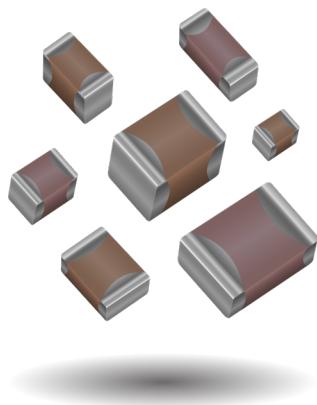


MLCC Tin/Lead Termination "B" (LD Series)

COG (NP0) – General Specifications



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. AVX has provided in the following pages a full range of values that we are currently offering in this special "B" termination. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Not RoHS Compliant

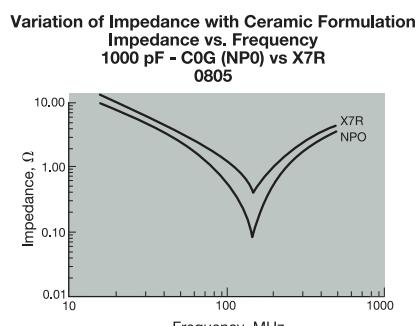
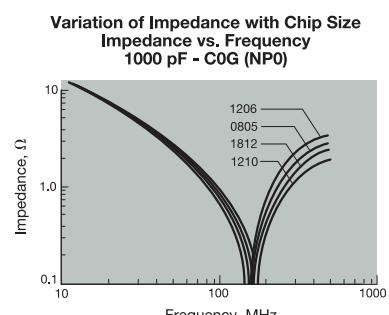
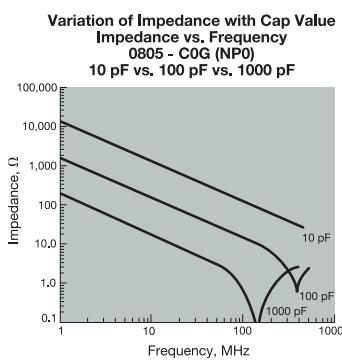
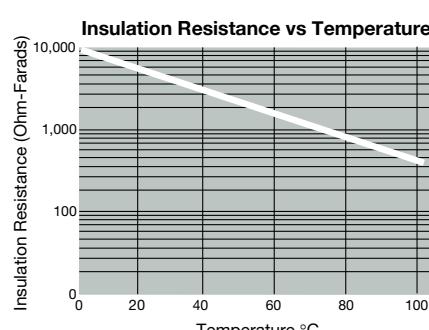
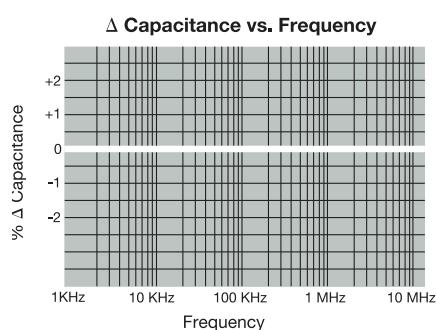
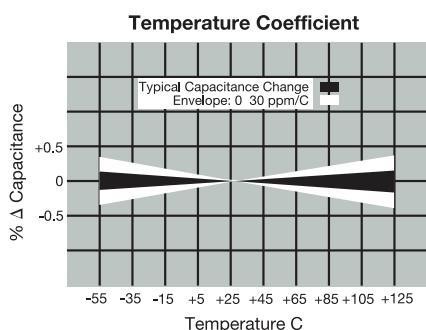
PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

LD05	5	A	101	J	A	B	2	A
Size	Voltage	Dielectric	Capacitance Code (In pF)	Capacitance Tolerance	Failure Rate	Terminations	Packaging	Special Code
LD02 - 0402	6.3V = 6	COG (NP0) = A	2 Sig. Digits + Number of Zeros	B = ± 10 pF (< 10 pF) C = ± 25 pF (< 10 pF) D = ± 50 pF (< 10 pF) F = $\pm 1\%$ (≥ 10 pF) G = $\pm 2\%$ (≥ 10 pF) J = $\pm 5\%$ K = $\pm 10\%$ M = $\pm 20\%$	A = Not Applicable 4 = Automotive	B = 5% min lead X = FLEXITERM® with 5% min lead**	2 = 7" Reel 4 = 13" Reel	A = Std. Product
LD03 - 0603	10V = Z	X7R = C						
LD04 - 0504*	16V = Y	X5R = D						
LD05 - 0805	25V = 3	X8R = F						
LD06 - 1206	35V = D							
LD10 - 1210	35V = D							
LD12 - 1812	50V = 5							
LD13 - 1825	100V = 1							
LD14 - 2225	200V = 2							
LD20 - 2220	500V = 7							

*LD04 has the same CV ranges as LD03.

See FLEXITERM® section for CV options

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.avx.com/disclaimer by reference and should be reviewed in full before placing any order.

MLCC Tin/Lead Termination "B"

