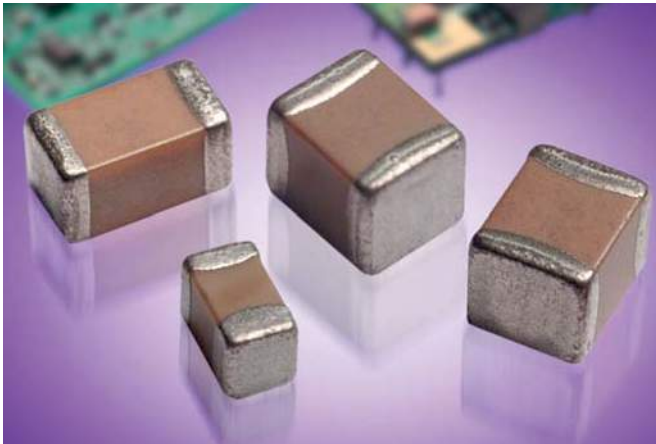


# MLCC Tin/Lead Termination “B”

## C0G (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**

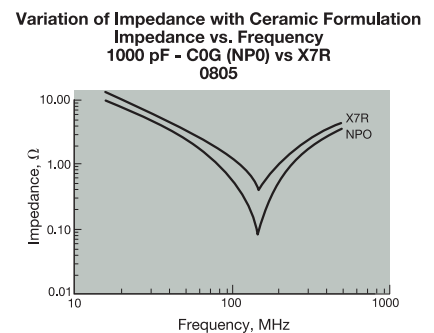
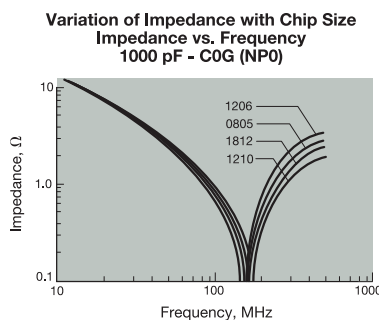
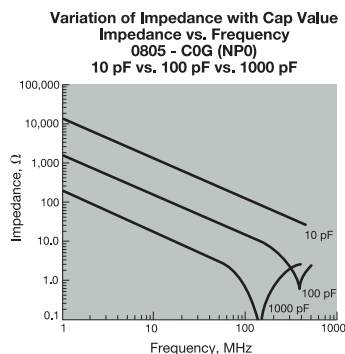
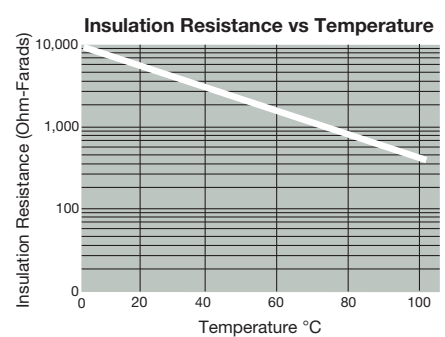
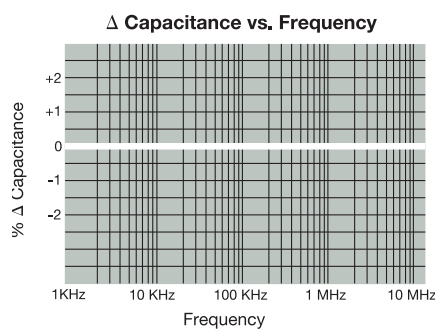
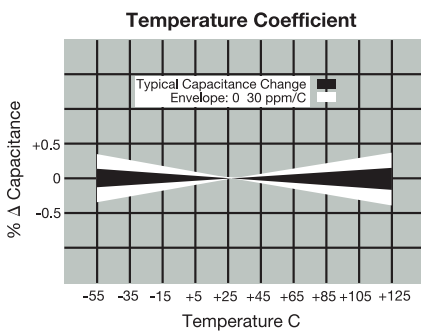
### PART NUMBER (see page 2 for complete part number explanation)

