	B	B								
223	.022	N	N	N		S	S	S	S	A	A	A	A	B	B	B	B								
273	.027	N	N	N		S	S	S	S	A	A	A	A	B	B	B	B								
333	.033	N	N	N		S	S	S	S	A	A	A	A	B	B	B	B								
393	.039	N	N	N		S	S	S	S	A	A	A	A	B	B	B	B								
473	.047	N	N	N		S	S	S	S	A	A	A	A	B	B	B	B								
563	.056	N	N			S	S	S	S	A	A	A	A	B	B	B	B								
683	.068	N	N			S	S	S	S	A	A	A	A	B	B	B	B								
823	.082	N	N			S	S	S	S	A	A	A	A	B	B	B	B								
104	.100µF	N	N			S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C	D	D	D	D
154	.150					S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C	D	D	D	D
224	.220					S	S	S		A	A	A	A	B	B	B	B	C	C	C	C	D	D	D	D
334	.330					S	S			B	B	B		B	B	B	B	C	C	C	C	D	D	D	D
474	.470					S	S			B	B	B		B	B	B	B	C	C	C		D	D	D	D
684	.680					S				B	B			B	B	B		C	C	C		D	D	D	D
105	1.00µF					S				B	B			C	C	C		C	C	C		D	D	D	D
155	1.50													C	C	C									
225	2.20													C	C	C									
335	3.30													D	D	D									
475	4.75													D	D	D									
106	10µF																								

\* Variations of size, capacitance, voltage, and 13" reel are available upon request.

## 100 Volts – 500 Volts

DIELECTRIC		Y5V											
EIA Cap Code	SIZE	0805				1206				1812			
	VDCW	100	200	250	500	100	200	250	500	100	200	250	500
103	.010µF	B				B	B	B	B				
123	.012	B				B	B	B	B				
153	.015	B				B	B	B	B				
183	.018	B				B	B	B	B				
223	.022	B				B	B	B	B				
273	.027	B				B	B	B	B				
333	.033	B				B	B	B	B				
393	.039	B				B	B	B	B				
473	.047	B				B	B	B					
563	.056	B				B	B	B					
683	.068	B				B	B	B					
823	.082	B				C	C	C					
104	.100µF	B				C	C	C		D	D	D	
154	.150					C				D	D	D	
224	.220					C				D	D	D	
334	.330									D	D	D	
474	.470									D	D	D	

\* Variations of size, capacitance, voltage, and 13" reel are available upon request.

### TAPE/REEL PACKAGE TYPE, QUANTITY, AND AVAILABILITY

Thickness in mm	0402 – 0603		0805 – 1206		1210		1808		1812	
	Type	Quantity	Type	Quantity	Type	Quantity	Type	Quantity	Type	Quantity
A = 0.65 + 0.05/-0.15			Paper	4K/Reel						
B = 0.85 + 0.5/-0.15			Paper	4K/Reel						
C = 1.00 + 0.05/-0.15			Plastic	3K/Reel	Plastic	3K/Reel	Plastic	3K/Reel		
D = 1.2 + 0.15			Plastic	3K/Reel	Plastic	3K/Reel	Plastic	3K/Reel	Plastic	1K/Reel
F = 1.40 + 0.05/-0.15			Plastic	2K/Reel	Plastic	2K/Reel	Plastic	1K/Reel	Plastic	1K/Reel
G = 1.60 + 0.05/-0.15			Plastic	2K/Reel	Plastic	2K/Reel	Plastic	1K/Reel	Plastic	1K/Reel
K = 2.00+0.2mm									Plastic	1K/Reel
S = 0.8 + 0.07	Paper	4K/Reel								
N = 0.5 + 0.05	Paper	10K/Reel								

