# Surface Mount Multilayer Ceramic Chip Capacitors for High Frequency

## FEATURES

- Case size 0402, 0603, 0805
- High frequency
- Ultra-stable dielectric material
- Non-magnetic copper termination “C”
- Lead (Pb)-free terminations code “X”
- Tin / lead termination code “L”
- 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?99912

Available

RoHS* Available

HALOGEN FREE 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

## ADDITIONAL RESOURCES

Design Tools  S-Parameters

## APPLICATIONS

- RF and microwave
- Broadband communication
- Satellite communication
- Base stations
- Medical instrumentation and test
- Military devices (radar, communication, etc.)
- Wireless devices

## ELECTRICAL SPECIFICATIONS

**Note**

- Electrical characteristics at 25 °C unless otherwise specified

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

**Capacitance Range:**

0402: 0.1 pF to 82 pF

0603: 0.1 pF to 470 pF

0805: 0.1 pF to 1.5 nF

**Voltage Rating:** 25 $V_{DC}$ to 250 $V_{DC}$

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

C0G (D): 0 ppm/°C ± 30 ppm/°C from -55 °C to +150 °C with zero (0) $V_{DC}$ applied

**Dissipation Factor (DF):**

C0G (D): 0.05 % max. at 1.0 $V_{RMS}$ and 1 MHz for values ≤ 1000 pF

C0G (D): 0.05 % max. at 1.0 $V_{RMS}$ and 1 kHz for values > 1000 pF

**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:
≤ 200 $V_{DC}$-rated: min. 250 % of rated voltage
> 200 $V_{DC}$-rated: min. 200 % of rated voltage

## QUICK REFERENCE DATA

| DIELECTRIC | CASE | MAXIMUM VOLTAGE (V) | CAPACITANCE | |
|---|---|---|---|---|
| | | | MINIMUM | MAXIMUM |
| D = HIFREQ | 0402 | 200 | 0.1 pF | 82 pF |
| | 0603 | 250 | 0.1 pF | 470 pF |
| | 0805 | 250 | 0.1 pF | 1.5 nF |

**Note**

- For values below 0.4 pF, contact mlccrf@vishay.com

## ORDERING INFORMATION

| VJ0603 | D | 1R0 | B | X | B | A | C |
|---|---|---|---|---|---|---|---|
| CASE CODE | DIELECTRIC | CAPACITANCE NOMINAL CODE | CAPACITANCE TOLERANCE | TERMINATION | DC VOLTAGE RATING (1) | MARKING | PACKAGING |
| 0402<br>0603<br>0805 | D = HIFREQ | Expressed in picofarads (pF). The first two digits are significant, the third is a multiplier. An "R" indicates a decimal point. Examples: 1R0 = 1.0 pF | V = ± 0.05 pF<br>B = ± 0.10 pF<br>C = ± 0.25 pF<br>D = ± 0.50 pF<br>F = ± 1 %<br>G = ± 2 %<br>J = ± 5 %<br>K = ± 10 %<br>M = ± 20 %<br>**Note**<br>Details see "Selection Chart" | C = non-magnetic copper barrier 100 % tin plate matte finish<br>E = AgPd (2)<br>X = Ni barrier 100 % tin plate matte finish<br>L = Ni barrier with tin lead plated finish min. 4 % lead | X = 25 V<br>A = 50 V<br>B = 100 V<br>C = 200 V<br>P = 250 V | A = unmarked (3)<br>Q = marked | T = 7" reel / plastic tape<br>C = 7" reel / paper tape<br>O = 7" reel / flamed paper tape<br>J = 7" reel (low quantity)<br>R = 11 1/4" / 13" reel / plastic tape<br>P = 11 1/4" / 13" reel / paper tape<br>I = 11 1/4" / 13" reel / flamed paper tape<br>B = bulk<br>**Note**<br>"I" and "O" is used for "E" termination code |

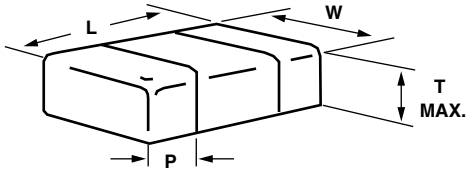
**Notes**

(1) DC voltage rating should not be exceeded in application
(2) Termination code "E" is for conductive epoxy assembly
(3) Case size 0402 only available with "A"

## ENVIRONMENTAL STATUS

| TERMINATION CODE | TERMINATION DESCRIPTION | RoHS COMPLIANT | VISHAY GREEN |
|---|---|---|---|
| C | Non-magnetic copper barrier 100 % tin plated matte finish | Yes | Yes |
| X | Ni barrier 100 % tin plated matte finish | Yes | Yes |
| E | AgPd | Yes | Yes |
| L | Ni barrier tin lead plated with min. 4 % lead | No | No |