COG (NP0) – Specifications and Test Methods



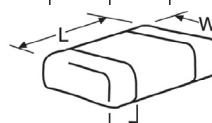
Parameter/Test	NP0 Specification Limits		Measuring Conditions		
Operating Temperature Range	-55°C to +125°C		Temperature Cycle Chamber		
Capacitance	Within specified tolerance		Freq.: 1.0 MHz \pm 10% for cap \leq 1000 pF 1.0 kHz \pm 10% for cap $>$ 1000 pF Voltage: 1.0Vrms \pm .2V		
Q	<30 pF: $Q \geq 400 + 20 \times \text{Cap Value}$ ≥ 30 pF: $Q \geq 1000$				
Insulation Resistance	100,000MΩ or 1000MΩ - μ F, whichever is less		Charge device with rated voltage for 60 \pm 5 secs @ room temp/humidity		
Dielectric Strength	No breakdown or visual defects		Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max) Note: Charge device with 150% of rated voltage for 500V devices.		
Resistance to Flexure Stresses	Appearance	No defects			
	Capacitance Variation	$\pm 5\%$ or $\pm .5$ pF, whichever is greater			
	Q	Meets Initial Values (As Above)			
	Insulation Resistance	\geq Initial Value $\times 0.3$			
Solderability	$\geq 95\%$ of each terminal should be covered with fresh solder		Dip device in eutectic solder at 230 \pm 5°C for 5.0 \pm 0.5 seconds		
Resistance to Solder Heat	Appearance	No defects, <25% leaching of either end terminal		Dip device in eutectic solder at 260°C for 60 seconds. Store at room temperature for 24 \pm 2 hours before measuring electrical properties.	
	Capacitance Variation	$\leq \pm 2.5\%$ or $\pm .25$ pF, whichever is greater			
	Q	Meets Initial Values (As Above)			
	Insulation Resistance	Meets Initial Values (As Above)			
	Dielectric Strength	Meets Initial Values (As Above)			
Thermal Shock	Appearance	No visual defects		Step 1: -55°C \pm 2°	
	Capacitance Variation	$\leq \pm 2.5\%$ or $\pm .25$ pF, whichever is greater		Step 2: Room Temp	
	Q	Meets Initial Values (As Above)		Step 3: +125°C \pm 2°	
	Insulation Resistance	Meets Initial Values (As Above)		Step 4: Room Temp	
	Dielectric Strength	Meets Initial Values (As Above)		Repeat for 5 cycles and measure after 24 hours at room temperature	
Load Life	Appearance	No visual defects		Charge device with twice rated voltage in test chamber set at 125°C \pm 2°C for 1000 hours (+48, -0). Remove from test chamber and stabilize at room temperature for 24 hours before measuring.	
	Capacitance Variation	$\leq \pm 3.0\%$ or $\pm .3$ pF, whichever is greater			
	Q	≥ 30 pF: $Q \geq 350$ ≥ 10 pF, <30 pF: $Q \geq 275 + 5C/2$ <10 pF: $Q \geq 200 + 10C$			
	Insulation Resistance	\geq Initial Value $\times 0.3$ (See Above)			
	Dielectric Strength	Meets Initial Values (As Above)			
Load Humidity	Appearance	No visual defects		Store in a test chamber set at 85°C \pm 2°C/ 85% \pm 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature for 24 \pm 2 hours before measuring.	
	Capacitance Variation	$\leq \pm 5.0\%$ or $\pm .5$ pF, whichever is greater			
	Q	≥ 30 pF: $Q \geq 350$ ≥ 10 pF, <30 pF: $Q \geq 275 + 5C/2$ <10 pF: $Q \geq 200 + 10C$			
	Insulation Resistance	\geq Initial Value $\times 0.3$ (See Above)			
	Dielectric Strength	Meets Initial Values (As Above)			

MLCC Tin/Lead Termination "B"

COG (NP0) – Capacitance Range

PREFERRED SIZES ARE SHADED

SIZE	LD02			LD03			LD05			LD06			
	Reflow/Wave			Reflow/Wave			Reflow/Wave			Reflow/Wave			
	All Paper			All Paper			Paper/Embossed			Paper/Embossed			
(L) Length (in.)	1.00 ± 0.10 (0.040 ± 0.004)	1.60 ± 0.15 (0.063 ± 0.006)		2.01 ± 0.20 (0.079 ± 0.008)			3.20 ± 0.20 (0.126 ± 0.008)						
W) Width (in.)	0.50 ± 0.10 (0.020 ± 0.004)	0.81 ± 0.15 (0.032 ± 0.006)		1.25 ± 0.20 (0.049 ± 0.008)			1.60 ± 0.20 (0.063 ± 0.008)						
(t) Terminal (in.)	0.25 ± 0.15 (0.010 ± 0.006)	0.35 ± 0.15 (0.014 ± 0.006)		0.50 ± 0.25 (0.020 ± 0.010)			0.50 ± 0.25 (0.020 ± 0.010)						
WVDC	16	25	50	16	25	50	100	16	25	50	100	200	500
Cap (pF)													
0.5	C	C	C	G	G	G	J	J	J	J	J	J	J
1.0	C	C	C	G	G	G	J	J	J	J	J	J	J
1.2	C	C	C	G	G	G	J	J	J	J	J	J	J
1.5	C	C	C	G	G	G	J	J	J	J	J	J	J
1.8	C	C	C	G	G	G	J	J	J	J	J	J	J
2.2	C	C	C	G	G	G	J	J	J	J	J	J	J
2.7	C	C	C	G	G	G	J	J	J	J	J	J	J
3.3	C	C	C	G	G	G	J	J	J	J	J	J	J
3.9	C	C	C	G	G	G	J	J	J	J	J	J	J
4.7	C	C	C	G	G	G	J	J	J	J	J	J	J
5.6	C	C	C	G	G	G	J	J	J	J	J	J	J
6.8	C	C	C	G	G	G	J	J	J	J	J	J	J
8.2	C	C	C	G	G	G	J	J	J	J	J	J	J
10	C	C	C	G	G	G	J	J	J	J	J	J	J
12	C	C	C	G	G	G	J	J	J	J	J	J	J
15	C	C	C	G	G	G	J	J	J	J	J	J	J
18	C	C	C	G	G	G	J	J	J	J	J	J	J
22	C	C	C	G	G	G	J	J	J	J	J	J	J
27	C	C	C	G	G	G	J	J	J	J	J	J	J
33	C	C	C	G	G	G	J	J	J	J	J	J	J
39	C	C	C	G	G	G	J	J	J	J	J	J	J
47	C	C	C	G	G	G	J	J	J	J	J	J	J
56	C	C	C	G	G	G	J	J	J	J	J	J	J
68	C	C	C	G	G	G	J	J	J	J	J	J	J
82	C	C	C	G	G	G	J	J	J	J	J	J	J
100	C	C	C	G	G	G	J	J	J	J	J	J	J
120	C	C	C	G	G	G	J	J	J	J	J	J	J
150	C	C	C	G	G	G	J	J	J	J	J	J	J
180	C	C	C	G	G	G	J	J	J	J	J	J	J
220	C	C	C	G	G	G	J	J	J	J	J	J	M
270	C	C	C	G	G	G	J	J	J	J	J	J	M
330	C	C	C	G	G	G	J	J	J	M	J	J	M
390	C	C	C	G	G	G	J	J	J	M	J	J	M
470	C	C	C	G	G	G	J	J	J	M	J	J	M
560				G	G	G	J	J	J	M	J	J	M
680				G	G	G	J	J	J	M	J	J	P
820				G	G	G	J	J	J	M	J	J	M
1000				G	G	G	J	J	J	M	J	J	Q
1200				G	G	G	J	J	J	M	J	J	Q
1500				G	G	G	J	J	J	M	J	J	M
1800							J	J	J	M	J	M	
2200							J	J	J	N	J	M	P
2700							J	J	J	N	J	M	P
3300							J	J			J	M	P
3900							J	J			J	M	P
4700							J	J			J	M	P
5600										J	J	M	
6800										M	M	M	
8200										M	M	M	
Cap (pF)	0.010												
0.012													
0.015													
0.018													
0.022													
0.027													
0.033													
0.039													
0.047													
0.068													
0.082													
0.1													
WVDC	16	25	50	16	25	50	100	16	25	50	100	200	500
SIZE	LD02			LD03			LD05			LD06			



Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
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MLCC Tin/Lead Termination "B"

C0G (NP0) – Capacitance Range



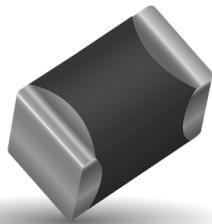
PREFERRED SIZES ARE SHADED

SIZE	LD10					LD12					LD13					LD14						
Soldering	Reflow Only					Reflow Only					Reflow Only					Reflow Only						
Packaging	Paper/Embossed					All Embossed					All Embossed					All Embossed						
(L) Length mm (in.)	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200	50	100	200	50	100	
W) Width mm (in.)	3.20 ± 0.20 (0.126 ± 0.008)	4.50 ± 0.30 (0.177 ± 0.012)	4.50 ± 0.30 (0.177 ± 0.012)	4.50 ± 0.30 (0.177 ± 0.012)	5.72 ± 0.25 (0.225 ± 0.010)	2.50 ± 0.20 (0.098 ± 0.008)	3.20 ± 0.20 (0.126 ± 0.008)	6.40 ± 0.40 (0.252 ± 0.016)	6.35 ± 0.25 (0.250 ± 0.010)	0.50 ± 0.25 (0.020 ± 0.010)	0.61 ± 0.36 (0.024 ± 0.014)	0.61 ± 0.36 (0.024 ± 0.014)	0.64 ± 0.39 (0.025 ± 0.015)	0.50	100	200	50	100	200	50	100	
(t) Terminal mm (in.)	0.50 ± 0.25 (0.020 ± 0.010)	0.61 ± 0.36 (0.024 ± 0.014)	0.61 ± 0.36 (0.024 ± 0.014)	0.61 ± 0.36 (0.024 ± 0.014)	0.64 ± 0.39 (0.025 ± 0.015)	WVDC	25	50	100	200	500	50	100	200	50	100	200	50	100	200	50	100
Cap (pF)	0.5																					
1.0																						
1.2																						
1.5																						
1.8																						
2.2																						
2.7																						
3.3																						
3.9																						
4.7																						
5.6																						
6.8																						
8.2																						
10																						
12																						
15																						
18																						
22																						
27																						
33																						
39																						
47																						
56																						
68																						
82																						
100																						
120																						
150																						
180																						
220																						
270																						
330																						
390																						
470																						
560	J	J	J	J	M	K	K	K	M	M	M	M	M	M	M	M	M	P				
680	J	J	J	J	M	M	K	K	M	M	M	M	M	M	M	M	M	M	P			
820	J	J	J	J	M	M	K	K	M	M	M	M	M	M	M	M	M	M	P			
1000	J	J	J	J	M	K	K	K	M	M	M	M	M	M	M	M	M	M	P			
1200	J	J	J	M	M	K	K	K	M	M	M	M	M	M	M	M	M	M	P			
1500	J	J	J	M	M	K	K	K	M	M	M	M	M	M	M	M	M	M	P			
1800	J	J	J	M	K	K	K	M	M	M	M	M	M	M	M	M	M	M	P			
2200	J	J	J	Q	K	K	K	P	M	M	M	M	M	M	M	M	M	M	P			
2700	J	J	J	Q	K	K	K	P	M	M	M	M	M	M	M	M	M	M	P			
3300	J	J	J	M	P	P	P	Q	M	M	M	M	M	M	M	M	M	M	P			
3900	J	J	M	M	P	P	P	Q	M	M	M	M	M	M	M	M	M	M	P			
4700	J	J	M	M	P	P	P	Q	M	M	M	M	M	M	M	M	M	M	P			
5600	J	J			P	P	P	X	Y	M	M	M	M	M	M	M	M	M	P			
6800	J	J			P	P	P	X	Y	M	M	M	M	M	M	M	M	M	P			
8200	J	J			P	P	P	X	Y	M	M	M	M	M	M	M	M	M	P			
Cap (pF)	0.010	J	J		P	P	Q	X	Y	M	M	M	M	M	M	M	M	M	P			
0.012	J	J			P	P	Q	Z	Y	M	M	M	M	M	M	M	M	M	P			
0.015					P	P	Q	Z	Y	M	M	M	M	M	M	M	M	M	Y			
0.018					P	P	X	Z	Y	P	M								M			
0.022					P	P	X	Z	Y	P									Y			
0.027					Q	X	X			P									P			
0.033					Q	X	X			P									P			
0.039					X	X	Z			P									P			
0.047					X	X	Z			P									P			
0.068					Z	Z	Z			P									P			
0.082					Z	Z	Z			P									Q			
0.1					Z	Z	Z			P									Q			
	WVDC	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200	50	100	200		
SIZE	LD10					LD12					LD13					LD14						

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
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MLCC Tin/Lead Termination "B"

X8R – General Specifications



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. AVX has provided in the following pages a full range of values that we are currently offering in this special "B" termination. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Not RoHS Compliant

PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

LD05	5	F	101	J	A	B	2	A
Size	Voltage	Dielectric	Capacitance Code (In pF)	Capacitance Tolerance	Failure Rate	Terminations	Packaging	Special Code
LD02 - 0402	6.3V = 6	X8R = F	2 Sig. Digits + Number of Zeros	B = $\pm .10$ pF (<10 pF)	A = Not Applicable	B = 5% min lead X = FLEXITERM® with 5% min lead**	2 = 7" Reel 4 = 13" Reel	A = Std. Product
LD03 - 0603	10V = Z			C = $\pm .25$ pF (<10 pF)				
LD04 - 0504*	16V = Y			D = $\pm .50$ pF (<10 pF)				
LD05 - 0805	25V = 3			F = $\pm 1\%$ (≥ 10 pF)				
LD06 - 1206	35V = D			G = $\pm 2\%$ (≥ 10 pF)				
LD10 - 1210	50V = 5			J = $\pm 5\%$				
LD12 - 1812	100V = 1			K = $\pm 10\%$				
LD13 - 1825	200V = 2			M = $\pm 20\%$				
LD20 - 2220	500V = 7							

LD04 has the same CV ranges as LD03.

