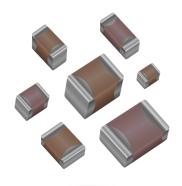
MLCC Tin/Lead Termination "B" (LD Series)

COG (NPO) - 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)

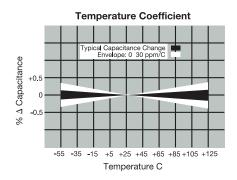
LD05 5	<u>A</u>	101	J	<u>A</u>	<u>B</u>	2	<u>A</u>
Size Volta LD02 - 0402 6.3V LD03 - 0603 10V LD04 - 0504* 16V LD05 - 0805 25V LD06 - 1206 35V LD10 - 1210 35V LD12 - 1812 50V LD13 - 1825 100V LD14 - 2225 200V	= 6	Capacitance Code (In pF) 2 Sig. Digits + Number of Zeros	Capacitance Tolerance B = ±.10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

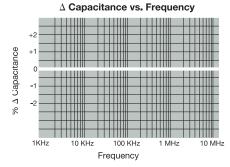
 $M = \pm 20\%$

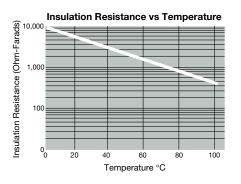
*LD04 has the same CV ranges as LD03.

See FLEXITERM® section for CV options

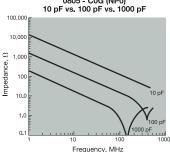
NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers. Contact factory for non-specified capacitance values.



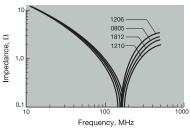




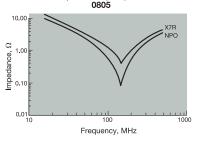
Variation of Impedance with Cap Value Impedance vs. Frequency 0805 - COG (NP0) 10 pF vs. 100 pF vs. 1000 pF







Variation of Impedance with Ceramic Formulation Impedance vs. Frequency 1000 pF - C0G (NP0) vs X7R









Parame	ter/Test	NP0 Specification Limits	Measuring Conditions
Operating Tem	perature Range	-55°C to +125°C	Temperature Cycle Chamber
Capac	itance	Within specified tolerance	Freq.: 1.0 MHz ± 10% for cap ≤ 1000 pF
(2	<30 pF: Q≥ 400+20 x Cap Value ≥30 pF: Q≥ 1000	1.0 kHz ± 10% for cap > 1000 pF Voltage: 1.0Vrms ± .2V
Insulation	Resistance	100,000ΜΩ or 1000ΜΩ - μF, whichever is less	Charge device with rated voltage for 60 ± 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.
	Appearance	No defects	Deflection: 2mm
Resistance to Flexure	Capacitance Variation	±5% or ±.5 pF, whichever is greater	Test Time: 30 seconds 7 1mm/sec
Stresses	Q	Meets Initial Values (As Above)	
	Insulation Resistance	≥ Initial Value x 0.3	90 mm
Solder	rability	≥ 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
	Appearance	No defects, <25% leaching of either end terminal	
	Capacitance Variation	≤ ±2.5% or ±.25 pF, whichever is greater	Dia during in contrasting allow at 00000 for 00
Resistance to Solder Heat	Q	Meets Initial Values (As Above)	Dip device in eutectic solder at 260°C for 60 seconds. Store at room temperature for 24 ± 2
Solder Fleat	Insulation Resistance	Meets Initial Values (As Above)	hours before measuring electrical properties.
	Dielectric Strength	Meets Initial Values (As Above)	
	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
Thermal Shock	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
	Dielectric Strength	Meets Initial Values (As Above)	Repeat for 5 cycles and measure after 24 hours at room temperature
	Appearance	No visual defects	
	Capacitance Variation	≤ ±3.0% or ± .3 pF, whichever is greater	Charge device with twice rated voltage in test chamber set at 125°C ± 2°C
Load Life	Q	≥ 30 pF: Q≥ 350 ≥10 pF, <30 pF: Q≥ 275 +5C/2 <10 pF: Q≥ 200 +10C	for 1000 hours (+48, -0). Remove from test chamber and stabilize at room
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)	temperature for 24 hours before measuring.
	Dielectric Strength	Meets Initial Values (As Above)	
	Appearance	No visual defects	
	Capacitance Variation	≤ ±5.0% or ± .5 pF, whichever is greater	Store in a test chamber set at 85°C ± 2°C/ 85% ±
Load Humidity	Q	≥ 30 pF: Q≥ 350 ≥10 pF, <30 pF: Q≥ 275 +5C/2 <10 pF: Q≥ 200 +10C	5% relative humidity for 1000 hours (+48, -0) with rated voltage applied.
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)	Remove from chamber and stabilize at room temperature for 24 ± 2 hours before measuring.
	Dielectric Strength	Meets Initial Values (As Above)	