LD05	5	A	101	J	A	B	2	A
<b>Size</b>	<b>Voltage</b>	<b>Dielectric</b>	<b>Capacitance Code (In pF)</b>	<b>Capacitance Tolerance</b>	<b>Failure Rate</b>	<b>Terminations</b>	<b>Packaging</b>	<b>Special Code</b>
LD02 - 0402 LD03 - 0603 LD04 - 0504* LD05 - 0805 LD06 - 1206 LD10 - 1210 LD12 - 1812 LD13 - 1825 LD14 - 2225 LD20 - 2220	6.3V = 6 10V = Z 16V = Y 25V = 3 35V = D 50V = 5 100V = 1 200V = 2 500V = 7	C0G (NP0) = A X7R = C X5R = D X8R = F	2 Sig. Digits + Number of Zeros	B = ±.10 pF (<10pF) C = ±.25 pF (<10pF) D = ±.50 pF (<10pF) F = ±1% (≥ 10 pF) G = ±2% (≥ 10 pF) J = ±5% K = ±10% M = ±20%	A = Not Applicable	B = 5% min lead X = FLEXITERM® with 5% min lead**	2 = 7" Reel 4 = 13" Reel	A = Std. Product
						**X7R only	<b>Contact Factory For Multiples</b>	

\*LD04 has the same CV ranges as LD03.

See FLEXITERM® section for CV options

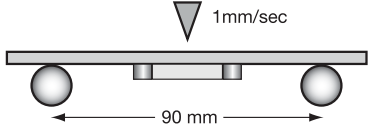
NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.  
Contact factory for non-specified capacitance values.



# MLCC Tin/Lead Termination “B”



## C0G (NP0) – Specifications and Test Methods

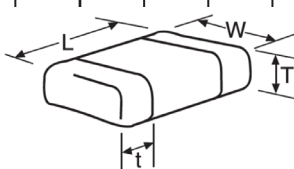
Parameter/Test		NP0 Specification Limits	Measuring Conditions	
Operating Temperature Range		-55°C to +125°C	Temperature Cycle Chamber	
Capacitance		Within specified tolerance	Freq.: 1.0 MHz ± 10% for cap ≤ 1000 pF 1.0 kHz ± 10% for cap > 1000 pF Voltage: 1.0Vrms ± .2V	
Q		<30 pF: Q ≥ 400+20 x Cap Value ≥30 pF: Q ≥ 1000	Charge device with rated voltage for 60 ± 5 secs @ room temp/humidity	
Insulation Resistance		100,000MΩ or 1000MΩ - μF, whichever is less	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.	
Dielectric Strength		No breakdown or visual defects	Deflection: 2mm Test Time: 30 seconds 	
Resistance to Flexure Stresses	Appearance	No defects		
	Capacitance Variation	±5% or ±.5 pF, whichever is greater		
	Q	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	≤ ±2.5% or ±.25 pF, whichever is greater		
	Q	Meets Initial Values (As Above)		
	Insulation Resistance	Meets Initial Values (As Above)		
Thermal Shock	Dielectric Strength	Meets Initial Values (As Above)	Repeat for 5 cycles and measure after 24 hours at room temperature	
	Appearance	No visual defects	Step 1: -55°C ± 2°	30 ± 3 minutes
	Capacitance Variation	≤ ±2.5% or ±.25 pF, whichever is greater	Step 2: Room Temp	≤ 3 minutes
	Q	Meets Initial Values (As Above)	Step 3: +125°C ± 2°	30 ± 3 minutes
	Insulation Resistance	Meets Initial Values (As Above)	Step 4: Room Temp	≤ 3 minutes
Load Life	Dielectric Strength	Meets Initial Values (As Above)	Remove from test chamber and stabilize at room temperature for 24 hours before measuring.	
	Appearance	No visual defects	Charge device with twice rated voltage in test chamber set at 125°C ± 2°C for 1000 hours (+48, -0).	
	Capacitance Variation	≤ ±3.0% or ± .3 pF, whichever is greater	Remove from test chamber and stabilize at room temperature for 24 hours before measuring.	
	Q (C=Nominal Cap)	≥ 30 pF: Q ≥ 350 ≥10 pF, <30 pF: Q ≥ 275 +5C/2 <10 pF: Q ≥ 200 +10C		
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)		
Load Humidity	Dielectric Strength	Meets Initial Values (As Above)	Store in a test chamber set at 85°C ± 2°C/ 85% ± 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied.	
	Appearance	No visual defects	Remove from chamber and stabilize at room temperature for 24 ± 2 hours before measuring.	
	Capacitance Variation	≤ ±5.0% or ± .5 pF, whichever is greater		
	Q	≥ 30 pF: Q ≥ 350 ≥10 pF, <30 pF: Q ≥ 275 +5C/2 <10 pF: Q ≥ 200 +10C		
Load Humidity	Insulation Resistance	≥ Initial Value x 0.3 (See Above)		
	Dielectric Strength	Meets Initial Values (As Above)		

