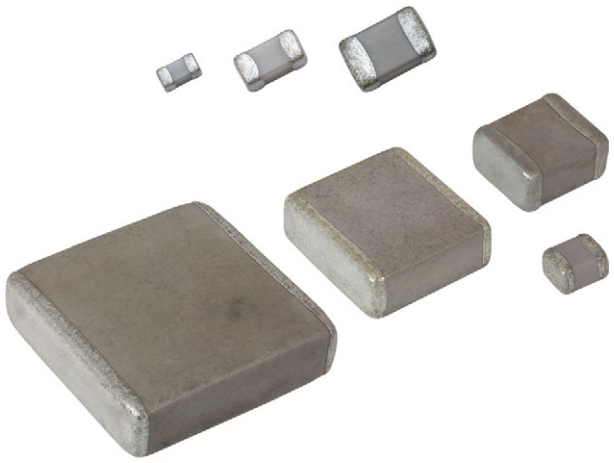
# Surface Mount Multilayer Ceramic Chip Capacitors for High Frequency Applications



## FEATURES

- Case size 0402, 0505, 0603, 0805, 1111, 2525, and 3838
- High frequency
- Ultra-stable, high Q 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

Pb 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

## LINKS TO ADDITIONAL RESOURCES

S-Parameters | Simulation Tools | Related Documents | Packages | Technical Notes

## APPLICATIONS

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

## 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
0505: 0.1 pF to 1.0 nF
0603: 0.1 pF to 470 pF
0805: 0.1 pF to 1.0 nF
1111: 0.2 pF to 3.3 nF
2525: 1.0 pF to 3.0 nF
3838: 1.0 pF to 12 nF

**Voltage Rating:**

0402: 25 $V_{DC}$ to 200 $V_{DC}$
0505: 50 $V_{DC}$ to 250 $V_{DC}$
0603: 25 $V_{DC}$ to 250 $V_{DC}$
0805: 25 $V_{DC}$ to 500 $V_{DC}$
1111: 50 $V_{DC}$ to 1500 $V_{DC}$
2525: 300 $V_{DC}$ to 3600 $V_{DC}$
3838: 300 $V_{DC}$ to 7200 $V_{DC}$

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

C0G (D): 0 ppm/°C ± 30 ppm/°C from -55 °C to +125 °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:

≤ 250 $V_{DC}$-rated: min. 200 % of rated voltage
> 250 $V_{DC}$- to 1000 $V_{DC}$-rated: min. 150 % of rated voltage
1500 $V_{DC}$ and up: 120 % rated voltage

## QUICK REFERENCE DATA

| DIELECTRIC | CASE | MAXIMUM VOLTAGE (V) | CAPACITANCE | |
|---|---|---|---|---|
| | | | MINIMUM | MAXIMUM |
| D = HIFREQ | 0402 | 200 | 0.1 pF | 82 pF |
| | 0505 | 250 | 0.1 pF | 1 nF |
| | 0603 | 250 | 0.1 pF | 470 pF |
| | 0805 | 500 | 0.1 pF | 1.0 nF |
| | 1111 | 1500 | 0.2 pF | 3.3 nF |
| | 2525 | 3600 | 1.0 pF | 3 nF |
| | 3838 | 7200 | 1.0 pF | 12 nF |

## ORDERING INFORMATION

| VJ0603 | D | 101 | J | X | A | A | T |
|---|---|---|---|---|---|---|---|
| CASE CODE | DIELECTRIC | CAPACITANCE NOMINAL CODE | CAPACITANCE TOLERANCE | TERMINATION | DC VOLTAGE RATING (1) | MARKING | PACKAGING (4) |
| 0402<br>0505<br>0603<br>0805<br>1111<br>2525<br>3838 | D = HIFREQ | Expressed in picofarads (pF). The first two digits are significant, the third is a multiplier. An "R" indicates a decimal point.<br>**Examples:**<br>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><br>**Note**<br>Details see "Selection Chart" | X = Ni barrier 100 % tin plate matte finish<br>C = non-magnetic copper barrier 100 % tin plate matte finish<br>E = AgPd (2)<br>L = Ni barrier with tin lead plated finish min. 4 % lead | X = 25 V<br>A = 50 V<br>B = 100 V<br>K = 150 V<br>C = 200 V<br>P = 250 V<br>D = 300 V<br>E = 500 V<br>L = 630 V<br>I = 800 V<br>G = 1000 V<br>R = 1500 V<br>F = 2000 V<br>O = 2500 V<br>H = 3000 V<br>W = 3600 V<br>M = 5000 V<br>S = 7200 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>W = waffle pack<br><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 - only available for EIA case sizes 0402, 0603, and 0805