See FLEXITERM® section for CV options

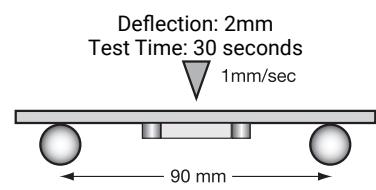
NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.avx.com/disclaimer by reference and should be reviewed in full before placing any order.

MLCC Tin/Lead Termination "B"

X8R – Specifications and Test Methods

Parameter/Test	X8R Specification Limits		Measuring Conditions		
Operating Temperature Range	-55°C to +150°C		Temperature Cycle Chamber		
Capacitance	Within specified tolerance		Freq.: 1.0 kHz ± 10% Voltage: 1.0Vrms ± .2V		
Dissipation Factor	≤ 2.5% for ≥ 50V DC rating ≤ 3.5% for 25V DC and 16V DC rating				
Insulation Resistance	100,000MΩ or 1000MΩ - µF, whichever is less		Charge device with rated voltage for 120 ± 5 secs @ room temp/humidity		
Dielectric Strength	No breakdown or visual defects		Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max) Note: Charge device with 150% of rated voltage for 500V devices.		
Resistance to Flexure Stresses	Appearance	No defects			
	Capacitance Variation	≤ ±12%			
	Dissipation Factor	Meets Initial Values (As Above)			
	Insulation Resistance	≥ Initial Value x 0.3			
Solderability	≥ 95% of each terminal should be covered with fresh solder		Dip device in eutectic solder at 230 ± 5°C for 5.0 ± 0.5 seconds		
Resistance to Solder Heat	Appearance	No defects, <25% leaching of either end terminal		Dip device in eutectic solder at 260°C for 60 seconds. Store at room temperature for 24 ± 2 hours before measuring electrical properties.	
	Capacitance Variation	≤ ±7.5%			
	Dissipation Factor	Meets Initial Values (As Above)			
	Insulation Resistance	Meets Initial Values (As Above)			
	Dielectric Strength	Meets Initial Values (As Above)			
Thermal Shock	Appearance	No visual defects		Step 1: -55°C ± 2°	
	Capacitance Variation	≤ ±7.5%		Step 2: Room Temp	
	Dissipation Factor	Meets Initial Values (As Above)		Step 3: +125°C ± 2°	
	Insulation Resistance	Meets Initial Values (As Above)		Step 4: Room Temp	
	Dielectric Strength	Meets Initial Values (As Above)		Repeat for 5 cycles and measure after 24 ± 2 hours at room temperature	
Load Life	Appearance	No visual defects		Charge device with 1.5 rated voltage (≤ 10V) in test chamber set at 150°C ± 2°C for 1000 hours (+48, -0) Remove from test chamber and stabilize at room temperature for 24 ± 2 hours before measuring.	
	Capacitance Variation	≤ ±12.5%			
	Dissipation Factor	≤ Initial Value x 2.0 (See Above)			
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)			
	Dielectric Strength	Meets Initial Values (As Above)			
Load Humidity	Appearance	No visual defects		Store in a test chamber set at 85°C ± 2°C/ 85% ± 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature and humidity for 24 ± 2 hours before measuring.	
	Capacitance Variation	≤ ±12.5%			
	Dissipation Factor	≤ Initial Value x 2.0 (See Above)			
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)			
	Dielectric Strength	Meets Initial Values (As Above)			

MLCC Tin/Lead Termination "B"

X8R – Capacitance Range



SIZE		LD03		LD05		LD06	
	WVDC	25V	50V	25V	50V	25V	50V
271	Cap 270	G	G				
331	(pF) 330	G	G	J	J		
471	470	G	G	J	J		
681	680	G	G	J	J		
102	1000	G	G	J	J	J	J
152	1500	G	G	J	J	J	J
182	1800	G	G	J	J	J	J
222	2200	G	G	J	J	J	J
272	2700	G	G	J	J	J	J
332	3300	G	G	J	J	J	J
392	3900	G	G	J	J	J	J
472	4700	G	G	J	J	J	J
562	5600	G	G	J	J	J	J
682	6800	G	G	J	J	J	J
822	Cap 8200	G	G	J	J	J	J
103	(μ F) 0.01	G	G	J	J	J	J
123	0.012	G	G	J	J	J	J
153	0.015	G	G	J	J	J	J
183	0.018	G	G	J	J	J	J
223	0.022	G	G	J	J	J	J
273	0.027	G	G	J	J	J	J
333	0.033	G	G	J	J	J	J
393	0.039	G	G	J	J	J	J
473	0.047	G	G	J	J	J	J
563	0.056	G		N	N	M	M
683	0.068	G		N	N	M	M
823	0.082			N	N	M	M
104	0.1			N	N	M	M
124	0.12			N	N	M	M
154	0.15			N	N	M	M
184	0.18			N		M	M
224	0.22			N		M	M
274	0.27					M	M
334	0.33					M	M
394	0.39					M	
474	0.47					M	
684	0.68						
824	0.82						
105	1						
	WVDC	25V	50V	25V	50V	25V	50V
	SIZE	LD03		LD05		LD06	

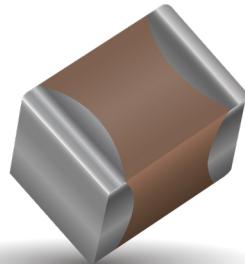
Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
PAPER					EMBOSSED								



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.avx.com/disclaimer by reference and should be reviewed in full before placing any order.