C0G (NP0) - Capacitance Range



PREFERRED SIZES ARE SHADED

							=										l		
SIZI	E		LD02			LD	003				LD05					LD0	6		
Solder	ring	Re	flow/Wa	ive		Reflow	v/Wave			Re	flow/Wa	ve				Reflow/\	Wave		
Packag	ging mm		All Pape .00 ± 0.1				aper ± 0.15				er/Embos .01 ± 0.2				Pa	aper/Eml			
(L) Length	(in.)	(0.0	040 ± 0.0	04)		(0.063	± 0.006)			(0.0	79 ± 0.0	08)			(0.126 ± 0	0.008)		
W) Width	mm (in.)	(0.0	.50 ± 0.1 020 ± 0.0	04)		(0.032	± 0.15 ± 0.006)			(0.0	.25 ± 0.2)49 ± 0.0	08)			(1.60 ± 0 0.063 ± 0	0.008)		
(t) Terminal	mm (in.)		.25 ± 0.1 010 ± 0.0				± 0.15 ± 0.006)				.50 ± 0.2 020 ± 0.0				(0.50 ± 0 0.020 ± 0			
Сар	WVDC 0.5	16 C	25 C	50	16 G	25 G	50	100	16 J	25	50	100	200	16	25	50	100	200	500
(pF)	1.0	С	С	C	G	G	G G	G G	J	J	J	J	J	J	J	J	J	J	J
	1.2 1.5	C C	C	C	G G	G G	G G	G	J	J	J J	J	J	J	J	J	J	J	J
	1.8 2.2	С	С	С	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	2.7	C C	C C	C	G G	G G	G G	G	7 7	7 7	J	J	7 7	J	J	J	7 7	J	J
	3.3 3.9	C	C	C	G	G G	G G	G	J	J	J	J	J	J	J	J	J	J	J
	4.7	С	С	С	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	5.6 6.8	C	C	C C	G G	G G	G G	G G	J	J	J	J	J	J	J	J	J	J	J
	8.2 10	C C	C	C	G G	G G	G G	G	J	J	J	J	J	J	J	J	J	J	J J
	12	С	С	С	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	15 18	C	C	C	G	G G	G G	G	J	J	J	J	J	J	J	J	J	J	J
	22 27	C	C	C	G	G G	G G	G	J	J	J	J	J J	J J	J	J	J	J	J J
	33	С	С	С	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	39 47	C C	C C	C	G G	G G	G G	G G	J	J	J	J	J	J	J	J	J	J	J
	56 68	C	C	C	G	G G	G G	G	J	J	J	J	J	J	J	J	J	J	J J
	82	С	С	С	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	100 120	C	C C	C	G	G G	G G	G G	J	J	J	J	J	J	J	J	J	J	J
	150 180	C	C	C	G	G G	G G	G	J	J	J	J	J	J	J	J	J	J	J J
	220	С	С	С	G	G	G	G	J	J	J	J	J	J	J	J	J	J	М
	270 330	C C	C	C	G	G G	G G	G	J	J	J	J	M M	J	J	J	J	J	M
	390 470	C	C	C	G	G G	G G	G	J	J	J	J	M M	J	J	J	J	J	M M
	560 680				G G	G G	G G		J	J	J	J	М	J	J	J	J	J	M P
	820				G	G	G		J	J	J	J		J	Ĵ	J	J	М	F
	1000 1200				G	G G	G		J	J	J	J		J	J	J	J	Q Q	
	1500 1800								J	J	J			J	J	J M	M M	Q	
	2200								J	J	N			J	J	М	Р		
	2700 3300								J	J	N			J	J	M M	P P		
	3900 4700								J	J				J	J	M M	P P		
	5600													J	J	М			
	6800 8200													M M	M M				
Cap (pF)	0.010 0.012													М	М				
	0.015		-	_		«	l _												
	0.022		~	-[W-W-													
	0.027		(الل	J ⊤ –											\vdash	
	0.039 0.047		`																
	0.068		†		t		_												
	0.082																		
	WVDC	16	25	50	16	25	50	100	16	25	50	100	200	16	25	50	100	200	500
	SIZE		LD02			LD	03				LD05					LD0	6		
Letter Max.	0.33	0.5		E 0.71	G 0.90	0	J 1.94	1.02	M 1.27	, ,	N 1.40	P 1.52	1.7		X 2.29	Y 2.54		Z 2.79	
Thickness	(0.013)	(0.0	22) ((0.028)	(0.035		.037)	(0.040)	(0.05		.055)	(0.060)	(0.0	70)	(0.090)	(0.10		0.110)	
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C0G (NP0) - Capacitance Range



