

# RF/Microwave Capacitors

## RF/Microwave C0G (NP0) Capacitors

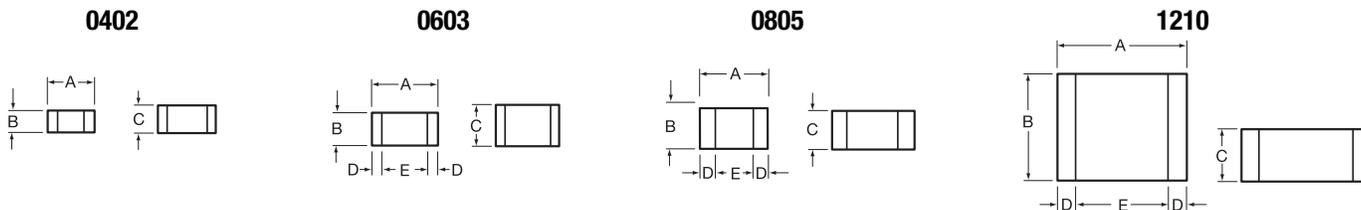
### Ultra Low ESR "U" Series, C0G (NP0) Capacitors (RoHS)



#### GENERAL INFORMATION

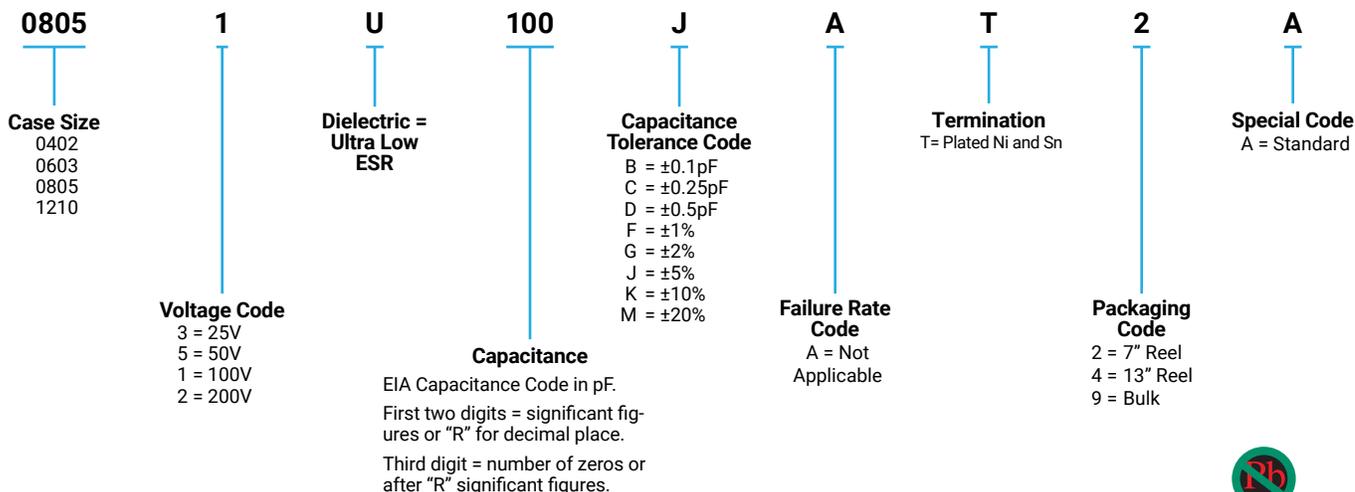
"U" Series capacitors are C0G (NP0) chip capacitors specially designed for "Ultra" low ESR for applications in the communications market. Max ESR and effective capacitance are met on each value producing lot to lot uniformity. Sizes available are EIA chip sizes 0603, 0805, and 1210.