MLCC Tin/Lead Termination "B"

X7R – General Specifications



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. AVX has provided in the following pages a full range of values that we are currently offering in this special "B" termination. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Not RoHS Compliant

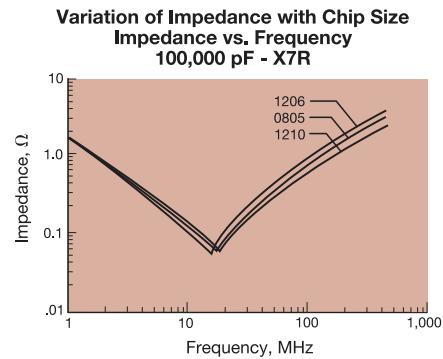
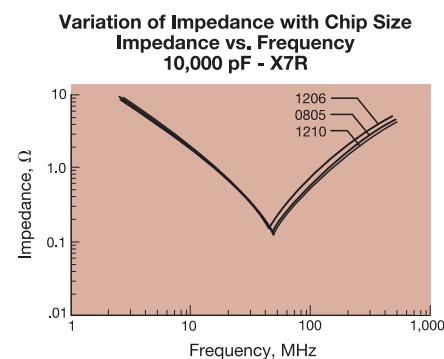
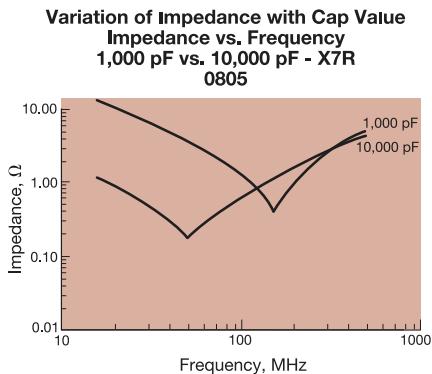
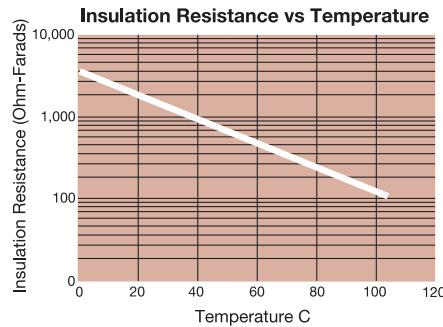
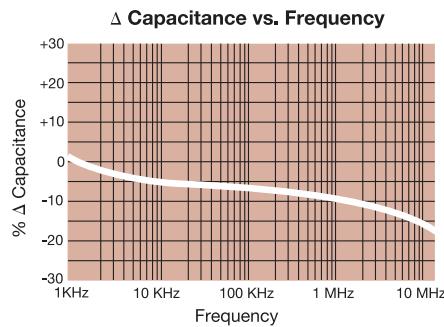
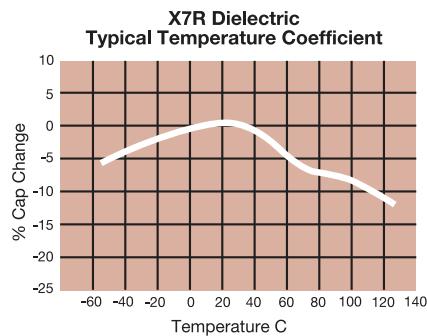
PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

LD05	5	C	101	J	A	B	2	A
Size LD03 - 0603	Voltage 6.3V = 6	Dielectric X7R = C	Capacitance Code (In pF) 2 Sig. Digits + Number of Zeros	Capacitance Tolerance B = ± 0.10 pF (<10pF) C = ± 0.25 pF (<10pF) D = ± 0.50 pF (<10pF) F = $\pm 1\%$ (≥ 10 pF) G = $\pm 2\%$ (≥ 10 pF) J = $\pm 5\%$ K = $\pm 10\%$ M = $\pm 20\%$	Failure Rate A = Not Applicable	Terminations B = 5% min lead X = FLEXITERM® with 5% min lead** **X7R only	Packaging 2 = 7" Reel 4 = 13" Reel	Special Code A = Std. Product
LD04 - 0504*	10V = Z							
LD05 - 0805	16V = Y							
LD06 - 1206	25V = 3							
LD10 - 1210	35V = D							
LD12 - 1812	50V = 5							
LD13 - 1825	100V = 1							
LD14 - 2225	200V = 2							
LD20 - 2220	500V = 7							

*LD04 has the same CV ranges as LD03.

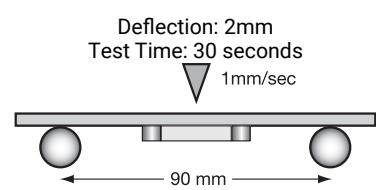
See FLEXITERM® section for CV options

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.



MLCC Tin/Lead Termination "B"

