

# RF/Microwave COG (NP0) Capacitors (RoHS)



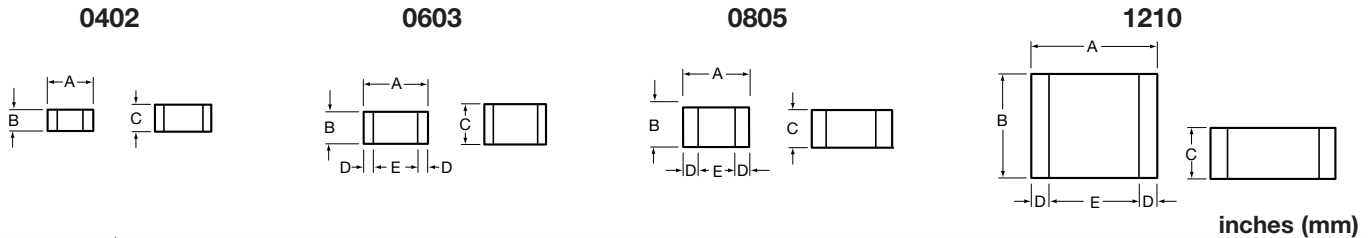
## Ultra Low ESR, "U" Series, COG (NP0) Chip Capacitors

### GENERAL INFORMATION

"U" Series capacitors are COG (NP0) chip capacitors specially designed for "Ultra" low ESR for applications in the communications market. Max ESR and effective capacitance

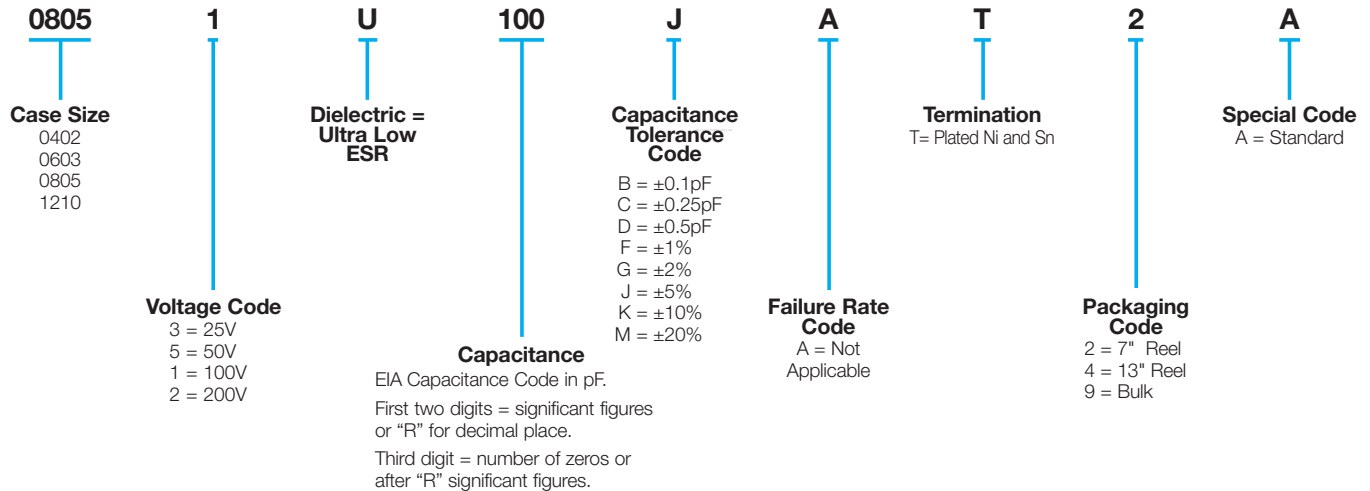
are met on each value producing lot to lot uniformity. Sizes available are EIA chip sizes 0603, 0805, and 1210.