#### DIMENSIONS: inches (millimeters)



Size	A	B	C	D	E
0402	0.039±0.004 (1.00±0.1)	0.020±0.004 (0.50±0.1)	0.024 (0.6) max	0.010 ± 0.006 (0.25 ± 0.15)	0.014 (0.36) min
0603	0.060±0.010 (1.52±0.25)	0.030±0.010 (0.76±0.25)	0.036 (0.91) max	0.010 ± 0.005 (0.25 ± 0.13)	0.030 (0.76) min
0805	0.079±0.008 (2.01±0.2)	0.049±0.008 (1.25±0.2)	0.045 (1.15mm) max	0.020 ± 0.010 (0.51 ± 0.254)	0.020 (0.51) min
1210	0.126±0.008 (3.2±0.2)	0.098±0.008 (2.49±0.2)	0.055 (1.40mm) max	0.025 ± 0.015 (0.635 ± 0.381)	0.040 (1.02) min

#### HOW TO ORDER



#### ELECTRICAL CHARACTERISTICS

##### Capacitance Values and Tolerances:

- Size 0402 - 0.2 pF to 22 pF @ 1 MHz
- Size 0603 - 1.0 pF to 100 pF @ 1 MHz
- Size 0805 - 1.6 pF to 160 pF @ 1 MHz
- Size 1210 - 2.4 pF to 1000 pF @ 1 MHz

##### Temperature Coefficient of Capacitance (TC):

0±30 ppm/°C (-55° to +125°C)

##### Insulation Resistance (IR):

- 10<sup>12</sup> Ω min. @ 25°C and rated WVDC
- 10<sup>11</sup> Ω min. @ 125°C and rated WVDC

##### Working Voltage (WVDC):

- |      |                     |
|------|---------------------|
| Size | Working Voltage     |
| 0402 | - 50, 25 WVDC       |
| 0603 | - 200, 100, 50 WVDC |
| 0805 | - 200, 100 WVDC     |
| 1210 | - 200, 100 WVDC     |

##### Dielectric Working Voltage (DWV):

250% of rated WVDC

##### Equivalent Series Resistance Typical (ESR):

- 0402 - See Performance Curve, page 300
- 0603 - See Performance Curve, page 300
- 0805 - See Performance Curve, page 300
- 1210 - See Performance Curve, page 300

##### Marking

Laser marking EIA J marking standard (except 0603) (capacitance code and tolerance upon request).



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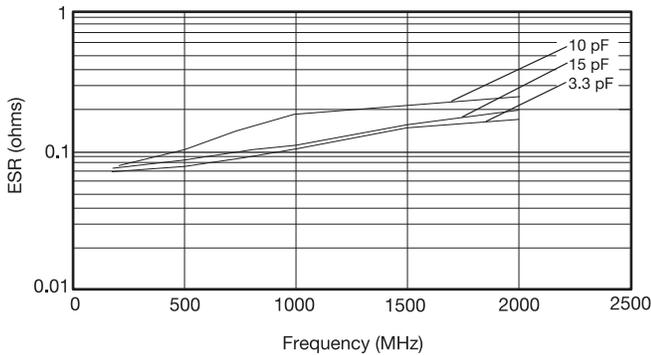


