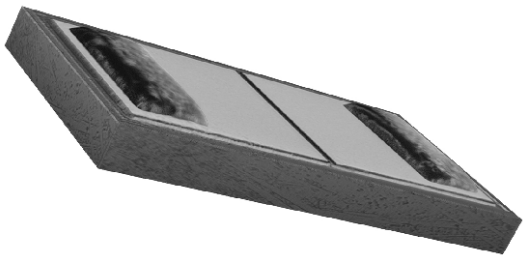
Not for new designs, this product will be discontinued soon

HPC0402A

Vishay

High Performance, High Precision Surface Mount 0402 Capacitor



PATENTED

FEATURES

- Terminations are Sn/Ag/Cu or Au. The standard product is lead (Pb)-free and RoHS compliant, but terminations containing lead are available
- 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 ± 1 % or 0.05 pF
- Ultra high SRF
- Low parasitic inductance (~ 0.032 nH)
- Capacitance range: 0.1 pF to 180

Pb-free Available

RoHS* COMPLIANT

ELECTRICAL SPECIFICATIONS

Operating Temperature: - 55 °C to + 125 °C

Temperature Coefficient of Capacitance (TCC): 0 ± 30 ppm/°C

Insulation Resistance: 10^{11} Ω min

Voltage: 2.5 x rated voltage (DC) for 5 seconds

Ageing: none

ENVIRONMENTAL SPECIFICATIONS

Life Test: 1000 hours, + 125 °C at 2 x rated voltage (DC)

Thermal Shock: 100 Cycles, - 55 °C/+ 150 °C

Moisture Resistance: 1000 hours at rated DCV, 85 % RH, + 85 °C

APPLICATIONS

- Wireless communications
- Mobile phones
- Cordless phones
- GPS
- VCO
- Filter Networks
- Matching Networks
- Embedded substrates

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

ORDERING INFORMATION

HPC	0402	A	100	G	X	X	T0	XX
MODEL	SIZE	TYPE	CAPACITANCE VALUE	CAPACITANCE TOLERANCE	TERMINATION	VOLTAGE	PACKAGING	SPECIAL ENGINEERING CONTROL CODE
			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 terminations	1 = 6 V Z = 10 V Y = 16 V X = 25 V M = 50 V L = 100 V	T0 = 10 000 pcs T5 = 5000 pcs T1 = 1000 pcs tape and reel	Leave blank when no special requirements apply

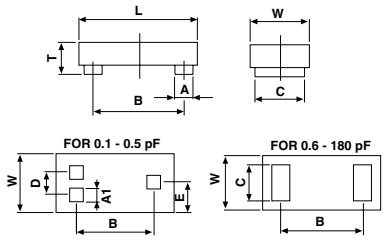
"W" terminations preferred.
"See Part Numbering System, Document 10147, for complete explanations."

* Pb containing terminations are not RoHS compliant, exemptions may apply.

For technical questions, contact: siliconRFcap@vishay.com

Document Number: 10117
Revision: 16-Dec-08

DIMENSIONS

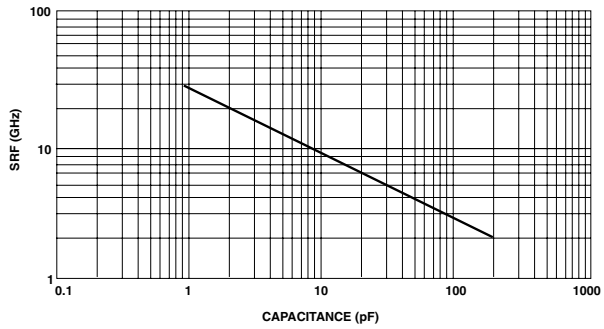


For PCB pad design please see assembly/reflow recommendations document 10125.