## DIMENSIONS in inches (millimeters)




| CASE CODE | STYLE | LENGTH (L) | WIDTH (W) | MAXIMUM THICKNESS (T) | TERMINATIONS PAD (P) | |
|---|---|---|---|---|---|---|
| | | | | | MINIMUM | MAXIMUM (1) |
| 0402 | VJ0402 | 0.040 ± 0.004<br>(1.02 ± 0.10) | 0.020 ± 0.004<br>(0.51 ± 0.10) | 0.024<br>(0.61) | 0.004<br>(0.10) | 0.016<br>(0.41) |
| 0603 | VJ0603 | 0.063 ± 0.006<br>(1.60 ± 0.15) | 0.031 ± 0.005<br>(0.80 ± 0.12) | 0.037<br>(0.94) | 0.010<br>(0.25) | 0.022<br>(0.55) |
| 0805 | VJ0805 | 0.079 ± 0.008<br>(2.00 ± 0.20) | 0.049 ± 0.008<br>(1.25 ± 0.20) | 0.057<br>(1.45) | 0.010<br>(0.25) | 0.030<br>(0.76) |

**Note**

(1) For Cu termination "C" add 0.01 mm to maximum pad terminations

## SELECTION CHART

| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | |
|---|---|---|---|---|---|---|
| STYLE | | VJ0402 | | | | TOLERANCE |
| CASE CODE | | 0402 | | | | |
| VOLTAGE ($V_{DC}$) | | 25 | 50 | 100 | 200 | |
| VOLTAGE CODE | | X | A | B | C | |
| CAP. CODE | CAP. | | | | | |
| 0R1 | 0.1 pF | •• | •• | •• | •• | V, B, C, D |
| 0R2 | 0.2 pF | •• | •• | •• | •• | V, B, C, D |
| 0R3 | 0.3 pF | •• | •• | •• | •• | V, B, C, D |
| 0R4 | 0.4 pF | •• | •• | •• | •• | V, B, C, D |
| 0R5 | 0.5 pF | •• | •• | •• | •• | V, B, C, D |
| 0R6 | 0.6 pF | •• | •• | •• | •• | V, B, C, D |
| 0R7 | 0.7 pF | •• | •• | •• | •• | V, B, C, D |
| 0R8 | 0.8 pF | •• | •• | •• | •• | V, B, C, D |
| 0R9 | 0.9 pF | •• | •• | •• | •• | V, B, C, D |
| 1R0 | 1.0 pF | •• | •• | •• | •• | V, B, C, D |
| 1R1 | 1.1 pF | •• | •• | •• | •• | V, B, C, D |
| 1R2 | 1.2 pF | •• | •• | •• | •• | V, B, C, D |
| 1R3 | 1.3 pF | •• | •• | •• | •• | V, B, C, D |
| 1R4 | 1.4 pF | •• | •• | •• | •• | V, B, C, D |
| 1R5 | 1.5 pF | •• | •• | •• | •• | V, B, C, D |
| 1R6 | 1.6 pF | •• | •• | •• | •• | V, B, C, D |
| 1R7 | 1.7 pF | •• | •• | •• | •• | V, B, C, D |
| 1R8 | 1.8 pF | •• | •• | •• | •• | V, B, C, D |
| 1R9 | 1.9 pF | •• | •• | •• | •• | V, B, C, D |
| 2R0 | 2.0 pF | •• | •• | •• | •• | V, B, C, D |
| 2R1 | 2.1 pF | •• | •• | •• | •• | V, B, C, D |
| 2R2 | 2.2 pF | •• | •• | •• | •• | V, B, C, D |
| 2R4 | 2.4 pF | •• | •• | •• | •• | V, B, C, D |
| 2R7 | 2.7 pF | •• | •• | •• | •• | V, B, C, D |
| 3R0 | 3.0 pF | •• | •• | •• | •• | V, B, C, D |
| 3R3 | 3.3 pF | •• | •• | •• | •• | V, B, C, D |
| 3R6 | 3.6 pF | •• | •• | •• | •• | V, B, C, D |
| 3R9 | 3.9 pF | •• | •• | •• | •• | V, B, C, D |
| 4R3 | 4.3 pF | •• | •• | •• | •• | V, B, C, D |
| 4R7 | 4.7 pF | •• | •• | •• | •• | V, B, C, D |
| 5R1 | 5.1 pF | •• | •• | •• | •• | V, B, C, D |
| 5R6 | 5.6 pF | •• | •• | •• | •• | V, B, C, D |
| 6R2 | 6.2 pF | •• | •• | •• | •• | V, B, C, D |
| 6R8 | 6.8 pF | •• | •• | •• | •• | V, B, C, D |
| 7R5 | 7.5 pF | •• | •• | •• | •• | V, B, C, D |
| 8R2 | 8.2 pF | •• | •• | •• | •• | V, B, C, D |
| 9R1 | 9.1 pF | •• | •• | •• | •• | V, B, C, D |
| 100 | 10 pF | •• | •• | •• | •• | V, 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 |
| 300 | 30 pF | •• | •• | | | F, G, J, K, M |
| 330 | 33 pF | •• | •• | | | F, G, J, K, M |
| 360 | 36 pF | •• | •• | | | F, G, J, K, M |
| 390 | 39 pF | •• | •• | | | F, G, J, K, M |
| 430 | 43 pF | •• | •• | | | F, G, J, K, M |
| 470 | 47 pF | •• | •• | | | F, G, J, K, M |
| 510 | 51 pF | •• | •• | | | F, G, J, K, M |
| 560 | 56 pF | •• | •• | | | F, G, J, K, M |
| 620 | 62 pF | •• | | | | F, G, J, K, M |
| 680 | 68 pF | •• | | | | F, G, J, K, M |
| 750 | 75 pF | •• | | | | F, G, J, K, M |
| 820 | 82 pF | •• | | | | F, G, J, K, M |
| 910 | 91 pF | | | | | |
| 101 | 100 pF | | | | | |
| 111 | 110 pF | | | | | |
| 121 | 120 pF | | | | | |

