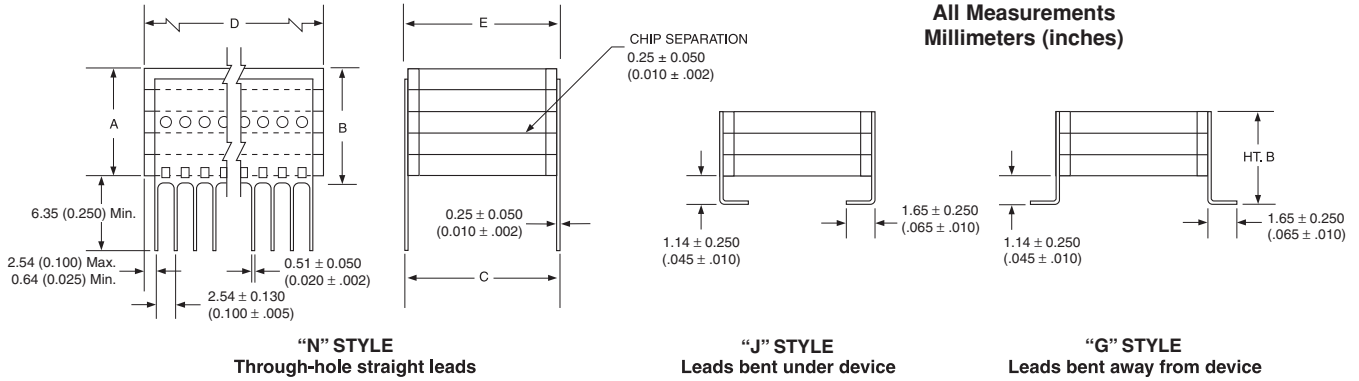


# X7R AND NPO STACKED CAPACITORS

## CAP DIMENSIONS



### PERFORMANCE CHARACTERISTICS

**Capacitance:** Tested at 1kHz, 25°C, 1 VAC RMS.  
**Dissipation Factor:** X7R < 2.5%, NPO < .15%, at 1kHz, 25°C, 1 VAC RMS.  
**Insulation Resistance (25°C):** 100,000 MegΩ or 1000 MegΩ•μF, whichever is less.  
**DWV:** Per MIL-PRF-49470 for 5 seconds, 50mA maximum charging current.  
**Burn-in (optional):** Per MIL-PRF-49470.  
**Voltage Temperature Coefficient:** From -55°C to +125°C.

**X7R:** ±15% maximum  $\varnothing$  without applied voltage  
 50 V rated: +15 / -30%  $\varnothing$  typical at 25 VDC  
                   +15 / -60%  $\varnothing$  typical at 50 VDC  
 100 V rated: +15 / -30%  $\varnothing$  typical at 50 VDC  
                   +15 / -60%  $\varnothing$  typical at 100 VDC

**BX:** ±15% maximum  $\varnothing$  at 0 VDC  
           +15 / -25% maximum  $\varnothing$  at rated voltage

**BR:** ±15% maximum  $\varnothing$  at 0 VDC  
           +15 / -40% maximum  $\varnothing$  at rated voltage

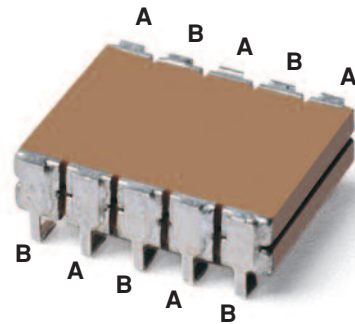
**BQ:** ±15% maximum  $\varnothing$  at 0 VDC  
           +15 / -50% maximum  $\varnothing$  at rated voltage

**NPO:** ±30 ppm per °C max.  $\varnothing$  at rated voltage

### ALSO AVAILABLE IN STACKED CAPACITORS

- Interdigitated stacked capacitors
- Voltage ratings optimized for your application
- BX, N2200, NPO, NPQ (High Q Porcelain)
- MIL-PRF-49470 style capacitors
- Encapsulated / Plastic Packages
- Vertical Stacks
- Custom Lead Styles

### Typical interdigitated stacked capacitor



Interdigitated configuration results in reduced ESL

## HOW TO ORDER

PH41	X7R	565	K	2	J	3
<b>SIZE CODE</b>	<b>DIELECTRIC TYPE</b>	<b>CAPACITANCE (IN PICO FARADS)</b>	<b>TOLERANCE CODE</b>	<b>VOLTAGE CODE</b>	<b>LEAD STYLE</b>	<b>NO. OF LEADS</b>
SIZE	NPO BX X7R BQ BR	Two significant figures followed by the number of zeros. Example: 103 = 10,000 pF = .01μF	F = ± 1% (NPO only) G = ± 2% (NPO only) J = ± 5% (NPO only) K = ± 10% M = ± 20% Z = -20% / +80%	2 = 50 V 3 = 100 V 4 = 200 V 6 = 500 V	J, G, N	Number of Leads Per Sde