# MLCC Tin/Lead Termination "B"

## Capacitance Range (NP0 Dielectric)

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	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	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	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	16	25	50	100	200	500	
Cap (pF)	0.5	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	1.0	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	1.2	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	1.5	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	1.8	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
2.2	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
2.7	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
3.3	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
3.9	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
4.7	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
5.6	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
6.8	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
8.2	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
10	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
12	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
15	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
18	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
22	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
27	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
33	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
39	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
47	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
56	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
68	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
82	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
100	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
120	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
150	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
180	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
220	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	M	
270	C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M	
330	C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M	
390	C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M	
470	C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M	
560	C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M	
680	C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M	
820				G	G	G	G	J	J	J	J	M	J	J	J	J	J	M	
1000				G	G	G	G	J	J	J	J	M	J	J	J	J	J	Q	
1200					G			J	J	J			J	J	J	J	J	Q	
1500								J	J	J			J	J	J	J	J	Q	
1800								J	J	J			J	J	M	M			
2200								J	J	N			J	J	M	P			
2700								J	J	N			J	J	M	P			
3300								J	J				J	J	M	P			
3900								J	J				J	J	M	P			
4700								J	J				J	J	M	P			
5600													J	J	M				
6800													M	M					
8200													M	M					
Cap (µF)														M	M				
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	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"

## Capacitance Range (NP0 Dielectric)

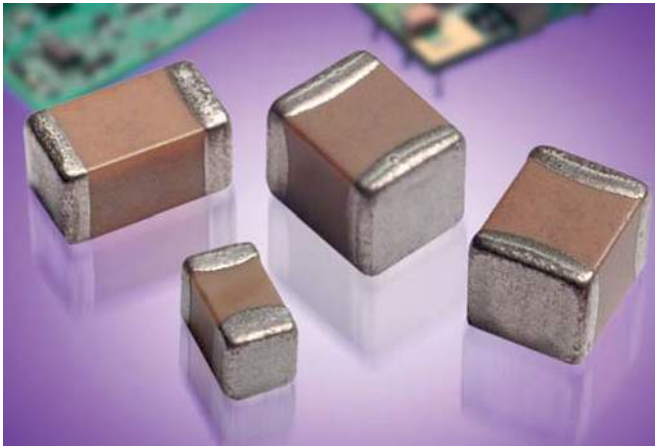
PREFERRED SIZES ARE SHADED

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	3.20 ± 0.20 (0.126 ± 0.008)					4.50 ± 0.30 (0.177 ± 0.012)					4.50 ± 0.30 (0.177 ± 0.012)			5.72 ± 0.25 (0.225 ± 0.010)		
(W) Width	mm	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)		
(t) Terminal	mm	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)		
WVDC		25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200
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					J											
	12					J											
	15					J											
	18					J											
	22					J											
	27					J											
	33					J											
	39					J											
	47					J											
	56					J											
	68					J											
	82					J											
	100					J											
	120					J											
	150					J											
	180					J											
	220					J											
	270					J											
	330					J											
	390					M											
	470					M											
	560	J	J	J	J	M											
	680	J	J	J	J	M											
	820	J	J	J	J	M											
	1000	J	J	J	J	M	K	K	K	K	M	M	M	M	M	M	P
	1200	J	J	J	M	M	K	K	K	K	M	M	M	M	M	M	P
	1500	J	J	J	M	M	K	K	K	K	M	M	M	M	M	M	P
	1800	J	J	J	M		K	K	K	K	M	M	M	M	M	M	P
	2200	J	J	J	Q		K	K	K	K	P	M	M	M	M	M	P
	2700	J	J	J	Q		K	K	K	P	Q	M	M	M	M	M	P
	3300	J	J	J			K	K	K	P	Q	M	M	M	M	M	P
	3900	J	J	M			K	K	K	P	Q	M	M	M	M	M	P
	4700	J	J	M			K	K	K	P	Q	M	M	M	M	M	P
	5600	J	J				K	K	M	P	X	M	M	M	M	M	P
	6800	J	J				K	K	M	X		M	M	M	M	M	P
	8200	J	J				K	M	M			M	M		M	M	P
Cap (µF)	0.010	J	J				K	M	M			M	M		M	M	P
	0.012	J	J				K	M				M	M		M	M	P
	0.015						M	M				M	M		M	M	Y
	0.018						M	M				P	M		M	M	Y
	0.022						M	M				P			M	Y	Y
	0.027						M	M				P			P	Y	Y
	0.033						M	M				P			P		
	0.039						M	M				P			P		
	0.047						M	M				P			P		
	0.068						M	M							P		
	0.082						M	M							Q		
	0.1														Q		
WVDC		25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200

