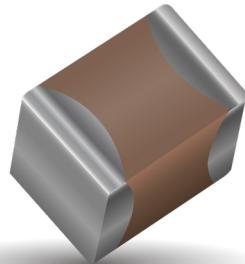


MLCC Tin/Lead Termination "B"

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

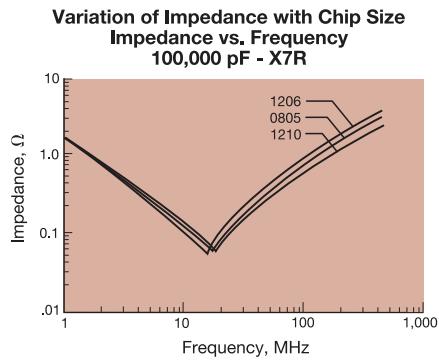
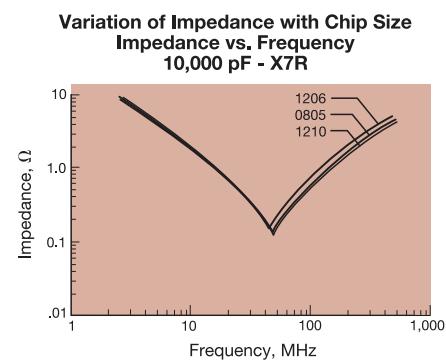
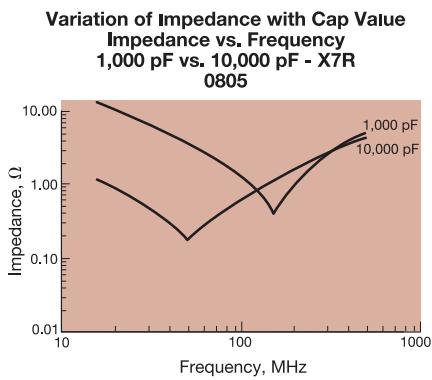
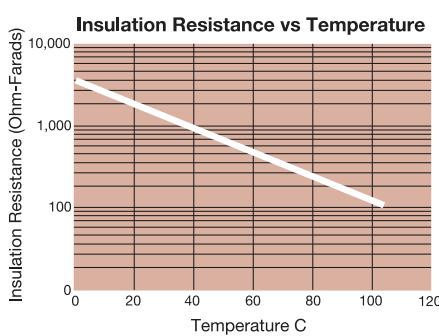
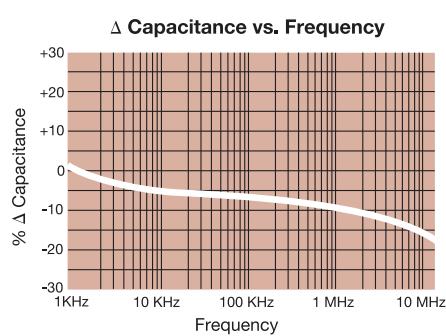
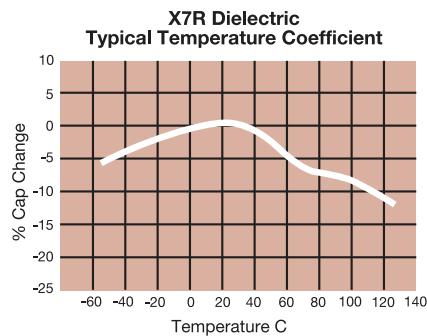
PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

LD05	5	C	101	J	A	B	2	A
Size LD03 - 0603 LD04 - 0504* LD05 - 0805 LD06 - 1206 LD10 - 1210 LD12 - 1812 LD13 - 1825 LD14 - 2225 LD20 - 2220	Voltage 6.3V = 6 10V = Z 16V = Y 25V = 3 35V = D 50V = 5 100V = 1 200V = 2 500V = 7	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	Contact Factory For Multiples*

*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"

