

RF/Microwave COG (NP0) Capacitors (RoHS)



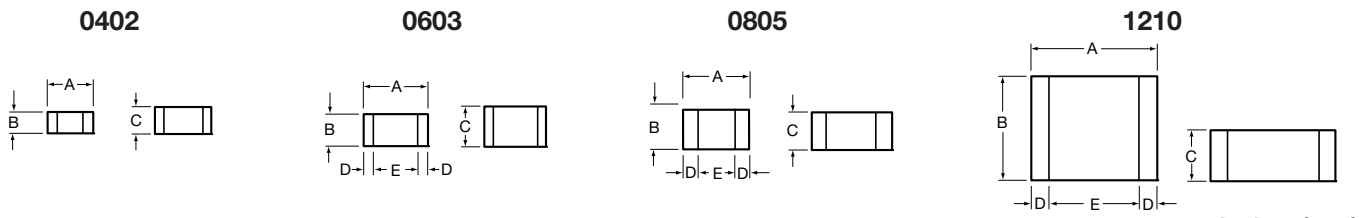
Ultra Low ESR, "U" Series, COG (NP0) Chip Capacitors

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

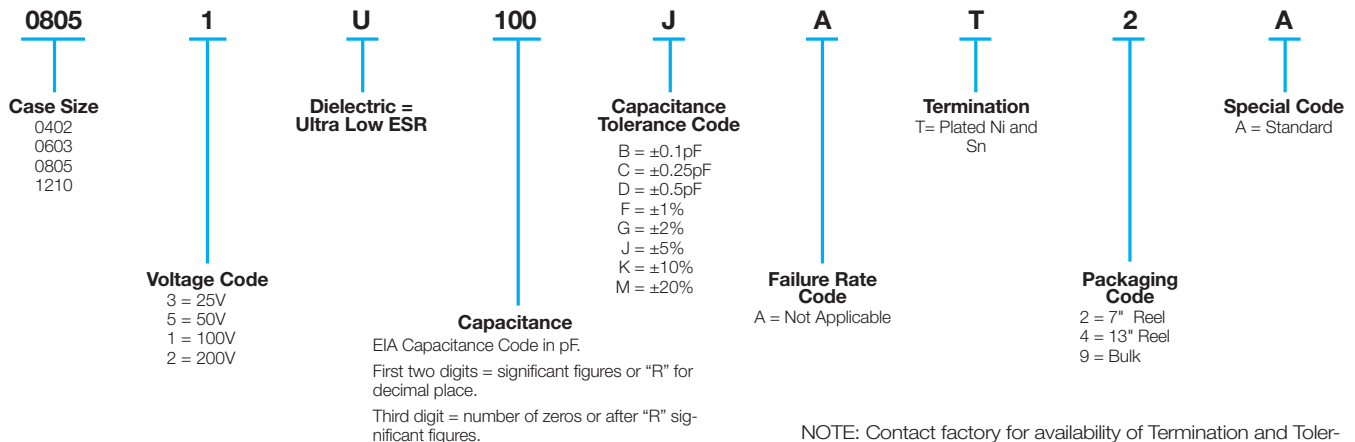
are met on each value producing lot to lot uniformity. Sizes available are EIA chip sizes 0402, 0603, 0805, and 1210.

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±0.255)	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



NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

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):

- 10¹² Ω min. @ 25°C and rated WVDC
- 10¹¹ 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 9
- 0603 - See Performance Curve, page 9
- 0805 - See Performance Curve, page 9
- 1210 - See Performance Curve, page 9

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 (RoHS)



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

CAPACITANCE RANGE

Cap (pF)	Available Tolerance	Size			
Cap (pF)	Available Tolerance	0402	0603	0805	1210
0.2	B,C	50V	N/A	N/A	N/A
0.3	B,C	50V	N/A	N/A	N/A
0.4	B,C	50V	N/A	N/A	N/A
0.5	B,C	50V	N/A	N/A	N/A
0.6	B,C,D	50V	N/A	N/A	N/A
0.7	B,C,D	50V	N/A	N/A	N/A
0.8	B,C,D	50V	N/A	N/A	N/A
0.9	B,C,D	50V	N/A	N/A	N/A

