

RF/Microwave COG (NP0) Capacitors (RoHS)



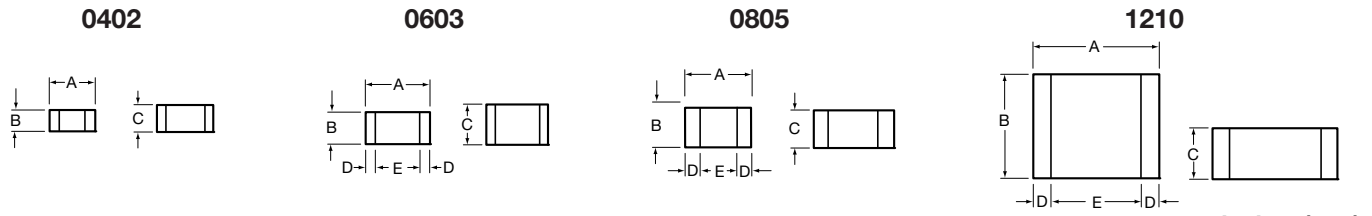
Ultra Low ESR, "U" Series, COG (NP0) Chip Capacitors

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

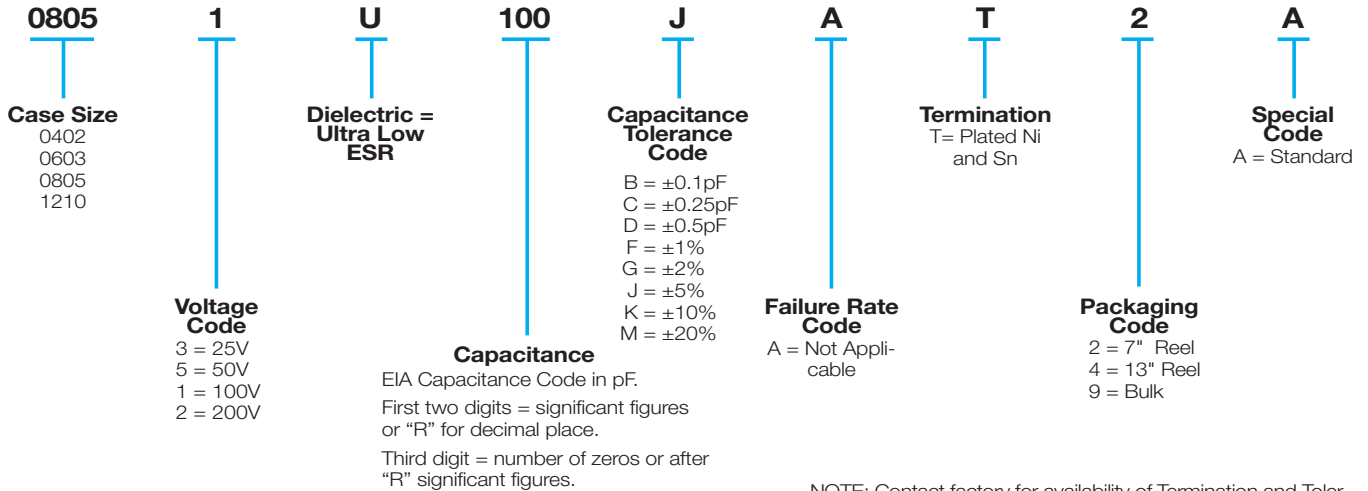
are met on each value producing lot to lot uniformity. Sizes available are EIA chip sizes 0603, 0805, and 1210.