#### CAPACITANCE RANGE

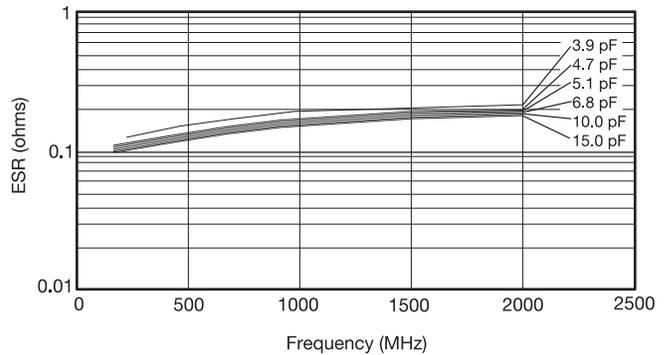
Cap (pF)	Available Tolerance	Size				Cap (pF)	Available Tolerance	Size				Cap (pF)	Available Tolerance	Size			
		0402	0603	0805	1210			0402	0603	0805	1210			0402	0603	0805	1210
0.2	B,C	50V	N/A	N/A	N/A	1.0	B,C,D	50V	200V	200V	200V	100	FG,J,K,M	N/A	100V	200V	200V
0.3	↓ B,C	↓	↓	↓	↓	1.1	↓	↓	↓	↓	↓	110	↓	↓	↓	↓	↓
0.4						1.2						120					
0.5	B,C	↓	↓	↓	↓	1.3	↓	↓	↓	↓	↓	130	↓	↓	↓	↓	↓
0.6	B,C,D					140											
0.7	B,C,D	↓	↓	↓	↓	1.4	↓	↓	↓	↓	↓	140	↓	↓	↓	↓	↓
0.8	B,C,D					150											
0.9	B,C,D	↓	↓	↓	↓	1.5	↓	↓	↓	↓	↓	150	↓	↓	↓	↓	↓
1.0	B,C,D					160											
1.1	↓	↓	↓	↓	↓	1.6	↓	↓	↓	↓	↓	160	↓	↓	↓	↓	↓
1.2						1.7						170					
1.3	B,C,D	↓	↓	↓	↓	1.8	↓	↓	↓	↓	↓	180	↓	↓	↓	↓	↓
1.4	B,C,D					190											
1.5	B,C,D	↓	↓	↓	↓	1.9	↓	↓	↓	↓	↓	190	↓	↓	↓	↓	↓
1.6	B,C,D					200											
1.7	B,C,D	↓	↓	↓	↓	2.0	↓	↓	↓	↓	↓	200	↓	↓	↓	↓	↓
1.8	B,C,D					210											
1.9	B,C,D	↓	↓	↓	↓	2.1	↓	↓	↓	↓	↓	210	↓	↓	↓	↓	↓
2.0	B,C,D					220											
2.1	B,C,D	↓	↓	↓	↓	2.2	↓	↓	↓	↓	↓	220	↓	↓	↓	↓	↓
2.2	B,C,D					230											
2.4	B,C,D	↓	↓	↓	↓	2.4	↓	↓	↓	↓	↓	230	↓	↓	↓	↓	↓
2.7	B,C,D					240											
3.0	B,C,D	↓	↓	↓	↓	2.7	↓	↓	↓	↓	↓	240	↓	↓	↓	↓	↓
3.3	B,C,D					250											
3.6	B,C,D	↓	↓	↓	↓	3.0	↓	↓	↓	↓	↓	250	↓	↓	↓	↓	↓
3.9	B,C,D					260											
4.3	B,C,D	↓	↓	↓	↓	3.3	↓	↓	↓	↓	↓	260	↓	↓	↓	↓	↓
4.7	B,C,D					270											
5.1	B,C,D	↓	↓	↓	↓	3.6	↓	↓	↓	↓	↓	270	↓	↓	↓	↓	↓
5.6	B,C,D					280											
6.2	B,C,D	↓	↓	↓	↓	3.9	↓	↓	↓	↓	↓	280	↓	↓	↓	↓	↓
6.8	B,C,D					290											
7.5	B,C,J,K,M	↓	↓	↓	↓	4.3	↓	↓	↓	↓	↓	290	↓	↓	↓	↓	↓
8.2	B,C,J,K,M					300											
9.1	B,C,J,K,M	↓	↓	↓	↓	4.7	↓	↓	↓	↓	↓	300	↓	↓	↓	↓	↓
10	B,C,J,K,M					310											
11	B,C,J,K,M	↓	↓	↓	↓	5.1	↓	↓	↓	↓	↓	310	↓	↓	↓	↓	↓
12	B,C,J,K,M					320											