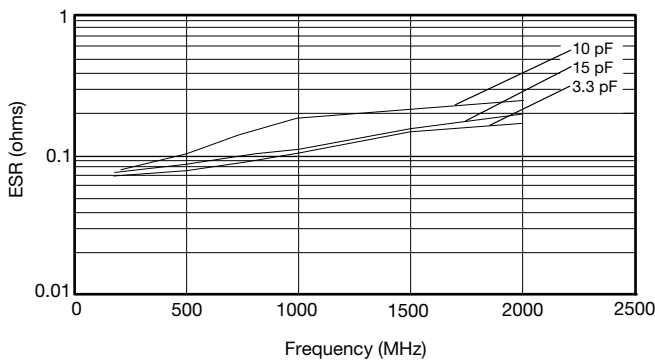
Cap (pF)	Available Tolerance	Size			
Cap (pF)	Available Tolerance	0402	0603	0805	1210
1.0	B,C,D	50V	200V	200V	200V
1.1	B,C,D	50V	200V	200V	200V
1.2	B,C,D	50V	200V	200V	200V
1.3	B,C,D	50V	200V	200V	200V
1.4	B,C,D	50V	200V	200V	200V
1.5	B,C,D	50V	200V	200V	200V
1.6	B,C,D	50V	200V	200V	200V
1.7	B,C,D	50V	200V	200V	200V
1.8	B,C,D	50V	200V	200V	200V
1.9	B,C,D	50V	200V	200V	200V
2.0	B,C,D	50V	200V	200V	200V
2.1	B,C,D	50V	200V	200V	200V
2.2	B,C,D	50V	200V	200V	200V
2.4	B,C,D	50V	200V	200V	200V
2.7	B,C,D	50V	200V	200V	200V
3.0	B,C,D	50V	200V	200V	200V
3.3	B,C,D	50V	200V	200V	200V
3.6	B,C,D	50V	200V	200V	200V
3.9	B,C,D	50V	200V	200V	200V
4.3	B,C,D	50V	200V	200V	200V
4.7	B,C,D	50V	200V	200V	200V
5.1	B,C,D	50V	200V	200V	200V
5.6	B,C,D	50V	200V	200V	200V
6.2	B,C,D	50V	200V	200V	200V
6.8	B,C,D	50V	200V	200V	200V

Cap (pF)	Available Tolerance	Size			
Cap (pF)	Available Tolerance	0402	0603	0805	1210
7.5	B,C,J,K,M	50V	200V	200V	200V
8.2	B,C,J,K,M	50V	200V	200V	200V
9.1	B,C,J,K,M	50V	200V	200V	200V
10	B,C,J,K,M	50V	200V	200V	200V
11	F,G,J,K,M	50V	200V	200V	200V
12	F,G,J,K,M	50V	200V	200V	200V
13	F,G,J,K,M	50V	200V	200V	200V
15	F,G,J,K,M	50V	200V	200V	200V
18	F,G,J,K,M	50V	200V	200V	200V
20	F,G,J,K,M	50V	200V	200V	200V
22	F,G,J,K,M	50V	200V	200V	200V
24	F,G,J,K,M	50V	200V	200V	200V
27	F,G,J,K,M	50V	200V	200V	200V
30	F,G,J,K,M	50V	200V	200V	200V
33	F,G,J,K,M	50V	200V	200V	200V
36	F,G,J,K,M	50V	200V	200V	200V
39	F,G,J,K,M	50V	200V	200V	200V
43	F,G,J,K,M	50V	200V	200V	200V
47	F,G,J,K,M	50V	200V	200V	200V
51	F,G,J,K,M	50V	200V	200V	200V
56	F,G,J,K,M	50V	200V	200V	200V
68	F,G,J,K,M	50V	200V	200V	200V
75	F,G,J,K,M	50V	200V	200V	200V
82	F,G,J,K,M	50V	200V	200V	200V
91	F,G,J,K,M	50V	200V	200V	200V