PREFERRED SIZES ARE SHADED

	_ 1																
SIZ				LD10 Reflow On	lv				LD12 Reflow Or	ılı			LD13 Reflow Only			LD14 Reflow Only	
Packag				er/Embo	<u> </u>				I Emboss				All Embossed			All Embossed	
(L) Length	mm		- ;	3.20 + 0.2	0				4.50 ± 0.3	0			4.50 ± 0.30			5.72 ± 0.25	
-	(in.) mm			126 ± 0.0 2.50 ± 0.2					177 ± 0.0 3.20 ± 0.2				(0.177 ± 0.012) 6.40 ± 0.40)	(0.225 ± 0.010) 6.35 ± 0.25)
W) Width	(in.) mm			098 ± 0.0					126 ± 0.0				0.252 ± 0.016 0.61 ± 0.36)	(0.250 ± 0.010) 0.64 ± 0.39)
(t) Terminal	(in.)		(0.	020 ± 0.0	10)			(0.	024 ± 0.0	14)			(0.024 ± 0.014)			0.025 ± 0.015)	
Сар	WVDC 0.5	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200
(pF)	1.0																
	1.2 1.5																
	1.8 2.2															>	√ \//
	2.7														_ <_\		
	3.3 3.9																
	4.7 5.6														_ `	$\overline{}$	
	6.8															t	
	8.2 10					J											
	12					J											
	15 18			 		J		+-+				+					
	22 27					J											
	33					J											
	39 47					J											
	56 68					J											
	82					J											
	100 120					J											
	150					J											
	180 220					J											
	270 330					J											
	390					М											
	470 560	J	J	J	J	M M											
	680	J	J	J	J	М											
	820 1000	J	J	J	J	M M	K	K	K	K	М	M	М	М	М	М	Р
	1200 1500	J J	J	J	M M	M M	K K	K	K K	K K	M M	M M	M M	M M	M M	M M	P P
	1800	J	J	J	М		K	K	K	K	М	М	М	М	М	М	P
	2200 2700	J	J	J	Q Q		K K	K	K K	K P	P Q	M M	M M	M M	M M	M M	P P
	3300 3900	J J	J	J M			K K	K K	K K	P P	Q	M M	M M	M M	M M	M M	P P
	4700	Ĵ	J	M			K	K	K	P	Q	М	М	М	М	М	Р
	5600 6800	٦	J				K K	K K	M M	P X	Х	M M	M M	M M	M M	М	P P
Сар	8200 0.010	J J	J				K	M M	M M			M M	M M		M M	M M	P P
(pF)	0.012	J	J				K	М	IVI			М	М		М	М	Р
	0.015 0.018						M	M				M P	M		M M	M M	Y
	0.022						М	М				Р			М	Υ	Υ
	0.027 0.033						M	M				P P			P P	Υ	Υ
	0.039 0.047						M M	M M				P P			P P		
	0.068						М	М							Р		
	0.082 0.1		L_	L			М	М							Q Q		
	WVDC	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200
SIZ								LD12				LD13			LD14		
Letter Max.	0.33	0.5		E 0.71	G 0.90	J 0.9		1.02	M 1.27		.40	P 1.52	Q > 1.78 2.1		2.79	-	
Max. Thickness	(0.013)	(0.02		0.028)	(0.035)	(0.03		(0.040)	(0.050		055)		0.070) (0.0				
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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	<u>5</u>	F	101	<u>J</u>	<u>A</u>	<u>B</u>	2	<u>A</u>
Size LD02 - 0402 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 X8R = F	Capacitance Code (In pF) 2 Sig. Digits + Number of Zeros	Capacitance Tolerance 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%	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*	Special Code 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.





