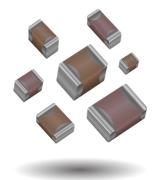
MLCC Tin/Lead Termination "B" (LD Series)

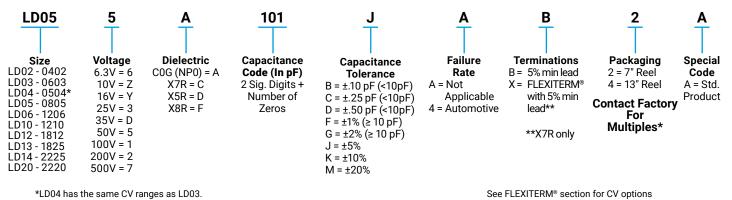
COG (NP0) – General Specifications





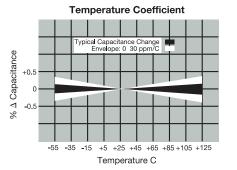
AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a 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.

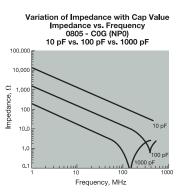
PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION) **Not RoHS Compliant**

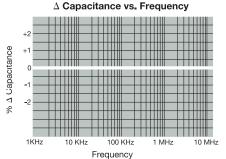


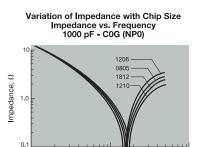
*LD04 has the same CV ranges as LD03.

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





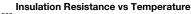


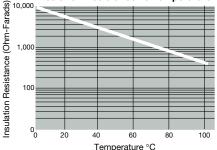


100

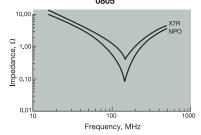
Frequency, MHz

1000





Variation of Impedance with Ceramic Formulation Impedance vs. Frequency 1000 pF - C0G (NP0) vs X7R 0805



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MLCC Tin/Lead Termination "B" COG (NP0) – Specifications and Test Methods



Paramet	ter/Test	NP0 Specification Limits	Measuring	Conditions
Operating Tem	perature Range	-55°C to +125°C	Temperature C	Cycle Chamber
Сарас	itance	Within specified tolerance	Freq.: 1.0 MHz ± 10	% for cap ≤ 1000 pF
c	2	<30 pF: Q≥ 400+20 x Cap Value ≥30 pF: Q≥ 1000	1.0 kHz ± 10% fc Voltage: 1.0	or cap > 1000 pF)Vrms ± .2V
Insulation I	Resistance	100,000MΩ or 1000MΩ - μF, whichever is less	Charge device with 60 ± 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 wit for 500V	and discharge current 0 mA (max) h 150% of rated voltage
	Appearance	No defects	Deflectio	on: 2mm
Resistance to Flexure	Capacitance Variation	$\pm 5\%$ or $\pm .5$ 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		mm
Solder	ability	≥ 95% of each terminal should be covered with fresh solder	Dip device in eutection for 5.0 ± 0.	
	Appearance	No defects, <25% leaching of either end terminal		
	Capacitance Variation	\leq ±2.5% or ±.25 pF, whichever is greater		adder at 00000 for 00
Resistance to Solder Heat	Q	Meets Initial Values (As Above)	Dip device in eutectic seconds. Store at room	temperature for 24 ± 2
oolder Heat	Insulation Resistance	Meets Initial Values (As Above)	hours before measurin	g 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 24 hours at roo	
	Appearance	No visual defects	4	
	Capacitance Variation	\leq ±3.0% or ± .3 pF, whichever is greater	Charge device with twi	ce rated voltage in test
Load Life	Q	≥ 30 pF: Q≥ 350 ≥10 pF, <30 pF: Q≥ 275 +5C/2 <10 pF: Q≥ 200 +10C	chamber set a for 1000 hou Remove from test chaml	urs (+48, -0).
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)	temperature before m	for 24 hours
	Dielectric Strength	Meets Initial Values (As Above)		
	Appearance	No visual defects		
	Capacitance Variation	$\leq \pm 5.0\%$ or $\pm .5$ pF, whichever is greater	Store in a test chamber s	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 humid (+48, -0) with rate	ity for 1000 hours d voltage applied.
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)	Remove from chamber temperature for 24 ± 2 h	
	Dielectric Strength	Meets Initial Values (As Above)		



