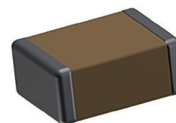


### • Applications

- X7R** : Stable ceramic  
Typical uses : passing, coupling, filtering, blocking
- BX** : Better voltage behaviour than X7R



RoHS compliant

### • Electrical Parameters

- Electrical Characteristics** at + 25°C unless otherwise specified
- Operating Temperature** - 55°C, + 125°C
- Dissipation Factor** ≤ 0.025 at 1kHz for C ≥ 1nF  
≤ 0.025 at 1MHz for C ≤ 1nF

#### Insulation Resistance (IR)

25°C/Un 10<sup>5</sup> MOhm or 1000 Ohm-Farad whichever is less

125°C/Un 10<sup>4</sup> MOhm or 100 Ohm-Farad whichever is less

#### Dielectric Strength Test

Performed per method 103 of EIA 198-2-E

Applied test voltages :

≤ 100Vdc-rated : 250% of rated voltage

Specifications	Classifications	Max Capacitance Change	
		No DC Voltage applied	Rated Voltage applied
EIA	X7R	± 15%	-
MIL	BX	± 15%	+ 15%, - 25%
CECC	2R1	± 15%	-
	2X1	± 15%	+ 20%, - 30%

### • Quick Reference Data

X7R :	0402	0603	0805	1206	1210	1812	1825	2220	2225
16V	100pF - 39nF	100pF - 150nF	100pF - 470nF	330pF - 1µF	470pF - 10µF				
25V	100pF - 22nF	100pF - 120nF	100pF - 330nF	330pF - 1µF	470pF - 1µF	4.7nF - 4.7µF	8.2nF - 6.8µF	10nF - 8.2µF	12nF - 8.2µF
50V	100pF - 10nF	100pF - 100nF	100pF - 220nF	330pF - 470nF	470pF - 1µF	4.7nF - 1.2µF	8.2nF - 1.8µF	10nF - 1.8µF	12nF - 2.2µF
100V	100pF - 4.7nF	100pF - 47nF	100pF - 100nF	330pF - 220nF	470pF - 470nF	4.7nF - 1µF	8.2nF - 1.5µF	10nF - 1.5µF	12nF - 1.8µF

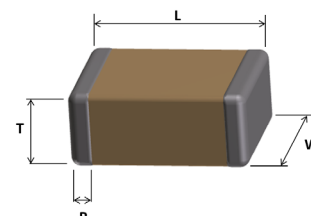
BX :			0805	1206	1210	1812	1825	2220	2225
50V			100pF - 68nF	1nF - 180nF	10nF - 220nF	22nF - 330nF	33nF - 560nF	47nF - 820nF	100nF - 1µF
100V			330pF - 22nF	4.7nF - 39nF	12nF - 100nF	27nF - 220nF	56nF - 470nF	56nF - 680nF	100nF - 1µF

### • Ordering Information

SIZE	DIELECTRIC	CAPACITANCE	TOLERANCE	VOLTAGE	TERMINATION	PACKAGING	SPECIAL PARAMETERS
0402 0603 0805 1206 1210 1812 1825 2220 2225	Y = X7R X = BX	Expressed in picofarads (pF). The first two digits are significant, the third digit give the number of noughts. Example : 102 = 1000pF	C = ± 0.25pF D = ± 0.5pF F = ± 1% G = ± 2% J = ± 5% K = ± 10% M = ± 20% Z = - 20%, + 80%	J = 16V X = 25V A = 50V B = 100V	F = Palladium-Silver W = Nickel with Gold plated finish X = Nickel with Tin plated finish P = Polymer with Tin plated finish C = Copper with Tin plated finish	B = 7" reel V = Bulk W = Waffle Pack	Specific testing E10 = 63V

### • Dimensions in millimeters

Designation	0402	0603	0805	1206	1210	1812	1825	2220	2225
Length (L)	1.00 ± 0.1	1.60 ± 0.1	2.00 ± 0.2	3.20 ± 0.2	3.20 ± 0.2	4.50 ± 0.3	4.50 ± 0.3	5.70 ± 0.4	5.70 ± 0.4
Width (W)	0.50 ± 0.1	0.80 ± 0.1	1.25 ± 0.2	1.60 ± 0.2	2.50 ± 0.2	3.20 ± 0.2	6.40 ± 0.3	5.00 ± 0.4	6.40 ± 0.4
Thickness (T)	0.60	0.90	1.40	1.70	1.70	2.80	2.20	4.00	4.50
Termination (P)	Min	0.10	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	Max	0.40	0.40	0.70	0.70	0.80	0.80	0.80	0.80



For P termination (Polymer type) add 0.20mm to all dimensions (except for 0402).