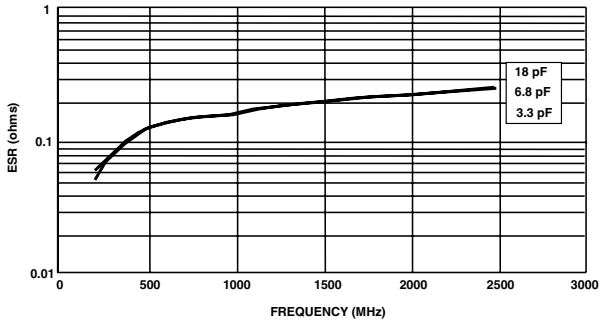
DIMENSION	INCHES	MILLIMETERS
L	0.040 ± 0.002	1.02 ± 0.05
W	0.020 ± 0.002	0.51 ± 0.05
T*	0.016 ± 0.004	0.40 ± 0.10
A	0.006 ± 0.002	0.15 ± 0.05
A1	0.004 ± 0.001	0.10 ± 0.03
B	0.028 ± 0.002	0.71 ± 0.05
C	0.014 ± 0.002	0.36 ± 0.05
D	0.008 ± 0.002	0.20 ± 0.05
E	0.010 ± 0.002	0.25 ± 0.05

* For low profile versions see data sheet HPC0402B/C

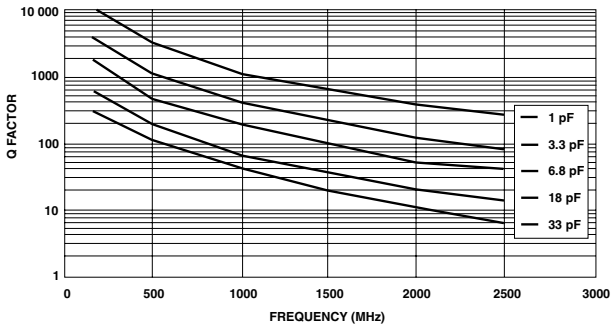
SRF VS. CAPACITANCE (TYPICAL)



ESR VS. FREQUENCY (TYPICAL)



Q VS. FREQUENCY (TYPICAL)



CAPACITANCE RANGE AND VOLTAGE

CAPACITANCE (pF)	TOLERANCE	VOLTAGE RATING AND VOLTAGE CODE					
		100 V	50 V	25 V	16 V	10 V	6 V
		CODE:	CODE:	CODE:	CODE:	CODE:	CODE:
0.1	A,B,C	L	M	X	Y	Z	1
0.2	A,B,C	L	M	X	Y	Z	1
0.3	A,B,C	L	M	X	Y	Z	1
0.4	A,B,C	L	M	X	Y	Z	1
0.5	A,B,C	L	M	X	Y	Z	1
0.6	A,B,C	L	M	X	Y	Z	1
0.7	A,B,C	L	M	X	Y	Z	1
0.8	A,B,C	L	M	X	Y	Z	1
0.9	A,B,C	L	M	X	Y	Z	1
1.0	A,B,C	L	M	X	Y	Z	1
1.2	A,B,C	L	M	X	Y	Z	1
1.3	A,B,C	L	M	X	Y	Z	1
1.5	A,B,C	L	M	X	Y	Z	1
1.6	A,B,C	L	M	X	Y	Z	1
1.8	A,B,C	L	M	X	Y	Z	1
2.0	A,B,C	L	M	X	Y	Z	1
2.2	A,B,C	L	M	X	Y	Z	1
2.4	A,B,C	L	M	X	Y	Z	1
2.7	A,B,C	L	M	X	Y	Z	1
3.0	A,B,C	L	M	X	Y	Z	1
3.3	A,B,C	L	M	X	Y	Z	1
3.6	A,B,C	L	M	X	Y	Z	1
3.9	A,B,C		M	X	Y	Z	1
4.3	A,B,C		M	X	Y	Z	1
4.7	A,B,C		M	X	Y	Z	1
5.1	A,B,C		M	X	Y	Z	1
5.6	A,B,C		M	X	Y	Z	1
6.2	A,B,C		M	X	Y	Z	1
6.8	A,B,C		M	X	Y	Z	1
7.5	A,B,C		M	X	Y	Z	1
8.2	A,B,C		M	X	Y	Z	1
9.1	A,B,C			X	Y	Z	1
10	F,G,J			X	Y	Z	1
11	F,G,J			X	Y	Z	1
12	F,G,J			X	Y	Z	1
13	F,G,J				Y	Z	1
15	F,G,J				Y	Z	1
16	F,G,J				Y	Z	1
18	F,G,J				Y	Z	1
20	F,G,J					Z	1
22	F,G,J					Z	1
24	F,G,J					Z	1
27	F,G,J					Z	1
30	F,G,J					Z	1
33	F,G,J					Z	1
36	F,G,J					Z	1
39	F,G,J					Z	1
43	F,G,J					Z	1
47	F,G,J					Z	1
51	F,G,J						1
56	F,G,J						1
62	F,G,J						1
68	F,G,J						1
75	F,G,J						1
82	F,G,J						1
91	F,G,J						1
100	F,G,J						1
110	F,G,J						1
120	F,G,J						1
130	F,G,J						1
150	F,G,J						1
160	F,G,J						1
180	F,G,J						1