X7R – Specifications and Test Methods

Parameter/Test	X7R Specification Limits		Measuring Conditions
Operating Temperature Range	-55°C to +125°C		Temperature Cycle Chamber
Capacitance	Within specified tolerance		
Dissipation Factor	$\leq 10\%$ for $\geq 50V$ DC rating $\leq 12.5\%$ for $25V$ DC rating $\leq 12.5\%$ for $25V$ and $16V$ DC rating $\leq 12.5\%$ for $\leq 10V$ DC rating		Freq.: 1.0 kHz $\pm 10\%$ Voltage: 1.0Vrms $\pm .2V$
Insulation Resistance	100,000MΩ or 1000MΩ - μF, whichever is less		Charge device with rated voltage for 120 ± 5 secs @ room temp/humidity
Dielectric Strength	No breakdown or visual defects		Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max) Note: Charge device with 150% of rated voltage for 500V devices.
Resistance to Flexure Stresses	Appearance	No defects	
	Capacitance Variation	$\leq \pm 12\%$	
	Dissipation Factor	Meets Initial Values (As Above)	
	Insulation Resistance	\geq Initial Value $\times 0.3$	
Solderability	$\geq 95\%$ of each terminal should be covered with fresh solder		Dip device in eutectic solder at $230 \pm 5^\circ C$ for 5.0 ± 0.5 seconds
Resistance to Solder Heat	Appearance	No defects, $<25\%$ leaching of either end terminal	Dip device in eutectic solder at $260^\circ C$ for 60 seconds. Store at room temperature for 24 ± 2 hours before measuring electrical properties.
	Capacitance Variation	$\leq \pm 7.5\%$	
	Dissipation Factor	Meets Initial Values (As Above)	
	Insulation Resistance	Meets Initial Values (As Above)	
	Dielectric Strength	Meets Initial Values (As Above)	
Thermal Shock	Appearance	No visual defects	Step 1: $-55^\circ C \pm 2^\circ$ 30 ± 3 minutes
	Capacitance Variation	$\leq \pm 7.5\%$	Step 2: Room Temp ≤ 3 minutes
	Dissipation Factor	Meets Initial Values (As Above)	Step 3: $+125^\circ C \pm 2^\circ$ 30 ± 3 minutes
	Insulation Resistance	Meets Initial Values (As Above)	Step 4: Room Temp ≤ 3 minutes
	Dielectric Strength	Meets Initial Values (As Above)	Repeat for 5 cycles and measure after 24 ± 2 hours at room temperature
Load Life	Appearance	No visual defects	Charge device with 1.5 rated voltage ($\leq 10V$) in test chamber set at $125^\circ C \pm 2^\circ C$ for 1000 hours (+48, -0) Remove from test chamber and stabilize at room temperature for 24 ± 2 hours before measuring.
	Capacitance Variation	$\leq \pm 12.5\%$	
	Dissipation Factor	\leq Initial Value $\times 2.0$ (See Above)	
	Insulation Resistance	\geq Initial Value $\times 0.3$ (See Above)	
	Dielectric Strength	Meets Initial Values (As Above)	
Load Humidity	Appearance	No visual defects	Store in a test chamber set at $85^\circ C \pm 2^\circ C$ / $85\% \pm 5\%$ relative humidity for 1000 hours (+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature and humidity for 24 ± 2 hours before measuring.
	Capacitance Variation	$\leq \pm 12.5\%$	
	Dissipation Factor	\leq Initial Value $\times 2.0$ (See Above)	
	Insulation Resistance	\geq Initial Value $\times 0.3$ (See Above)	
	Dielectric Strength	Meets Initial Values (As Above)	

MLCC Tin/Lead Termination "B"

X7R – Capacitance Range



PREFERRED SIZES ARE SHADED

SIZE	LD02				LD03				LD05				LD06				
	Reflow/Wave		Reflow/Wave		Reflow/Wave		Reflow/Wave		Reflow/Wave		Reflow/Wave		Reflow/Wave		Reflow/Wave		
Soldering	All Paper		All Paper		Paper/Embossed												
Packaging	All Paper		All Paper		Paper/Embossed												
(L) Length	mm (in.)	1.00 ± 0.10 (0.040 ± 0.004)		1.60 ± 0.15 (0.063 ± 0.006)		2.01 ± 0.20 (0.079 ± 0.008)		3.20 ± 0.20 (0.126 ± 0.008)									
W) Width	mm (in.)	0.50 ± 0.10 (0.020 ± 0.004)		0.81 ± 0.15 (0.032 ± 0.006)		1.25 ± 0.20 (0.049 ± 0.008)		1.60 ± 0.20 (0.063 ± 0.008)									
(t) Terminal	mm (in.)	0.25 ± 0.15 (0.010 ± 0.006)		0.35 ± 0.15 (0.014 ± 0.006)		0.50 ± 0.25 (0.020 ± 0.010)											
WVDC	16	25	50	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	
Cap (pF)	100																
	150																
	220		C														
	330		C					G	G	G	J	J	J	J	J	J	K
	470		C					G	G	G	J	J	J	J	J	J	K
	680		C					G	G	G	J	J	J	J	J	J	K
	1000		C					G	G	G	J	J	J	J	J	J	K
	1500		C					G	G	G	J	J	J	J	J	J	M
	2200		C					G	G	G	J	J	J	J	J	J	M
	3300		C	C				G	G	G	J	J	J	J	J	J	M
	4700		C	C	C			G	G	G	J	J	J	J	J	J	M
	6800		C	C	C			G	G	G	J	J	J	J	J	J	P
Cap (μF)	0.010	C	C					G	G	G	J	J	J	J	J	J	J
	0.015	C						G	G	G	J	J	J	J	J	J	M
	0.022	C						G	G	G	J	J	J	J	J	J	M
	0.033	C						G	G	G	J	J	J	N		J	M
	0.047							G	G	G	J	J	J	N		J	M
	0.068							G	G	G	J	J	J	N		J	P
	0.10	C*						G	G	G	J	J	J	N		J	P
	0.15							G	G	G	J	J	J	N		J	Q
	0.22							G	G	G	J	J	N	N		J	Q
	0.33							J*			N	N	N	N		J	P
	0.47										N	N	N	N		M	Q
	0.68										N	N	N	N		M	Q
	1.0							J*	J*		N	N	N*			M	Q
	1.5										P*					P	Q
	2.2											P*				Q	Q
	3.3														Q*	Q*	
	4.7														Q*	Q*	
	10														Q	Q	
	22																
	47																
	100																
WVDC	16	25	50	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200
SIZE	LD02				LD03				LD05				LD06				

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
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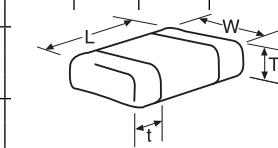
= Under Development

MLCC Tin/Lead Termination "B"

