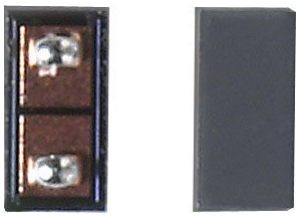
Thin Film Surface Mounted RF Capacitor



Product may not be to scale

RFCS series of thin film capacitors on silicon are designed for RF circuits that require exceptional performance at frequencies up to 20 GHz. The unique structure of the RFCS capacitors is based on thin-film electrodes deposited on a highly conductive silicon substrate. This unique structure is characterized by low parasitic inductance allowing the capacitors to maintain their performance to higher frequencies than other technologies.

The RFCS replaces the HPC product line.
Additional values and form factors available upon request.

FEATURES

- Industries highest SRF
- Low DCR, high Q
- Small size: 0.040" x 0.020" x 0.015"
- S parameter files available upon request
- High frequency up to 20 GHz
- Surface mount
- Case size: 0402
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available
RoHS* Available
HALOGEN FREE Available
GREEN (5-2008) Available

Note

* This datasheet provides information about parts that are RoHS-compliant and/or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information/tables in this datasheet for details.

APPLICATIONS

- Lumped element filters
- Impedance matching circuits
- Decoupling and DC blocking
- Smart cards
- Other high Q RF circuitry

WV (DC) VALUES AND TOLERANCES		
CAPACITOR MODEL	**RCFS**	**UNIT**
Case Size	0402	
Capacitance Values	0.2 to 27	pF
Tolerance (1)	± 5	%
DC Working Voltage	50	V

Note

(1) ± 0.1 pF for values < 2 pF

STANDARD ELECTRICAL SPECIFICATIONS		
PARAMETER	**VALUE**	**UNIT**
Capacitance Range (2)	0.2 to 27	pF
Maximum Working Voltage	Up to 50	V
Operating Temperature	- 55 to + 125	°C
Storage Temperature	- 55 to + 125	°C
Temperature Coefficient	± 100	ppm/°C
ESD Classification (3)	Value dependant, up to class 2	

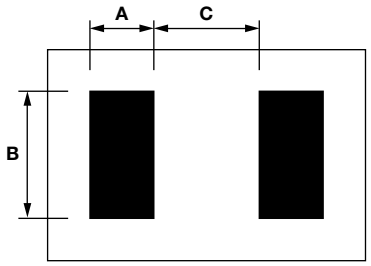
Notes

(2) Custom values available upon request. See custom design section below
(3) According to AEC-Q200 method 002. Contact factory for more details

RF CHARACTERISTICS - typical values				
CAPACITANCE (pF)	**Q**		**SRF (GHz)**	**MAX. OPERATING VOLTAGE (V)**
AT 1 MHz	**100 MHz**	**1 GHz**		
0.2	70 500	3190	> 20	50
0.3	45 700	2050	> 20	50
0.4	33 600	1490	19.4	50
0.5	26 500	1170	18.2	50
0.6	21 800	960	17.2	50
0.7	18 500	810	16.5	50
0.8	16 000	700	15.8	50
0.9	14 100	610	15.3	50
1	12 600	540	14.9	50
1.2	10 400	450	14.1	50
1.5	8170	350	13.2	50
1.8	6720	290	12.5	50
2.2	3360	130	10.6	50
2.7	2720	100	10.4	50
3.3	2220	80	10.2	25
3.9	1870	70	10.1	25
4.7	1540	60	9.9	25
5.6	1290	50	9.8	25
6.8	1060	40	9.6	25
8.2	870	30	9.4	25
10	710	25	9.3	25
12	600	21	9.1	16
15	470	20	8.9	16
18	400	15	8.8	16
22	320	10	8.6	10
27	260	10	8.5	10

DIMENSIONS in inches (millimeters)			
	LENGTH	**WIDTH**	**THICKNESS**
PART	0.04	0.02	0.015 (0.5) ± 0.001
Mounting Pad C ≥ 2.2 pF	0.014	0.006	
Mounting Pad C < 2.2 pF	0.012	0.004	

FOOTPRINT DIMENSIONS in inches (millimeters)



VALUE RANGE	**A**	**B**	**C**
0.2 to 27	0.008	0.014	0.018

CUSTOM DESIGNED CAPACITORS

Vishay EFI will custom design and measure additional values and form factors upon request.
Typical capacitance density is limited to: ~ 200 pF/mm^2

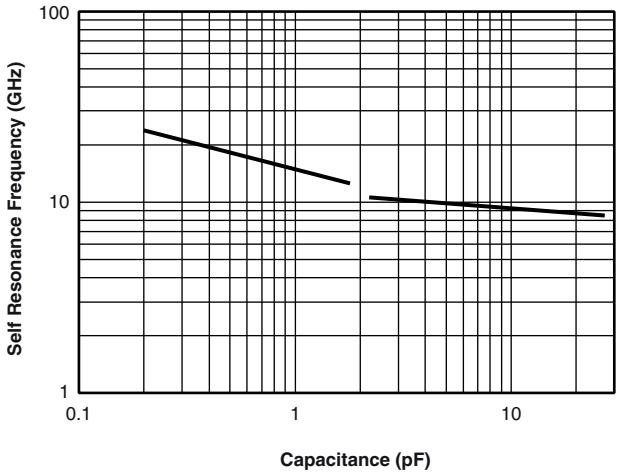
GLOBAL PART NUMBER INFORMATION

Global Part Number: RFCS04021000BKTT1
Global Part Number Description: RFCS 0402 10 pF 10 % e1 T1

R	F	C	S	0	4	0	2	1	0	0	0	B	K	T	T	1

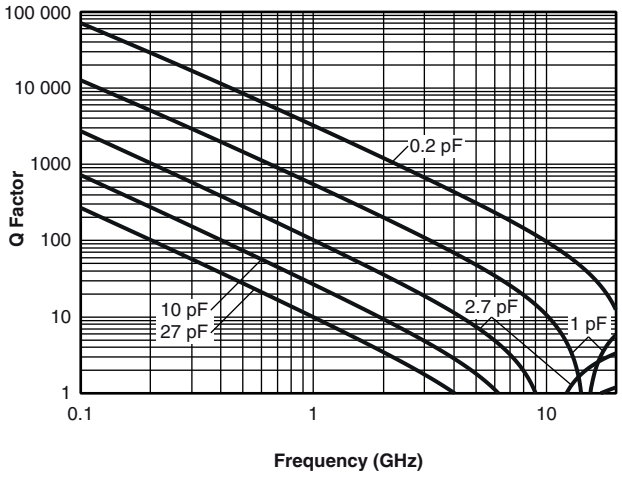
MODEL	SIZE	CAPACITANCE (pF)	INDUCTANCE MULTIPLIER CODE	TOLERANCE CODE	TERMINATION	PACKAGING CODE
RFCS	**0402**	First 4 digits are significant figures of capacitance	**D** = 0.0001 **C** = 0.001 **B** = 0.01	**J** = 5 % **K** = 10 % **M** = 20 % **L** = 25 % **B** = ± 0.1 pF	**S** = SnPb **T** = Lead (Pb)-free (e1) **G** = Gold	WAFFLE **WS** = 100 min., 1 mult TAPE AND REEL **T1** = 1000 min., 1000 mult

TYPICAL COMPONENT PERFORMANCE



Self Resonance vs. Value

Two electrode geometries are used to cover the value range. For this reason the above plot exhibits discontinuity.



Quality Factor vs. Frequency

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