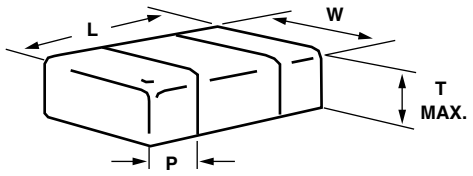
(3) Case size 0402 only available with "A"

(4) See "Standard Packaging Quantities" table

## 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) |
| 0505 | VJ0505 | 0.055 + 0.015 / - 0.010<br>(1.40 + 0.382 / - 0.254) | 0.055 ± 0.015<br>(1.40 ± 0.38) | 0.057<br>(1.45) | 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) |
| 1111 | VJ1111 | 0.117 + 0.015 / - 0.010<br>(2.98 + 0.382 / - 0.254) | 0.110 + 0.015 / - 0.020<br>(2.79 + 0.382 / - 0.509) | 0.102<br>(2.59) | 0.012<br>(0.30) | 0.018 [2]<br>(0.46) |
| 2525 | VJ2525 | 0.250 + 0.020 / - 0.025<br>(6.35 + 0.508 / - 0.63) | 0.250 ± 0.015<br>(6.35 ± 0.381) | 0.102<br>(2.59) | 0.010<br>(0.25) | 0.030 [3]<br>(0.76) |
| 3838 | VJ3838 | 0.381 ± 0.015<br>(9.7 ± 0.40) | 0.381 + 0.017 / - 0.015<br>(9.7 + 0.45 / - 0.40) | 0.118<br>(3.00) | 0.010<br>(0.25) | 0.030 [3]<br>(0.76) |

**Notes**

[1] For Cu termination “C” add 0.01 mm to maximum pad terminations

[2] For Cu termination “C” case size 1111 add 0.17 mm to maximum pad termination

[3] For Cu termination “C” case sizes 2525 and 3838 maximum pad termination size is 0.041 inches (1.04 mm)

| SELECTION CHART | | | | | | |
|---|---|---|---|---|---|---|
| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | |
| STYLE | | VJ0402 | | | | |
| CASE CODE | | 0402 | | | | |
| VOLTAGE ($V_{DC}$) | | 25 | 50 | 100 | 200 | TOLERANCE |
| 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 |

**Notes**

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

•• Paper carrier

- For soldering conditions see Vishay Soldering Recommendations www.vishay.com/doc?45034

| SELECTION CHART | | | | | | |
|---|---|---|---|---|---|---|
| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | |
| STYLE | | VJ0402 | | | | |
| CASE CODE | | 0402 | | | | |
| VOLTAGE ($V_{DC}$) | | 25 | 50 | 100 | 200 | TOLERANCE |
| VOLTAGE CODE | | X | A | B | C | |
| CAP. CODE | CAP. | | | | | |
| 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 |
| 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

- For soldering conditions see Vishay Soldering Recommendations www.vishay.com/doc?45034

| SELECTION CHART | | | | | | | |
|---|---|---|---|---|---|---|---|
| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | |
| STYLE | | VJ0505 | | | | | |
| CASE CODE | | 0505 | | | | | |
| VOLTAGE ($V_{DC}$) | | 50 | 100 | 150 | 200 | 250 | TOLERANCE |
| VOLTAGE CODE | | A | B | K | 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 | • | • | • | • | • | B, C, D |
| 6R2 | 6.2 pF | • | • | • | • | • | B, C, D |
| 6R8 | 6.8 pF | • | • | • | • | • | B, C, D |
| 7R5 | 7.5 pF | • | • | • | • | • | B, C, D |
| 8R2 | 8.2 pF | • | • | • | • | • | B, C, D |
| 9R1 | 9.1 pF | • | • | • | • | • | B, C, D |
| 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 |
| 160 | 16 pF | • | • | • | • | • | F, G, J, K, M |
| 180 | 18 pF | • | • | • | • | • | F, G, J, K, M |

