

# Surface Mount Multilayer Ceramic Chip Capacitors High Frequency DSCC Qualified Type 05003



## FEATURES

- US Defense Supply Center approved
- Federal stock control number, CAGE CODE 2770A
- Case size 0402
- High frequency
- Excellent aging characteristics
- Tin / lead termination code "Z"
- Lead (Pb)-free terminations code "M"
- Surface mount, wet build process
- Reliable Noble Metal Electrode (NME) system
- Made with a combination of design, materials and tight process control to achieve very high field reliability
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?999912](http://www.vishay.com/doc?999912)



Available  
**RoHS\***  
Available  
**HALOGEN  
FREE**

## 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

- Broadband wireless communication
- Satellite communication
- WiFi (802.11) and WiMax (802.16)
- VoIP networks and cellular base stations
- Subscriber based wireless devices

## ELECTRICAL SPECIFICATIONS

### Note

- Electrical characteristics at +25 °C unless otherwise specified

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

**Capacitance Range:** 1.0 pF to 27 pF

**Voltage Rating:** 50 V<sub>DC</sub> to 100 V<sub>DC</sub>

**Temperature Coefficient of Capacitance (TCC):**

BP: 0 ppm/°C ± 30 ppm/°C from -55 °C to +125 °C with zero (0) V<sub>DC</sub> applied

**Dissipation Factor (DF):**

BP: 0.05 % max. at 1.0 V<sub>RMS</sub> and 1 MHz

**Aging Rate:** 0 % maximum per decade

**Insulation Resistance (IR):**

at +25 °C and rated voltage 100 000 MΩ minimum or 1000 ΩF, whichever is less

at +125 °C and rated voltage 10 000 MΩ minimum or 100 ΩF, whichever is less

**Dielectric Strength Test:**

performed per method 103 of EIA-198-2-E.

Applied test voltages

≤ 250 V<sub>DC</sub>-rated: 200 % of rated voltage

**QUICK REFERENCE DATA**

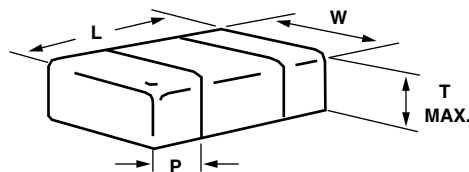
DIELECTRIC	CASE CODE	MAXIMUM VOLTAGE (V)	CAPACITANCE	
			MINIMUM	MAXIMUM
BP	0402	100	1.0 pF	27 pF

**ORDERING INFORMATION**

05003- DSCC NUMBER	1R0 CAPACITANCE NOMINAL CODE	B DC VOLTAGE RATING <sup>(1)</sup>	C CAPACITANCE TOLERANCE	Z TERMINATION	- GROUP C TESTING OPTION <sup>(2)(3)</sup>	C PACKAGING
0402 Case size High Frequency	Expressed in picofarads (pF). The first two digits are significant, the third is a multiplier. An "R" indicates a decimal point. <b>Examples:</b> 1R0 = 1.0 pF	A = 50 V B = 100 V	B = $\pm 0.1$ pF C = $\pm 0.25$ pF D = $\pm 0.50$ pF F = $\pm 1$ % G = $\pm 2$ % J = $\pm 5$ % K = $\pm 10$ % M = $\pm 20$ % <b>Note:</b> B, C, D $\leq 6.2$ pF B, C, J, K, M 6.8 pF to 9.1 pF F, G, J, K, M $\geq 10$ pF	M = silver palladium Z = Ni barrier with tin / lead plate min. 4 % lead	C = full group C L = 2000 h life test only M = 1000 h life test only H = low voltage humidity test only - = group A test only	C = 7" reel / paper tape O = 7" reel / flamed paper tape J = 7" reel (low quantity) P = 11 1/4" / 13" reel / paper tape I = 11 1/4" / 13" reel / flamed paper tape B = bulk <b>Note:</b> "I" and "O" is used for "M" termination code

**Notes**

- (1) DC voltage rating should not be exceeded in application
- (2) Selecting one of the group C options with life testing may extend the delivery time
- (3) To receive data package, add "P" to the end of the part number. For example, 05003-1R0BCZCCP. Group C will be completed and data included with shipment.