X7R – Capacitance Range

PREFERRED SIZES ARE SHADED

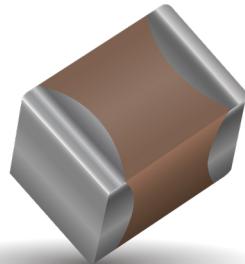
SIZE	LD10						LD12						LD13			LD20			LD14	
Soldering	Reflow Only						Reflow Only						Reflow Only			Reflow Only			Reflow Only	
Packaging	Paper/Embossed						All Embossed						All Embossed			All Embossed			All Embossed	
(L) Length (in.)	3.20 ± 0.20 (0.126 ± 0.008)						4.50 ± 0.30 (0.177 ± 0.012)						4.50 ± 0.30 (0.177 ± 0.012)			5.70 ± 0.50 (0.224 ± 0.020)			5.72 ± 0.25 (0.225 ± 0.010)	
W) Width (in.)	2.50 ± 0.20 (0.098 ± 0.008)						3.20 ± 0.20 (0.126 ± 0.008)						6.40 ± 0.40 (0.252 ± 0.016)			5.00 ± 0.40 (0.197 ± 0.016)			6.35 ± 0.25 (0.250 ± 0.010)	
(t) Terminal (in.)	0.50 ± 0.25 (0.020 ± 0.010)						0.61 ± 0.36 (0.024 ± 0.014)						0.61 ± 0.36 (0.024 ± 0.014)			0.64 ± 0.39 (0.025 ± 0.015)			0.64 ± 0.39 (0.025 ± 0.015)	
WVDC	10	16	25	50	100	200	500	50	100	200	500	50	100	25	50	100	200	50	100	
Cap (pF)	100																			
	150																			
	220																			
	330																			
	470																			
	680																			
	1000																			
	1500	J	J	J	J	J	J	M												
	2200	J	J	J	J	J	J	M												
	3300	J	J	J	J	J	J	M												
	4700	J	J	J	J	J	J	M												
	6800	J	J	J	J	J	J	M												
Cap (μF)	0.010	J	J	J	J	J	J	M	K	K	K	K	M	M		X	X	X	M	P
	0.015	J	J	J	J	J	J	P	K	K	K	K	P	M	M	X	X	X	M	P
	0.022	J	J	J	J	J	J	Q	K	K	K	K	P	M	M	X	X	X	M	P
	0.033	J	J	J	J	J	J	K	K	K	K	X	M	M		X	X	X	M	P
	0.047	J	J	J	J	J	J	K	K	K	K	Z	M	M		X	X	X	M	P
	0.068	J	J	J	J	J	M	K	K	K	K	Z	M	M		X	X	X	M	P
	0.10	J	J	J	J	J	M	K	K	K	K	Z	M	M		X	X	X	M	P
	0.15	J	J	J	J	M	Z	K	K	P	P	M	M	M		X	X	X	M	P
	0.22	J	J	J	J	P	Z	K	K	P	P	M	M	M		X	X	X	M	P
	0.33	J	J	J	J	Q		K	M	X		M	M			X	X	X	M	P
	0.47	M	M	M	M	Q		K	P			M	M			X	X	X	M	P
	0.68	M	M	P	X	X		M	Q			M	P			X	X	X	M	P
	1.0	N	N	P	X	Z		M	X			M	P			X	X		M	P
	1.5	N	N	Z	Z	Z		Z	Z			M				X	X		M	P
	2.2	X	X	Z	Z	Z		Z	Z							X	X		M	P
	3.3	X	X	Z	Z			Z								X	Z			
	4.7	X	X	Z	Z			Z								X	Z			
	10	Z	Z	Z	Z											Z	Z			
	22	Z	Z													Z				
	47																			
	100																			
WVDC	10	16	25	50	100	200	500	50	100	200	500	50	100	25	50	100	200	50	100	
SIZE	LD10						LD12						LD13			LD20			LD14	



Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
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MLCC Tin/Lead Termination "B"

X5R – General Specifications



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. AVX has provided in the following pages a full range of values that we are currently offering in this special "B" termination. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Not RoHS Compliant

PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

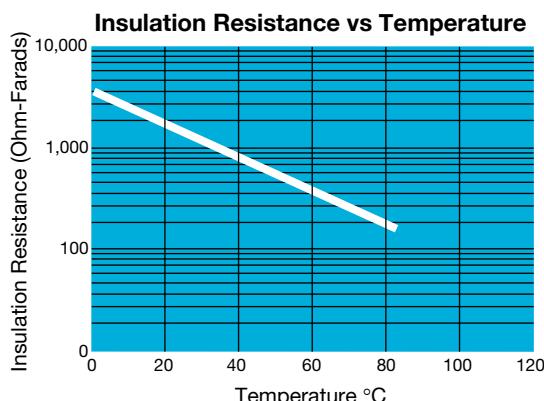
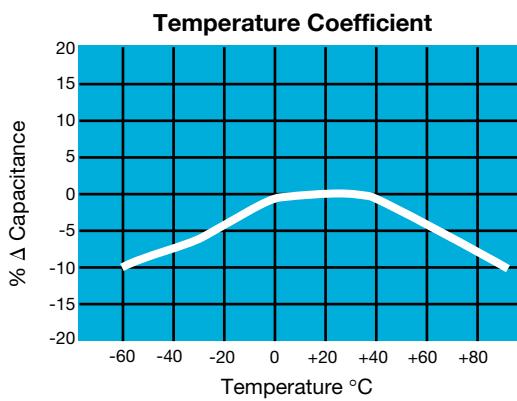
LD05	5	D	101	J	A	B	2	A
Size	Voltage	Dielectric	Capacitance Code (In pF)	Capacitance Tolerance	Failure Rate	Terminations	Packaging	Special Code
LD02 - 0402	6.3V = 6	X5R = D	2 Sig. Digits + Number of Zeros	B = $\pm 10\text{ pF}$ ($<10\text{ pF}$) C = $\pm 25\text{ pF}$ ($<10\text{ pF}$) D = $\pm 50\text{ pF}$ ($<10\text{ pF}$) F = $\pm 1\%$ ($\geq 10\text{ pF}$) G = $\pm 2\%$ ($\geq 10\text{ pF}$) J = $\pm 5\%$ K = $\pm 10\%$ M = $\pm 20\%$	A = Not Applicable	B = 5% min lead X = FLEXITERM® with 5% min lead**	2 = 7" Reel 4 = 13" Reel	A = Std. Product
LD03 - 0603	10V = Z							
LD04 - 0504*	16V = Y							
LD05 - 0805	25V = 3							
LD06 - 1206	35V = D							
LD10 - 1210	35V = D							
LD12 - 1812	50V = 5							
LD13 - 1825	100V = 1							
LD14 - 2225	200V = 2							
LD20 - 2220	500V = 7							

*LD04 has the same CV ranges as LD03.