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MLCC Tin/Lead Termination "B" COG (NP0) – Capacitance Range



PREFERRED SIZES ARE SHADED

						1]		
SIZE			LD02			LD	03				LD05					LD0	6		
Solderi			eflow/Wa				v/Wave				flow/Wa					Reflow/			
Packagi			All Pape				Paper				er/Embos				P	aper/Em			
(L) Length	mm		.00 ± 0.1				± 0.15				.01 ± 0.20				,	3.20 ± 0			
	(in.) mm		040 ± 0.0				<u>± 0.006)</u> ± 0.15				079 ± 0.00				(0.126 ± 0 1.60 ± 0			
W) Width	(in.)		0.00 ± 0.00			(0.032 :)49 ± 0.0				(0.063 ± 0			
(t) Terminal	mm		.25 ± 0.1				± 0.15				.50 ± 0.2					0.50 ± 0			
(t) reminar	(in.)		010 ± 0.0				± 0.006)				20 ± 0.0					0.020 ± (
	WVDC	16	25	50	16	25	50	100	16	25	50	100	200	16	25	50	100	200	500
Сар	0.5	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
(pF)	1.0 1.2	C C	C C	C C	G G	G	G	G	J	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
	1.8	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	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	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	3.3	С	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	3.9 4.7	C C	C C	C C	GG	G	G	G G	J	J	J	J	J	J	J	J	J	J	J
	5.6	<u>с</u>	C C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	6.8	č	c	c	G	G	G	G	J	J	J	J	J	J	J	J	J	Ĵ	Ĵ
	8.2	С	С	С	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	10	С	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	12 15	C C	C C	C C	GG	G G	G	G G	J	J	J	J	J	J	J		J	J	J
	15	<u>с</u>	C	C	G	G	G G	G	J	J	J	J	J	J	J	J	J	J	J
	22	č	c	c	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	27	С	С	С	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	33	С	C	С	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	39	С	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	47 56	C C	C C	C C	G G	G	G	G	J	J	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	č	c	c	Ğ	G	G	G	Ĵ	Ĵ	Ĵ	Ĵ	Ĵ	Ĵ	Ĵ	Ĵ	Ĵ	Ĵ	Ĵ
	100	С	С	С	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	120	С	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	150	<u>C</u>	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J
	180 220	C C	C C	C C	G G	G G	G G	G G	J	J J	J	J	J J	J	J	J	J	J J	J M
	270	č	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	С	С	С	G	G	G	G	J	J	J	J	М	J	J	J	J	J	м
	470	С	C	С	G	G	G		J	J	J	J	M	J	J	J	J	J	M
	560 680				G G	G G	G G		J	J	J	J	M	J	J	J	J	J J	M P
	820				G	G	G		J	J	J	J		J	J	J	J	M	F
	1000				G	G	G		J	J	J	J		J	J	J	J	Q	
	1200					G			J	J	J			J	J	J	J	Q	
	1500								J	J	J			J	J	J	M	Q	
	1800								J	J	J			J	J	M	M P		
	2200 2700								J	J	N N			J	J	M	I P		
	3300		1		1	1		1	J	J				J	J	M	P		
	3900								J	J				J	J	м	Р		
	4700								J	J				J	J	M	Р		
	5600													J	J	м			
	6800 8200													M M	M				
Сар	0.010		1		1		1					1		M	M				
(pF)	0.012															1			
	0.015		Ļ	. >		W.													
	0.018		-	-1	\sim		\sim												
	0.022 0.027		(-			Îт												
	0.027		Η (<u> </u>							
	0.039																		
	0.047		L				_												
	0.068					1	. —												
	0.082																		
	0.1 WVDC	16	25	50	16	25	50	100	16	25	50	100	200	16	25	50	100	200	500
	SIZE	10	LD02	1 30	10		03	100	10	20	LD05	100	200	10	20	LD0		200	- 300
	OIZE		2002			LD					2000					200	~		

Letter	А	С	E	G	J	K	М	N	Р	Q	Х	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)
			PAPER						EMBO	199ED			