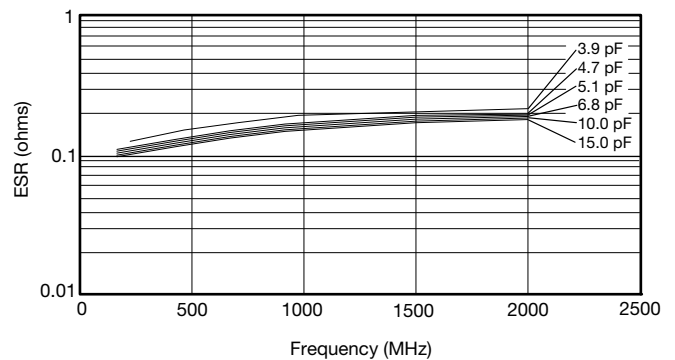
Cap (pF)	Available Tolerance	Size			
Cap (pF)	Available Tolerance	0402	0603	0805	1210
100	F,G,J,K,M	N/A	100V	200V	200V
110	F,G,J,K,M	N/A	50V	200V	200V
120	F,G,J,K,M	N/A	50V	200V	200V
130	F,G,J,K,M	N/A	50V	200V	200V
140	F,G,J,K,M	N/A	N/A	200V	200V
150	F,G,J,K,M	N/A	N/A	100V	200V
160	F,G,J,K,M	N/A	N/A	100V	200V
180	F,G,J,K,M	N/A	N/A	100V	200V
200	F,G,J,K,M	N/A	N/A	N/A	200V
220	F,G,J,K,M	N/A	N/A	N/A	200V
270	F,G,J,K,M	N/A	N/A	N/A	200V
300	F,G,J,K,M	N/A	N/A	N/A	200V
330	F,G,J,K,M	N/A	N/A	N/A	200V
360	F,G,J,K,M	N/A	N/A	N/A	200V
390	F,G,J,K,M	N/A	N/A	N/A	200V
430	F,G,J,K,M	N/A	N/A	N/A	200V
470	F,G,J,K,M	N/A	N/A	N/A	200V
510	F,G,J,K,M	N/A	N/A	N/A	200V
560	F,G,J,K,M	N/A	N/A	N/A	200V
620	F,G,J,K,M	N/A	N/A	N/A	200V
680	F,G,J,K,M	N/A	N/A	N/A	200V
750	F,G,J,K,M	N/A	N/A	N/A	200V
820	F,G,J,K,M	N/A	N/A	N/A	200V
910	F,G,J,K,M	N/A	N/A	N/A	200V
1000	F,G,J,K,M	N/A	N/A	N/A	200V

ULTRA LOW ESR, "U" SERIES

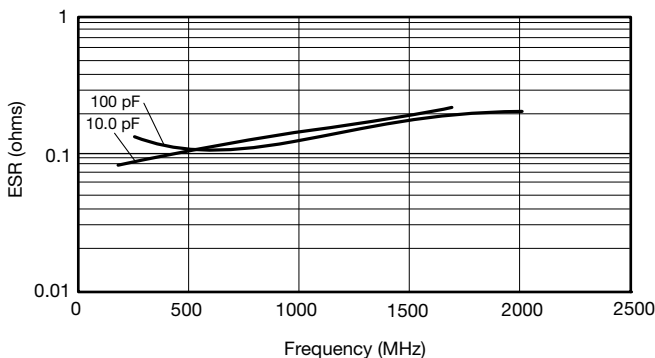
TYPICAL ESR vs. FREQUENCY
0402 "U" SERIES



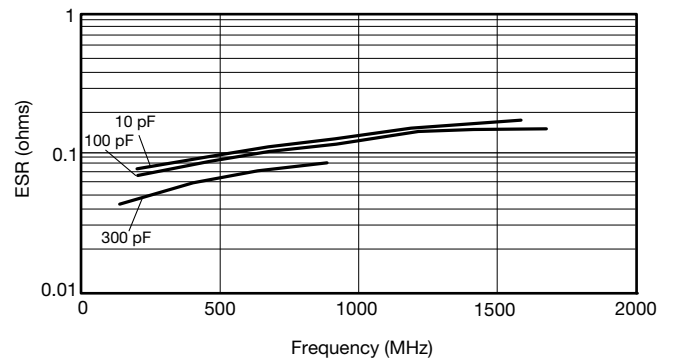
TYPICAL ESR vs. FREQUENCY
0603 "U" SERIES