ELECTRICAL SPECIFICATIONS[1)]

CAPACITANCE (pF)	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	
0.1	A,B,C	N/A										
0.2	A,B,C	N/A										
0.3	A,B,C	N/A										
0.4	A,B,C	N/A										
0.5	A,B,C	N/A										
0.6	A,B,C	N/A										
0.7	A,B,C	N/A										
0.8	A,B,C	32.5	0.80	12 994	0.80	3924	0.80	1392	0.80	439	0.80	296
0.9	A,B,C	30.6	0.90	12 052	0.90	3639	0.90	1291	0.90	407	0.91	275
1.0	A,B,C	29.1	1.00	11 340	1.00	3424	1.00	1215	1.00	383	1.01	258
1.2	A,B,C	26.5	1.20	10 395	1.20	3139	1.20	1113	1.21	351	1.21	236
1.3	A,B,C	25.5	1.30	9595	1.30	2897	1.30	1028	1.31	324	1.31	218
1.5	A,B,C	23.7	1.50	8316	1.50	2511	1.50	890	1.51	280	1.52	189
1.6	A,B,C	23.0	1.60	7796	1.60	2354	1.60	835	1.61	263	1.62	177
1.8	A,B,C	21.7	1.80	6930	1.80	2092	1.80	742	1.82	233	1.82	157
2.0	A,B,C	20.5	2.00	6237	2.00	1883	2.00	667	2.02	210	2.03	141
2.2	A,B,C	19.6	2.20	5670	2.20	1711	2.21	607	2.22	190	2.24	128
2.4	A,B,C	18.8	2.40	5197	2.40	1569	2.41	556	2.43	174	2.44	117
2.7	A,B,C	17.7	2.70	4620	2.70	1394	2.71	494	2.73	155	2.76	104
3.0	A,B,C	16.8	3.00	4158	3.00	1255	3.01	444	3.04	139	3.07	93
3.3	A,B,C	16.0	3.30	3780	3.30	1141	3.31	404	3.35	126	3.38	85
3.6	A,B,C	15.3	3.60	3464	3.60	1045	3.62	370	3.66	116	3.70	77
3.9	A,B,C	14.7	3.90	3198	3.90	965	3.92	341	3.97	107	4.02	71
4.3	A,B,C	14.0	4.30	2900	4.31	875	4.32	310	4.39	96	4.44	64
4.7	A,B,C	13.4	4.70	2654	4.71	801	4.73	283	4.81	88	4.87	59
5.1	A,B,C	12.9	5.10	2445	5.11	738	5.13	261	5.23	81	5.30	54
5.6	A,B,C	12.3	5.60	2227	5.61	672	5.64	237	5.75	74	5.84	49
6.2	A,B,C	11.7	6.20	2011	6.21	607	6.25	214	6.39	66	6.50	44
6.8	A,B,C	11.1	6.80	1834	6.81	553	6.86	195	7.03	60	7.16	40
7.5	A,B,C	10.6	7.50	1663	7.52	501	7.57	177	7.78	54	7.94	36
8.2	A,B,C	10.1	8.20	1521	8.22	458	8.28	162	8.53	50	8.73	33
9.1	A,B,C	9.6	9.10	1370	9.12	413	9.20	145	9.51	45	9.76	29