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					EMBOSSSED							

# 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 2 for complete part number explanation)

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

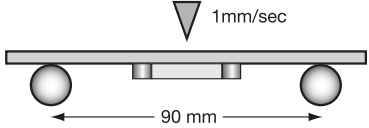
\*LD04 has the same CV ranges as LD03.

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”

## X8R – Specifications and Test Methods

Parameter/Test		X8R Specification Limits	Measuring Conditions	
<b>Operating Temperature Range</b>		-55°C to +150°C	Temperature Cycle Chamber	
<b>Capacitance</b>		Within specified tolerance	Freq.: 1.0 kHz ± 10%	
<b>Dissipation Factor</b>		≤ 2.5% for ≥ 50V DC rating ≤ 3.5% for 25V DC and 16V DC rating	Voltage: 1.0Vrms ± .2V	
<b>Insulation Resistance</b>		100,000MΩ or 1000MΩ - μF, whichever is less	Charge device with rated voltage for 120 ± 5 secs @ room temp/humidity	
<b>Dielectric Strength</b>		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.	
<b>Resistance to Flexure Stresses</b>	Appearance	No defects	Deflection: 2mm Test Time: 30 seconds 	
	Capacitance Variation	≤ ±12%		
	Dissipation Factor	Meets Initial Values (As Above)		
	Insulation Resistance	≥ Initial Value x 0.3		
<b>Solderability</b>		≥ 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	
<b>Resistance to Solder Heat</b>	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)		
<b>Thermal Shock</b>	Appearance	No visual defects	Step 1: -55°C ± 2°	30 ± 3 minutes
	Capacitance Variation	≤ ±7.5%	Step 2: Room Temp	≤ 3 minutes
	Dissipation Factor	Meets Initial Values (As Above)	Step 3: +125°C ± 2°	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	
<b>Load Life</b>	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)		
<b>Load Humidity</b>	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”

## Capacitance Range (X8R Dielectric)

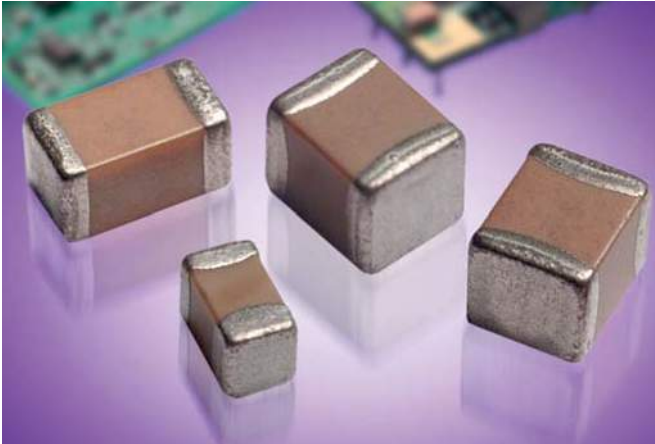
SIZE		LD03		LD05		LD06	
	WVDC	25V	50V	25V	50V	25V	50V
271	Cap 270	G	G				
331	(pF) 330	G	G	J	J		
471	470	G	G	J	J		
681	680	G	G	J	J		
102	1000	G	G	J	J	J	J
152	1500	G	G	J	J	J	J
182	1800	G	G	J	J	J	J
222	2200	G	G	J	J	J	J
272	2700	G	G	J	J	J	J
332	3300	G	G	J	J	J	J
392	3900	G	G	J	J	J	J
472	4700	G	G	J	J	J	J
562	5600	G	G	J	J	J	J
682	6800	G	G	J	J	J	J
822	8200	G	G	J	J	J	J
103	Cap 0.01	G	G	J	J	J	J
123	(µF) 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						
SIZE	WVDC	25V	50V	25V	50V	25V	50V
		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					EMBOSSSED							