Paramet	ter/Test	X8R Specification Limits	Measuring (Conditions
Operating Temp	perature Range	-55°C to +150°C	Temperature C	ycle Chamber
Capac	itance	Within specified tolerance	1 O I	U- 1 100/
Dissipatio	on Factor	≤ 2.5% for ≥ 50V DC rating ≤ 3.5% for 25V DC and 16V DC rating	Freq.: 1.0 k Voltage: 1.0	
Insulation I	Resistance	100,000MΩ or 1000MΩ - μF, whichever is less	Charge device with 120 ± 5 secs @ roo	
Dielectric	Strength	No breakdown or visual defects	Charge device with 250 1-5 seconds, w/charge limited to 50 Note: Charge device with for 500V	and discharge current mA (max) n 150% of rated voltage
	Appearance	No defects	Deflectio	n: 2mm
Resistance to	Capacitance Variation	≤ ±12%	Test Time: 3	-
Flexure Stresses	Dissipation Factor	Meets Initial Values (As Above)		
	Insulation Resistance	≥ Initial Value x 0.3	90 r	mm —
Solder	ability	≥ 95% of each terminal should be covered with fresh solder	Dip device in eutection for 5.0 ± 0.9	solder at 230 ± 5°C seconds
	Appearance	No defects, <25% leaching of either end terminal		
	Capacitance Variation	≤ ±7.5%	Dia desire in conservation	- Ll + 00000 for 00
Resistance to Solder Heat	Dissipation Factor	Meets Initial Values (As Above)	Dip device in eutectic s seconds. Store at room	temperature for 24 ± 2
	Insulation Resistance	Meets Initial Values (As Above)	hours before measuring	g electrical properties.
	Dielectric Strength	Meets Initial Values (As Above)		
	Appearance	No visual defects	Step 1: -55°C ± 2°	30 ± 3 minutes
	Capacitance Variation	≤ ±7.5%	Step 2: Room Temp	≤ 3 minutes
Thermal Shock	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 24 ± 2 hours at ro	
	Appearance	No visual defects		
	Capacitance Variation	≤ ±12.5%	Charge device with 1.5 r test chamber set	ated voltage (≤ 10V) in
Load Life	Dissipation Factor	≤ Initial Value x 2.0 (See Above)	for 1000 hou	
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)	Remove from test chamb temperature for 24 ± 2 h	
	Dielectric Strength	Meets Initial Values (As Above)		
	Appearance	No visual defects		
	Capacitance Variation	≤ ±12.5%	Store in a test chamber s 5% relative humidi	
Load	Dissipation Factor	≤ Initial Value x 2.0 (See Above)	(+48, -0) with rated	
Humidity	Insulation Resistance	≥ Initial Value x 0.3 (See Above)	Remove from chamber temperature an	d humidity for
Soldera Resistance to Solder Heat Thermal Shock Load Life	Dielectric Strength	Meets Initial Values (As Above)	24 ± 2 hours bef	ore measuring.



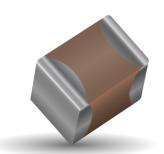


	SIZ	ΖE			LDC)3		L	D05			LD06	
		WVD	C	2	5V	50V		25V		50V	25V		50V
271	Cap	270			3	G							
331	(pF)	330		(3	G		J		J			
471		470		(3	G		J		J			
681		680		(3	G		J		J			
102		1000		(3	G		J		J	J		J
152		1500			3	G		J		J	J		J
182		1800			3	G		J		J	J		J
222		2200			3	G		J		۲	J		J
272		2700		(3	G		J		J	J		J
332		3300		(3	G		J		J	J		J
392		3900		(3	G		J		J	J		J
472		4700		(3	G		J		J	J		J
562		5600		(3	G		J		J	J		J
682		6800		1	3	G		J		J	J		J
822	Cap	8200			3	G		J		J	J		J
103	(µF)	0.01			3	G		J		J	J		J
123		0.012			3	G		J		J	J		J
153		0.015		1	3	G		J		J	J		J
183		0.018			3	G		J		J	J		J
223		0.022			3	G		J		J	J		J
273		0.022			3	G		J		J	J		J
333		0.033			3	G		J		J	J		J
393		0.039			3	G		J		J	J		J
473		0.047			3	G		J		J	J		J
563		0.056			3			N		N	М		М
683		0.068			3			N		N	М		М
823		0.082						N		N	М		М
104		0.1						N		N	М		М
124		0.12			ĺ			N		N	М		М
154		0.15						N		N	М		М
184		0.18		İ				N			М		М
224		0.22						N			M		M
274		0.27									М		М
334		0.33					i				М		М
394		0.39		İ							M		
474		0.47									M		
684		0.68		1									
824	1	0.82		İ									
105		1											
		WVD		2	5V	50V		25V		50V	25V		50V
	SIZ				LDC				D05		LD06		
1 - 11 - 11		0				l v					1 V	I V	
Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z

Letter	Α	С	E	G	J	K	М	N	Р	Q	Х	Υ	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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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)

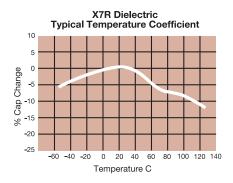
<u>LD05</u> <u>5</u>	<u>c</u>	101		A	B	2	<u>A</u>
	Dielectric X7R = C	Capacitance Code (In pF) 2 Sig. Digits + Number of Zeros	Capacitance Tolerance B = ±.10 pF (<10pF) C = ±.25 pF (<10pF) D = ±.50 pF (<10pF) F = ±1% (≥ 10 pF) G = ±2% (≥ 10 pF) J = ±5% K = ±10%	Failure Rate A = Not Applicable	Terminations B = 5% min lead X = FLEXITERM® with 5% min lead** **X7R only	Packaging 2 = 7" Reel 4 = 13" Reel Contact Factory For Multiples*	Special Code A = Std. Product

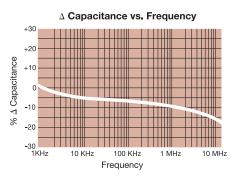
^{*}LD04 has the same CV ranges as LD03.