**Notes**

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

• Plastic carrier tape

- For soldering conditions see Vishay Soldering Recommendations www.vishay.com/doc?45034

| SELECTION CHART | | | | | | | |
|---|---|---|---|---|---|---|---|
| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | |
| STYLE | | VJ0505 | | | | | |
| CASE CODE | | 0505 | | | | | |
| VOLTAGE ($V_{DC}$) | | 50 | 100 | 150 | 200 | 250 | TOLERANCE |
| VOLTAGE CODE | | A | B | K | C | P | |
| CAP. CODE | CAP. | | | | | | |
| 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 |
| 161 | 160 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 | 1000 pF | • | | | | | F, G, J, K, M |
| 112 | 1100 pF | | | | | | |
| 122 | 1200 pF | | | | | | |

**Notes**

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

- Plastic carrier tape
- For soldering conditions see Vishay Soldering Recommendations www.vishay.com/doc?45034

| SELECTION CHART | | | | | | | |
|---|---|---|---|---|---|---|---|
| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | |
| STYLE | | VJ0603 | | | | | |
| CASE CODE | | 0603 | | | | | |
| VOLTAGE ($V_{DC}$) | | 25 | 50 | 100 | 200 | 250 | TOLERANCE |
| 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 | •• | •• | •• | •• | •• | 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 |

**Notes**

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

•• Paper carrier • Plastic carrier tape

- For case size 0603: Cu termination “C” is only available in plastic carrier tape
- For soldering conditions see Vishay Soldering Recommendations www.vishay.com/doc?45034

| SELECTION CHART | | | | | | | |
|---|---|---|---|---|---|---|---|
| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | |
| STYLE | | VJ0603 | | | | | |
| CASE CODE | | 0603 | | | | | |
| VOLTAGE ($V_{DC}$) | | 25 | 50 | 100 | 200 | 250 | TOLERANCE |
| VOLTAGE CODE | | X | A | B | C | P | |
| CAP. CODE | CAP. | | | | | | |
| 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 | | | | | | |
| 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

- For case size 0603: Cu termination “C” is only available in plastic carrier tape
- For soldering conditions see Vishay Soldering Recommendations www.vishay.com/doc?45034

## SELECTION CHART

| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| STYLE | | VJ0805 | | | | | | |
| CASE CODE | | 0805 | | | | | | |
| VOLTAGE ($V_{DC}$) | | 25 | 50 | 100 | 200 | 250 | 500 | TOLERANCE (1) |
| VOLTAGE CODE | | X | A | B | C | P | E | |
| 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

- For soldering conditions see Vishay Soldering Recommendations www.vishay.com/doc?45034

(1) 500 V, < 10 pF tolerances B, C, D only

## SELECTION CHART

| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| STYLE | | VJ0805 | | | | | | |
| CASE CODE | | 0805 | | | | | | |
| VOLTAGE ($V_{DC}$) | | 25 | 50 | 100 | 200 | 250 | 500 | TOLERANCE (1) |
| VOLTAGE CODE | | X | A | B | C | P | E | |
| CAP. CODE | CAP. | | | | | | | |
| 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 |
| 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 |

**Notes**

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

• Plastic carrier tape

- For soldering conditions see Vishay Soldering Recommendations www.vishay.com/doc?45034

(1) 500 V, < 10 pF tolerances B, C, D only

| SELECTION CHART | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | | | | |
| STYLE | | VJ1111 | | | | | | | | |
| CASE CODE | | 1111 | | | | | | | | |
| VOLTAGE ($V_{DC}$) | | 50 | 100 | 200 | 300 | 500 | 630 | 1000 | 1500 | TOLERANCE |
| VOLTAGE CODE | | A | B | C | D | E | L | G | R | |
| CAP. CODE | CAP. | | | | | | | | | |
| 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 | • | • | • | • | • | • | • | • | B, C, D |
| 6R2 | 6.2 pF | • | • | • | • | • | • | • | • | B, C, D |
| 6R8 | 6.8 pF | • | • | • | • | • | • | • | • | B, C, D |
| 7R5 | 7.5 pF | • | • | • | • | • | • | • | • | B, C, D |
| 8R2 | 8.2 pF | • | • | • | • | • | • | • | • | B, C, D |
| 9R1 | 9.1 pF | • | • | • | • | • | • | • | • | B, C, D |
| 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 |
| 160 | 16 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 |