# 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**

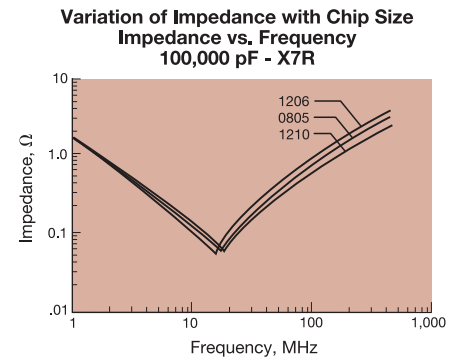
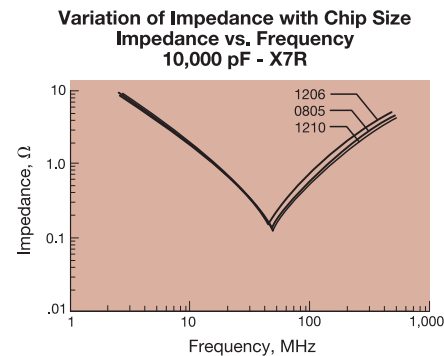
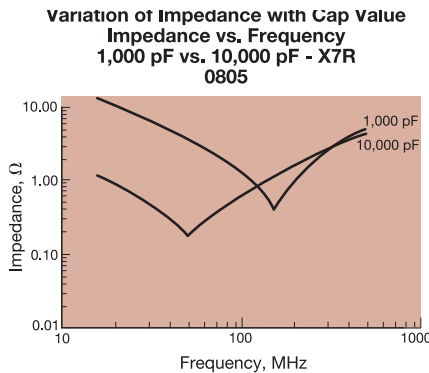
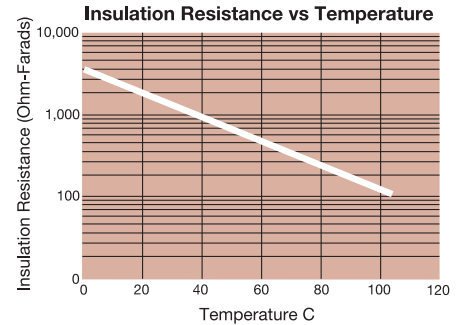
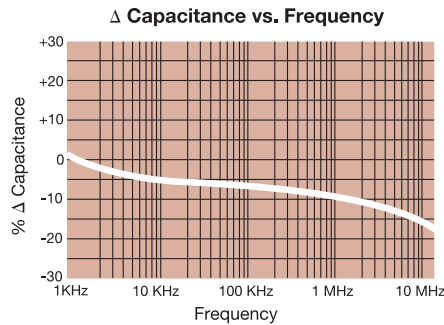
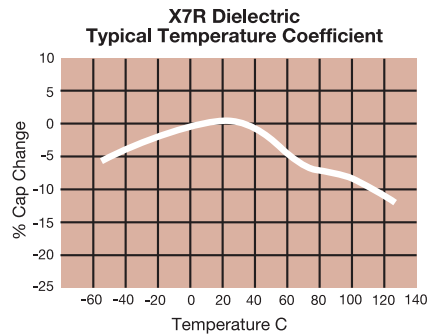
### PART NUMBER (see page 2 for complete part number explanation)

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

\*LD04 has the same CV ranges as LD03.

See FLEXITERM® section for CV options

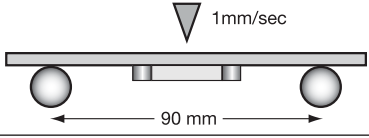
NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.  
Contact factory for non-specified capacitance values.