### 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	N/A	N/A
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)	0.040±0.005 (1.02±0.127)	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)	0.050±0.005 (1.27±0.127)	0.025±0.015 (0.635±0.381)	0.040 (1.02) min

### HOW TO ORDER



## 7 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 127
- 0603 - See Performance Curve, page 127
- 0805 - See Performance Curve, page 127
- 1210 - See Performance Curve, page 127

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

### MILITARY SPECIFICATIONS

Meets or exceeds the requirements of MIL-C-55681



# RF/Microwave COG (NP0) Capacitors (RoHS)



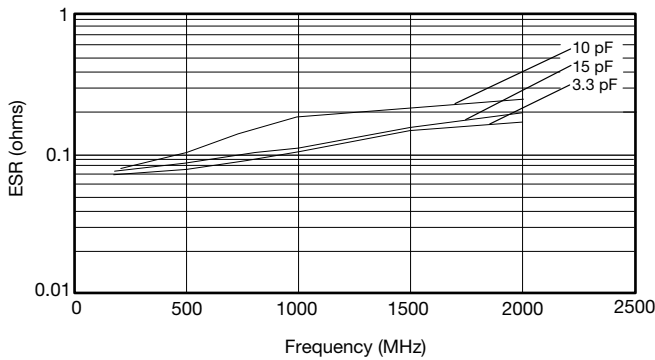
## Ultra Low ESR, "U" Series, COG (NP0) Chip Capacitors

### CAPACITANCE RANGE

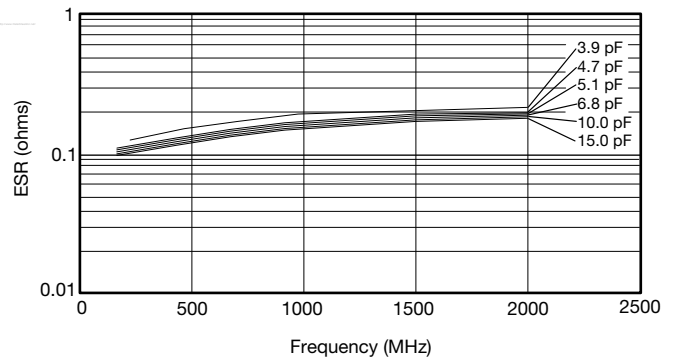
Cap (pF)	Available Tolerance	Size				Cap (pF)	Available Tolerance	Size				Cap (pF)	Available Tolerance	Size				Cap (pF)	Available Tolerance	Size			
		0402	0603	0805	1210			0402	0603	0805	1210			0402	0603	0805	1210			0402	0603	0805	1210
0.2	B,C	50V	N/A	N/A	N/A	1.0	B,C,D	50V	200V	200V	200V	7.5	B,C,J,K,M	50V	200V	200V	200V	100	F,G,J,K,M	N/A	100V	200V	200V
0.3						1.1						8.2						110			50V	200V	200V
0.4						1.2						9.1	B,C,J,K,M					120			50V	200V	200V
0.5	B,C					1.3						10	F,G,J,K,M					130			N/A	200V	200V
0.6	B,C,D					1.4						11						140				100V	200V
0.7						1.5						12						150				100V	N/A
0.8						1.6						13						160				100V	N/A
0.9	B,C,D					1.7						15						180				N/A	
						1.8						18						200					
						1.9						20						220					
						2.0						22						270					
						2.1						24						300					
						2.2						27						330					
						2.4						30						360					
						2.7						33						390					
						3.0						36						430					
						3.3						39						470					
						3.6						43						510					
						3.9						47						560					
						4.3						51						620					
						4.7						56						680					
						5.1						68						750					
						5.6						75						820					
						6.2	B,C,D					82						910					
						6.8	B,C,J,K,M					91						1000	F,G,J,K,M				