10	F,G,J	9.2	10.0	1247	10.0	376	10.1	132	10.5	40	10.8	27
11	F,G,J	8.8	11.0	1133	11.0	341	11.1	120	11.6	36	12.0	24
12	F,G,J	8.4	12.0	1039	12.0	313	12.2	110	12.7	33	13.2	22
13	F,G,J	8.1	13.0	959	13.1	289	13.2	101	13.9	31	14.4	20
15	F,G,J	7.5	15.0	831	15.1	250	15.3	88	16.1	26	16.9	17
16	F,G,J	7.3	16.0	779	16.1	234	16.3	82	17.3	24	18.1	16
18	F,G,J	6.8	18.0	692	18.1	208	18.4	73	19.7	22	20.8	14
20	F,G,J	6.5	20.0	623	20.1	187	20.5	65	22.1	19	23.5	12
22	F,G,J	6.2	22.0	566	22.1	170	22.6	59	24.6	17	26.3	11
24	F,G,J	5.9	24.0	519	24.2	156	24.7	54	27.1	16	29.2	10
27	F,G,J	5.6	27.0	461	27.2	138	27.9	48	31.0	14	33.7	8
30	F,G,J	5.3	30.0	415	30.3	124	31.1	43	35.0	12	38.6	7
33	F,G,J	5.1	33.1	377	33.3	113	34.3	39	39.1	11	43.7	7
36	F,G,J	4.8	36.1	346	36.4	104	37.6	36	43.4	10	49.1	6
39	F,G,J	4.7	39.1	319	39.5	95	40.9	33	47.8	9	54.8	5
43	F,G,J	4.4	43.1	290	43.6	87	45.3	30	54.0	8	63.1	5
47	F,G,J	4.2	47.1	265	47.7	79	49.8	27	60.5	7	72.1	4
51	F,G,J	4.1	51.1	244	51.8	73	54.3	25	67.2	6	81.9	3
56	F,G,J	3.9	56.1	222	56.9	66	60.0	22	76.2	6	95.6	3
62	F,G,J	3.7	62.2	201	63.2	60	66.9	20	87.8	5	114.6	2
68	F,G,J	3.5	68.2	183	69.4	54	74.0	18	100.3	4	136.9	2
75	F,G,J	3.4	75.3	166	76.7	49	82.3	16	116.3	4	168.6	2
82	F,G,J	3.2	82.3	152	84.0	45	90.8	15	134.1	3	208.6	1
91	F,G,J	3.0	91.4	136	93.5	40	102.0	13	160.0	3	278.8	1
100	F,G,J	2.9	100.5	124	103.1	37	113.4	12	190.0	2	384.9	1
110	F,G,J	2.8	110.6	113	113.7	33	126.5	11	229.7	2		
120	F,G,J	2.7	120.7	103	124.4	30	139.9	10	278.1	2		
130	F,G,J	2.5	130.8	95	135.2	28	153.7	9	338.4	1		
150	F,G,J	2.4	151.1	83	157.0	24	182.4	7	518.3	1		
160	F,G,J	2.3	161.2	77	168.0	22	197.4	7	661.1	1		
180	F,G,J	2.2	181.5	69	190.1	20	228.8	6				

1. 1) Additional non-standard values available on request
   ** A = ± 0.05; B = ± 0.10; C = ± 0.25; F = ± 1 %; G = ± 2 %; J = ± 5 %

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