# MLCC Tin/Lead Termination “B”

## X7R – Specifications and Test Methods

Parameter/Test		X7R Specification Limits	Measuring Conditions	
<b>Operating Temperature Range</b>		-55°C to +125°C	Temperature Cycle Chamber	
<b>Capacitance</b>		Within specified tolerance		
<b>Dissipation Factor</b>		$\leq 10\%$ for $\geq 50\text{V}$ DC rating $\leq 12.5\%$ for 25V DC rating $\leq 12.5\%$ for 25V and 16V DC rating $\leq 12.5\%$ for $\leq 10\text{V}$ DC rating	Freq.: 1.0 kHz $\pm$ 10% Voltage: 1.0Vrms $\pm$ .2V	
<b>Insulation Resistance</b>		100,000M $\Omega$ or 1000M $\Omega$ - $\mu$ F, whichever is less	Charge device with rated voltage for 120 $\pm$ 5 secs @ room temp/humidity	
<b>Dielectric Strength</b>		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.	
<b>Resistance to Flexure Stresses</b>	Appearance	No defects	Deflection: 2mm Test Time: 30 seconds 	
	Capacitance Variation	$\leq \pm 12\%$		
	Dissipation Factor	Meets Initial Values (As Above)		
	Insulation Resistance	$\geq$ Initial Value x 0.3		
<b>Solderability</b>		$\geq 95\%$ 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	
<b>Resistance to Solder Heat</b>	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	$\leq \pm 7.5\%$		
	Dissipation Factor	Meets Initial Values (As Above)		
	Insulation Resistance	Meets Initial Values (As Above)		
	Dielectric Strength	Meets Initial Values (As Above)		
<b>Thermal Shock</b>	Appearance	No visual defects	Step 1: -55°C $\pm$ 2°	30 $\pm$ 3 minutes
	Capacitance Variation	$\leq \pm 7.5\%$	Step 2: Room Temp	$\leq 3$ minutes
	Dissipation Factor	Meets Initial Values (As Above)	Step 3: +125°C $\pm$ 2°	30 $\pm$ 3 minutes
	Insulation Resistance	Meets Initial Values (As Above)	Step 4: Room Temp	$\leq 3$ minutes
	Dielectric Strength	Meets Initial Values (As Above)	Repeat for 5 cycles and measure after 24 $\pm$ 2 hours at room temperature	
<b>Load Life</b>	Appearance	No visual defects	Charge device with 1.5 rated voltage ( $\leq 10\text{V}$ ) 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 $\pm$ 2 hours before measuring.	
	Capacitance Variation	$\leq \pm 12.5\%$		
	Dissipation Factor	$\leq$ Initial Value x 2.0 (See Above)		
	Insulation Resistance	$\geq$ Initial Value x 0.3 (See Above)		
	Dielectric Strength	Meets Initial Values (As Above)		
<b>Load Humidity</b>	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 and humidity for 24 $\pm$ 2 hours before measuring.	
	Capacitance Variation	$\leq \pm 12.5\%$		
	Dissipation Factor	$\leq$ Initial Value x 2.0 (See Above)		
	Insulation Resistance	$\geq$ Initial Value x 0.3 (See Above)		
	Dielectric Strength	Meets Initial Values (As Above)		

# MLCC Tin/Lead Termination “B”

## Capacitance Range (X7R Dielectric)

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	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	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	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)									
WDC	16	25	50	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	500
Cap (pF)																									
100																									
150																									
220			C																						
330								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		J	J	J	J	J	J	M
2200			C					G	G	G		J	J	J	J	J	J		J	J	J	J	J	J	M
3300		C	C					G	G	G		J	J	J	J	J	J		J	J	J	J	J	J	M
4700		C	C					G	G	G		J	J	J	J	J	J		J	J	J	J	J	J	M
6800	G	C	C					G	G	G		J	J	J	J	J	J		J	J	J	J	J	J	P
Cap (µF)																									
0.010	C	C						G	G	G		J	J	J	J	J	J		J	J	J	J	J	J	P
0.015	C							G	G	G		J	J	J	J	J	J		J	J	J	J	J	J	M
0.022	C							G	G	G		J	J	J	J	J	J		J	J	J	J	J	J	M
0.033	C							G	G	G		J	J	J	J	N	N		J	J	J	J	J	J	M
0.047							G	G	G	G		J	J	J	J	N	N		J	J	J	J	J	J	M
0.068							G	G	G	G		J	J	J	J	N	N		J	J	J	J	J	J	P
0.10		C*				G	G	G	G	G		J	J	J	J	N	N		J	J	J	J	J	P	P
0.15				G	G	G	G	G	G	G		J	J	J	J	N	N		J	J	J	J	J	J	
0.22				G	G	G	G	G	G	G		J	J	J	J	N	N		J	J	J	J	J	J	Q
0.33												N	N	N	N	N	N		J	J	M	P	Q	Q	
0.47							J*					N	N	N	N	N	N		M	M	M	P	Q	Q	
0.68							J*	J*				N	N	N	N	N	N		M	M	M	Q	Q	Q	
1.0												N	N	N*					M	M	Q	Q	Q	Q	
1.5																			P	Q	Q	Q			
2.2			J*												P*				Q	Q	Q				
3.3																									
4.7													P*	P*					Q*	Q*	Q*				
10												P*	P						Q*	Q*	Q*	Q			
22																			Q*						
47																									
100																									
WDC	16	25	50	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	500