**Notes**

RoHS-compliant except when supplied with lead (Pb)-containing termination, code “L”

•• Paper carrier

## SELECTION CHART

| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | |
|---|---|---|---|---|---|---|---|
| STYLE | | VJ0603 | | | | | TOLERANCE |
| CASE CODE | | 0603 | | | | | |
| VOLTAGE ($V_{DC}$) | | 25 | 50 | 100 | 200 | 250 | |
| VOLTAGE CODE | | X | A | B | C | P | |
| CAP. CODE | CAP. | | | | | | |
| 0R1 | 0.1 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 0R2 | 0.2 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 0R3 | 0.3 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 0R4 | 0.4 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 0R5 | 0.5 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 0R6 | 0.6 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 0R7 | 0.7 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 0R8 | 0.8 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 0R9 | 0.9 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 1R0 | 1.0 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 1R1 | 1.1 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 1R2 | 1.2 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 1R3 | 1.3 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 1R4 | 1.4 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 1R5 | 1.5 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 1R6 | 1.6 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 1R7 | 1.7 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 1R8 | 1.8 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 1R9 | 1.9 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 2R0 | 2.0 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 2R1 | 2.1 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 2R2 | 2.2 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 2R4 | 2.4 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 2R7 | 2.7 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 3R0 | 3.0 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 3R3 | 3.3 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 3R6 | 3.6 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 3R9 | 3.9 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 4R3 | 4.3 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 4R7 | 4.7 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 5R1 | 5.1 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 5R6 | 5.6 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 6R2 | 6.2 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 6R8 | 6.8 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 7R5 | 7.5 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 8R2 | 8.2 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 9R1 | 9.1 pF | •• | •• | •• | •• | •• | V, B, C, D |
| 100 | 10 pF | •• | •• | •• | •• | •• | V, 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 |
| 300 | 30 pF | •• | •• | •• | •• | •• | F, G, J, K, M |
| 330 | 33 pF | •• | •• | •• | •• | •• | F, G, J, K, M |
| 360 | 36 pF | •• | •• | •• | •• | •• | F, G, J, K, M |
| 390 | 39 pF | •• | •• | •• | •• | •• | F, G, J, K, M |
| 430 | 43 pF | •• | •• | •• | •• | •• | F, G, J, K, M |
| 470 | 47 pF | •• | •• | •• | •• | •• | F, G, J, K, M |
| 510 | 51 pF | •• | •• | •• | •• | •• | F, G, J, K, M |
| 560 | 56 pF | •• | •• | •• | •• | •• | F, G, J, K, M |
| 620 | 62 pF | • | • | • | • | • | F, G, J, K, M |
| 680 | 68 pF | • | • | • | • | • | F, G, J, K, M |
| 750 | 75 pF | • | • | • | • | • | F, G, J, K, M |
| 820 | 82 pF | • | • | • | • | • | F, G, J, K, M |
| 910 | 91 pF | • | • | • | • | • | F, G, J, K, M |

**Notes**

RoHS-compliant except when supplied with lead (Pb)-containing termination, code “L”