### ULTRA LOW ESR, "U" SERIES

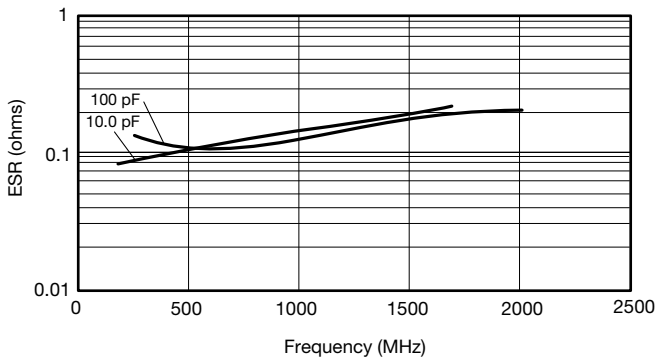
TYPICAL ESR vs. FREQUENCY  
0402 "U" SERIES



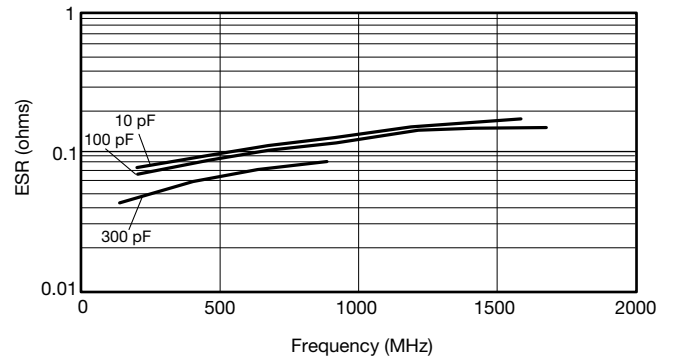
TYPICAL ESR vs. FREQUENCY  
0603 "U" SERIES