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

# MLCC Tin/Lead Termination “B”

## Capacitance Range (X7R Dielectric)

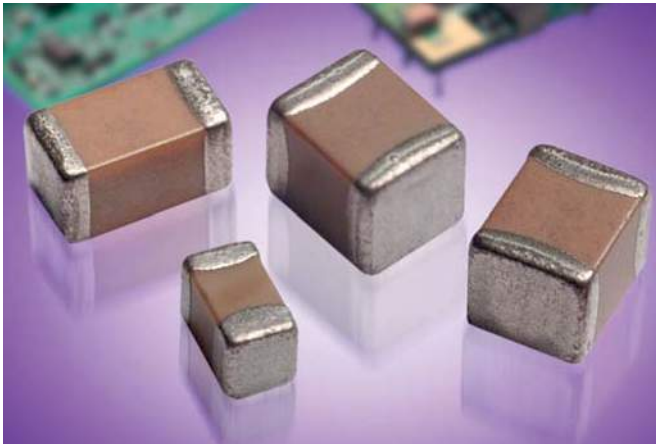
PREFERRED SIZES ARE SHADED

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	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)		5.70 ± 0.40 (0.225 ± 0.016)			5.72 ± 0.25 (0.225 ± 0.010)		
(W) Width	mm (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	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)		0.64 ± 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	P	M	M		X	X	X	M	P
	0.022	J	J	J	J	J	J	Q	K	K	K	P	M	M		X	X	X	M	P
	0.033	J	J	J	J	J	J	Q	K	K	K	X	M	M		X	X	X	M	P
	0.047	J	J	J	J	J	J		K	K	K	Z	M	M		X	X	X	M	P
	0.068	J	J	J	J	J	M		K	K	K	Z	M	M		X	X	X	M	P
	0.10	J	J	J	J	J	M		K	K	K	Z	M	M		X	X	X	M	P
	0.15	J	J	J	J	M	Z		K	K	P		M	M		X	X	X	M	P
	0.22	J	J	J	J	P	Z		K	K	P		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		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	X
	2.2	X	X	Z	Z	Z			Z	Z						X	X		M	
	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

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					EMBOSSSED							

# 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 2 for complete part number explanation)

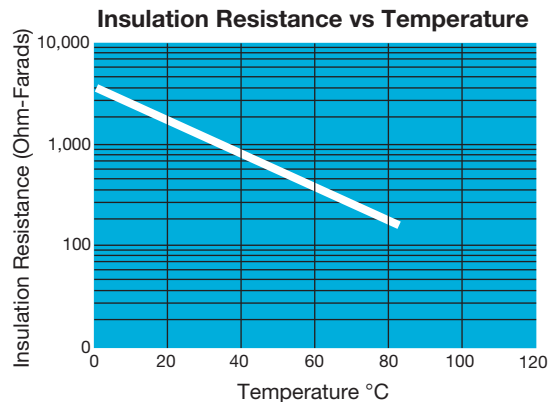
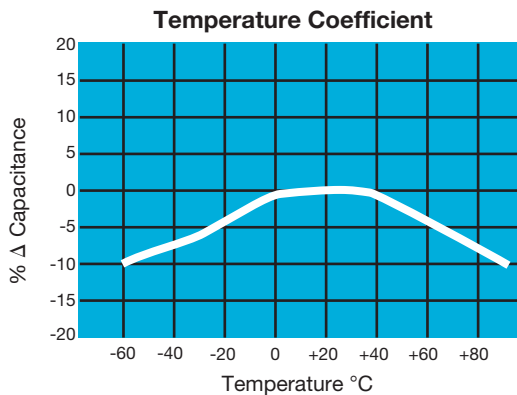
LD05	5	D	101	J	A	B	2	A
<b>Size</b>	<b>Voltage</b>	<b>Dielectric</b>	<b>Capacitance Code (In pF)</b>	<b>Capacitance Tolerance</b>	<b>Failure Rate</b>	<b>Terminations</b>	<b>Packaging</b>	<b>Special Code</b>
LD02 - 0402 LD03 - 0603 LD04 - 0504* LD05 - 0805 LD06 - 1206 LD10 - 1210 LD12 - 1812 LD13 - 1825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

\*LD04 has the same CV ranges as LD03.