•• Paper carrier • Plastic carrier tape

## SELECTION CHART

| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | |
|---|---|---|---|---|---|---|---|
| STYLE | | VJ0603 | | | | | TOLERANCE |
| CASE CODE | | 0603 | | | | | |
| VOLTAGE ($V_{DC}$) | | 25 | 50 | 100 | 200 | 250 | |
| VOLTAGE CODE | | X | A | B | C | P | |
| CAP. CODE | CAP. | | | | | | |
| 101 | 100 pF | • | • | • | • | • | F, G, J, K, M |
| 111 | 110 pF | • | • | • | | | F, G, J, K, M |
| 121 | 120 pF | • | • | • | | | F, G, J, K, M |
| 131 | 130 pF | • | • | • | | | F, G, J, K, M |
| 151 | 150 pF | • | • | • | | | F, G, J, K, M |
| 181 | 180 pF | • | • | | | | F, G, J, K, M |
| 201 | 200 pF | • | • | | | | F, G, J, K, M |
| 221 | 220 pF | • | • | | | | F, G, J, K, M |
| 241 | 240 pF | • | • | | | | F, G, J, K, M |
| 271 | 270 pF | • | • | | | | F, G, J, K, M |
| 301 | 300 pF | • | • | | | | F, G, J, K, M |
| 331 | 330 pF | • | • | | | | F, G, J, K, M |
| 361 | 360 pF | • | | | | | F, G, J, K, M |
| 391 | 390 pF | • | | | | | F, G, J, K, M |
| 431 | 430 pF | • | | | | | F, G, J, K, M |
| 471 | 470 pF | • | | | | | F, G, J, K, M |
| 511 | 510 pF | | | | | | |
| 561 | 560 pF | | | | | | |
| 621 | 620 pF | | | | | | |
| 681 | 680 pF | | | | | | |
| 751 | 750 pF | | | | | | |
| 821 | 820 pF | | | | | | |
| 911 | 910 pF | | | | | | |
| 102 | 1.0 nF | | | | | | |
| 112 | 1.1 nF | | | | | | |
| 122 | 1.2 nF | | | | | | |
| 132 | 1.3 nF | | | | | | |
| 152 | 1.5 nF | | | | | | |
| 182 | 1.8 nF | | | | | | |

**Notes**

RoHS-compliant except when supplied with lead (Pb)-containing termination, code “L”

•• Paper carrier • Plastic carrier tape

| SELECTION CHART | | | | | | | |
|---|---|---|---|---|---|---|---|
| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | |
| STYLE | | VJ0805 | | | | | TOLERANCE |
| CASE CODE | | 0805 | | | | | |
| VOLTAGE ($V_{DC}$) | | 25 | 50 | 100 | 200 | 250 | |
| VOLTAGE CODE | | X | A | B | C | P | |
| CAP. CODE | CAP. | | | | | | |
| 0R1 | 0.1 pF | • | • | • | • | • | V, B, C, D |
| 0R2 | 0.2 pF | • | • | • | • | • | V, B, C, D |
| 0R3 | 0.3 pF | • | • | • | • | • | V, B, C, D |
| 0R4 | 0.4 pF | • | • | • | • | • | V, B, C, D |
| 0R5 | 0.5 pF | • | • | • | • | • | V, B, C, D |
| 0R6 | 0.6 pF | • | • | • | • | • | V, B, C, D |
| 0R7 | 0.7 pF | • | • | • | • | • | V, B, C, D |
| 0R8 | 0.8 pF | • | • | • | • | • | V, B, C, D |
| 0R9 | 0.9 pF | • | • | • | • | • | V, B, C, D |
| 1R0 | 1.0 pF | • | • | • | • | • | V, B, C, D |
| 1R1 | 1.1 pF | • | • | • | • | • | V, B, C, D |
| 1R2 | 1.2 pF | • | • | • | • | • | V, B, C, D |
| 1R3 | 1.3 pF | • | • | • | • | • | V, B, C, D |
| 1R4 | 1.4 pF | • | • | • | • | • | V, B, C, D |
| 1R5 | 1.5 pF | • | • | • | • | • | V, B, C, D |
| 1R6 | 1.6 pF | • | • | • | • | • | V, B, C, D |
| 1R7 | 1.7 pF | • | • | • | • | • | V, B, C, D |
| 1R8 | 1.8 pF | • | • | • | • | • | V, B, C, D |
| 1R9 | 1.9 pF | • | • | • | • | • | V, B, C, D |
| 2R0 | 2.0 pF | • | • | • | • | • | V, B, C, D |
| 2R1 | 2.1 pF | • | • | • | • | • | V, B, C, D |
| 2R2 | 2.2 pF | • | • | • | • | • | V, B, C, D |
| 2R4 | 2.4 pF | • | • | • | • | • | V, B, C, D |
| 2R7 | 2.7 pF | • | • | • | • | • | V, B, C, D |
| 3R0 | 3.0 pF | • | • | • | • | • | V, B, C, D |
| 3R3 | 3.3 pF | • | • | • | • | • | V, B, C, D |
| 3R6 | 3.6 pF | • | • | • | • | • | V, B, C, D |
| 3R9 | 3.9 pF | • | • | • | • | • | V, B, C, D |
| 4R3 | 4.3 pF | • | • | • | • | • | V, B, C, D |
| 4R7 | 4.7 pF | • | • | • | • | • | V, B, C, D |
| 5R1 | 5.1 pF | • | • | • | • | • | V, B, C, D |
| 5R6 | 5.6 pF | • | • | • | • | • | V, B, C, D |
| 6R2 | 6.2 pF | • | • | • | • | • | V, B, C, D |
| 6R8 | 6.8 pF | • | • | • | • | • | V, B, C, D |
| 7R5 | 7.5 pF | • | • | • | • | • | V, B, C, D |
| 8R2 | 8.2 pF | • | • | • | • | • | V, B, C, D |
| 9R1 | 9.1 pF | • | • | • | • | • | V, B, C, D |

