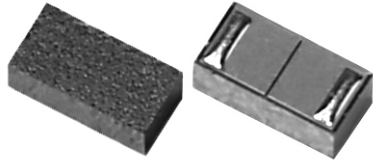




## High Performance, High Precision Surface Mount 0603 Capacitor



**PATENTED**

**FEATURES**

- New technology surface mount capacitor based on a special semiconductor process
- Construction reduces the parasitic inductance and brings the SRF values to ultra-high frequencies
- Capacitance is extremely stable in a wide range of frequencies from 1 MHz to several GHz.
- High Q and low ESR
- Tight tolerance to  $\pm 1\%$  or 0.05 pF
- Ultra high SRF
- Low parasitic inductance (  $\sim 0.046$  nH)
- Capacitance range : 0.8 pF to 560 pF

**ELECTRICAL SPECIFICATIONS**

Operating Temperature: - 55 °C to + 125 °C  
 Temperature Coefficient of Capacitance (TCC):  $0 \pm 30$  ppm/°C  
 Insulation Resistance:  $10^{11} \Omega$  min  
 Voltage: 2.5 x rated voltage for 5 seconds  
 Ageing: none

**ENVIRONMENTAL SPECIFICATIONS**

Life Test: 1000 hours, + 125 °C at 2 x rated voltage  
 Thermal Shock: 100 Cycles, - 55 °C/+ 125 °C  
 Moisture Resistance: 240 hours, 85 % RH, + 85 °C

**APPLICATIONS**

- Wireless communications
- Mobile phones
- Cordless phones
- GPS
- VCO
- Filter Networks
- Matching Networks
- Base station
- DC Blocking
- High speed circuitry

CAPACITANCE TOLERANCE CODE					
FOR LESS THAN 10 pF			FOR 10 pF AND HIGHER		
A	B	C	F	G	J
$\pm 0.05$ pF	$\pm 0.10$ pF	$\pm 0.25$ pF	$\pm 1\%$	$\pm 2\%$	$\pm 5\%$

**ORDERING INFORMATION**

HPC	0603	A	100	G	X	X	T5
MODEL	SIZE	TYPE	CAPACITANCE VALUE	CAPACITANCE TOLERANCE	TERMINATION	VOLTAGE	PACKAGING
			The first two digits are significant, the third is a multiplier. An "R" indicates a decimal point. Examples: 101 = 100 pF 4R7 = 4.7 pF	see chart above	X = Tin/Lead termination W = Lead (Pb)-free termination	1 = 6 V Z = 10 V Y = 16 V X = 25 V M = 50 V	T5 = 5000 pcs tape and reel T1 = 1000 pcs tape and reel

# HPC0603A

Vishay

High Performance, High Precision  
Surface Mount 0603 Capacitor



DIMENSIONS			
	DIMENSION	INCHES	MILLIMETERS
	L	0.063 ± 0.002	1.60 ± 0.05
	W	0.031 ± 0.002	0.80 ± 0.05
	T	0.022 ± 0.002	0.56 ± 0.05
	A	0.008 ± 0.002	0.20 ± 0.05
	B	0.049 ± 0.002	1.24 ± 0.05
	C	0.025 ± 0.002	0.64 ± 0.05
For PAD DESIGN, please see assembly/reflow recommendations page 21.			

CAPACITANCE RANGE AND VOLTAGE						
CAPACITANCE (pF)	CAPACITANCE CODE	VOLTAGE (V)				
		6	10	16	25	50
0.8	0R8					
1.0	1R0					
1.2	1R2					
1.5	1R5					
1.8	1R8					
2.2	2R2					
2.7	2R7					
3.3	3R3					
3.9	3R9					
4.7	4R7					
5.6	5R6					
6.8	6R8					
8.2	8R2					
10	100					
12	120					
15	150					
18	180					
22	220					
27	270					
33	330					
39	390					
47	470					
56	560					
68	680					
82	820					
100	101					
120	121					
150	151					
180	181					
220	221					
270	271					
330	331					
390	391					
470	471					
560	561					