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±0.255)	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			
		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

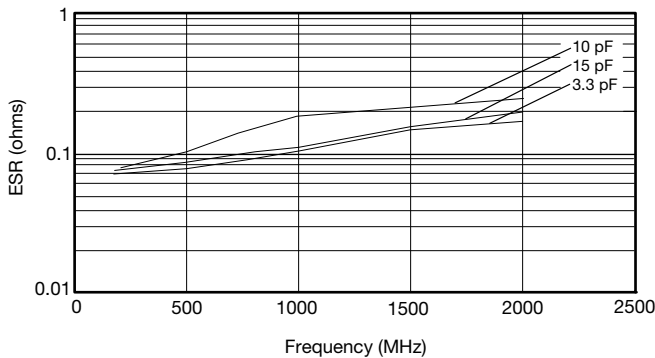
Cap (pF)	Available Tolerance	Size			
		0402	0603	0805	1210
1.0	B,C,D	50V	200V	200V	200V
1.1	B,C,D	50V	200V	200V	200V
1.2	B,C,D	50V	200V	200V	200V
1.3	B,C,D	50V	200V	200V	200V
1.4	B,C,D	50V	200V	200V	200V
1.5	B,C,D	50V	200V	200V	200V
1.6	B,C,D	50V	200V	200V	200V
1.7	B,C,D	50V	200V	200V	200V
1.8	B,C,D	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			
		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	F,G,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

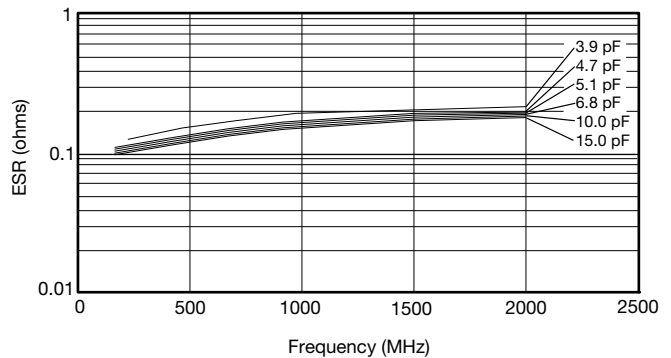
Cap (pF)	Available Tolerance	Size			
		0402	0603	0805	1210
100	F,G,J,K,M	N/A	100V	200V	200V
110	F,G,J,K,M	N/A	50V	200V	200V
120	F,G,J,K,M	N/A	50V	200V	200V
130	F,G,J,K,M	N/A	50V	200V	200V
140	F,G,J,K,M	N/A	50V	200V	200V
150	F,G,J,K,M	N/A	50V	200V	200V
160	F,G,J,K,M	N/A	50V	200V	200V
180	F,G,J,K,M	N/A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

ULTRA LOW ESR, "U" SERIES

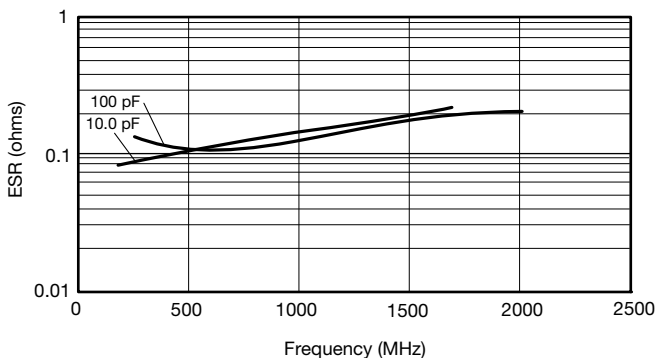
TYPICAL ESR vs. FREQUENCY
0402 "U" SERIES



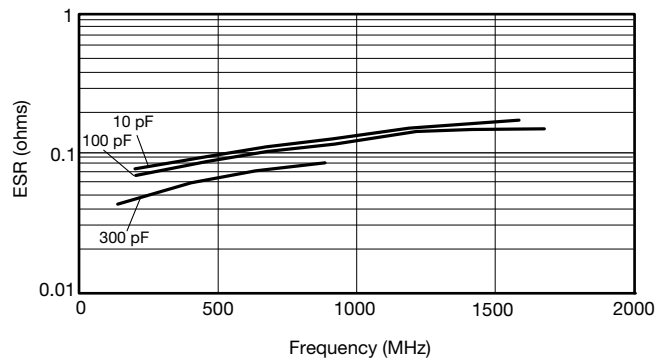
TYPICAL ESR vs. FREQUENCY
0603 "U" SERIES