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# X7R AND NPO STACKED CAPACITORS

## TABLE 1 — MAXIMUM CAPACITANCE (μF)

### PRESIDIO CASE SIZE

PR41NP0104K2N3  
10μF, 10%, 50V, N Leads

PH32NP0223J6G3  
.022μF, 5%, 500V, G Leads

	50V			100 V			200V			500V			"B" Height Max. mm (inches)
	X7R	BX	NPO	X7R	BX	NPO	X7R	BR	NPO	X7R	BQ	NPO	
PH31	2.7	1.8	.056	1.5	.62	.047	—	.33	.036	—	.15	.012	5.3 (.209)
PH32	5.2	3.3	.12	3.0	1.2	.082	—	.68	.082	—	.27	.022	8.9 (.351)
PH33	8.2	5.0	.18	4.7	2.0	.15	—	1.0	.12	—	.39	.039	12.6 (.496)
PH34	1.0	6.8	.22	5.6	2.7	.20	—	1.5	.15	—	.56	.047	16.3 (.642)
PH41	5.6	3.3	.10	2.7	1.2	.082	—	.56	.068	—	.22	.018	5.3 (.209)
PH42	10	6.8	.22	5.6	2.5	.18	—	1.2	.15	—	.47	.039	8.9 (.351)
PH43	16	10	.33	8.2	3.9	.27	—	1.8	.22	—	.68	.056	12.6 (.496)
PH44	20	12	.39	10	5.2	.33	—	2.2	.27	—	1.0	.068	16.3 (.642)
PH51	8.2	5.6	.18	3.9	1.8	.12	—	1.0	.10	—	.39	.027	5.3 (.209)
PH52	16	10	.39	8.2	3.9	.27	—	2.2	.22	—	.82	.056	8.9 (.351)
PH53	25	15	.56	12	6.0	.39	—	3.3	.33	—	1.2	.082	12.6 (.496)
PH54	33	22	.68	15	8.2	.47	—	3.9	.39	—	1.5	1.0	16.3 (.642)
PH61	15	10	.33	8.2	3.6	.22	—	2.2	.18	—	.82	.056	5.3 (.209)
PH62	30	22	.68	15	7.5	.47	—	4.7	.39	—	1.8	.12	8.9 (.351)
PH63	47	33	1.0	22	12	.68	—	6.8	.56	—	2.7	.18	12.6 (.496)
PH64	62	39	1.2	33	16	1.0	—	10	.68	—	3.3	.22	16.3 (.642)
PH71	30	18	.56	15	6.2	.47	—	3.3	.33	—	1.5	.10	5.3 (.209)
PH72	56	39	1.2	27	14	1.0	—	6.8	.68	—	3.3	.22	8.9 (.351)
PH73	90	56	1.8	39	20	1.5	—	10	1.0	—	4.7	.33	12.6 (.496)
PH74	110	68	2.2	47	27	1.8	—	12	1.2	—	5.6	.39	16.3 (.642)
PH76	30	18	.56	15	6.8	.47	—	3.3	.33	—	1.5	.10	5.3 (.209)
PH77	56	39	1.2	27	14	1.0	—	6.8	.68	—	3.3	.22	8.9 (.351)
PH78	90	56	1.8	39	22	1.5	—	10	1.0	—	4.7	.33	12.6 (.496)
PH79	120	68	2.2	47	30	1.8	—	12	1.2	—	5.6	.39	16.3 (.642)
PH81	33	22	.68	18	7.5	.56	—	3.9	.47	—	1.5	.15	5.3 (.209)
PH82	62	47	1.5	39	15	1.2	—	8.2	1.0	—	3.3	.33	8.9 (.351)
PH83	100	68	2.2	56	24	1.8	—	12	1.5	—	4.7	.47	12.6 (.496)
PH84	130	82	2.7	68	33	2.2	—	15	1.8	—	5.6	.56	16.3 (.642)
PH86	56	33	1.0	27	12	.82	—	6.8	.68	—	2.2	.22	5.3 (.209)
PH87	100	68	2.2	56	25	1.8	—	15	1.5	—	4.7	.47	8.9 (.351)
PH88	160	100	3.3	82	39	2.7	—	22	2.2	—	6.8	.68	12.6 (.496)
PH89	200	120	3.9	100	52	3.3	—	27	2.7	—	8.2	.82	16.3 (.642)
PH91	75	47	1.5	39	16	1.2	—	10	1.0	—	4.7	.33	5.3 (.209)
PH92	140	100	3.3	82	33	2.7	—	22	2.2	—	10	.68	8.9 (.351)
PH93	220	150	4.7	120	52	3.9	—	33	3.3	—	15	1.0	12.6 (.496)
PH94	270	180	5.6	150	72	4.7	—	39	3.9	—	18	1.2	16.3 (.642)