• Standard Sizes for X7R : 0402 to 1206

SIZE		0402				0603				0805				1206			
Voltage (Vdc)		16	25	50	100	16	25	50	100	16	25	50	100	16	25	50	100
Cap. Code	Cap.																
101	100pF																
121	120pF																
151	150pF																
181	180pF																
221	220pF																
271	270pF																
331	330pF																
391	390pF																
471	470pF																
561	560pF																
681	680pF																
821	820pF																
102	1nF																
122	1.2nF																
152	1.5nF																
182	1.8nF																
222	2.2nF																
272	2.7nF																
332	3.3nF																
392	3.9nF																
472	4.7nF																
562	5.6nF																
682	6.8nF																
822	8.2nF																
103	10nF																
123	12nF																
153	15nF																
183	18nF																
223	22nF																
273	27nF																
333	33nF																
393	39nF																
473	47nF																
563	56nF																
683	68nF																
823	82nF																
104	100nF																
124	120nF																
154	150nF																
184	180nF																
224	220nF																
274	270nF																
334	330nF																
394	390nF																
474	470nF																
564	560nF																
684	680nF																
824	820nF																
105	1μF																
125	1.2μF																
155	1.5μF																
185	1.8μF																
225	2.2μF																
275	2.7μF																
335	3.3μF																
395	3.9μF																
475	4.7μF																
565	5.6μF																
685	6.8μF																
825	8.2μF																
106	10μF																
126	12μF																

Other sizes available on request. Example : 0504, 0907, 1808, 3033.

• Standard Sizes for X7R : 1210 to 2225

SIZE		1210				1812			1825			2220			2225		
Voltage (Vdc)		16	25	50	100	25	50	100	25	50	100	25	50	100	25	50	100
Cap. Code	Cap.																
101	100pF																
121	120pF																
151	150pF																
181	180pF																
221	220pF																
271	270pF																
331	330pF																
391	390pF																
471	470pF																
561	560pF																
681	680pF																
821	820pF																
102	1nF																
122	1.2nF																
152	1.5nF																
182	1.8nF																
222	2.2nF																
272	2.7nF																
332	3.3nF																
392	3.9nF																
472	4.7nF																
562	5.6nF																
682	6.8nF																
822	8.2nF																
103	10nF																
123	12nF																
153	15nF																
183	18nF																
223	22nF																
273	27nF																
333	33nF																
393	39nF																
473	47nF																
563	56nF																
683	68nF																
823	82nF																
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124	120nF																
154	150nF																
184	180nF																
224	220nF																
274	270nF																
334	330nF																
394	390nF																
474	470nF																
564	560nF																
684	680nF																
824	820nF																
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565	5.6μF																
685	6.8μF																
825	8.2μF																
106	10μF																
126	12μF																

Other sizes available on request. Example : 0504, 0907, 1808, 3033.

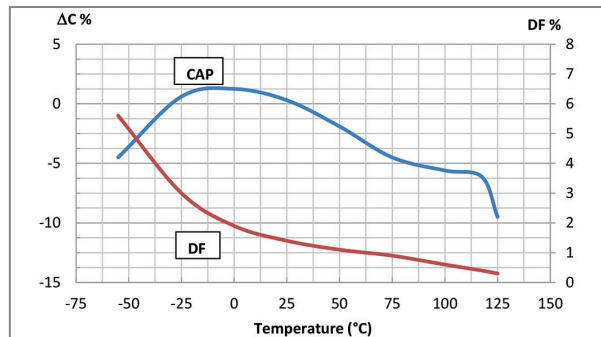
• Standard Sizes for BX : 0805 to 2225

SIZE		0805		1206		1210		1812		1825		2220		2225	
Voltage (Vdc)		50	100	50	100	50	100	50	100	50	100	50	100	50	100
Cap. Code	Cap.														
101	100pF														
121	120pF														
151	150pF														
181	180pF														
221	220pF														
271	270pF														
331	330pF														
391	390pF														
471	470pF														
561	560pF														
681	680pF														
821	820pF														
102	1nF														
122	1.2nF														
152	1.5nF														
182	1.8nF														
222	2.2nF														
272	2.7nF														
332	3.3nF														
392	3.9nF														
472	4.7nF														
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103	10nF														
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223	22nF														
273	27nF														
333	33nF														
393	39nF														
473	47nF														
563	56nF														
683	68nF														
823	82nF														
104	100nF														
124	120nF														
154	150nF														
184	180nF														
224	220nF														
274	270nF														
334	330nF														
394	390nF														
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335	3.3μF														
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565	5.6μF														
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126	12μF														

