

VISHAY / SPRAGUE SMD Silicon-Based Capacitors

RoHS Compliant. This product is RoHS compliant.

VISHAY HPC0402A, HPC0603A SERIES HIGH FREQUENCY INTERGRATED SILICON CAPACITORS

High Performance, High Precision

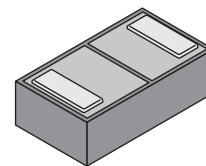
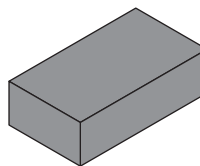
In the last decade or two, semiconductor production has been greatly refined in materials, processes, producibility, cost reduction, repeatability, reliability, and simplicity. In contrast, there have been few significant innovative advances in passive components. So the search for a significant advance in a high Q, high frequency capacitor centered on the semiconductor processes instead of the traditional capacitor processes. The resultant product yields a true RF capacitor with a ten-fold increase in capacitance density based on simple, low cost, high reliability semiconductor processes, and on materials economically available throughout the world.

Features:

- New technology surface mount capacitor based on a special semi-conductor 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 1MHz to several GHz
- High Q and low ESR
- Tight tolerance to ± 1% or 0.05pF
- Ultra high SRF
- Low parasitic inductance
- Capacitance range: 0.1pF to 180pF

Applications:

- Wireless communications
- Mobile phones
- Cordless phones
- GPS
- VCO
- Filter Networks
- Matching Networks
- Smart cards



Main Advantages of the HPC0402

Integrated Silicon Capacitor:

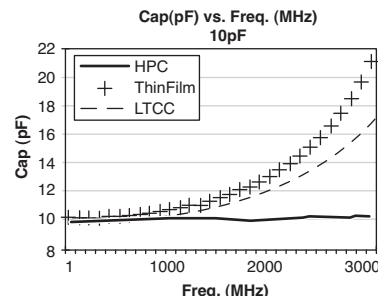
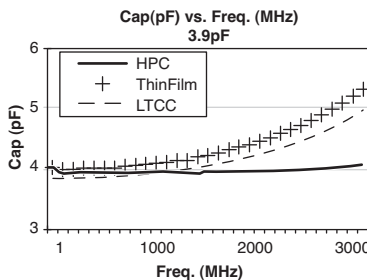
- Capacitance stability per frequency
- 10 fold capacitance for the same size
- 10 fold capacitance density
- Low profile
- Ultra high SRF
- Low parasitic inductance
- High Q
- Low ESR
- Tight tolerance
- No tombstone effect
- Eliminates board assembly problems
- Use directly on existing pads
- Reduce board size 25-45%
- Cost effective

Electrical Specifications:

- Operating Temperature: -55°C to + 125°C
- Temperature Coefficient of Capacitance (TCC): 0 ± 30ppm/°C
- Insulation Resistance: 10 (11)Ω min
- Voltage: 2.5 x rated voltage for 5 seconds
- Ageing: none

Environmental Specifications:

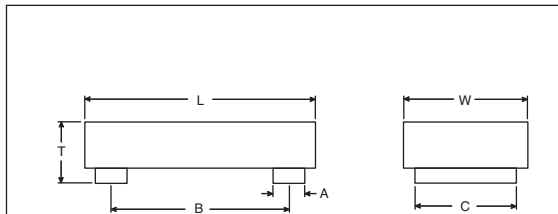
- Life Test: 1000 hours, + 125°C @ 2 x rated voltage
- Thermal Shock: 5 Cycles, -55°C/+ 125°C
- Moisture Resistance: 240 hours, 85% RH, + 85°C



For quantities of 10,000 and up, please call for quote.