PH88BX396K3J14  
39μ, 10%, 100V, J Leads

### DIMENSIONS mm (inch)

	PH31-34	PH41-44	PH51-54	PH61-64	PH71-74	PH76-79	PH81-84	PH86-89	PH91-94
C (±.5mm)	6.4 (.252)	8.2 (.322)	10.2 (.400)	14.0 (.551)	15.2 (.600)	20.3* (.800)	10.2 (.400)	15.2 (.600)	20.3* (.800)
D (Max) Width	6.4 (.252)	8.7 (.342)	10.7 (.421)	13.6 (.535)	21.6 (.850)	16.6 (.653)	38.2 (1.503)	38.2 (1.503)	40.6 (1.598)
E (Max) Length	7.4 (.291)	9.2 (.362)	10.7 (.421)	14.9 (.586)	16.8 (.661)	21.6 (.850)	12.0 (.472)	18.9 (.744)	24.0 (.944)
Leads per Side	3	3	4	5	7	6	14	14	14
Chip Size	2424	3033	3740	5550	5783	7763	37148	57148	77148

**Notes:**

1. "B" height dimensions in Table 1 are based on commonly ordered parts. Custom heights are available.
2. \* Tolerance is ± .8mm (.032").
3. The above case sizes are the most commonly used. Other case sizes are available, consult factory or website.
4. Vertical stacks are available, consult factory.
5. Other voltages available; consult factory.



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# X7R AND NPO STACKED CAPACITORS

TABLE 2 — MAXIMUM CAPACITANCE (μF)

*PR41BX106K2N3  
10μF, 10%, 50V, N Leads*

*PR32NP0223J6G3  
.025μF, 5%, 500V, G Leads*

## PRESIDIO CASE SIZE

	50V			100 V			200V			500V			"B" Height Max. mm (inches)
	X7R	BX	NPO	X7R	BX	NPO	X7R	BR	NPO	X7R	BQ	NPO	
PR21	2.2	1.2	.056	2.2	.47	.33	.47	.27	.027	.18	.12	.010	4.6 (.181)
PR22	4.7	2.5	.10	4.7	1.0	.68	1.0	.52	.050	.33	.22	.018	7.5 (.295)
PR31	2.7	1.5	.068	1.8	.82	.047	.68	.39	.039	.25	.15	.012	5.08 (.200)
PR32	5.6	3.0	.12	3.9	1.5	.10	1.2	.82	.080	.47	.3	.025	8.13 (.320)
PR41	4.7	2.7	.10	3.3	1.2	.082	1.2	.68	.068	.39	.25	.022	4.9 (.192)
PR42	10	5.6	.22	6.8	2.5	.15	2.2	1.2	.12	.82	.5	.047	8.2 (.323)
PR51	6.8	4.2	.15	4.7	2.2	.12	1.8	1.0	.10	.56	.39	.033	4.9 (.192)
PR52	12	8.2	.33	10	4.5	.25	3.6	2.2	.20	1.2	.82	.068	8.2 (.323)
PR61	15	7.5	.33	10	3.9	.25	3.3	2.2	.20	1.2	.82	.068	4.9 (.192)
PR62	30	15	.68	20	8.2	.47	6.8	3.9	.39	2.5	1.5	.12	8.2 (.323)

## DIMENSIONS mm (inch)

	PR21-22	PR31-32	PR41-42	PR51-52	PR61-62
C (±.5mm)	6.4 (.252)	6.4 (.252)	8.2 (.322)	10.2 (.400)	14.0 (.551)
D (Max) Width	5.4 (0.213)	6.9 (.27)	8.7 (.342)	10.7 (.421)	13.6 (.535)
E (Max) Length	7.6 (.300)	7.6 (.3)	9.2 (.362)	10.7 (.421)	14.9 (.586)
Leads per Side	2	3	3	4	5
Chip Size	2620	2626	3233	3740	5451

**Notes:**

1. "B" height dimensions in Table 2 are based on commonly ordered parts. Custom heights are available.
2. The above case sizes are the most commonly used. Other case sizes are available, consult factory or website.
3. Vertical stacks are available, consult factory.
4. Other voltages available; consult factory.



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