**Notes**

RoHS-compliant except when supplied with lead (Pb)-containing termination, code “L”

• Plastic carrier tape

## SELECTION CHART

| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | |
|---|---|---|---|---|---|---|---|
| STYLE | | VJ0805 | | | | | |
| CASE CODE | | 0805 | | | | | |
| VOLTAGE ($V_{DC}$) | | 25 | 50 | 100 | 200 | 250 | TOLERANCE |
| VOLTAGE CODE | | X | A | B | C | P | |
| CAP. CODE | CAP. | | | | | | |
| 100 | 10 pF | • | • | • | • | • | V, 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 |
| 300 | 30 pF | • | • | • | • | • | F, G, J, K, M |
| 330 | 33 pF | • | • | • | • | • | F, G, J, K, M |
| 360 | 36 pF | • | • | • | • | • | F, G, J, K, M |
| 390 | 39 pF | • | • | • | • | • | F, G, J, K, M |
| 430 | 43 pF | • | • | • | • | • | F, G, J, K, M |
| 470 | 47 pF | • | • | • | • | • | F, G, J, K, M |
| 510 | 51 pF | • | • | • | • | • | F, G, J, K, M |
| 560 | 56 pF | • | • | • | • | • | F, G, J, K, M |
| 620 | 62 pF | • | • | • | • | • | F, G, J, K, M |
| 680 | 68 pF | • | • | • | • | • | F, G, J, K, M |
| 750 | 75 pF | • | • | • | • | • | F, G, J, K, M |
| 820 | 82 pF | • | • | • | • | • | F, G, J, K, M |
| 910 | 91 pF | • | • | • | • | • | F, G, J, K, M |
| 101 | 100 pF | • | • | • | • | • | F, G, J, K, M |
| 111 | 110 pF | • | • | • | • | • | F, G, J, K, M |
| 121 | 120 pF | • | • | • | • | • | F, G, J, K, M |
| 131 | 130 pF | • | • | • | • | • | F, G, J, K, M |
| 151 | 150 pF | • | • | • | • | • | F, G, J, K, M |
| 181 | 180 pF | • | • | • | • | • | F, G, J, K, M |
| 201 | 200 pF | • | • | • | • | • | F, G, J, K, M |
| 221 | 220 pF | • | • | • | • | • | F, G, J, K, M |
| 241 | 240 pF | • | • | • | • | • | F, G, J, K, M |
| 271 | 270 pF | • | • | • | • | • | F, G, J, K, M |
| 301 | 300 pF | • | • | • | • | • | F, G, J, K, M |
| 331 | 330 pF | • | • | • | • | • | F, G, J, K, M |
| 361 | 360 pF | • | • | • | • | | F, G, J, K, M |
| 391 | 390 pF | • | • | • | • | | F, G, J, K, M |
| 431 | 430 pF | • | • | • | | | F, G, J, K, M |
| 471 | 470 pF | • | • | • | | | F, G, J, K, M |
| 511 | 510 pF | • | • | • | | | F, G, J, K, M |
| 561 | 560 pF | • | • | • | | | F, G, J, K, M |
| 621 | 620 pF | • | • | • | | | F, G, J, K, M |
| 681 | 680 pF | • | • | • | | | F, G, J, K, M |
| 751 | 750 pF | • | • | | | | F, G, J, K, M |
| 821 | 820 pF | • | • | | | | F, G, J, K, M |
| 911 | 910 pF | • | • | | | | F, G, J, K, M |
| 102 | 1.0 nF | • | • | | | | F, G, J, K, M |
| 112 | 1.1 nF | • | | | | | F, G, J, K, M |
| 122 | 1.2 nF | • | | | | | F, G, J, K, M |
| 132 | 1.3 nF | • | | | | | F, G, J, K, M |
| 152 | 1.5 nF | • | | | | | F, G, J, K, M |
| 182 | 1.8 nF | | | | | | |