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MLCC Tin/Lead Termination "B" COG (NP0) – Capacitance Range



PREFERRED SIZES ARE SHADED

SIZE	1		LD10					LD12				LD13			LD14	
Soldering		F	Reflow On	ly				Reflow O				Reflow Only			Reflow Only	
Packaging			er/Embos 3.20 + 0.2					II Embos 4.50 ± 0.3				All Embossed 4.50 ± 0.30			All Embossed 5.72 ± 0.25	l
(L) Length mm (in.))	(0.	126 ± 0.0	08)			(0	.177 ± 0.0	012)			(0.177 ± 0.012)		(0.225 ± 0.010)
W) Width (in.)			2.50 ± 0.2 098 ± 0.0					3.20 ± 0.2 .126 ± 0.0				6.40 ± 0.40 (0.252 ± 0.016)		6.35 ± 0.25 (0.250 ± 0.010))
(t) Terminal mm (in.)	1		0.50 ± 0.2 020 ± 0.0	5				0.61 ± 0.3 .024 ± 0.0	36			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 0.5 (pF) 1.0 1.2 1.5																
1.8 2.2 2.7																W
3.3 3.9 4.7 5.6																
6.8 8.2 10					J										* € [*]]	
12 15 18					J											
22 27 33 39					1 1 1											
47 56 68					J J											
82 100 120 150]]]											
180 220 270					J											
330 390 470 560		J	J	J	J M M M											
680 820 1000	J	J]]]]]	M M M	к	К	К	К	M	М	M	М	M	M	P
1200 1500 1800	J J J	J J J	J J	M M M	M M	K K K	K K K	K K	K K K	M M M	M M M	M M M	M M M	M M M	M M M	P P P
2200 2700 3300 3900	J	J J J	J J M	Q Q		K K P P	K K P P	K K P P	K P P	P Q Q Q	M M M M	M M M M	M M M M	M M M M	M M M M	P P P P
4700 5600 6800	J	J J J	м			P P P	P P P	P P Q	P P Q	Y Y Y	M M M	M M M	M M M	M M M	M M M	P P P
8200 Cap 0.010 (pF) 0.012 0.015 0.015	J	J J J				Р Р Р Р	P P P P	Q Q Q Q	Q Q X X	Y Y Y Y	M M M M	M M M M		M M M M	M M M M	P P P Y
0.018 0.022 0.027 0.033						P P Q Q	P P X X	X X X X	X X Z Z	Y	P P P	М		M M P P	M Y Y	Y Y Y
0.039 0.047 0.068						X X Z	X X Z	Z Z Z	Z Z Z		P P P			P P P		
0.082 0.1 WVDC		50	100	200	500	Z Z 25	Z Z 50	Z Z 100	200	500	50	100	200	Q Q 50	100	200
SIZE			LD10					LD12				LD13			LD14	

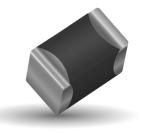
Letter	А	С	E	G	J	К	М	N	Р	Q	Х	Y	Z
Max.	0.33	0.56	0.71	0.90	0.94	1.02	1.27	1.40	1.52	1.78	2.29	2.54	2.79
Thickness	(0.013)	(0.022)	(0.028)	(0.035)	(0.037)	(0.040)	(0.050)	(0.055)	(0.060)	(0.070)	(0.090)	(0.100)	(0.110)
			PAPER						EMB	OSSED	·		



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X8R – General Specifications

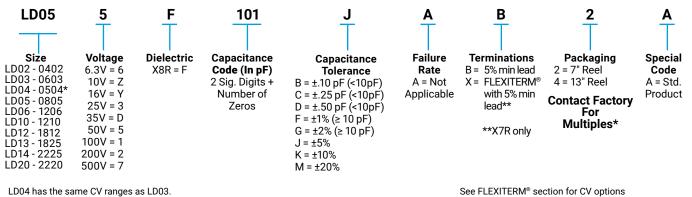




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Not RoHS Compliant

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



LD04 has the same CV ranges as LD03.