TYPICAL ESR vs. FREQUENCY  
0805 "U" SERIES



TYPICAL ESR vs. FREQUENCY  
1210 "U" SERIES



ESR Measured on the Boonton 34A

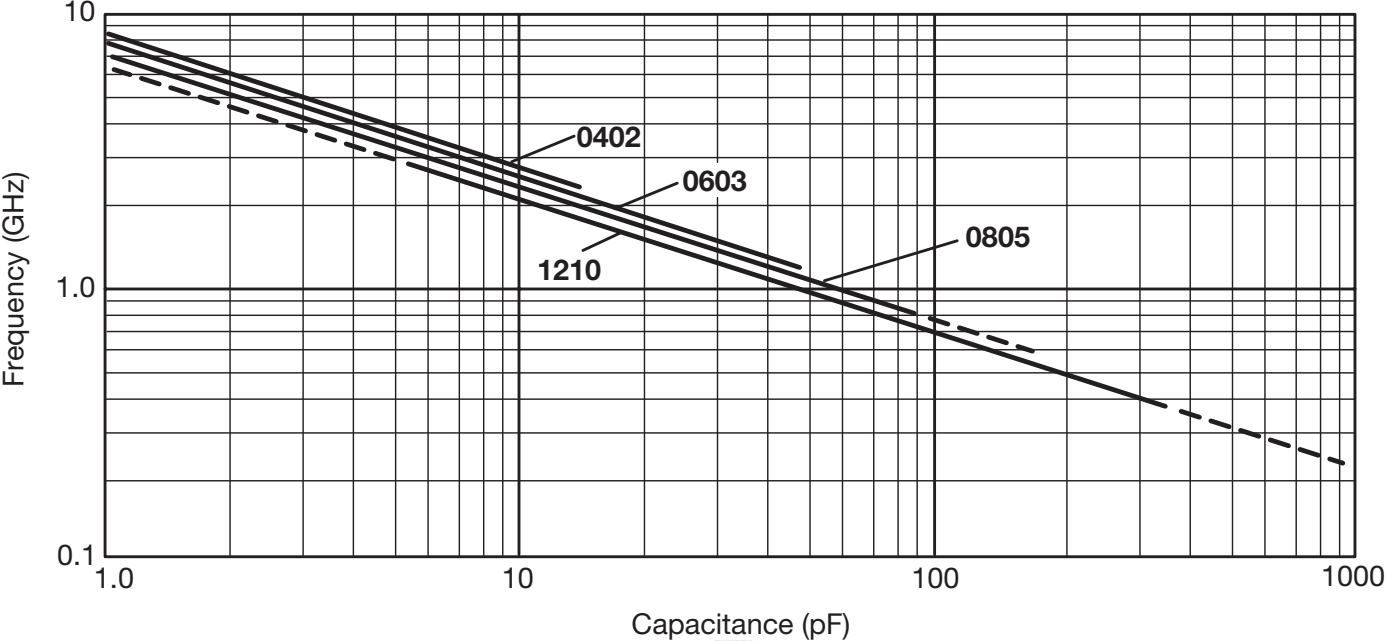


# RF/Microwave C0G (NP0) Capacitors (RoHS)



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

TYPICAL  
SERIES RESONANT FREQUENCY  
"U" SERIES CHIP



7



# RF/Microwave C0G (NP0) Capacitors (Sn/Pb)



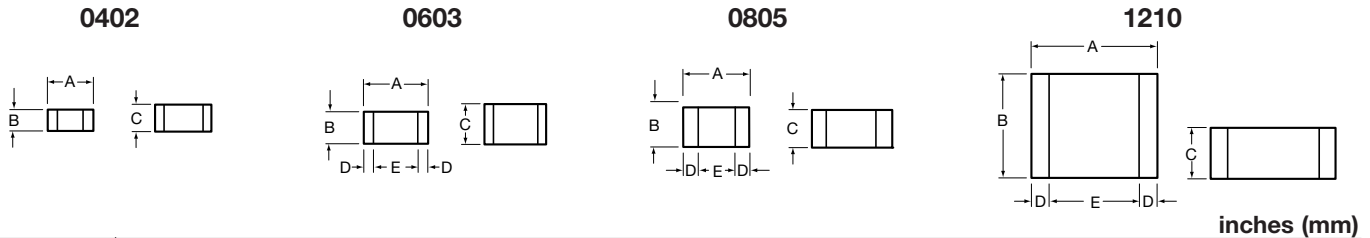
## Ultra Low ESR, "U" Series, C0G (NP0) Chip Capacitors

### 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

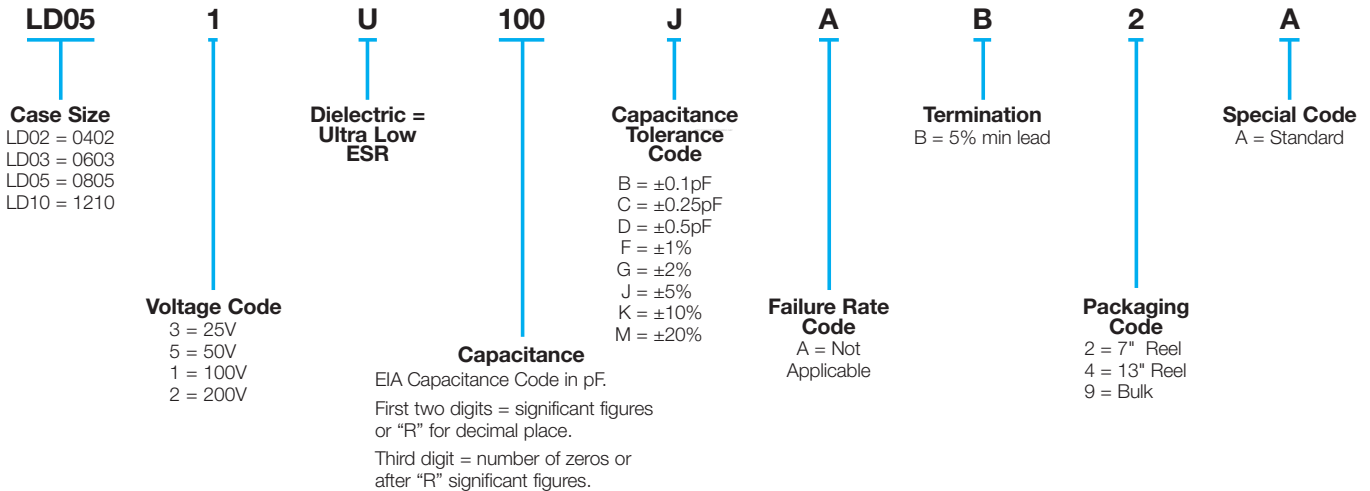
are met on each value producing lot to lot uniformity. Sizes available are EIA chip sizes 0603, 0805, and 1210.