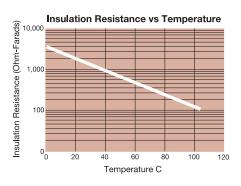
See FLEXITERM® section for CV options

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.

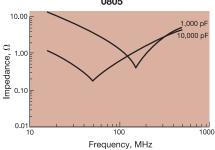
Contact factory for non-specified capacitance values.

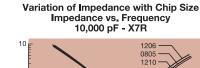


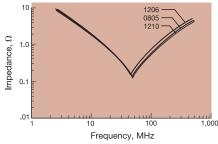




Variation of Impedance with Cap Value Impedance vs. Frequency 1,000 pF vs. 10,000 pF - X7R 0805







Impedance vs. Frequency
100,000 pF - X7R

10
1206
0805
1210
0.1

Frequency, MHz

Variation of Impedance with Chip Size





Parame	ter/Test	X7R Specification Limits	Measuring (Conditions
Operating Tem	perature Range	-55°C to +125°C	Temperature C	ycle Chamber
Capac	Capacitance Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Solderability Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Dissipation Factor Strength Appearance Capacitance Variation Dissipation Factor Dissipation Factor Dissipation Factor Factor Dissipation Factor	Within specified tolerance		
Dissipati	on 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 k Voltage: 1.0'	
Insulation	Capacitance Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Solderability Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance	100,000MΩ or 1000MΩ - μF, whichever is less	Charge device with 120 ± 5 secs @ roo	
Dielectric	: Strength	No breakdown or visual defects	Charge device with 250 1-5 seconds, w/charge limited to 50 Note: Charge device with for 500V	and discharge current mA (max) n 150% of rated voltage
	Appearance	No defects	Deflectio	n: 2mm
Resistance to		≤ ±12%	Test Time: 3	0 seconds 7 1mm/sec
Stresses	Capacitance Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Solderability Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance	Meets Initial Values (As Above)		
		≥ Initial Value x 0.3	90 n	
Solder	rability	≥ 95% of each terminal should be covered with fresh solder	Dip device in eutectic for 5.0 ± 0.5	
		No defects, <25% leaching of either end terminal		
		≤ ±7.5%		
Resistance to Solder Heat	Dissipation Factor	Meets Initial Values (As Above)	Dip device in eutectic s seconds. Store at room	temperature for 24 ± 2
		Meets Initial Values (As Above)	hours before measuring	g electrical properties.
		Meets Initial Values (As Above)		
		No visual defects	Step 1: -55°C ± 2°	30 ± 3 minutes
	Capacitance Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Solderability Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Insulation Resistance Dielectric Dielectric	≤ ±7.5%	Step 2: Room Temp	≤ 3 minutes
Thermal Shock		Meets Initial Values (As Above)	Step 3: +125°C ± 2°	30 ± 3 minutes
		Meets Initial Values (As Above)	Step 4: Room Temp	≤ 3 minutes
		Meets Initial Values (As Above)	Repeat for 5 cycles 24 ± 2 hours at ro	
	· ·	No visual defects		
		≤ ±12.5%	Charge device with 1.5 r	ated voltage (≤ 10V) in
Load Life		≤ Initial Value x 2.0 (See Above)	test chamber set for 1000 hou	
		≥ Initial Value x 0.3 (See Above)	Remove from test chamb temperature for 24 ± 2 ho	
		Meets Initial Values (As Above)		
	Appearance	No visual defects		
	Variation	≤ ±12.5%	Store in a test chamber s 5% relative humidi	
	•	≤ Initial Value x 2.0 (See Above)	(+48, -0) with rated	
numany		≥ Initial Value x 0.3 (See Above)	Remove from chamber temperature an	d humidity for
		Meets Initial Values (As Above)	24 ± 2 hours bef	ore measuring.