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



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X8R – Specifications and Test Methods

Paramet	ter/Test	X8R Specification Limits	Measuring	Conditions
Operating Tem	perature Range	-55°C to +150°C	Temperature C	ycle Chamber
Capac	itance	Within specified tolerance	Freg.: 1.0 k	Hz + 10%
Dissipatio	on Factor	\leq 2.5% for \geq 50V DC rating \leq 3.5% for 25V DC and 16V DC rating	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) 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	nm
Solder	ability	≥ 95% of each terminal should be covered with fresh solder	Dip device in eutectic for 5.0 ± 0.5	
	Appearance	No defects, <25% leaching of either end terminal		
	Capacitance Variation	≤ ±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
	Insulation Resistance	Meets Initial Values (As Above)	hours before measuring	g electrical properties.
	Dielectric Strength	Meets Initial Values (As Above)		1
	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	
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 Humidity	Dissipation Factor	≤ Initial Value x 2.0 (See Above)	(+48, -0) with rated	voltage applied.
Training	Insulation Resistance	≥ Initial Value x 0.3 (See Above)	Remove from chamber temperature an	d humidity for
	Dielectric Strength	Meets Initial Values (As Above)	24 ± 2 hours bef	ore measuring.



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X8R – Capacitance Range

	SIZE	LD	03	LD	05	LD	06
	WVDC	25V	50V	25V	50V	25V	50V
271	Сар 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	(μF) 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	М	М
683	0.068	G		N	N	М	М
823	0.082			N	N	М	Μ
104	0.1			N	N	М	М
124	0.12			N	N	М	М
154	0.15			N	N	М	М
184	0.18			N		М	М
224	0.22			N		М	М
274	0.27					М	М
334	0.33					М	М
394	0.39					М	
474	0.47					М	
684	0.68						
824	0.82						
105	1						
	WVDC	25V	50V	25V	50V	25V	50V
	SIZE	LD	03	LD	05	LD	06

Letter	А	С	E	G	J	К	М	N	Р	Q	Х	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)
			PAPER	~					EMBC	SSED	~		



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X7R – General Specifications

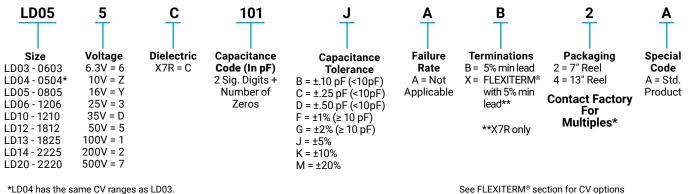




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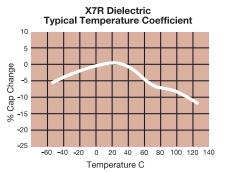
Not RoHS Compliant

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

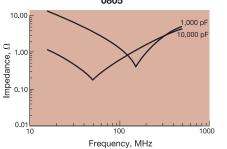


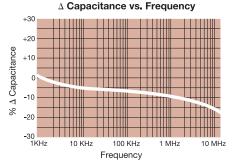
*LD04 has the same CV ranges as LD03.

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

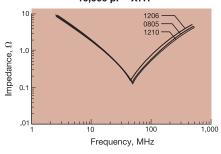




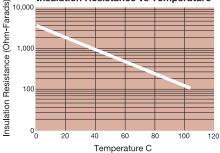




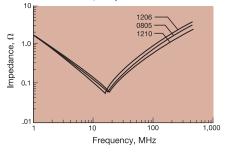
Variation of Impedance with Chip Size Impedance vs. Frequency 10,000 pF X7R



Insulation Resistance vs Temperature 10,000



Variation of Impedance with Chip Size Impedance vs. Frequency 100,000 pF - X7R





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X7R – Specifications and Test Methods