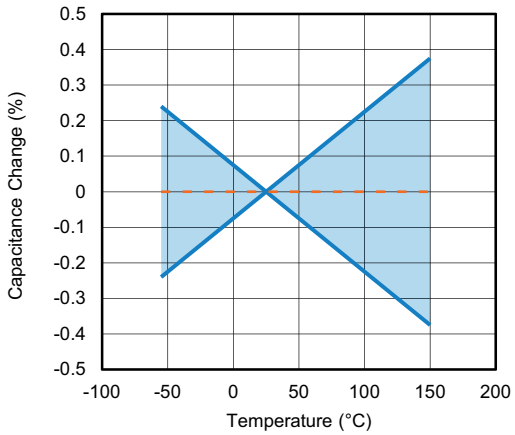
**Notes**

RoHS-compliant except when supplied with lead (Pb)-containing termination, code “L”

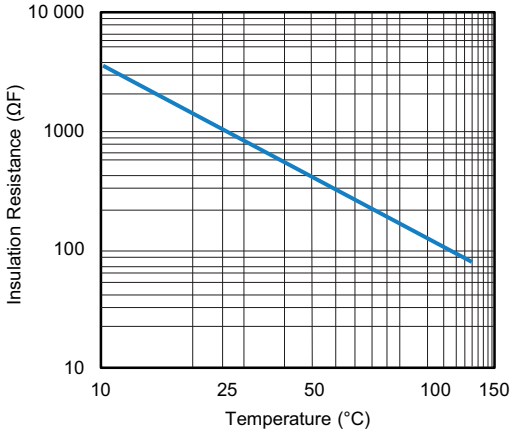
• Plastic carrier tape

## HIGH FREQ DIELECTRIC - TYPICAL PARAMETERS

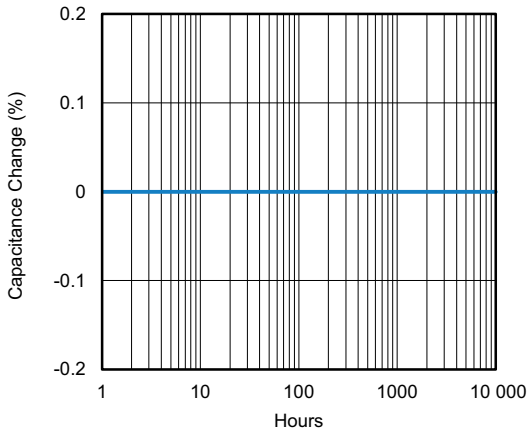
Temperature Coefficient of Capacitance



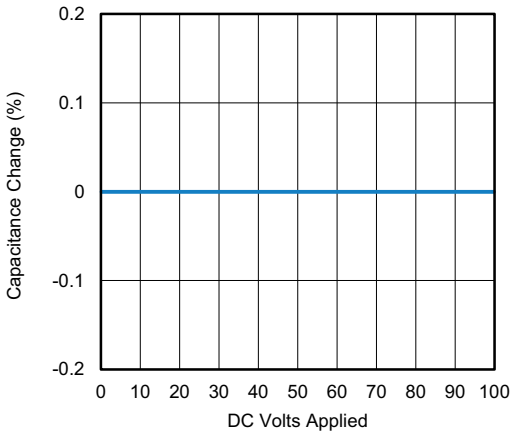

Minimum Insulation Resistance vs. Temperature



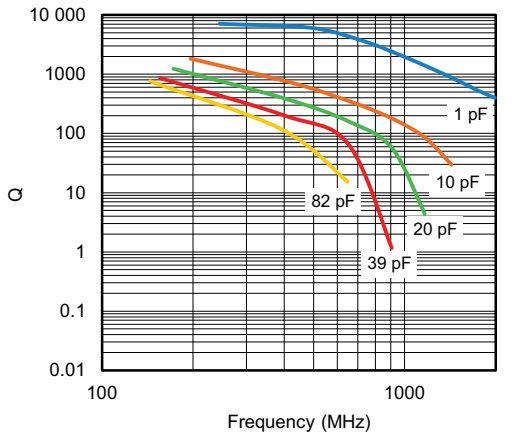

Aging Rate