### 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	N/A	N/A
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)	0.040±0.005 (1.02±0.127)	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)	0.050±0.005 (1.27±0.127)	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 130
- 0603 - See Performance Curve, page 130
- 0805 - See Performance Curve, page 130
- 1210 - See Performance Curve, page 130

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

#### MILITARY SPECIFICATIONS

Meets or exceeds the requirements of MIL-C-55681



# RF/Microwave C0G (NP0) Capacitors (Sn/Pb)



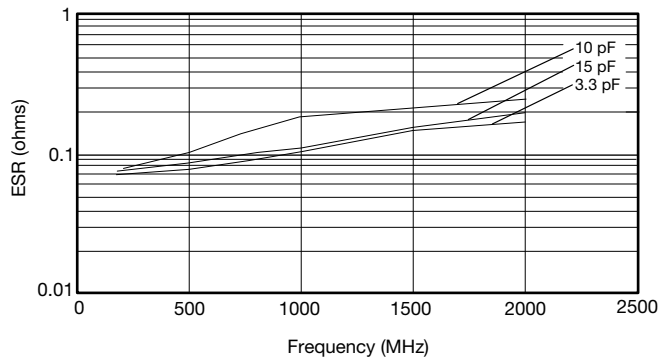
## Ultra Low ESR, "U" Series, C0G (NP0) Chip Capacitors

### CAPACITANCE RANGE

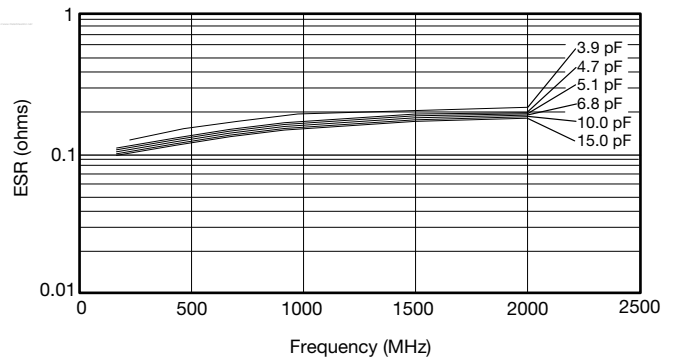
Cap (pF)	Available Tolerance	Size				Cap (pF)	Available Tolerance	Size				Cap (pF)	Available Tolerance	Size				Cap (pF)	Available Tolerance	Size									
		LD02	LD03	LD05	LD10			LD02	LD03	LD05	LD10			LD02	LD03	LD05	LD10			LD02	LD03	LD05	LD10						
0.2	B,C	50V	N/A	N/A	N/A	1.0	B,C,D	50V	200V	200V	200V	7.5	B,C,J,K,M	50V	200V	200V	200V	100	F,G,J,K,M	N/A	100V	200V	200V	110		N/A	100V	200V	200V
0.3						1.1						8.2						120			50V	200V	200V	120			50V	200V	200V
0.4						1.2						9.1	B,C,J,K,M					130			N/A	200V	200V	130			N/A	200V	200V
0.5	B,C					1.3						10	F,G,J,K,M					140				100V	200V	140				100V	200V
0.6	B,C,D					1.4						11						150				100V	200V	150				100V	200V
0.7						1.5						12						160				100V	200V	160				100V	200V
0.8						1.6						13						180				100V	200V	180				100V	200V
0.9	B,C,D					1.7						15						200				100V	200V	200				100V	200V
						1.8						18						220				100V	200V	220				100V	200V
						1.9						20						270				100V	200V	270				100V	200V
						2.0						22						300				100V	200V	300				100V	200V
						2.1						24						330				100V	200V	330				100V	200V
						2.2						27						360				100V	200V	360				100V	200V
						2.4						30		50V				390				100V	200V	390				100V	200V
						2.7						33		N/A				430				100V	200V	430				100V	200V
						3.0						36						470				100V	200V	470				100V	200V
						3.3						39						510				100V	200V	510				100V	200V
						3.6						43						560				100V	200V	560				100V	200V
						3.9						47						620				100V	200V	620				100V	200V
						4.3						51						680				100V	200V	680				100V	200V
						4.7						56						750				100V	200V	750				100V	200V
						5.1						68						820				100V	200V	820				100V	200V
						5.6						75						910				100V	200V	910				100V	200V
						6.2	B,C,D					82						1000		F,G,J,K,M		100V	200V	1000				100V	200V
						6.8	B,C,J,K,M					91										100V	200V					100V	200V