13	B,C,J,K,M	↓	↓	↓	↓	5.6	↓	↓	↓	↓	↓	320	↓	↓	↓	↓	↓
15	B,C,J,K,M					330											
18	B,C,J,K,M	↓	↓	↓	↓	6.2	↓	↓	↓	↓	↓	330	↓	↓	↓	↓	↓
20	B,C,J,K,M					340											
22	B,C,J,K,M	↓	↓	↓	↓	6.8	↓	↓	↓	↓	↓	340	↓	↓	↓	↓	↓
24	B,C,J,K,M					350											
27	B,C,J,K,M	↓	↓	↓	↓	7.5	↓	↓	↓	↓	↓	350	↓	↓	↓	↓	↓
30	B,C,J,K,M					360											
33	B,C,J,K,M	↓	↓	↓	↓	8.2	↓	↓	↓	↓	↓	360	↓	↓	↓	↓	↓
36	B,C,J,K,M					370											
39	B,C,J,K,M	↓	↓	↓	↓	9.1	↓	↓	↓	↓	↓	370	↓	↓	↓	↓	↓
43	B,C,J,K,M					380											
47	B,C,J,K,M	↓	↓	↓	↓	10	↓	↓	↓	↓	↓	380	↓	↓	↓	↓	↓
51	B,C,J,K,M					390											
56	B,C,J,K,M	↓	↓	↓	↓	11	↓	↓	↓	↓	↓	390	↓	↓	↓	↓	↓
68	B,C,J,K,M					400											
75	B,C,J,K,M	↓	↓	↓	↓	12	↓	↓	↓	↓	↓	400	↓	↓	↓	↓	↓
82	B,C,J,K,M					410											
91	B,C,J,K,M	↓	↓	↓	↓	13	↓	↓	↓	↓	↓	410	↓	↓	↓	↓	↓
100	B,C,J,K,M					420											
110	B,C,J,K,M	↓	↓	↓	↓	15	↓	↓	↓	↓	↓	420	↓	↓	↓	↓	↓
120	B,C,J,K,M					430											
130	B,C,J,K,M	↓	↓	↓	↓	18	↓	↓	↓	↓	↓	430	↓	↓	↓	↓	↓
140	B,C,J,K,M					440											
150	B,C,J,K,M	↓	↓	↓	↓	20	↓	↓	↓	↓	↓	440	↓	↓	↓	↓	↓
160	B,C,J,K,M					450											
180	B,C,J,K,M	↓	↓	↓	↓	22	↓	↓	↓	↓	↓	450	↓	↓	↓	↓	↓
200	B,C,J,K,M					460											
220	B,C,J,K,M	↓	↓	↓	↓	24	↓	↓	↓	↓	↓	460	↓	↓	↓	↓	↓
270	B,C,J,K,M					470											
300	B,C,J,K,M	↓	↓	↓	↓	27	↓	↓	↓	↓	↓	470	↓	↓	↓	↓	↓
330	B,C,J,K,M					480											
360	B,C,J,K,M	↓	↓	↓	↓	30	↓	↓	↓	↓	↓	480	↓	↓	↓	↓	↓
390	B,C,J,K,M					490											
430	B,C,J,K,M	↓	↓	↓	↓	33	↓	↓	↓	↓	↓	490	↓	↓	↓	↓	↓
470	B,C,J,K,M					500											
510	B,C,J,K,M	↓	↓	↓	↓	36	↓	↓	↓	↓	↓	500	↓	↓	↓	↓	↓
560	B,C,J,K,M					510											
620	B,C,J,K,M	↓	↓	↓	↓	39	↓	↓	↓	↓	↓	510	↓	↓	↓	↓	↓
680	B,C,J,K,M					520											
750	B,C,J,K,M	↓	↓	↓	↓	43	↓	↓	↓	↓	↓	520	↓	↓	↓	↓	↓
820	B,C,J,K,M					530											
910	B,C,J,K,M	↓	↓	↓	↓	47	↓	↓	↓	↓	↓	530	↓	↓	↓	↓	↓
1000	B,C,J,K,M					540											