TYPICAL ESR vs. FREQUENCY
0805 "U" SERIES



TYPICAL ESR vs. FREQUENCY
1210 "U" SERIES



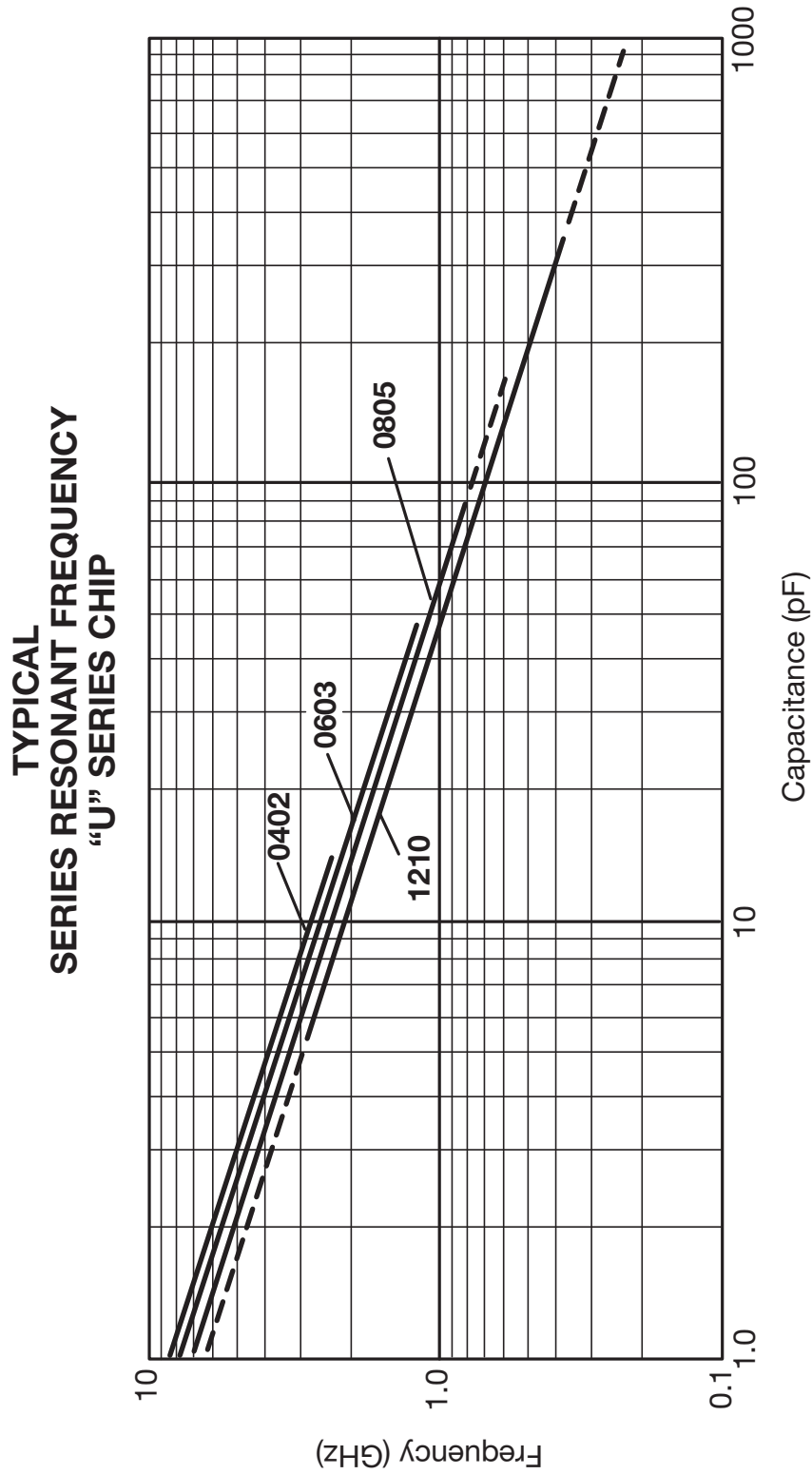
ESR Measured on the Boonton 34A



RF/Microwave C0G (NP0) Capacitors



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



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



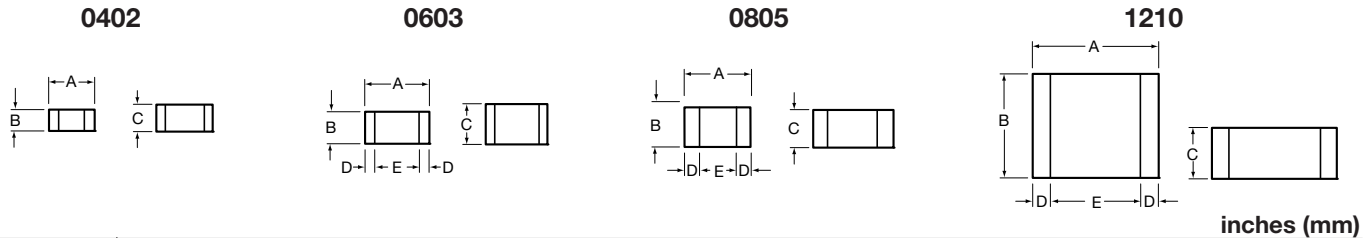
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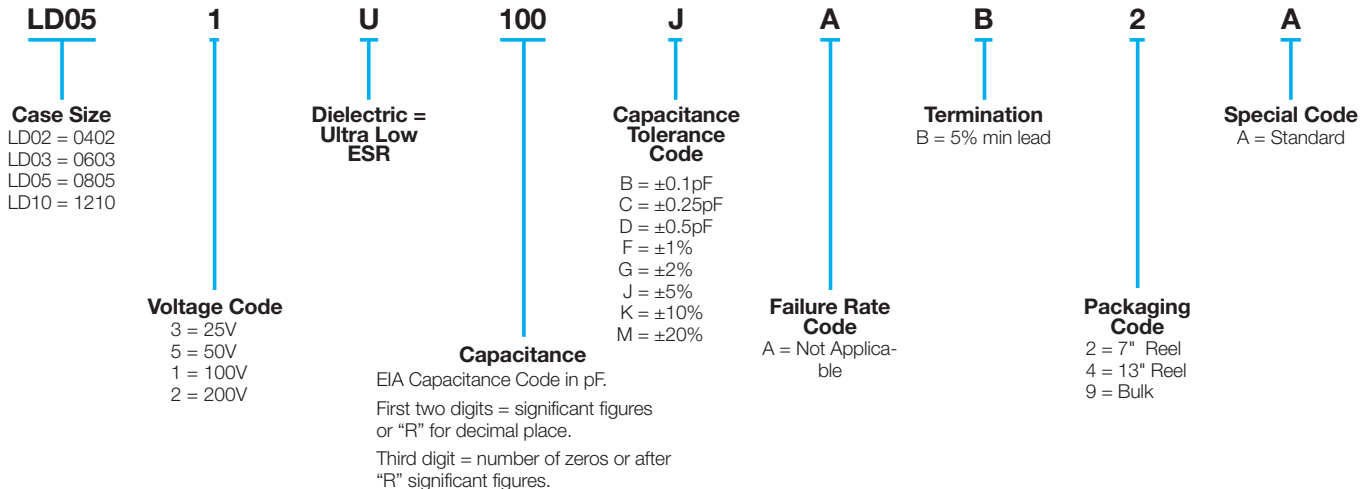
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DIMENSIONS: inches (millimeters)



Size	A	B	C	D	E
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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

Not RoHS Compliant

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):

10¹² Ω min. @ 25°C and rated WVDC
10¹¹ 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 12
- 0603 - See Performance Curve, page 12
- 0805 - See Performance Curve, page 12
- 1210 - See Performance Curve, page 12

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)



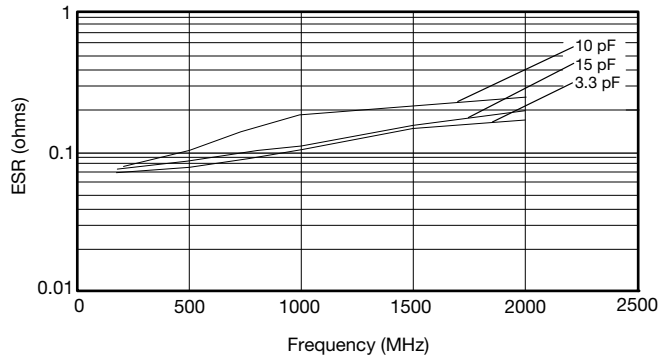
Ultra Low ESR, "U" Series, C0G (NP0) Chip Capacitors