### ULTRA LOW ESR, "U" SERIES

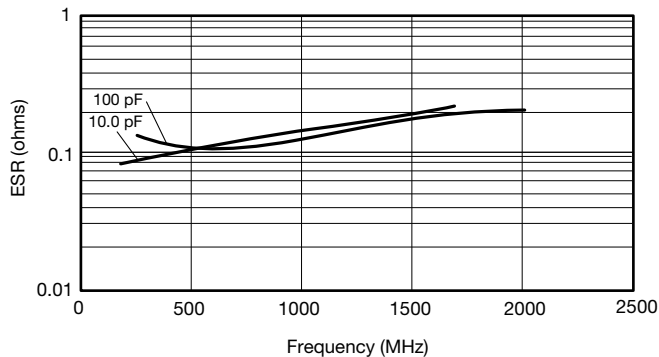
TYPICAL ESR vs. FREQUENCY  
0402 "U" SERIES



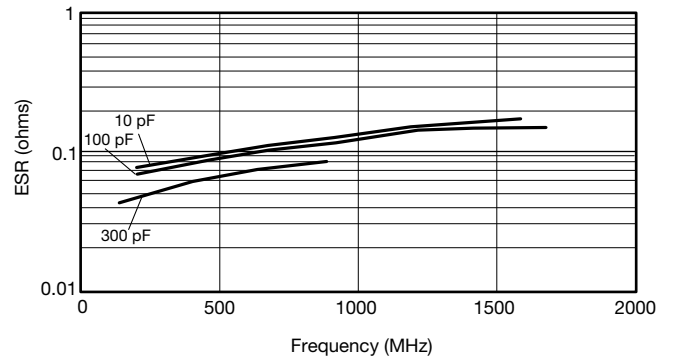
TYPICAL ESR vs. FREQUENCY  
0603 "U" SERIES