**DIMENSIONS** in inches (millimeters)


PART ORDERING NUMBER	LENGTH (L)	WIDTH (W)	MAXIMUM THICKNESS (T)	TERMINATIONS PAD (P)	
				MINIMUM	MAXIMUM
05003-	0.040 $\pm$ 0.004 (1.00 $\pm$ 0.10)	0.020 $\pm$ 0.004 (0.50 $\pm$ 0.10)	0.024 (0.60)	0.004 (0.10)	0.016 (0.41)



SELECTION CHART				
DIELECTRIC		BP		
STYLE		05003		TOLERANCE
CASE CODE		0402		
VOLTAGE (V <sub>DC</sub> )		50	100	
VOLTAGE CODE		A	B	
CAP. CODE	CAP.			
1R0	1.0 pF	••	••	B, C
1R1	1.1 pF	••	••	B, C, D
1R2	1.2 pF	••	••	B, C, D
1R3	1.3 pF	••	••	B, C, D
1R5	1.5 pF	••	••	B, C, D
1R6	1.6 pF	••	••	B, C, D
1R7	1.7 pF	••	••	B, C, D
1R8	1.8 pF	••	••	B, C, D
2R0	2.0 pF	••	••	B, C, D
2R1	2.1 pF	••	••	B, C, D
2R2	2.2 pF	••	••	B, C, D
2R4	2.4 pF	••	••	B, C, D
2R7	2.7 pF	••	••	B, C, D
3R0	3.0 pF	••	••	B, C, D
3R3	3.3 pF	••	••	B, C, D
3R6	3.6 pF	••	••	B, C, D
3R9	3.9 pF	••	••	B, C, D
4R3	4.3 pF	••	••	B, C, D
4R7	4.7 pF	••	••	B, C, D
5R1	5.1 pF	••	••	B, C, D
5R6	5.6 pF	••	••	B, C, D
6R2	6.2 pF	••	••	B, C, D
6R8	6.8 pF	••	••	B, C, J, K, M
7R5	7.5 pF	••	••	B, C, J, K, M
8R2	8.2 pF	••	••	B, C, J, K, M
9R1	9.1 pF	••	••	B, C, J, K, M
100	10 pF	••	••	F, G, J, K, M
110	11 pF	••	••	F, G, J, K, M
120	12 pF	••	••	F, G, J, K, M
130	13 pF	••	••	F, G, J, K, M
150	15 pF	••	••	F, G, J, K, M
180	18 pF	••	••	F, G, J, K, M
200	20 pF	••		F, G, J, K, M
220	22 pF	••		F, G, J, K, M
240	24 pF	••		F, G, J, K, M
270	27 pF	••		F, G, J, K, M

**Notes**

RoHS-compliant except when supplied with lead (Pb)-containing termination, code "Z"

•• Paper carrier tape

**DSCC PACKAGING QUANTITIES <sup>(1)</sup>**

CASE CODE	TAPE SIZE	7" REEL QUANTITIES		11 1/4" AND 13" REEL QUANTITIES	BULK
		PACKAGING CODE "C" / "O"	PACKAGING CODE "J"	PAPER TAPE PACKAGING CODE "P" / "I"	VIAL PACKAGING CODE "B"
0402	8 mm	4000	1000	10 000	100

**Note**

<sup>(1)</sup> Reference: EIA Standard RS 481 - "Taping of Surface Mount Components for Automatic Placement"

**STORAGE AND HANDLING CONDITIONS**

(1) Store the components at 5 °C to +40 °C ambient temperature and ≤ 70 % related humidity conditions.

(2) The product is recommended to be used within a time-frame of 2 years after shipment.

Check solderability in case extended shelf life beyond the expiry date is needed.

**Precautions:**

- Do not store products in an environment containing corrosive elements, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. This may cause corrosion or oxidization of the terminations, which can easily lead to poor soldering.
- Store products on the shelf and avoid exposure to moisture or dust.
- Do not expose products to excessive shock, vibration, direct sunlight and so on.



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