#### ULTRA LOW ESR, "U" SERIES

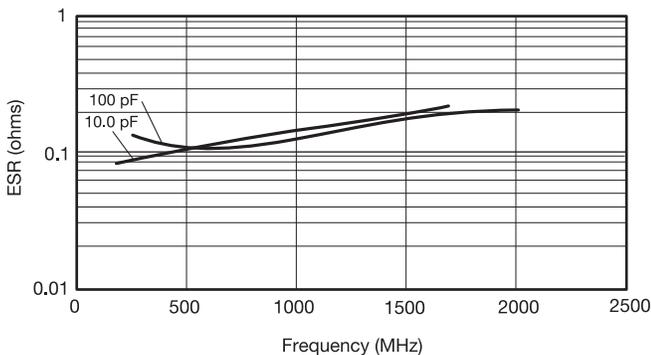
TYPICAL ESR vs. FREQUENCY  
0402 "U" SERIES



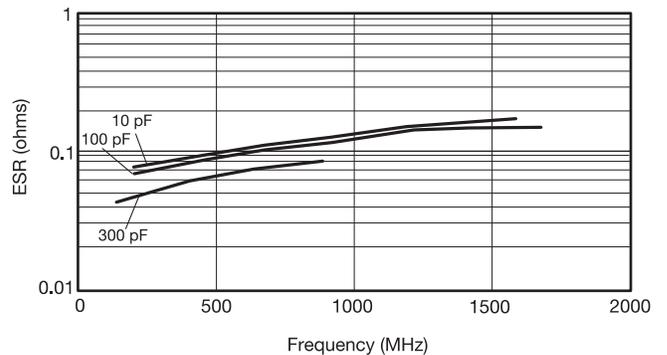
TYPICAL ESR vs. FREQUENCY  
0603 "U" SERIES



TYPICAL ESR vs. FREQUENCY  
0805 "U" SERIES

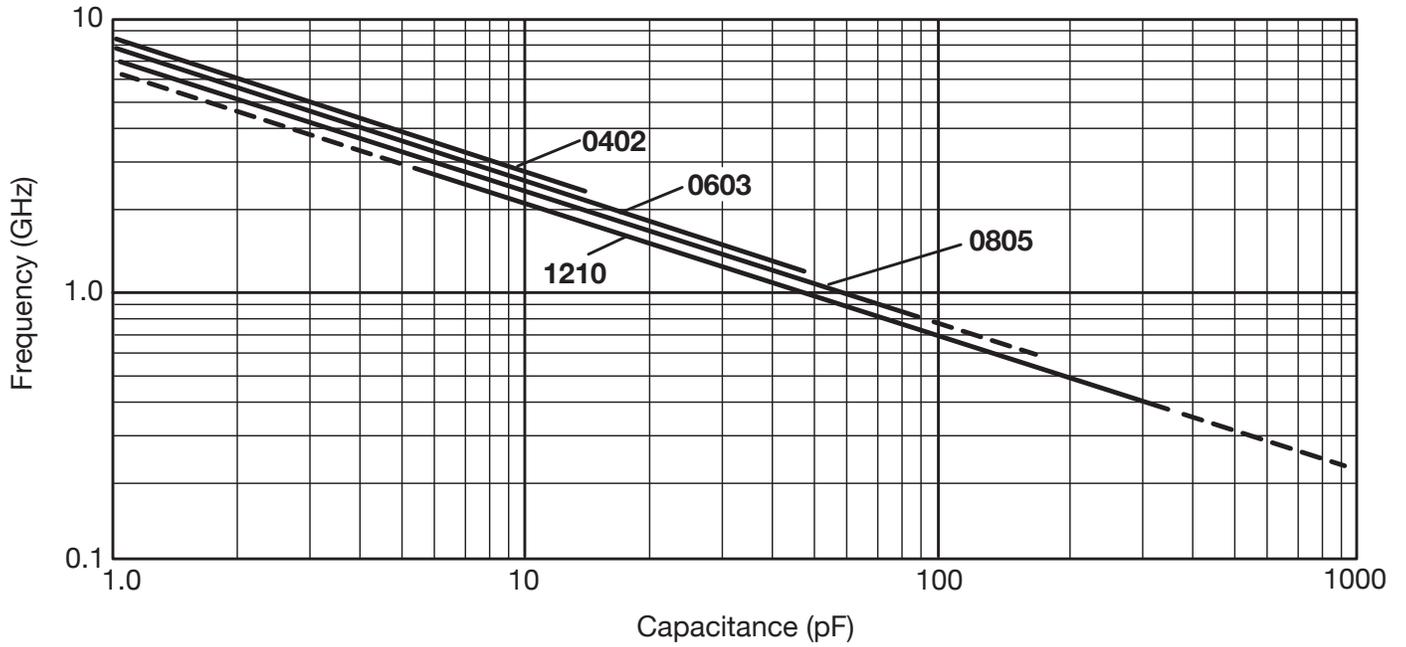


TYPICAL ESR vs. FREQUENCY  
1210 "U" SERIES



ESR Measured on the Boonton 34A

TYPICAL  
SERIES RESONANT FREQUENCY  
"U" SERIES CHIP



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