TYPICAL ESR vs. FREQUENCY  
0805 "U" SERIES



TYPICAL ESR vs. FREQUENCY  
1210 "U" SERIES



ESR Measured on the Boonton 34A

7

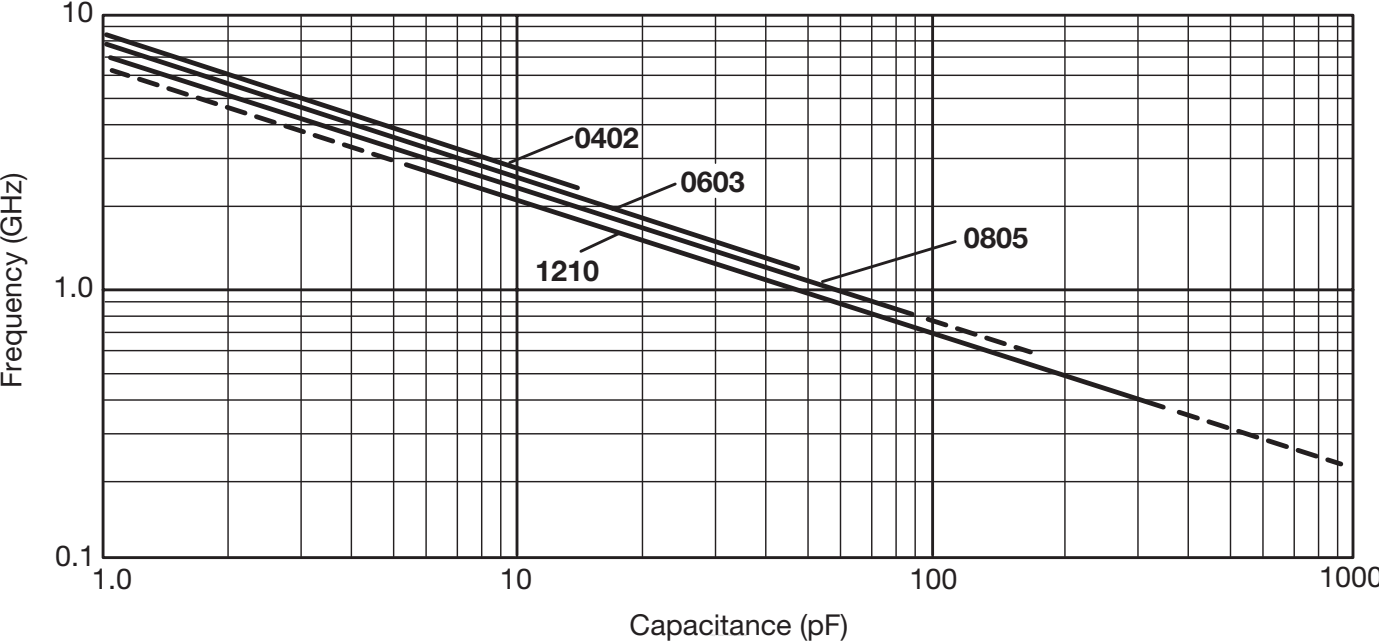


# RF/Microwave C0G (NP0) Capacitors (Sn/Pb)



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

TYPICAL  
SERIES RESONANT FREQUENCY  
"U" SERIES CHIP



**AVX RF**  
**RF/Microwave**  
“U” Series  
Designer Kits

## “U” Dielectric Kits

### 0402

Kit 5000 UZ			
Cap. Value pF	Tolerance	Cap. Value pF	Tolerance
0.5	B (±0.1pF)	4.7	B (±0.1pF)
1.0		5.6	
1.5		6.8	
1.8		8.2	
2.2		10.0	
2.4		12.0	
3.0		15.0	
3.6			J (±5%)

\*\*\*25 each of 15 values

### 0603

Kit 4000 UZ			
Cap. Value pF	Tolerance	Cap. Value pF	Tolerance
1.0	B (±0.1pF)	6.8	B (±0.1pF)
1.2		7.5	
1.5		8.2	
1.8		10.0	
2.0		12.0	J (±5%)
2.4		15.0	
2.7		18.0	
3.0		22.0	
3.3		27.0	
3.9		33.0	
4.7		39.0	
5.6		47.0	

\*\*\*25 each of 24 values

### 0805

Kit 3000 UZ			
Cap. Value pF	Tolerance	Cap. Value pF	Tolerance
1.0	B (±0.1pF)	15.0	J (±5%)
1.5		18.0	
2.2		22.0	
2.4		24.0	
2.7		27.0	
3.0		33.0	
3.3		36.0	
3.9		39.0	
4.7		47.0	
5.6		56.0	
7.5		68.0	
8.2		82.0	
9.1		100.0	
10.0		130.0	
12.0	J (±5%)	160.0	

\*\*\*25 each of 30 values

### 1210

Kit 3500 UZ			
Cap. Value pF	Tolerance	Cap. Value pF	Tolerance
2.2	B (±0.1pF)	36.0	J (±5%)
2.7		39.0	
4.7		47.0	
5.1		51.0	
6.8		56.0	
8.2		68.0	
9.1		82.0	
10.0		100.0	
13.0	J (±5%)	120.0	
15.0		130.0	
18.0		240.0	
20.0		300.0	
24.0		390.0	
27.0		470.0	
30.0		680.0	

\*\*\*25 each of 30 values