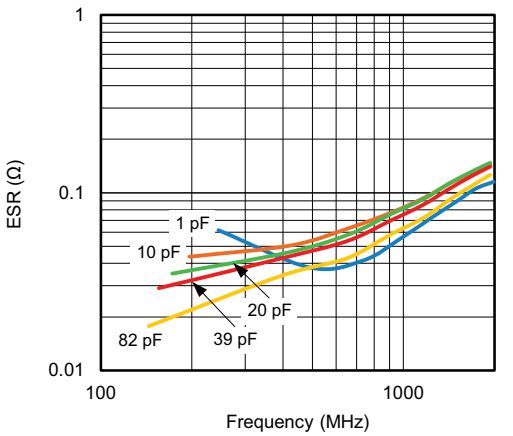

Voltage Coefficient of Capacitance




Typical Q Value vs. Frequency (Size 0402)

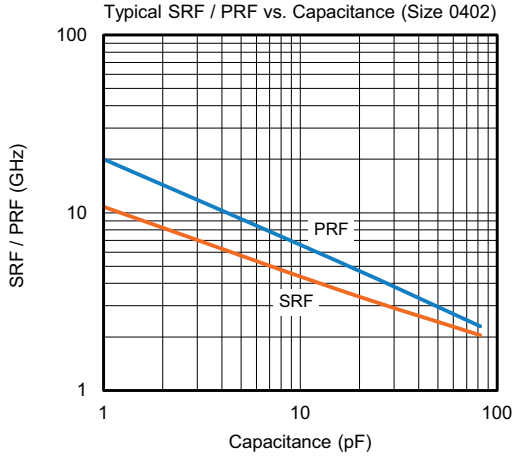



Typical ESR vs. Frequency (Size 0402)

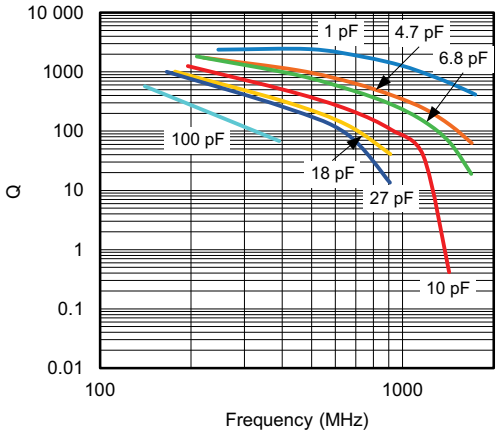


## HIGH FREQ DIELECTRIC - TYPICAL PARAMETERS

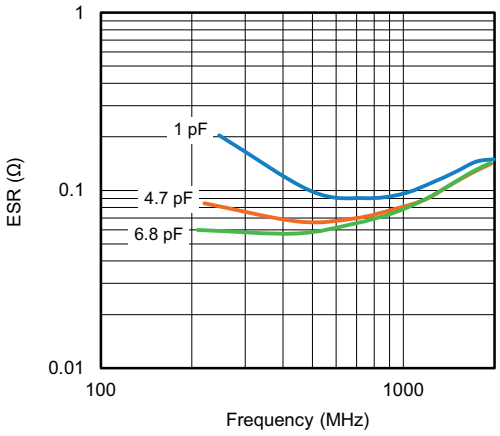
Typical SRF / PRF vs. Capacitance (Size 0402)



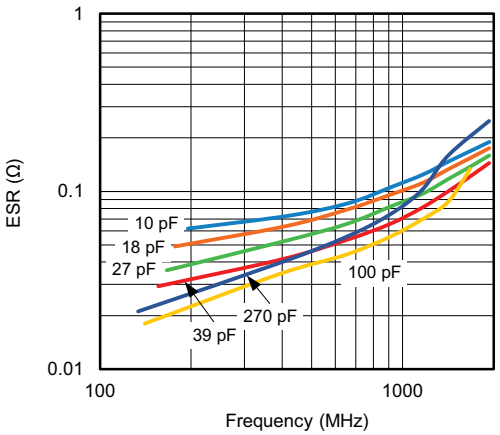

Typical Q Value vs. Frequency (Size 0603)