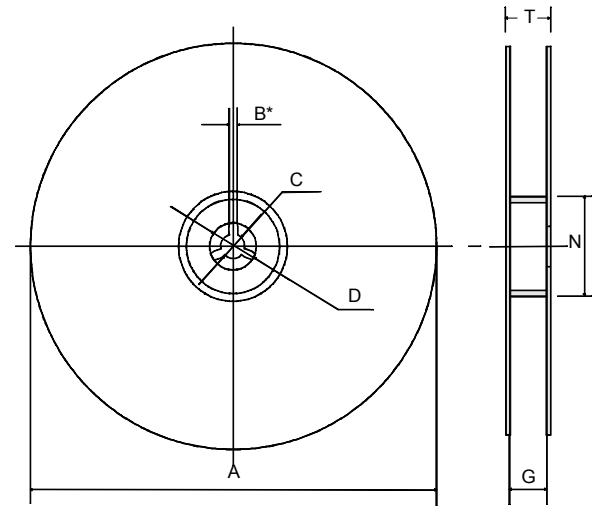
# MLCC Products – Packaging

## PACKAGING ON TAPE AND REEL

Size	T (mm)	Tape	Quantity
0603	0.90~0.70	Paper Tape	4,000/Reel
0805	0.70~0.50	Paper Tape	4,000/Reel
	0.90~0.70	Paper Tape	4,000/Reel
	1.05~0.85	Plastic Tape	3,000/Reel
1206	1.35~1.05	Plastic Tape	3,000/Reel
	0.90~0.70	Paper Tape	4,000/Reel
	1.05~0.85	Plastic Tape	3,000/Reel
1210	1.35~1.05	Plastic Tape	3,000/Reel
	1.05~0.85	Paper Tape	3,000/Reel
1808	1.35~1.05	Plastic Tape	3,000/Reel
	1.05~0.85	Paper Tape	3,000/Reel
1812	2.15~1.85	Plastic Tape	1,000/Reel
	1.35~1.05	Paper Tape	1,000/Reel

## REEL FOR TAPING

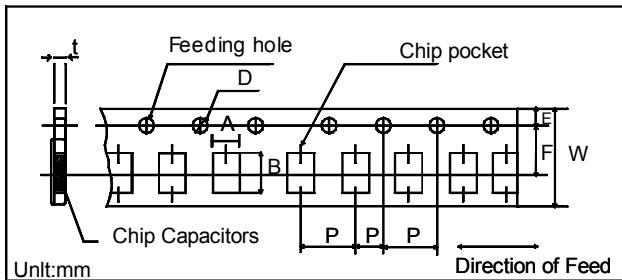
Taping is in accordance with EIA RS-481 or IEC 286-3



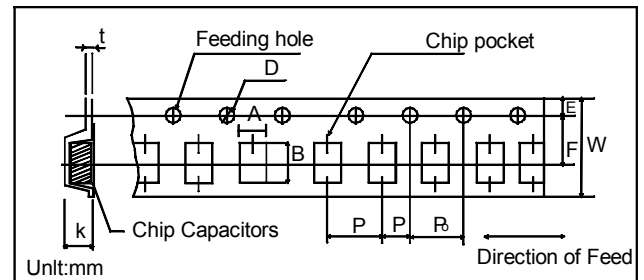
Unit: mm

Symbol	A	N	C	D	B	G	T
Dimension	178 ± 2.0	50 min	130 ± 0.5	20 min.	2.0±0.5	10.0± 1.5	14.9max

### 1. PAPER TAPE DIMENSIONS



### 2. PLASTIC TAPE DIMENSIONS



#### PAPER TAPE

Dimensions in mm	
W	8.0 ± 0.3
F	3.5 ± 0.05
E	1.75 ± 0.1
P <sub>1</sub>	4.0 ± 0.1
P <sub>2</sub>	2.0 ± 0.05
P <sub>0</sub>	4.0 ± 0.1
∅P	1.5 + 0.1 -0
t <sub>1</sub>	1.2 maximum

#### PLASTIC TAPE

Dimension in mm	
W	8.0 ± 0.3
F	3.5 ± 0.05
E	1.75 ± 0.1
P <sub>1</sub>	4.0 ± 0.1
P <sub>2</sub>	2.0 ± 0.05
P <sub>0</sub>	4.0 ± 0.1
∅P	1.5 + 0.1 -0
t <sub>1</sub>	0.3 maximum
K	2.0 maximum