

RF/Microwave Capacitors

RF/Microwave COG (NP0) Capacitors

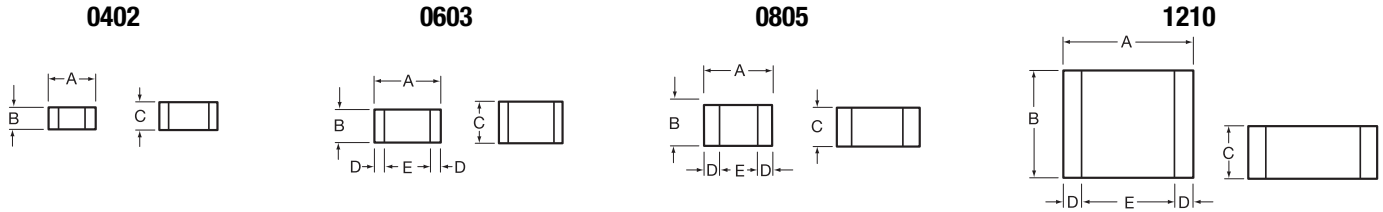
Ultra Low ESR "U" Series, COG (NP0) Capacitors (RoHS), KGQ Series



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	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

<p>KGQ</p> <p>Series General Purpose Tin/ Nickel Finish</p>	<p>05</p> <p>Size 05 = 0402 15 = 0603 21 = 0805 32 = 1210</p>	<p>F</p> <p>Thickness See Cap Chart</p>	<p>CG</p> <p>Dielectric COG = CG</p>	<p>1H</p> <p>Voltage 1H = 50V 2A = 100V 2D = 200V</p>	<p>9R1</p> <p>Capacitance Code Code (in pF) 2 Significant Digits +Number of zeros eg. 10µF = 106 10nF = 103 47pF = 470</p>	<p>B</p> <p>Capacitance Tolerance B = ± 0.1pF(<10pF) C = ± 0.25pF(<10pF) D = ± 0.5pF(<10pF) G = ±2% F = ±1% J = ±5% K = ±10% M = ±20%</p>	<p>N</p> <p>Packaging See Table Below</p>
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PACKAGING CODES

Code	EIA (inch)	IEC(mm)	7" Paper	7" Embossed	13" Paper	13" Embossed
05	0402	1005	H		N	
15	0603	1608	T		M	
21	0805	2012	T		M	
32	1210	3225	T		M	

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 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).

Military Specifications

Meets or exceeds the requirements of MIL-C-55681.



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.kyocera-avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.

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RF/Microwave C0G (NP0) Capacitors

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



CAPACITANCE RANGE

SIZE		0402				0603				0805				1210			
Soldering		All Paper				All Paper				All Embossed				All Embossed			
(L) Length	mm	1.00±0.10				1.60±0.15				2.01±0.20				3.20±0.20			
	(in.)	(0.040±0.004)				(0.063±0.006)				(0.079±0.008)				(0.126±0.008)			
(W) Width	mm	0.50±0.10				0.81±0.15				1.25±0.20				2.50±0.20			
	(in.)	(0.020±0.004)				(0.032±0.006)				(0.049±0.008)				(0.098±0.008)			
(t) Terminal	mm	0.25±0.15				0.35±0.15				0.50±0.25				0.50±0.25			
	(in.)	(0.010±0.006)				(0.014±0.006)				(0.020±0.010)				(0.020±0.010)			
WVDC		50				50 100 200				100 200				100 200			
Cap (pF)	0.2	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	0.3	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	0.4	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	0.5	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	0.6	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	0.7	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	0.8	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	0.9	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	1.0	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	1.1	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	1.2	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	1.3	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	1.4	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	1.5	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	1.6	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	1.7	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	1.8	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	1.9	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	2.0	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	2.1	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	2.2	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	2.4	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	2.7	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	3.0	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	3.3	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	3.6	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	3.9	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	4.3	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	4.7	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	5.1	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	5.6	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	6.2	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	6.8	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	7.5	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	8.2	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	9.1	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	10	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	11	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	12	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	18	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	20	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	22	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
WVDC		50				50 100 200				100 200				100 200			
SIZE		0402				0603				0805				1210			

SIZE		0402				0603				0805				1210			
Soldering		All Paper				All Paper				All Embossed				All Embossed			
(L) Length	mm	1.00±0.10				1.60±0.15				2.01±0.20				3.20±0.20			
	(in.)	(0.040±0.004)				(0.063±0.006)				(0.079±0.008)				(0.126±0.008)			
(W) Width	mm	0.50±0.10				0.81±0.15				1.25±0.20				2.50±0.20			
	(in.)	(0.020±0.004)				(0.032±0.006)				(0.049±0.008)				(0.098±0.008)			
(t) Terminal	mm	0.25±0.15				0.35±0.15				0.50±0.25				0.50±0.25			
	(in.)	(0.010±0.006)				(0.014±0.006)				(0.020±0.010)				(0.020±0.010)			
WVDC		50				50 100 200				100 200				100 200			
	24	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	27	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
Cap (pF)	30	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	33	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	36	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	39	F	A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	43		A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	47		A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	51		A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	56		A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	68		A	A	A	H	H	D	D	D	D	D	D	D	D	D	D
	75		A	A		H	H	D	D	D	D	D	D	D	D	D	D
	82		A	A		H	H	D	D	D	D	D	D	D	D	D	D
	91		A	A		H	H	D	D	D	D	D	D	D	D	D	D
	100		A	A		H	H	D	D	D	D	D	D	D	D	D	D
	110					H	H	D	D	D	D	D	D	D	D	D	D
	120					H	H	D	D	D	D	D	D	D	D	D	D
	130					H	H	D	D	D	D	D	D	D	D	D	D
	140					H	H	D	D	D	D	D	D	D	D	D	D
	150					H	H	D	D	D	D	D	D	D	D	D	D
	160					H		D	D	D	D	D	D	D	D	D	D
	180							D	D	D	D	D	D	D	D	D	D
	200							D	D	D	D	D	D	D	D	D	D
	220							D	D	D	D	D	D	D	D	D	D
	270							D	D	D	D	D	D	D	D	D	D
	300							D	D	D	D	D	D	D	D	D	D
	330							D	D	D	D	D	D	D	D	D	D
	360							D	D	D	D	D	D	D	D	D	D
	390							D	D	D	D	D	D	D	D	D	D
	430							D	D	D	D	D	D	D	D	D	D
	470							D									
	510							D									
	560							D									
	620							D									
	680							D									
	750							D									
	820							D									
	910							D									
	1000							D									
WVDC		50				50 100 200				100 200				100 200			
SIZE		0402				0603				0805				1210			