TYPICAL ESR vs. FREQUENCY
0805 "U" SERIES



TYPICAL ESR vs. FREQUENCY
1210 "U" SERIES



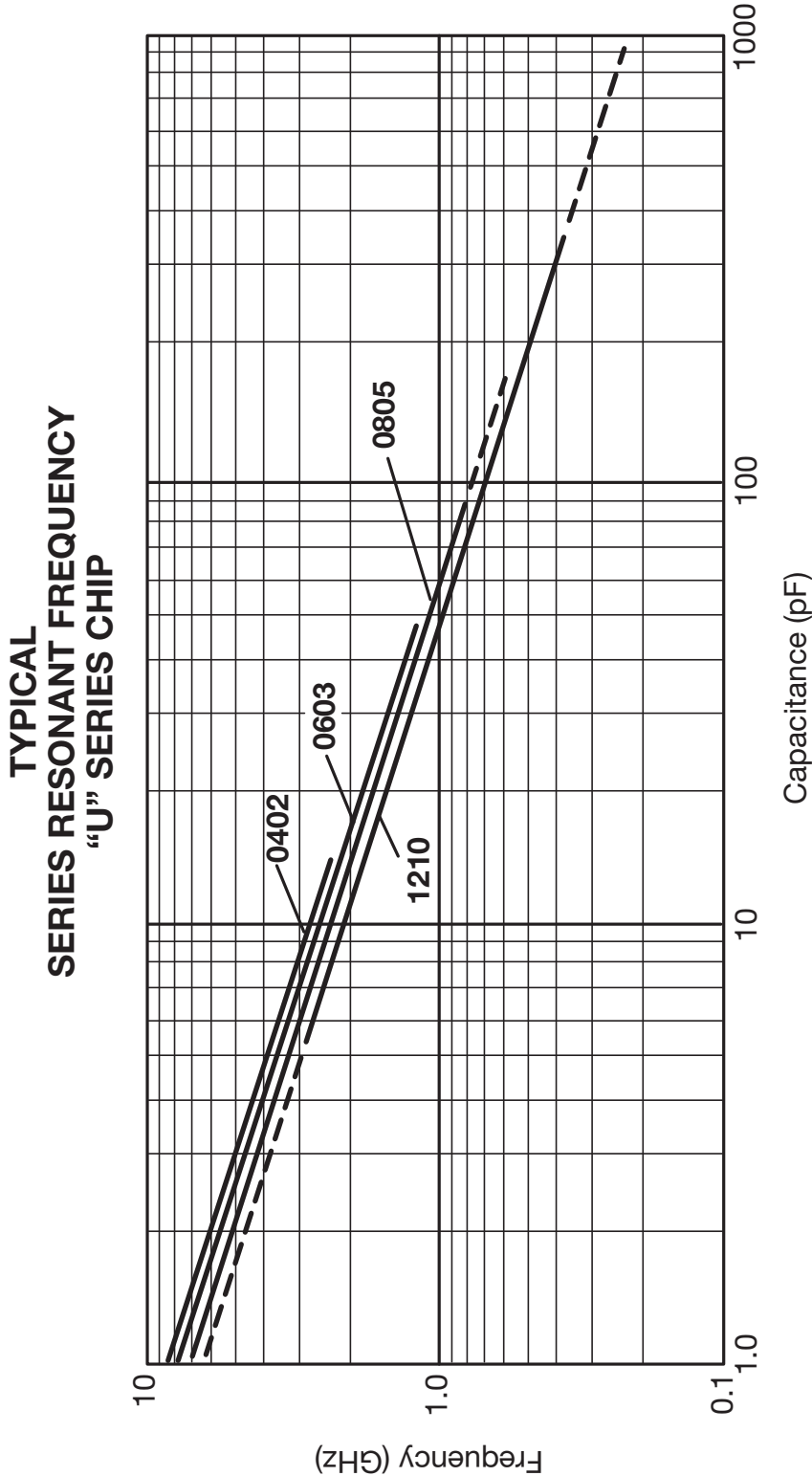
ESR Measured on the Boonton 34A



RF/Microwave C0G (NP0) Capacitors



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



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

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.