See FLEXITERM® section for CV options

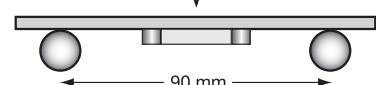
NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

TYPICAL ELECTRICAL CHARACTERISTICS



MLCC Tin/Lead Termination "B"

X5R – Specifications and Test Methods

Parameter/Test	X5R Specification Limits		Measuring Conditions		
Operating Temperature Range	-55°C to +85°C		Temperature Cycle Chamber		
Capacitance	Within specified tolerance				
Dissipation Factor	$\leq 2.5\%$ for $\geq 50V$ DC rating $\leq 3.0\%$ for 25V, 35V DC rating $\leq 12.5\%$ Max. for 16V DC rating and lower Contact Factory for DF by PN		Freq.: 1.0 kHz $\pm 10\%$ Voltage: 1.0Vrms $\pm .2V$ For Cap $> 10 \mu F$, 0.5Vrms @ 120Hz		
Insulation Resistance	10,000MΩ or 500MΩ - μF , whichever is less		Charge device with rated voltage for 120 ± 5 secs @ room temp/humidity		
Dielectric Strength	No breakdown or visual defects		Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max)		
Resistance to Flexure Stresses	Appearance	No defects			
	Capacitance Variation	$\leq \pm 12\%$			
	Dissipation Factor	Meets Initial Values (As Above)			
	Insulation Resistance	\geq Initial Value $\times 0.3$			
Solderability	$\geq 95\%$ of each terminal should be covered with fresh solder		Dip device in eutectic solder at $230 \pm 5^\circ C$ for 5.0 ± 0.5 seconds		
Resistance to Solder Heat	Appearance	No defects, $<25\%$ leaching of either end terminal		Dip device in eutectic solder at $260^\circ C$ for 60 seconds. Store at room temperature for 24 ± 2 hours before measuring electrical properties.	
	Capacitance Variation	$\leq \pm 7.5\%$			
	Dissipation Factor	Meets Initial Values (As Above)			
	Insulation Resistance	Meets Initial Values (As Above)			
	Dielectric Strength	Meets Initial Values (As Above)			
Thermal Shock	Appearance	No visual defects		Step 1: $-55^\circ C \pm 2^\circ$ 30 ± 3 minutes	
	Capacitance Variation	$\leq \pm 7.5\%$		Step 2: Room Temp ≤ 3 minutes	
	Dissipation Factor	Meets Initial Values (As Above)		Step 3: $+85^\circ C \pm 2^\circ$ 30 ± 3 minutes	
	Insulation Resistance	Meets Initial Values (As Above)		Step 4: Room Temp ≤ 3 minutes	
	Dielectric Strength	Meets Initial Values (As Above)		Repeat for 5 cycles and measure after 24 ± 2 hours at room temperature	
Load Life	Appearance	No visual defects		Charge device with 1.5X rated voltage in test chamber set at $85^\circ C \pm 2^\circ C$ for 1000 hours (+48, -0). Note: Contact factory for *optional specification part numbers that are tested at $< 1.5X$ rated voltage.	
	Capacitance Variation	$\leq \pm 12.5\%$			
	Dissipation Factor	\leq Initial Value $\times 2.0$ (See Above)			
	Insulation Resistance	\geq Initial Value $\times 0.3$ (See Above)			
	Dielectric Strength	Meets Initial Values (As Above)			
Load Humidity	Appearance	No visual defects		Remove from test chamber and stabilize at room temperature for 24 ± 2 hours before measuring.	
	Capacitance Variation	$\leq \pm 12.5\%$			
	Dissipation Factor	\leq Initial Value $\times 2.0$ (See Above)			
	Insulation Resistance	\geq Initial Value $\times 0.3$ (See Above)			
	Dielectric Strength	Meets Initial Values (As Above)			

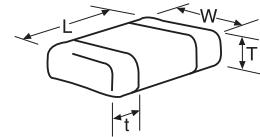
MLCC Tin/Lead Termination "B"



X5R – Capacitance Range

PREFERRED SIZES ARE SHADED

SIZE	LD02					LD03					LD05					LD06					LD10										
Soldering	Reflow/Wave					Reflow/Wave					Reflow/Wave					Reflow/Wave					Reflow/Wave										
Packaging	All Paper					All Paper					Paper/Embossed					Paper/Embossed					Paper/Embossed										
(L) Length (in.)	1.00 ± 0.10 (0.040 ± 0.004)					1.60 ± 0.15 (0.063 ± 0.006)					2.01 ± 0.20 (0.079 ± 0.008)					3.20 ± 0.20 (0.126 ± 0.008)					3.20 ± 0.20 (0.126 ± 0.008)										
(W) Width (in.)	0.50 ± 0.10 (0.020 ± 0.004)					0.81 ± 0.15 (0.032 ± 0.006)					1.25 ± 0.20 (0.049 ± 0.008)					1.60 ± 0.20 (0.063 ± 0.008)					2.50 ± 0.20 (0.098 ± 0.008)										
(t) Terminal (in.)	0.25 ± 0.15 (0.010 ± 0.006)					0.35 ± 0.15 (0.014 ± 0.006)					0.50 ± 0.25 (0.020 ± 0.010)					0.50 ± 0.25 (0.020 ± 0.010)					0.50 ± 0.25 (0.020 ± 0.010)										
WVDC	4	6.3	10	16	25	50	4	6.3	10	16	25	35	50	6.3	10	16	25	35	50	4	6.3	10	16	25	35	50	6.3	10	25	50	
Cap (pF)	100																														
150																															
220							C																								
330							C																								
470							C																								
680							C																								
1000							C																								
1500							C																								
2200							C																								
3300							C																								
4700							C																								
6800							C																								
Cap (μ F)	0.010																														
0.015																															
0.022							C	C																							
0.033							C																								
0.047							C	C																							
0.068							C	C																							
0.10							C	C	C																						
0.15																															
0.22							C*																								
0.33																															
0.47							C*	C*																							
0.68																															
1.0							C*	C*	C*																						
1.5																															
2.2							C*																								
3.3																															
4.7																															
10																															
22																															
47																															
100																															
WVDC	4	6.3	10	16	25	50	4	6.3	10	16	25	35	50	6.3	10	16	25	35	50	6.3	10	16	25	35	50	4	6.3	10	25	50	
SIZE	LD02					LD03					LD05					LD06					LD10					LD12					



***Optional Specifications – Contact factory**

NOTE: Contact factory for non-specified capacitance values