X7R - Capacitance Range



PREFERRED SIZES ARE SHADED

						63																	1			
SIZI	E		LD02					LD03	3						LD05	;						LD	06			
Solder	ing	Ref	flow/W	ave			Ref	low/V	/ave					Ref	low/W	ave						Reflow	/Wave			
Packag	ging	Α	II Pap	er			Α	II Par	er					Paper	/Emb	osse	d				Pa	per/Er	nbos	sed		
(L) Length	mm		00 ± 0.					60 ± 0							01 ± 0.							3.20 ±				
() - 3-	(in.) mm		40 ± 0. 50 ± 0.					63 ± 0 81 ± 0							79 ± 0. 25 ± 0.						(0.126 ± 1.60		3)		
W) Width	(in.)		30 ± 0. 20 ± 0.					32 ± 0							49 ± 0.						(1.00 ±		3)		
(t) Terminal	mm	0.	25 ± 0.	15			0.3	35 ± 0	.15					0.	50 ± 0.	.25						0.50 ±	0.25			
· /	(in.)		10 ± 0.		60	10		14 ± 0		100	1000	6.0	10		20 ± 0.		100	Loon	6.0	1 10		0.020 ±			Loop	L 500
Cap	100	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
(pF)	150																								'	
(p.)	220			С																					'	
	330			С					G	G	G		J	J	J	J	J	J							\Box	K
	470			С					G	G	G		J	J	J	J	J	J							'	K
	680			С					G	G	G		J	J	J	J	J	J							<u> </u>	K
	1000			С					G	G	G		J	J	J	J	J	J								K
	1500 2200			C					G G	G			J	J	J	J	J	J		J	J	J	J	J	J	M M
	3300		С	C					G	G			J	J	J	J	J	J		J	J	J	J	J	J	M
	4700		C	C					G	G			J	Ĵ	Ĵ	Ĵ	Ĵ	Ĵ		J	Ĵ	Ĵ	J	J	Ĵ	М
	6800	С	С						G	G		İ	J	J	J	J	J	J	İ	J	J	J	J	J	J	Р
Сар	0.010	С	С						G	G			J	J	J	J	J	J		J	J	J	J	J	J	Р
(μF)	0.015	С						G	G				J	J	J	J	J	J		J	J	J	J	J	M	
	0.022	С						G	G				J	J	J	J	J	N		J	J	J	J	J	M	\vdash
	0.033 0.047	С					G	G	G				J	J	J	J	N N			J	J	J	J	J	M	
	0.047						G	G	G				J J	J	J	J	N			J J	J	J	J	.1	P	
	0.10		C*			G	G	G	G				J	J	J	J	N			J	J	J	J	P	P	\vdash
	0.15				G	G						İ	J	J	J	N	N		İ	J	J	J	J	Q		
	0.22				G	G							J	J	N	N	N			J	J	J	J	Q		
	0.33												N	N	N	N	N			J	J	М	Р	Q		
	0.47							J*					N	N	N	N	N			M	M	M	P 0	Q		
	0.68 1.0					J*	J*						N N	N	N N*					M	M	Q	0	Q	_	\vdash
	1.5					J	J						IN	IN	IN					P	Q	Q	Ų	Ų	1 '	
	2.2				J*	ĺ		l	l						P*	ĺ			ĺ	Q	Q	Q	l	l		
	3.3								İ																	П
	4.7												P*	P*						Q*	Q*	Q*				
	10				ļ							P*	Р					_	0+	Q*	Q*	Q			<u> </u>	\sqcup
	22 47																		Q*							
	100																									
	WVDC	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
	SIZE		LD02					LD03							LD05							LD	06			
					_							_														
Letter	Α		С		E		G		J		K		M	N		Р		Q		Χ		Υ		Z		
Max.	0.33		0.56		0.71		0.90).94		.02		27	1.4		1.5		1.78		2.29	, ,	2.54		2.79		
Thickness	(0.013)) ((0.022)		0.028)	_ \ -	.035)	(0	.037)	(0.0	U40)	(0.0	050)	(0.0	55)	(0.06	- /	(0.07)	U)	(0.090)) (0.100) (0).110)	4	
				P	APER	, (= = =)										E	MBOS	SED								