CAPACITANCE RANGE

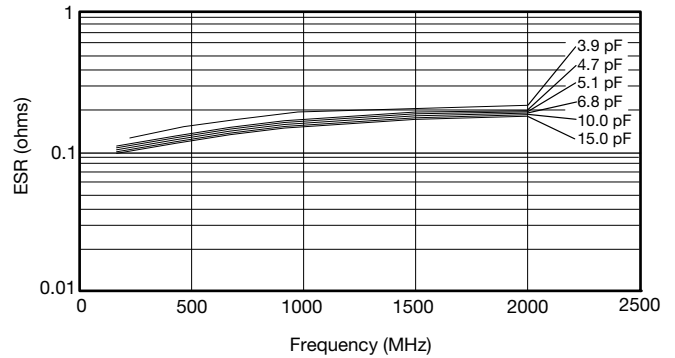
Cap (pF)	Available Tolerance	Size				Cap (pF)	Available Tolerance	Size				Cap (pF)	Available Tolerance	Size				Cap (pF)	Available Tolerance	Size																																																																																																																					
		LD02	LD03	LD05	LD10			LD02	LD03	LD05	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	100	F,G,J,K,M	N/A	100V	200V	200V	110					120					130					140					150					160					180					200					220					270					300					330					360					390					430					470					510					560					620					680					750					820					910					1000				

ULTRA LOW ESR, "U" SERIES

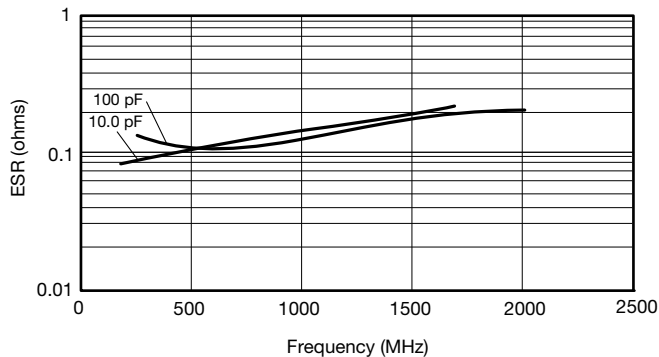
TYPICAL ESR vs. FREQUENCY
0402 "U" SERIES



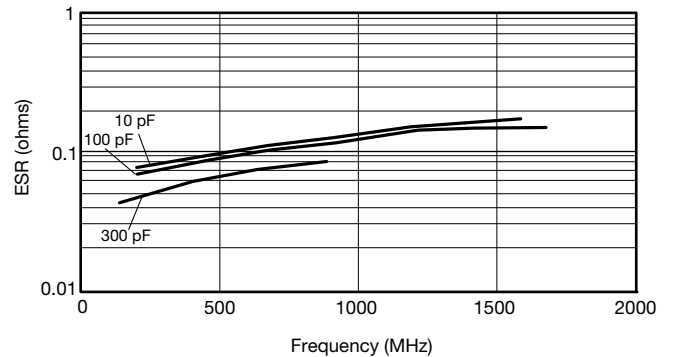
TYPICAL ESR vs. FREQUENCY
0603 "U" SERIES



TYPICAL ESR vs. FREQUENCY
0805 "U" SERIES



TYPICAL ESR vs. FREQUENCY
1210 "U" SERIES



ESR Measured on the Boonton 34A



“U” SERIES KITS

0402

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

***25 each of 15 values

0603

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

***25 each of 24 values

0805

Kit 3000 UZ					
Cap. Value pF	Tolerance	Cap. Value pF	Tolerance		
1.0	B ($\pm 0.1\text{pF}$)	15.0	J ($\pm 5\%$)		
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		J ($\pm 5\%$)		130.0	J ($\pm 5\%$)
12.0				160.0	

***25 each of 30 values

1210

Kit 3500 UZ			
Cap. Value pF	Tolerance	Cap. Value pF	Tolerance
2.2	B ($\pm 0.1\text{pF}$)	36.0	J ($\pm 5\%$)
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		J ($\pm 5\%$)	
13.0	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