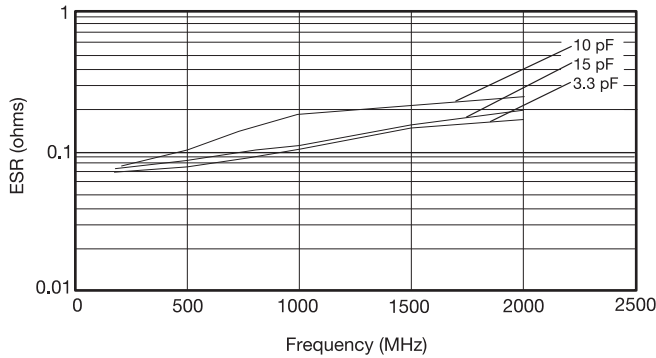
Case Size	0402 (KGQ05)	0603 (KGQ15)	0805 (KGQ21)	1210 (KGQ32)
Thickness Letter	F	A	H	D
Max Thickness(mm)	0.60	0.90	1.15	1.40
Carrier Tape	PAPER	PAPER	PAPER	PAPER
Packaging Code 7"reel	H	T	T	T
Packaging Code 13"reel	N	M	M	M
	PAPER			

TOLERANCE OPTIONS

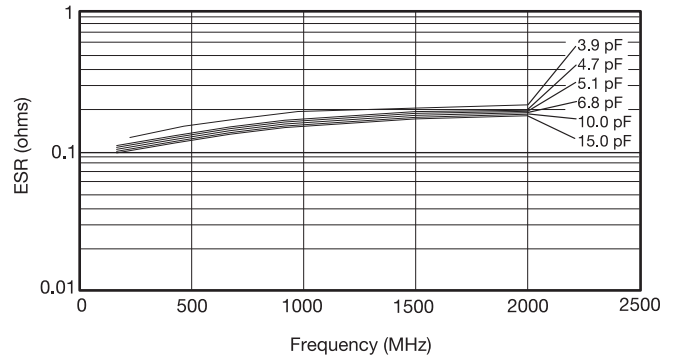
Capacitance Range	Available Tolerances
0.20-0.50 pF	B, C
0.60-6.2 pF	B, C, D
6.8-9.1 pF	B, C, J, K, M
10-1000 pF	F, G, J, K, M

ULTRA LOW ESR, "U" SERIES

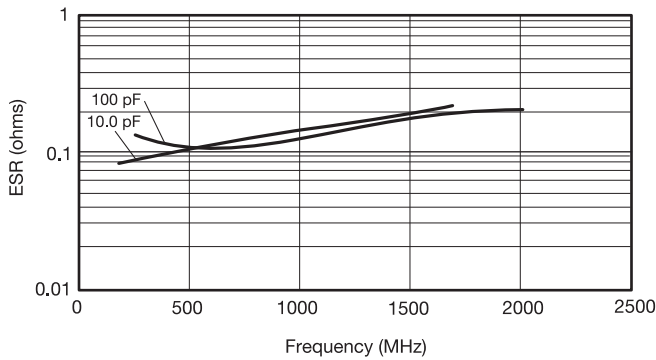
TYPICAL ESR vs. FREQUENCY
0402 "U" SERIES



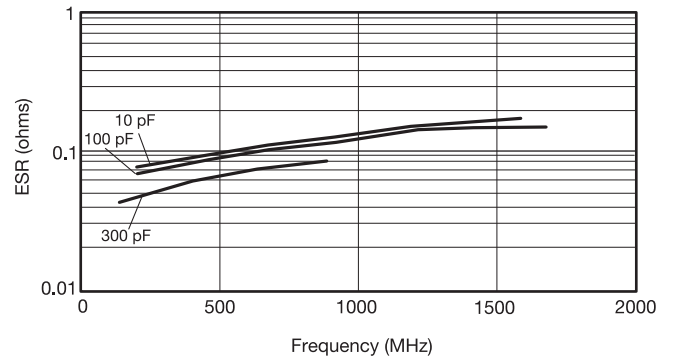
TYPICAL ESR vs. FREQUENCY
0603 "U" SERIES



TYPICAL ESR vs. FREQUENCY
0805 "U" SERIES



TYPICAL ESR vs. FREQUENCY
1210 "U" SERIES



ESR Measured on the Boonton 34A

TYPICAL SERIES RESONANT FREQUENCY "U" SERIES CHIP

