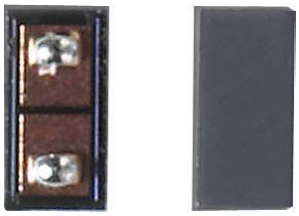
Surface Mounted RF Capacitor
HPC Replacement Part



FEATURES

- Industries highest SRF
- Low DCR, high Q
- Small size: 0.040" x 0.020" x 0.015"
- S parameter files available upon request

APPLICATIONS

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

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.

STANDARD ELECTRICAL SPECIFICATIONS		
PARAMETER	**VALUE**	**UNIT**
Substrate Material	Silicon	
Terminations	Lead (Pb)-free solder	
Capacitance Range (1)	0.2 to 27	pF
Tolerance (2)	± 5	%
Working Voltage	Up to 50	V
Operating Temperature	- 55 to + 125	°C
Storage Temperature	- 55 to + 125	°C
Temperature Coefficient	± 30	ppm/°C
ESD Classification (3)	Value dependant, up to class 2	

Notes

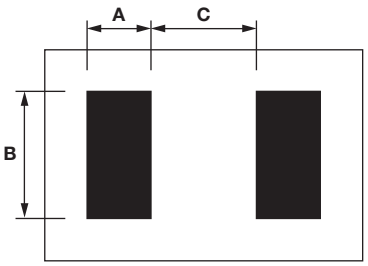
(1) Custom values available upon request. See custom design section below
(2) ± 0.1 pF for values < 2 pF
(3) According to AEC-Q200 method 002. Contact factory for more details

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

RF CHARACTERISTICS - Typical Values				
CAPACITANCE (pF)	**Q**		**SRF (GHz)**	**MAX. OPERATING VOLTAGE (V)**
AT 1 MHz	**100 MHz**	**1 GHz**		
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	14	6	
Mounting Pad C < 2.2 pF	12	4	

FOOTPRINT DIMENSIONS in inches (millimeters)



VALUE RANGE	**A**	**B**	**C**
0.2 to 27	8	14	18

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

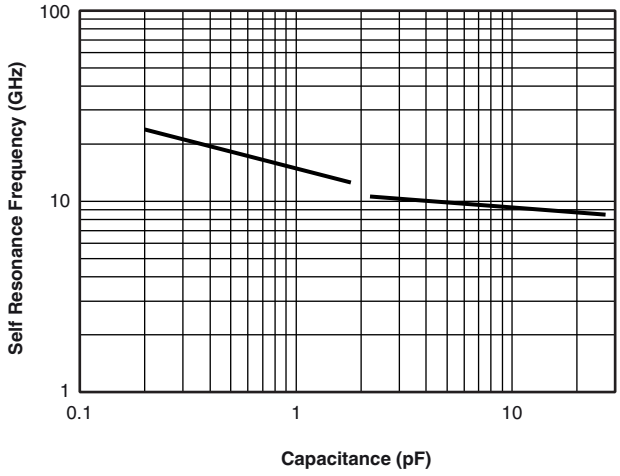
GLOBAL PART NUMBER INFORMATION

Global Part Number: RFCS04021000BKNT1
Global Part Number Description: RFCS 0402 1 pF 10 % on tape

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

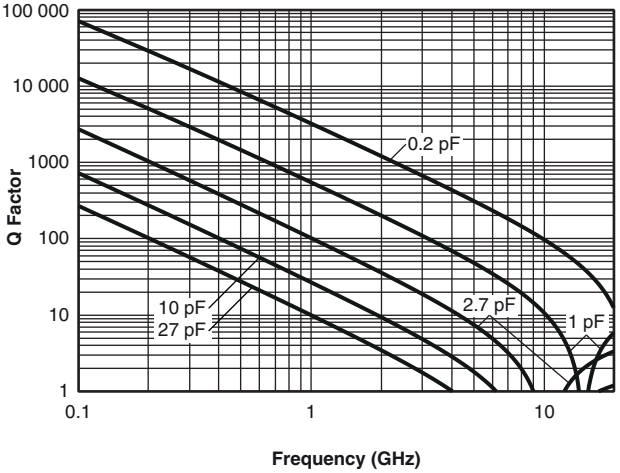
MODEL	SIZE	CAPACITANCE (pF)	INDUCTANCE MULTIPLIER CODE	TOLERANCE CODE	SPECIAL	PACKAGING CODE
RFCS	**0402**	First 4 digits are significant figures of inductance	**D** = 0.0001 **C** = 0.001 **B** = 0.01	**J** = 5 % **K** = 10 % **M** = 20 % **L** = 25 % **B** = ± 0.1 pF	**N** = None	WAFFLE **WS** = 100 min., 1 mult TAPE AND REEL **T0** = 100 min., 100 mult **T1** = 1000 min., 100 mult **TS** = 100 min., 1 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

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay’s knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.