Paramet	ter/Test	X7R Specification Limits	Measuring	Conditions
Operating Tem	perature Range	-55°C to +125°C	Temperature C	ycle Chamber
Сарас	itance	Within specified tolerance		
Dissipatio	s Dissipation Factor Insulation Resistance Solderability Appearance Capacitance Variation Factor Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Dissipation Factor Dissipation Factor Dissipation Factor Dielectric Strength Appearance Capacitance Variation Factor Dielectric Strength Appearance Dielectric Strength Appearance Capacitance Variation Resistance Dielectric Strength Appearance Capacitance Variation Factor Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Factor Dissipation Factor Insulation Resistance Dielectric Strength Appearance Capacitance Variation Factor	≤ 10% for ≥ 50V DC rating ≤ 12.5% for 25V DC rating ≤ 12.5% for 25V and 16V DC rating ≤ 12.5% for ≤ 10V 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 @ roc	
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) h 150% of rated voltage
	Appearance	No defects	Deflectio	n: 2mm
Resistance to		≤ ±12%	Test Time: 3	
Flexure Stresses		Meets Initial Values (As Above)		
		≥ Initial Value x 0.3	90 r	
Solder	ability	≥ 95% of each terminal should be covered with fresh solder	Dip device in eutection for 5.0 ± 0.1	
	Appearance	No defects, <25% leaching of either end terminal	-	
		≤ ±7.5%	_	
Resistance to Solder Heat		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)		1
	Appearance	No visual defects	Step 1: -55°C ± 2°	30 ± 3 minutes
		≤ ±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	-	
	Variation	≤ ±12.5%	Charge device with 1.5 r test chamber set	
Load Life	Factor	≤ Initial Value x 2.0 (See Above)	for 1000 hou	
		≥ Initial Value x 0.3 (See Above)	Remove from test chamb temperature for 24 ± 2 h	
		Meets Initial Values (As Above)		
		No visual defects	4	
		≤ ±12.5%	Store in a test chamber s 5% relative humidi	
Load Humidity		≤ Initial Value x 2.0 (See Above)	(+48, -0) with rated	d voltage applied.
		≥ Initial Value x 0.3 (See Above)	Remove from chamber temperature an 24 ± 2 hours bef	d humidity for
		Meets Initial Values (As Above)		ore measuring.

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.



X7R – Capacitance Range

PREFERRED SIZES ARE SHADED

			•					m														Œ				
SIZE			LD02					LD03							LD05							LD				
Solderi			low/V					low/V							low/W			. <u></u>				Reflow				
Packag			ll Pap 00 ± 0					<u>ll Pap</u> 60 ± 0							r/Emb 01 ± 0						Pa	aper/Er 3.20 ±		sed		
(L) Length	mm (in.)	(0.0	40 ± 0	.004)			(0.0	63 ± 0	.006)					(0.0	79 ± 0	.008)					(0.126 :	0.008			
W) Width	mm (in.)		50 ± 0 20 ± 0					81 ± 0 32 ± 0							25 ± 0 49 ± 0						()	1.60 : : 0.063				
(1) T : 1	mm		25 ± 0					35 ± 0							50 ± 0							0.50 :		-)		
(t) Terminal	(in.)	(0.0	10 ± 0	.006)			(0.0	14 ± 0	.006)					(0.0	20 ± 0	.010)					()	0.020 ±	£ 0.010	0)		
WVD	;	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
Сар	100								1								1									
(pF)	150																									
(1-1)	220			С																						
	330			C					G	G	G		J	J	J	J	J	J								К
	470			c					G	G	G		J	Ĵ	J	J	J	Ĵ								ĸ
	680			c					G	G	G		J	J	J	J	J	J								ĸ
	1000			C					G	G	G		J	J	J	J	J	J								K
	1500			c					G	G	0		J	J	J	J	J	J		J	J	J	J	J	J	M
	2200			c					G	G				J	J	J	J	J		J	J	J	J	J	J	M
	3300		С	C					G	G			J	J	J	J	J	J		J	J	J	J	J	J	M
	4700		c	C C					G	G			J	J	J	J	J	J		J	J	J	J	J	J	M
	6800	С	C C						G	G			J	J	J	J	J	J		J	J	J	J	J	J	P
Сар	0.010	<u>с</u>	C						G	G			J	J	J	J	J	J		J	J	J	J	J	J	P
	0.010							G	G	G			-					-		J	-				-	F
(µF)	0.015	С						-					J	J	J	J	J	J			J	J	J	J	M	
	0.022	C C						G	G				J	J	J	J	J	N		J	J	J	J	J	M	
	0.033	C						G	G				J	J	J	J	N			J	J	J	J	J	M	
	0.047						G	G	G				J	J	J	J	N			J	J	J	J	J	M P	
			0*				G	G	G	-			J	J	J	J	N			J	J	J	J	J		
	0.10		C*			G	G	G	G				J	J	J	J	N			J	J	J	J	P	Р	
	0.15				G	G							J	J	J	N	N			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	M	P	Q		
	0.47							J*					N	N	N	N	N			M	M	M	P	Q		
	0.68												N	N	N					M	M	Q	Q	Q		
	1.0					J*	J*						N	N	N*					M	M	Q	Q	Q		
	1.5																			P	Q	Q				
	2.2				J*										P*					Q	Q	Q				
	3.3												-													
	4.7												P*	P*						Q*	Q*	Q*				
	10								<u> </u>			P*	Р				<u> </u>			Q*	Q*	Q				
	22																		Q*							
	47																									
	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	2				LD03							LD05							LD	06			