= Under Development

X7R - Capacitance Range

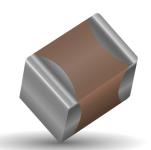


PREFERRED SIZES ARE SHADED

SIZE					LD10					LD	12		LD1	3		LD	20		LD)14
Solderin	ng			R	teflow Only					Reflov	v Only		Reflow	Only		Reflo	v Only		Reflo	w Only
Packagir	ng			Pap	er/Emboss	ed				All Emb	ossed		All Embo	ssed		All Eml	bossed		All Em	bossed
(L) Length	mm				3.20 + 0.20					4.50 ±			4.50 ± 0			5.70 :				± 0.25
-	(in.) mm				126 ± 0.00 2.50 ± 0.20	8)				(0.177 ± 3.20 ±			(0.177 ± 0			(0.224 :	± 0.020) ± 0.40			± 0.010) ± 0.25
W) Width	(in.)			(0.0	098 ± 0.00	8)				$(0.126 \pm$	(800.0		(0.252 ±			(0.197 :	± 0.016)		(0.250 :	± 0.010)
(t) Terminal	mm				0.50 ± 0.25	2)				0.61			0.61 ± 0			0.64 :				± 0.39
WVDC	(in.)	10	16	25	020 ± 0.01	100	200	500	50	(0.024 ±	200	500	(0.024 ± 0	100	25	(0.025 :	100	200	50	± 0.015) 100
Сар	100			1 20	"	100	200		- 00			- 555	- 55			00				1
(pF)	150																_[\sim W	•
	220 330															+ <	<u> </u>		J).	ÎT :
	470)) .	_J	<u>*</u>
	680																	-		
	1000															Τ		₹ T]
	1500	J	J	J	J	J	J	M												
	2200 3300	J	J	J	J		J	M												
	4700	Ĵ	Ĵ	Ĵ	Ĵ	Ĵ	Ĵ	M												
	6800	J	J	J	J	J	J	М												
	0.010 0.015	J	J	J	J	J	J	M P	K K	K K	K	K P	M	M		X	X	X X	M	P P
	0.013	J	J	J	J	J	J	0	K	K	K K	P	M	M M		X	X	X	M 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	М	М		X	X	Х	M	P
	0.068	J	J	J	J	J J	M M		K	K K	K	Z	M	M		X	X	X	M	P
	0.10	J	J	J	J	M	Z		K	K	P		M	M		x	l â	x	M	P
	0.22	J	J	J	J	Р	Z		K	K	Р		М	М		X	Х	Х	М	Р
	0.33	J	J	J	J	Q			K	М	Х		M	М		X	X	X	M	P
	0.47 0.68	M M	M M	M P	M X	Q X			K M	P Q			M M	M P		X	X	Χ	M M	P 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			М			X	Х		М	X
	3.3	X	X	Z	Z	Z			Z Z	Z						X	Z		М	
	4.7	X	X	Z	Z				Z							X	Z			
	10	Z	Z	Z	Z											Ž	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							LD			LD1			LD				14	
Letter	^							V	N 4		ı I	Р	0		,	Υ	Z			
Max.	0.33	C E G J K 3 0.56 0.71 0.90 0.94 1.02					1.02	M 1.27	1.		1.52	1.78	2.		2.54	2.79				
	(0.013)	(0.0)	-	(0.028)	(0.035)	(0.0		(0.040)	(0.050			(0.060)	(0.070)	(0.0		(0.100)	(0.110			
	(0.0)	(0.02		PAPER	(0.000)	(5.6	/	(2.0.0)	(5.500	/ (3.0		EMBC		(5.6	- 0,	((5	/		

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	<u>5</u>	D	101	Ţ	<u>A</u>	<u>B</u>	2	<u>A</u>
Size LD02 - 0402 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 X5R = D	Capacitance Code (In pF) 2 Sig. Digits + Number of Zeros	Capacitance Tolerance $B = \pm .10 \text{ pF} (<10 \text{pF})$ $C = \pm .25 \text{ pF} (<10 \text{pF})$ $D = \pm .50 \text{ pF} (<10 \text{pF})$ $F = \pm 1\% (\ge 10 \text{ pF})$ $G = \pm 2\% (\ge 10 \text{ pF})$ $J = \pm 5\%$ $K = \pm 10\%$ $M = \pm 20\%$	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*	Special Code A = Std. Product

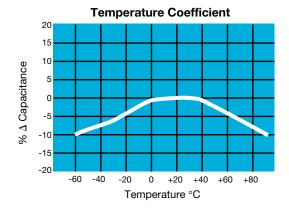
^{*}LD04 has the same CV ranges as LD03.

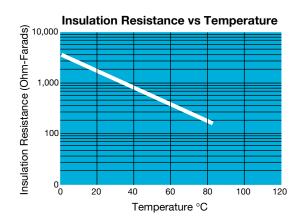
See FLEXITERM® section for CV options

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.

Contact factory for non-specified capacitance values.