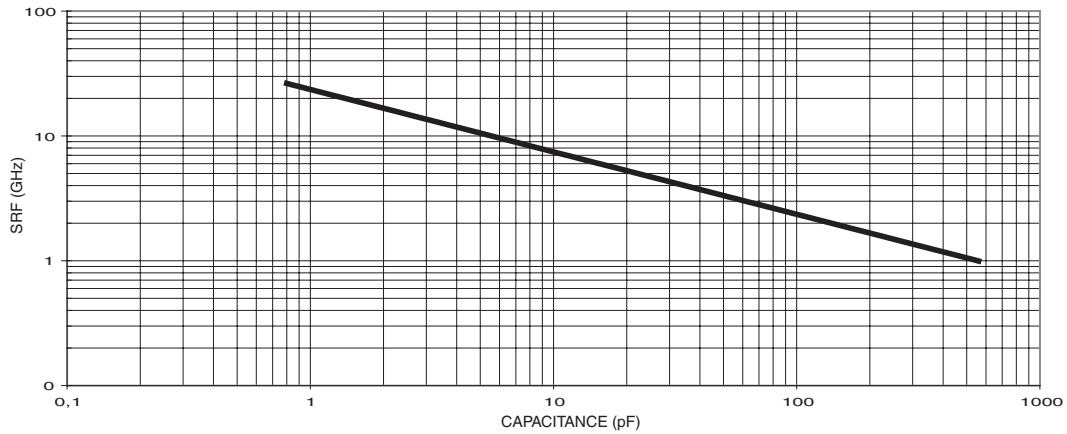


High Performance, High Precision  
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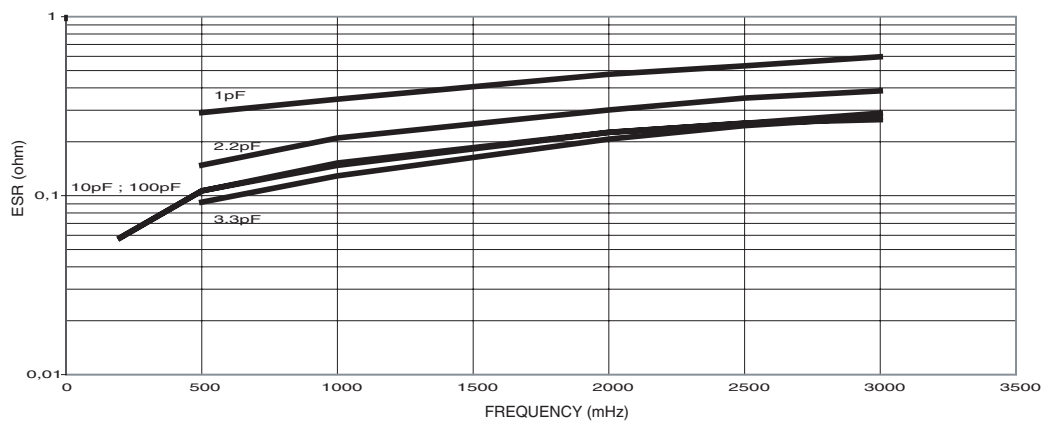
ELECTRICAL SPECIFICATIONS*												
CAPACITANCE (pF) AT 1 MHz	TOLERANCE CODE**	SRF (GHz) TYP.	Ceff TYP.	Q	Ceff TYP.	Q	Ceff TYP.	Q	Ceff TYP.	Q	Ceff TYP.	Q
			200 MHz		500 MHz		1000 MHz		2000 MHz		2500 MHz	
0.8	A,B,C	26.4	0.80	6813	0.80	1491	0.80	519	0.80	174	0.81	124
1	A,B,C	23.6	1.00	5826	1.00	1275	1.00	443	1.01	148	1.01	105
1.2	A,B,C	21.5	1.20	5232	1.20	1145	1.20	398	1.21	133	1.22	95
1.5	A,B,C	19.2	1.50	4724	1.50	1033	1.50	359	1.52	120	1.53	85
1.8	A,B,C	17.6	1.80	4465	1.80	977	1.81	339	1.82	113	1.84	80
2.2	A,B,C	15.9	2.20	3947	2.20	863	2.21	300	2.24	100	2.26	70
2.7	A,B,C	14.3	2.70	3480	2.70	761	2.71	264	2.75	88	2.78	62
3.3	A,B,C	13.0	3.30	4157	3.30	909	3.32	315	3.38	104	3.43	73
3.6	A,B,C	12.4	3.60	3810	3.61	833	3.62	289	3.70	95	3.75	67
3.9	A,B,C	11.9	3.90	3517	3.91	769	3.93	266	4.01	88	4.08	62
4.3	A,B,C	11.4	4.30	3190	4.31	697	4.33	241	4.44	79	4.52	56
4.7	A,B,C	10.9	4.70	2918	4.71	638	4.74	221	4.86	72	4.96	51
5.1	A,B,C	10.4	5.10	2689	5.11	587	5.15	203	5.29	66	5.41	46
5.6	A,B,C	10.0	5.60	2449	5.61	535	5.66	185	5.84	60	5.98	42
6.2	B,C	9.5	6.20	2212	6.22	483	6.27	167	6.49	54	6.66	38
6.8	B,C	9.0	6.80	2017	6.82	440	6.88	152	7.15	49	7.36	34
7.5	B,C	8.6	7.50	1828	7.53	399	7.60	138	7.93	44	8.19	31
8.2	B,C	8.2	8.20	1672	8.23	365	8.32	126	8.71	40	9.03	28
9.1	B,C	7.8	9.11	1507	9.14	329	9.25	113	9.74	36	10.14	25
10	F,G,J	7.5	10.0	1371	10.0	299	10.2	103	10.8	33	11.3	22
11	F,G,J	7.1	11.0	1246	11.1	272	11.2	93	11.9	29	12.6	20
12	F,G,J	6.8	12.0	1142	12.1	249	12.3	85	13.1	27	13.9	18
13	F,G,J	6.5	13.0	1054	13.1	230	13.3	79	14.3	25	15.2	16
15	F,G,J	6.1	15.0	914	15.1	199	15.4	68	16.8	21	18.0	14
16	F,G,J	5.9	16.0	857	16.1	186	16.5	63	18.1	19	19.5	13
18	F,G,J	5.6	18.0	761	18.1	165	18.6	56	20.7	17	22.6	11
20	F,G,J	5.3	20.0	685	20.2	149	20.7	50	23.4	15	25.8	10
22	F,G,J	5.0	22.0	623	22.2	135	22.9	46	26.1	13	29.2	9
24	F,G,J	4.8	24.0	571	24.3	124	25.1	42	29.0	12	32.9	8
27	F,G,J	4.5	27.1	507	27.3	110	28.4	37	33.5	11	38.8	6
30	F,G,J	4.3	30.1	456	30.4	99	31.7	33	38.3	9	45.3	6
33	F,G,J	4.1	33.1	415	33.5	90	35.1	30	43.3	8	52.5	5
36	F,G,J	3.9	36.1	380	36.6	82	38.5	27	48.6	7	60.5	4
39	F,G,J	3.8	39.1	351	39.7	76	41.9	25	54.2	6	69.5	4
43	F,G,J	3.6	43.1	318	43.8	68	46.6	22	62.3	6	83.3	3
47	F,G,J	3.4	47.2	291	48.0	63	51.3	20	71.0	5	99.7	3
51	F,G,J	3.3	51.2	268	52.2	58	56.2	19	80.6	4	119.7	2
56	F,G,J	3.1	56.2	244	57.4	52	62.3	17	93.8	4	151.4	2
62	F,G,J	3.0	62.2	220	63.8	47	69.8	15	112.0	3	205.0	1
68	F,G,J	2.9	68.2	201	70.1	43	77.5	13	133.2	3	289.5	1
75	F,G,J	2.7	75.4	182	77.6	39	86.7	12	163.1	2	480.3	1
82	F,G,J	2.6	82.5	166	85.1	35	96.2	11	200.2	2		
91	F,G,J	2.5	91.6	150	94.9	32	108.8	10	264.0	1		
100	F,G,J	2.4	100.7	136	104.7	29	122.0	9	357.3	1		
110	F,G,J	2.2	110.9	124	115.7	26	137.2	8	529.1	1		
120	F,G,J	2.2	121.0	113	126.9	24	153.1	7				
130	F,G,J	2.1	131.2	105	138.1	22	169.7	6				
150	F,G,J	1.9	151.6	90	160.9	19	205.5	5				
160	F,G,J	1.9	161.9	85	172.4	17	224.7	5				
180	F,G,J	1.8	182.4	75	195.9	15	266.7	4				
200	F,G,J	1.7	202.9	68	219.8	14	312.5	3				
220	F,G,J	1.6	223.5	61	244.2	12	364.3	3				
240	F,G,J	1.5	244.2	56	269.1	11	422.6	2				
270	F,G,J	1.4	275.4	50	307.3	10	525.4	2				
300	F,G,J	1.4	306.6	45	346.8	9	652.3	2				
330	F,G,J	1.3	338.0	41	387.6	8	812.9	1				
360	F,G,J	1.2	369.6	37	429.6	7	1022.9	1				
390	F,G,J	1.2	401.3	34	473.0	6	1309.1	1				
430	F,G,J	1.1	443.7	31	533.2	6	1903.4	1				
470	F,G,J	1.1	486.5	28	596.1	5						
510	F,G,J	1.0	529.4	26	661.9	5						
560	F,G,J	1.0	583.5	24	748.7	4						