Letter	А	С	E	G	J	К	М	N	Р	Q	Х	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)
			PAPER						EMBC	OSSED			

= Under Development



X7R – Capacitance Range

PREFERRED SIZES ARE SHADED

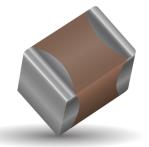
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$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Packagir	ng																			bossed
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$\begin{array}{c c c c c c c c c c c c c c c c c c c $	W) Width																				
	,														/			/			/
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(pr) 150 220 -			10	10	23	- 50	100	200	300		100	200	300	- 30	100	23	- 30	100	200	- 30	100
220 220 20 20 20 20 20 100 330 470 680 1000 1000 1																					
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1000 J		470																$\langle -$)) fī	-
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WVDC 10 16 25 50 100 200 50 100 200 50 100 25 50 100 200 50			10	16	25	50	100	200	500	50	100	200	500	50	100	25	50	100	200	50	100
SIZE LD10 LD12 LD13 LD20 LD	SIZE					LD10					LD	12		LC	013		LD	20		LC	014

Letter	А	С	E	G	ſ	К	М	N	Р	Q	Х	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)			
			PAPER			EMBOSSED										



X5R – General Specifications

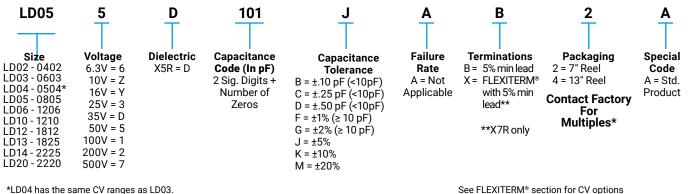




AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a 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

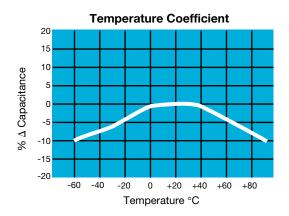
PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

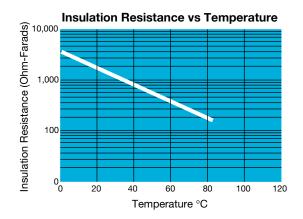


*LD04 has the same CV ranges as LD03.

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

TYPICAL ELECTRICAL CHARACTERISTICS





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X5R – Specifications and Test Methods

Parame	ter/Test	X5R Specification Limits	Measuring	Measuring Conditions							
Operating Tem	perature Range	-55°C to +85°C	Temperature Cycle Chamber								
Сарас	itance	Within specified tolerance	-								
Dissipatio	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 120 ± 5 secs @ roc								
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: 3								
Flexure Stresses	Dissipation Factor	Meets Initial Values (As Above)									
	Insulation Resistance	≥ Initial Value x 0.3	90 mm								
Solder	ability	≥ 95% of each terminal should be covered with fresh solder	Dip device in eutection for 5.0 ± 0.1								
	Appearance	No defects, <25% leaching of either end terminal	-								
	Capacitance Variation	≤ ±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							
	Insulation Resistance	Meets Initial Values (As Above)	hours before measuring	g electrical properties.							
	Dielectric Strength	Meets Initial Values (As Above)		1							
	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									
	Capacitance Variation	≤ ±12.5%	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.								
Load Life	Dissipation Factor	≤ Initial Value x 2.0 (See Above)									
	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	ours before measuring							
	Appearance	No visual defects	-								
	Capacitance Variation	≤ ±12.5%	Store in a test chamber s 5% relative humidi	ty for 1000 hours							
Load Humidity	Dissipation Factor	≤ Initial Value x 2.0 (See Above)	(+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature and humidity for 24 ± 2 hours before measuring.								
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)									
	Dielectric Strength	Meets Initial Values (As Above)									