See FLEXITERM® section for CV options

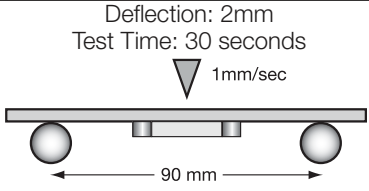
NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.  
Contact factory for non-specified capacitance values.

### TYPICAL ELECTRICAL CHARACTERISTICS



# MLCC Tin/Lead Termination “B”

## X5R – Specifications and Test Methods

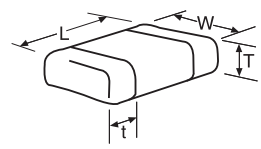
Parameter/Test		X5R Specification Limits	Measuring Conditions	
<b>Operating Temperature Range</b>		-55°C to +85°C	Temperature Cycle Chamber	
<b>Capacitance</b>		Within specified tolerance	Freq.: 1.0 kHz ± 10% Voltage: 1.0Vrms ± .2V For Cap > 10 µF, 0.5Vrms @ 120Hz	
<b>Dissipation Factor</b>		≤ 2.5% for ≥ 50V DC rating ≤ 3.0% for 25V, 35V DC rating ≤ 12.5% Max. for 16V DC rating and lower Contact Factory for DF by PN		
<b>Insulation Resistance</b>		10,000MΩ or 500MΩ - µF, whichever is less	Charge device with rated voltage for 120 ± 5 secs @ room temp/humidity	
<b>Dielectric Strength</b>		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)	
<b>Resistance to Flexure Stresses</b>	Appearance	No defects	Deflection: 2mm Test Time: 30 seconds 	
	Capacitance Variation	≤ ±12%		
	Dissipation Factor	Meets Initial Values (As Above)		
	Insulation Resistance	≥ Initial Value x 0.3		
<b>Solderability</b>		≥ 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	
<b>Resistance to Solder Heat</b>	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)		
<b>Thermal Shock</b>	Appearance	No visual defects	Step 1: -55°C ± 2°	30 ± 3 minutes
	Capacitance Variation	≤ ±7.5%	Step 2: Room Temp	≤ 3 minutes
	Dissipation Factor	Meets Initial Values (As Above)	Step 3: +85°C ± 2°	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	
<b>Load Life</b>	Appearance	No visual defects	Charge device with 1.5X rated voltage in test chamber set at 85°C ± 2°C for 1000 hours (+48, -0). Note: Contact factory for *optional specification part numbers that are tested at < 1.5X rated voltage.  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)		
<b>Load Humidity</b>	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”

## Capacitance Range (X5R Dielectric)

PREFERRED SIZES ARE SHADED

SIZE	LD02	LD03	LD05	LD06	LD10	LD12	
<b>Soldering</b>	Reflow/Wave	Reflow/Wave	Reflow/Wave	Reflow/Wave	Reflow/Wave		
<b>Packaging</b>	All Paper	All Paper	Paper/Embossed	Paper/Embossed	Paper/Embossed		
(L) Length	mm (in.)	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	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	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 16 25 35 50	6.3 10 25 50	
Cap (pF)	100 150 220	C					
	330 470 680	C C C					
	1000 1500 2200	C C C					
	3300 4700 6800	C	G G				
Cap (µF)	0.010 0.015 0.022	C C C	G G G G	N			
	0.033 0.047 0.068	C C C	G G G G	N N N N			
	0.10 0.15 0.22	C C*	G G G	N N N N	Q		
	0.33 0.47 0.68	C* C*	G G G	N N N N	Q Q	X	
	1.0 1.5 2.2	C* C* C*	G G G J*	N N N P*	Q Q	X X X	
	3.3 4.7 10		G* J* J* J* K*	N N N N* P P	Q Q	Z X	
	22 47 100			P* P*	X X X X X	Z Z Z Z	Z
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 16 25 35 50	6.3 10 25 50	
<b>SIZE</b>	<b>LD02</b>	<b>LD03</b>	<b>LD05</b>	<b>LD06</b>	<b>LD10</b>	<b>LD12</b>	



Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
<b>Max. Thickness</b>	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					EMBOSSSED							

**\*Optional Specifications – Contact factory**

NOTE: Contact factory for non-specified capacitance values