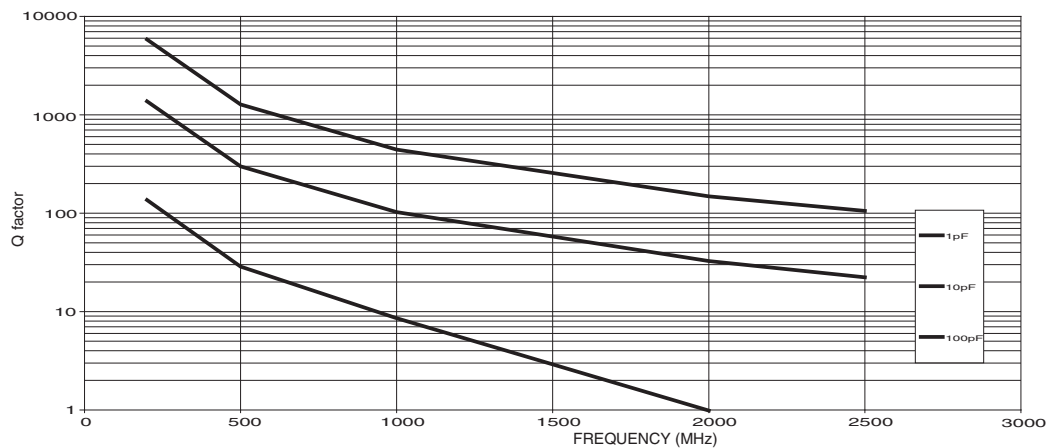
**SRF VS. CAPACITANCE (TYPICAL)**



**ESR VS. FREQUENCY (TYPICAL)**



**Q VS. FREQUENCY (TYPICAL)**





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