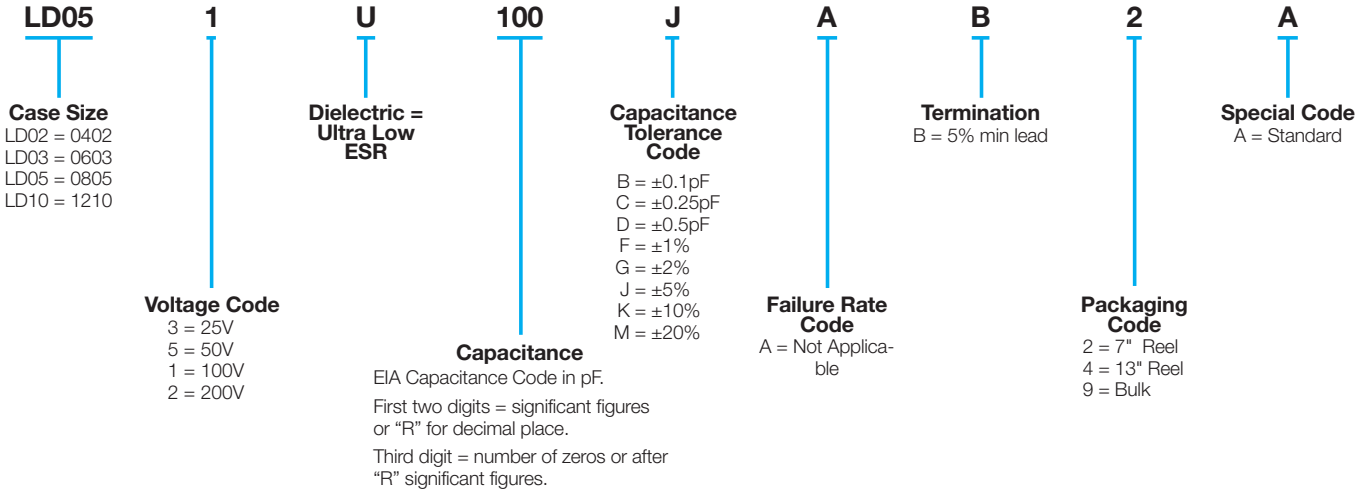
DIMENSIONS: inches (millimeters)



inches (mm)

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
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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

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)



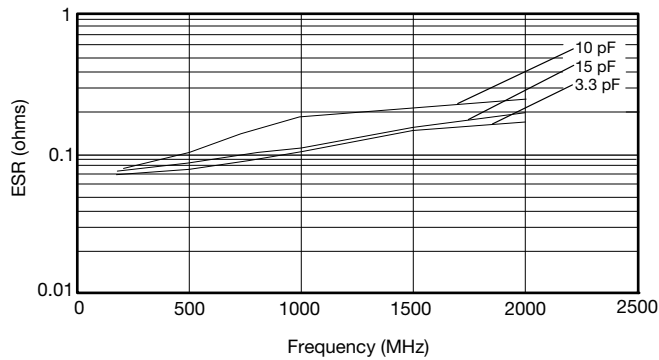
Ultra Low ESR, "U" Series, C0G (NP0) Chip Capacitors