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X5R – Capacitance Range

PREFERRED SIZES ARE SHADED

SIZE LD02							LD03						LD05					LD06					LD10								LD	12					
Solder	ing		F	leflo	N/W	ave				Reflo	w/V	Vave	Э			Re	flow	/Wav	е			Re	flow	/Wav	/e		Reflow/Wave Paper/Embossed										
Packag	jing			All I	Pape	er				All	Pap	ber			P	ape	r/En	nbos	sse	d	Р	ape	r/En	nbo	sse	d					_		_				
(L) Length	mm			1.00	± 0.	10				1.60) ± 0).15						0.20				3	.20 ±	0.20)				3.20) ± 0	.20						
	(in.)				± 0.0				((0.063								0.00					26 ±					((.008)					
W) Width	mm (in.)				± 0.1	10 004)			((0.81								0.20					.60 ±)63 ±					((0 ± 0	.20 .008	`					
(4) T	mm				± 0.				((0.3								0.25		_			.50 ±							$\frac{1}{2} \pm 0$		/			_		-
(t) Terminal	(in.)		(0	.010	± 0.0	006)				0.014	1 ± 0	0.00	6)			(0.0)20 ±	0.01	0)			(0.0)20 ±	0.01	10)).020) ± 0	.010						
WVD		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
Сар	100																																				
(pF)	150																																				
	220						C																												\square		_
	330						C																				1	I	I		7	_	-	- -	i I V		
	470						C																					~	-	-1_	/	\sim	\sim	$\overline{}$	12	\leq	
	680		<u> </u>	-			C					-	<u> </u>																$\overline{)}$		\geq	~) '	ÎT	
	1000						C																						L	_)		~		/	-	
	1500						C																								<u>'</u>	1					
	2200						C																									ť					
	3300					0	С							0																	. '						
	4700					C								G																							
0.00	6800 0.010		-	-		C C	-							G G	-										_										\vdash		_
Cap (µF)	0.010					c						G	G	G																					1		
(μF)	0.015				с	C C						G	G	G						Ν																	
	0.022			-	C	C	-					G	G	G	-					N					_										\vdash		_
	0.033				c	С						G	G	G						N																	
	0.047				c							G	0	G						N															1		
	0.008			С	C	С						G		G				N		N					_				_						\vdash		_
	0.15				U							G		0				N	Ν	14															1		
	0.13		C*								G	G						N	N							0									1		
	0.33										G	G						N	14							Q									H		_
	0.47	C*	C*								G							N						Q	Q								х		1		
	0.68	Ū	Ŭ								G							N						4	۹								~		í I		
	1.0	C*	C*	C*					G	G	G	J*					N	N		P*				Q	Q						х	Х	х		H		_
	1.5								-				1											-											í I		
	2.2	C*						G*	G*	J*	J*					Ν	Ν	Ν					Q	Q							Z	х			1		
	3.3														N	N					Х	Х	-														_
	4.7							*	*	J*		1			N	N	N*	N*			х	X	Х	Х						Q	Z						
	10							K*			1				Р	Р	Р				х	x	х	х					Х	z	z					Ζ	
	22									1					P*						Х	Х	Х	Х				Ζ	Ζ	Ζ	Z						_
	47																				х							Z*									
	100																										Z*	Ζ									_
	WVDC	4	6.3			25	50	4	6.3			_	35	50	6.3	10			35	50	6.3	10			35	50	4	6.3	10	16	25	35	50	6.3	10	25	5
	SIZE			L	002					L	D03	3					LD	05		LD05			LD06				LD10)				LD	12			

Letter	Α	С	E	G	J	K	М	N	Р	Q	Х	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)			
			PAPER			FMBOSSED										

*Optional Specifications – Contact factory

NOTE: Contact factory for non-specified capacitance values