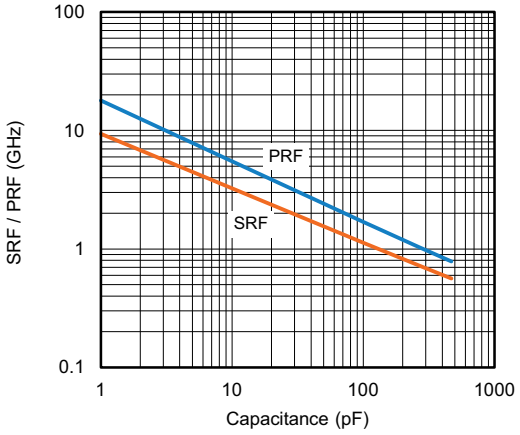

Typical ESR vs. Frequency (Size 0603)




Typical ESR vs. Frequency (Size 0603)

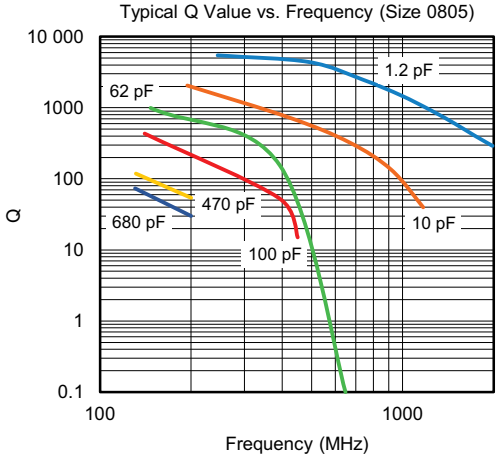



Typical SRF / PRF vs. Capacitance (Size 0603)

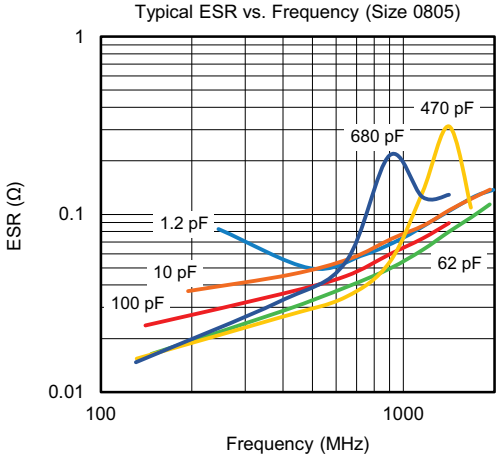


## HIGH FREQ DIELECTRIC - TYPICAL PARAMETERS

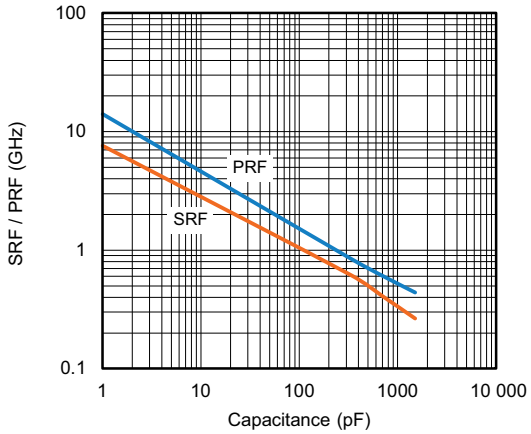
Typical Q Value vs. Frequency (Size 0805)




Typical ESR vs. Frequency (Size 0805)




Typical SRF / PRF vs. Capacitance (Size 0805)




## STANDARD PACKAGING QUANTITIES (1)(2)(3)

| CASE CODE | TAPE SIZE | 7" REEL QUANTITIES | | | 11 1/4" AND 13" REEL QUANTITIES | |
|---|---|---|---|---|---|---|
| | | PAPER TAPE PACKAGING CODE "C" / "O" | PLASTIC TAPE PACKAGING CODE "T" | LOW QUANTITY "J" (5) | PAPER TAPE PACKAGING CODE "P" / "I" | PLASTIC TAPE PACKAGING CODE "R" |
| 0402 | 8 mm | 5000 | n/a | 1000 | 10 000 | n/a |
| 0603 (4) | 8 mm | 4000 | 4000 | 1000 | 10 000 | 10 000 |
| 0805 (4) | 8 mm | n/a | 3000 | 1000 | n/a | 10 000 |

**Notes**

(1) Vishay Vitramon uses embossed plastic carrier tape
(2) REFERENCE: EIA standard RS 481 - "Taping of Surface Mount Components for Automatic Placement"
(3) n/a = not available
(4) Packaging "C" / "P" / "O" / "I" and "T" / "R" or lower quantities can depend from product thickness
(5) Paper / plastic tape used by availability

## STORAGE AND HANDLING CONDITIONS

(1) Store the components at 5 °C to +40 °C ambient temperature and ≤ 70 % relative 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:

a. 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.
b. Store products on the shelf and avoid exposure to moisture or dust.
c. Do not expose products to excessive shock, vibration, direct sunlight and so on.

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