CAPACITANCE RANGE

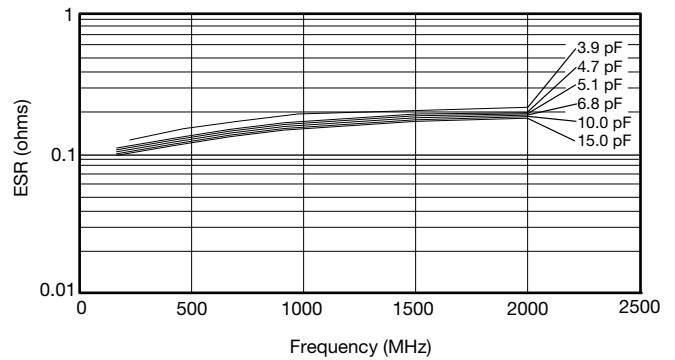
Cap (pF)	Available Tolerance	Size				Cap (pF)	Available Tolerance	Size				Cap (pF)	Available Tolerance	Size				Cap (pF)	Available Tolerance	Size			
		LD02	LD03	LD05	LD10			LD02	LD03	LD05	LD10			LD02	LD03	LD05	LD10			LD02	LD03	LD05	LD10
0.2	B,C	50V	N/A	N/A	N/A	1.0	B,C,D	50V	200V	200V	200V	100	F,G,J,K,M	N/A	100V	200V	200V	110		N/A	100V	200V	200V
0.3						1.1						110						120			50V	200V	200V
0.4						1.2						120						130			50V	200V	200V
0.5	B,C					1.3						130						140			N/A	200V	200V
0.6	B,C,D					1.4						140						150				100V	200V
0.7						1.5						150						160				100V	200V
0.8						1.6						160						180				100V	200V
0.9	B,C,D					1.7						180						200				100V	200V
						1.8						200						220				100V	200V
						1.9						220						270				100V	200V
						2.0						270						300				100V	200V
						2.1						300						330				100V	200V
						2.2						330						360				100V	200V
						2.4						360						390				100V	200V
						2.7						390						430				100V	200V
						3.0						430						470				100V	200V
						3.3						470						510				100V	200V
						3.6						510						560				100V	200V
						3.9						560						620				100V	200V
						4.3						620						680				100V	200V
						4.7						680						750				100V	200V
						5.1						750						820				100V	200V
						5.6						820						910				100V	200V
						6.2	B,C,D					910						1000				100V	200V
						6.8	B,C,J,K,M					1000	F,G,J,K,M										

ULTRA LOW ESR, "U" SERIES

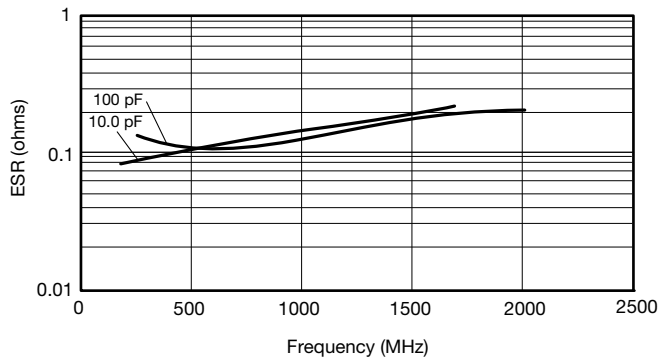
TYPICAL ESR vs. FREQUENCY
0402 "U" SERIES



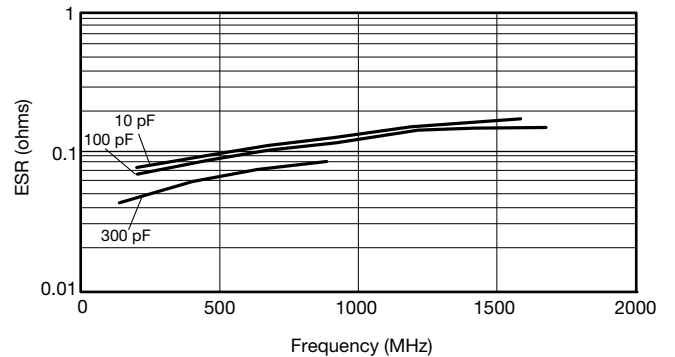
TYPICAL ESR vs. FREQUENCY
0603 "U" SERIES



TYPICAL ESR vs. FREQUENCY
0805 "U" SERIES



TYPICAL ESR vs. FREQUENCY
1210 "U" SERIES



ESR Measured on the Boonton 34A



“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	J ($\pm 5\%$)
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	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 ($\pm 0.1\text{pF}$)	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 ($\pm 5\%$)		100.0
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