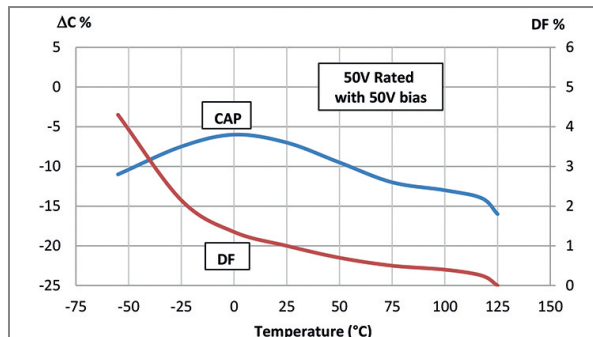
Other sizes available on request. Example : 0504, 0907, 1808, 3033.

• Typical Characteristics

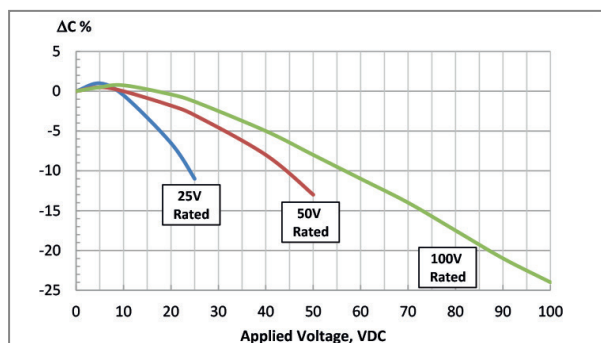
X7R Capacitance and dissipation factor vs temperature



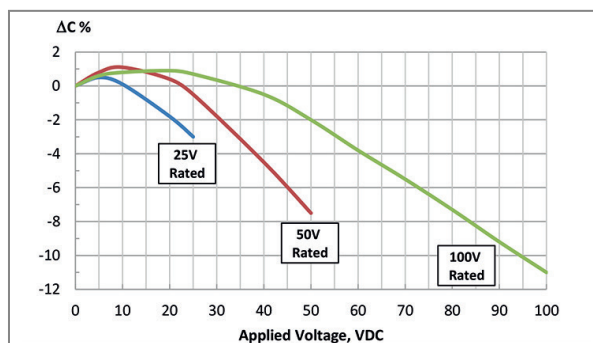
BX Capacitance and dissipation factor vs temperature



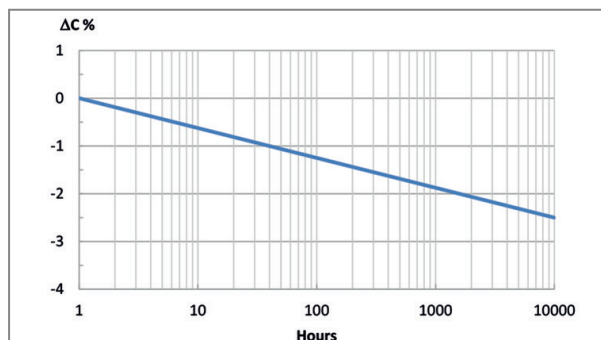
X7R Voltage coefficient of capacitance



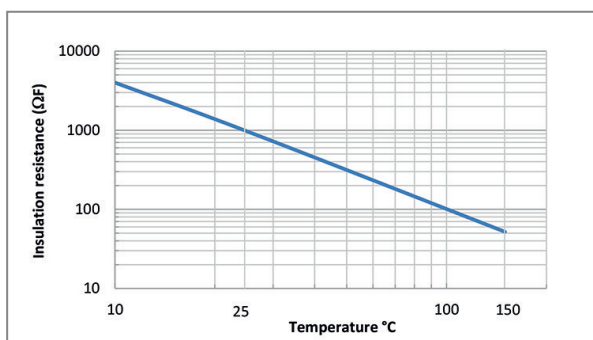
BX Voltage coefficient of capacitance



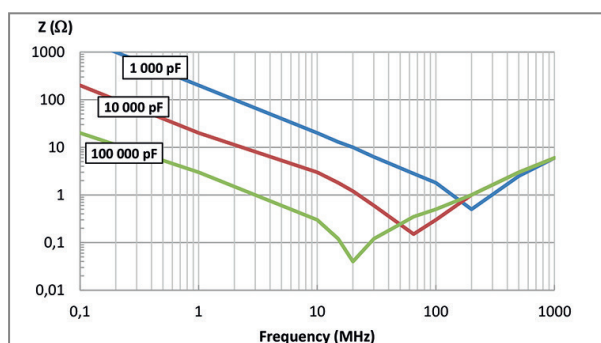
X7R and BX Aging



X7R and BX Insulation resistance vs temperature



X7R Impedance vs frequency



BX Impedance vs frequency