TYPICAL ELECTRICAL CHARACTERISTICS









Parame	ter/Test	X5R Specification Limits	Measuring	Conditions								
	perature Range	-55°C to +85°C	Temperature Cycle Chamber									
Capac	itance	Within specified tolerance										
Dissipation	on Factor	≤ 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	Freq.: 1.0 kHz ± 10% Voltage: 1.0Vrms ± .2V For Cap > 10 μF, 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)									
	Appearance	No defects	Deflectio	n: 2mm								
Resistance to	Capacitance Variation	≤ ±12%	Test Time: 30 seconds 1mm/sec									
Flexure Stresses	Dissipation Factor	Meets Initial Values (As Above)	90 mm									
	Insulation Resistance	≥ Initial Value x 0.3										
Solder	rability	≥ 95% of each terminal should be covered with fresh solder	Dip device in eutection for 5.0 ± 0.									
Resistance to Solder Heat	Appearance	No defects, <25% leaching of either end terminal										
	Capacitance Variation	≤ ±7.5%										
	Dissipation Factor	Meets Initial Values (As Above)	Dip device in eutectic solder at 260°C for 60 seconds. Store at room temperature for 24 ± 2 hours before measuring electrical properties.									
	Insulation Resistance	Meets Initial Values (As Above)	hours before measuring	g electrical properties.								
	Dielectric Strength	Meets Initial Values (As Above)										
	Appearance	No visual defects	Step 1: -55°C ± 2°	30 ± 3 minutes								
	Capacitance Variation	≤ ±7.5%	Step 2: Room Temp	≤ 3 minutes								
Thermal Shock	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									
	Appearance	No visual defects	0 1 11	v . l								
	Capacitance Variation	≤ ±12.5%	Charge device with 1.5 chamber set at 85°C	± 2°C for 1000 hours								
Load Life	Dissipation Factor	≤ Initial Value x 2.0 (See Above)	(+48, -0). Note: Contact factory for *optional specification part numbers that are tested at < 1.5X rated voltage.									
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)	Remove from test chamb	· ·								
	Dielectric Strength	Meets Initial Values (As Above)	temperature for 24 ± 2 h									
	Appearance	No visual defects										
	Capacitance Variation	≤ ±12.5%	Store in a test chamber s 5% relative humidi									
Load Humidity	Dissipation Factor	≤ Initial Value x 2.0 (See Above)	(+48, -0) with rated voltage applied.									
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)	Remove from chamber and stabilize at room temperature and humidity for									
	Dielectric Strength	Meets Initial Values (As Above)	24 ± 2 hours before measuring.									

X5R - Capacitance Range



PREFERRED SIZES ARE SHADED

1												=							1					Ш	⊐															
Packaging Mil Paper Mil Paper Paper/Embossed Pa	SIZ	E			L	D02	2 LI						LD03				LD05							LD06					LD10							LD12				
Company Comp	Solder	ring		F	Reflo	w/V	Vave			Reflow/Wave						Reflow/Wave							Reflow/Wave							Refl	ow/V	Vave								
	Packag	ging			All	Par	oer																ape	er/Er	nbo	sse	d		Pa	per/	/Emb	osse	ed							
10 10 10 10 10 10 10 10	(L) Length																																							
Overline (n, n) (0.020 ± 0.004) (0.032 ± 0.006) (0.049 ± 0.008) (0.054 ± 0.008) (0.054 ± 0.008) (0.076 ±	· · ·																																		1	_		-		
Open	W) Width					(0.032 ± 0.006)							(0.049 ± 0.008)												(0.098 ± 0.008)															
WYDC	(t) Terminal																		0.50 ± 0.25																					
Cap (μF) 220	***							T 50	1						50	63					150	63					50	1						Isn	6.3	10	25	50		
(PF) 150 220			17	0.0	10	1	, 23	30	1	0.5	10	10	23	33	30	0.5	10	10	23	33	30	0.5	10	10	25	33	30	7	0.5	10	10	20	33	100	0.5	10	20	30		
220 330 470 680 C C C C C C C C C C C C C C C C C C C																								İ					Ì									l		
470 680 1000 1500 2200 C C C C C C C C C C C C C C C C	(I-)							С																İ														l		
680		330	T			T		С					İ																			~	\geq	<	▼ V	٧,	_			
1000 1500 2200 C C C C C C C C C C C C C C C C		470						С																					7	<		<			$\sqrt{}$	$\setminus^{<}$	+			
1500 2200		680		\perp																\perp								\Box		(_	$\overline{}$	7			ノ゛	Ψ.			
2200		1000						С			1																				_	Ų	4	_						
3300 4700 6800 C C 6 C C C C C C C C C C C C C C C C					1																											.	-							
4700 6800 C C C C C C C C C C C C C C C C C C			╄	\bot	_	╙				_										_								\vdash				- 1	LI							
Cap 0.010								С																														l		
Cap (µF) 0.015 (µF) 0.015 0.01																																								
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*Optional Specifications - Contact factory

NOTE: Contact factory for non-specified capacitance values