MOUSER STOCK NO.		Capacitance Value (pF)	Volt	Tol. ±	Price Each					
Mfr.	Mfr. Part No.				1	100	500	1000	2000	5000
75	HPC0402A0R6BXXT5	0.6	25	0.10pF						
75	HPC0402A0R7BXXT5	0.7	25	0.10pF						
75	HPC0402A0R8BXXT5	0.8	25	0.10pF						
75	HPC0402A0R9BXXT5	0.9	25	0.10pF						
75	HPC0402A1R0BXXT5	1	25	0.10pF						
75	HPC0402A1R5BXXT5	1.5	25	0.10pF						
75	HPC0402A1R8BXXT5	1.8	25	0.10pF						
75	HPC0402A2R2BXXT5	2.2	25	0.10pF						
75	HPC0402A2R7BXXT5	2.7	25	0.10pF						
75	HPC0402A3R9BXXT5	3.9	25	0.10pF						
75	HPC0402A4R7BXXT5	4.7	25	0.10pF						
75	HPC0402A6R2BXXT5	6.2	25	0.10pF						
75	HPC0402A6R8BXXT5	6.8	25	0.10pF						
75	HPC0402A100FXXT5	10	25	1%						
75	HPC0402A120FXXT5	12	25	1%						
75	HPC0402A150FXXT5	15	16	1%						
75	HPC0402A180FXXT5	18	16	1%						
75	HPC0402A220FXXT5	22	10	1%						
75	HPC0402A270FXXT5	27	10	1%						
75	HPC0402A330FXXT5	33	10	1%						
75	HPC0402A390FXXT5	39	10	1%						
75	HPC0603A0R8AXMT1	0.8	50	0.05pF						
75	HPC0603A1R1AXMT1	1.1	50	0.05pF						
75	HPC0603A1R2BAXMT1	1.2	50	0.1pF						
75	HPC0603A1R5BAXMT1	1.5	50	0.1pF						
75	HPC0603A1R8AXMT1	1.8	50	0.05pF						
75	HPC0603A2R0BAXMT1	2	50	0.1pF						
75	HPC0603A2R2BAXMT1	2.2	50	0.1pF						
75	HPC0603A2R4BAXMT1	2.4	50	0.1pF						
75	HPC0603A2R7BAXMT1	2.7	50	0.1pF						
75	HPC0603A3R0BAXMT1	3	50	0.1pF						
75	HPC0603A3R3AXMT1	3.3	50	0.05pF						
75	HPC0603A3R9BAXMT1	3.9	50	0.1pF						
75	HPC0603A4R7BAXMT1	4.7	50	0.1pF						
75	HPC0603A5R6BAXMT1	5.6	50	0.1pF						
75	HPC0603A6R8BAXMT1	6.8	50	0.1pF						
75	HPC0603A8R2BAXMT1	8.2	50	0.1pF						
75	HPC0603A100FXMT1	10	50	1%						
75	HPC0603A120FXMT1	12	50	1%						
75	HPC0603A150FXMT1	15	50	1%						
75	HPC0603A180FXMT1	18	50	1%						
75	HPC0603A220FXMT1	22	50	1%						
75	HPC0603A470FXXT1	47	25	1%						
75	HPC0603A101GXXT1	100	16	2%						

DIMENSIONS



Case Code	Dimension	Inches	Millimeters
0402	L	0.04 ± 0.004	1.02 ± 0.1
	W	0.02 ± 0.004	0.51 ± 0.1
	T	0.016 ± 0.004	0.4 ± 0.1
	A	0.006 ± 0.002	0.15 ± 0.05
	B	0.028 ± 0.002	0.71 ± 0.05
	C	0.014 ± 0.002	0.36 ± 0.05
0603	L	0.063 ± 0.002	1.60 ± 0.1
	W	0.031 ± 0.002	0.80 ± 0.1
	T	0.022 ± 0.002	0.56 ± 0.1
	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

Process Yields and Capacitance Density vs. Technology, offered by leading manufacturers of precision RF capacitors

Technology	HPC Semiconductor	LTCC (LTCC)	ThinFilm
Process stability w/o trimming w/o sorting	±2%	± 15%	± 9%
Max Capacitance values	Up to 200pF	Up to 15pF	Up to 22pF
Capacitance density	0.27pF/mil ²	0.02pF/mil ²	0.03pF/mil ²

Comparison by Technology, Key Features of RF Capacitors

	HPC	LTCC	ThinFilm
Capacitance Tolerance	Very Good	Good	Good
Capacitance stability vs. frequency	Very Good	Good	Good
Capacitance variation (batch to batch)	Very Good	Low	Good
High capacitance capability	High	Poor	Poor
Resistance	Good	Very Good	Very Good
Q	Good	Good	Good

VISHAY SMD SILICON-BASED CAPACITOR KITS

- Kit 01 Contains 20 pieces each of 16 values from 1.2pF-22pF.
- Kit 02 Contains 20 pieces each of 32 values from 0.6pF-180pF.

MOUSER STOCK NO.		Range of Values Per Kit (pF)	Price Each	
Mfr.	Mfr. Part No.		1	2
75	HPC0402AKIT01	1.2, 1.5, 1.8, 2.2, 2.7, 3.3, 3.9, 4.7, 5.6, 6.8, 8.2, 10, 12, 15, 18, 22		
75	HPC0402AKIT02	0.6, 0.7, 0.8, 0.9, 1.0, 1.2, 1.5, 1.8, 2.2, 2.7, 3.3, 3.9, 4.7, 5.6, 6.8, 8.2, 10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68, 82, 100, 120, 150, 180		