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.: $1.0 \text{ kHz} \pm 10\%$ Voltage: $1.0 \text{ Vrms} \pm .2\text{V}$		
Insulation Resistance	$100,000\Omega$ or $1000\Omega - \mu\text{F}$, 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		 Deflection: 2mm Test Time: 30 seconds 1mm/sec	
	Capacitance Variation	$\leq \pm 12\%$			
	Dissipation Factor	Meets Initial Values (As Above)			
	Insulation Resistance	$\geq \text{Initial Value} \times 0.3$			
Solderability	$\geq 95\%$ of each terminal should be covered with fresh solder		Dip device in eutectic solder at $230 \pm 5^\circ\text{C}$ 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	$\leq \pm 7.5\%$			
	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: $-55^\circ\text{C} \pm 2^\circ$ 30 ± 3 minutes	
	Capacitance Variation	$\leq \pm 7.5\%$		Step 2: Room Temp ≤ 3 minutes	
	Dissipation Factor	Meets Initial Values (As Above)		Step 3: $+125^\circ\text{C} \pm 2^\circ$ 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 $125^\circ\text{C} \pm 2^\circ\text{C}$ 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	$\leq \text{Initial Value} \times 2.0$ (See Above)			
	Insulation Resistance	$\geq \text{Initial Value} \times 0.3$ (See Above)			
	Dielectric Strength	Meets Initial Values (As Above)			
Load Humidity	Appearance	No visual defects		Store in a test chamber set at $85^\circ\text{C} \pm 2^\circ\text{C}/ 85\% \pm 5\%$ 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	$\leq \text{Initial Value} \times 2.0$ (See Above)			
	Insulation Resistance	$\geq \text{Initial Value} \times 0.3$ (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				
Soldering	Reflow/Wave			Reflow/Wave					Reflow/Wave					Reflow/Wave				
Packaging	All Paper			All Paper					Paper/Embossed					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)					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	200	500
Cap (pF)	100																	
150																		
220			C															
330			C					G	G	G	J	J	J	J	J			K
470			C					G	G	G	J	J	J	J	J			K
680			C					G	G	G	J	J	J	J	J			K
1000			C					G	G	G	J	J	J	J	J			K
1500			C					G	G	G	J	J	J	J	J			M
2200			C					G	G	G	J	J	J	J	J			M
3300		C	C					G	G	G	J	J	J	J	J			M
4700		C	C					G	G	G	J	J	J	J	J			M
6800	C	C	C					G	G	G	J	J	J	J	J			P
Cap (μF)	0.010	C	C					G	G	G	J	J	J	J	J			P
0.015	C	C						G	G	G	J	J	J	J	J			M
0.022	C							G	G	G	J	J	J	J	J			M
0.033	C							G	G	G	J	J	J	N				M
0.047								G	G	G	J	J	J	N				M
0.068								G	G	G	J	J	J	N				P
0.10	C*			G	G	G					J	J	J	N				P
0.15				G	G						J	J	J	N				Q
0.22				G	G						J	J	N	N				Q
0.33											N	N	N	N				
0.47											N	N	N	N				
0.68											N	N	N	N				
1.0											N	N	N*					
1.5																		
2.2				J*	J*													
3.3																		
4.7																		
10																		
22																		
47																		
100																		
WVDC	16	25	50	6.3	10	16	25	50	100	200	6.3	10	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)
	PAPER							EMBOSSED					

 = 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.)	mm 3.20 ± 0.20 (0.126 ± 0.008)							mm 4.50 ± 0.30 (0.177 ± 0.012)				mm 4.50 ± 0.30 (0.177 ± 0.012)			mm 5.70 ± 0.50 (0.224 ± 0.020)				mm 5.72 ± 0.25 (0.225 ± 0.010)	
W) Width (in.)	mm 2.50 ± 0.20 (0.098 ± 0.008)							mm 3.20 ± 0.20 (0.126 ± 0.008)				mm 6.40 ± 0.40 (0.252 ± 0.016)			mm 5.00 ± 0.40 (0.197 ± 0.016)				mm 6.35 ± 0.25 (0.250 ± 0.010)	
(t) Terminal (in.)	mm 0.50 ± 0.25 (0.020 ± 0.010)							mm 0.61 ± 0.36 (0.024 ± 0.014)				mm 0.61 ± 0.36 (0.024 ± 0.014)			mm 0.64 ± 0.39 (0.025 ± 0.015)				mm 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	Z							X	Z			
	10	Z	Z	Z	Z											Z	Z			
	22	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	