**Notes**

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

• Plastic carrier tape

| SELECTION CHART | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | | | | |
| STYLE | | VJ1111 | | | | | | | | |
| CASE CODE | | 1111 | | | | | | | | |
| VOLTAGE ($V_{DC}$) | | 50 | 100 | 200 | 300 | 500 | 630 | 1000 | 1500 | TOLERANCE |
| VOLTAGE CODE | | A | B | C | D | E | L | G | R | |
| CAP. CODE | CAP. | | | | | | | | | |
| 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 |
| 161 | 160 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 | 1000 pF | • | • | • | • | | | | | F, G, J, K, M |
| 112 | 1100 pF | • | • | • | | | | | | F, G, J, K, M |
| 122 | 1200 pF | • | • | • | | | | | | F, G, J, K, M |
| 132 | 1300 pF | • | • | • | | | | | | F, G, J, K, M |
| 152 | 1500 pF | • | • | • | | | | | | F, G, J, K, M |
| 162 | 1600 pF | • | • | • | | | | | | F, G, J, K, M |
| 182 | 1800 pF | • | • | | | | | | | F, G, J, K, M |
| 202 | 2000 pF | • | • | | | | | | | F, G, J, K, M |
| 222 | 2200 pF | • | • | | | | | | | F, G, J, K, M |
| 242 | 2400 pF | • | • | | | | | | | F, G, J, K, M |
| 272 | 2700 pF | • | • | | | | | | | F, G, J, K, M |
| 302 | 3000 pF | • | • | | | | | | | F, G, J, K, M |
| 332 | 3300 pF | • | • | | | | | | | F, G, J, K, M |

**Notes**

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

• Plastic carrier tape

## SELECTION CHART

| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STYLE | | VJ2525 | | | | | | | | | | |
| CASE CODE | | 2525 | | | | | | | | | | |
| VOLTAGE ($V_{DC}$) | | 300 | 500 | 630 | 800 | 1000 | 1500 | 2000 | 2500 | 3000 | 3600 | TOLERANCE |
| VOLTAGE CODE | | D | E | L | I | G | R | F | O | H | W | |
| CAP. CODE | CAP. | | | | | | | | | | | |
| 1R0 | 1.0 pF | • | • | • | • | • | • | • | • | • | • | B, C, D |
| 1R1 | 1.1 pF | • | • | • | • | • | • | • | • | • | • | B, C, D |
| 1R2 | 1.2 pF | • | • | • | • | • | • | • | • | • | • | B, C, D |
| 1R3 | 1.3 pF | • | • | • | • | • | • | • | • | • | • | B, C, D |
| 1R4 | 1.4 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 |
| 1R9 | 1.9 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, D |
| 7R5 | 7.5 pF | • | • | • | • | • | • | • | • | • | • | B, C, D |
| 8R2 | 8.2 pF | • | • | • | • | • | • | • | • | • | • | B, C, D |
| 9R1 | 9.1 pF | • | • | • | • | • | • | • | • | • | • | B, C, D |
| 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 |
| 160 | 16 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 |

**Notes**

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

- Plastic carrier tape

| SELECTION CHART | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | | | | | | |
| STYLE | | VJ2525 | | | | | | | | | | |
| CASE CODE | | 2525 | | | | | | | | | | |
| VOLTAGE ($V_{DC}$) | | 300 | 500 | 630 | 800 | 1000 | 1500 | 2000 | 2500 | 3000 | 3600 | TOLERANCE |
| VOLTAGE CODE | | D | E | L | I | G | R | F | O | H | W | |
| CAP. CODE | CAP. | | | | | | | | | | | |
| 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 |
| 161 | 160 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 | 1000 pF | • | • | • | • | • | • | | | | | F, G, J, K, M |
| 112 | 1100 pF | • | • | • | • | • | • | | | | | F, G, J, K, M |
| 122 | 1200 pF | • | • | • | • | • | • | | | | | F, G, J, K, M |
| 152 | 1500 pF | • | • | • | • | | | | | | | F, G, J, K, M |
| 182 | 1800 pF | • | • | • | • | | | | | | | F, G, J, K, M |
| 222 | 2200 pF | • | • | • | • | | | | | | | F, G, J, K, M |
| 242 | 2400 pF | • | • | • | | | | | | | | F, G, J, K, M |
| 272 | 2700 pF | • | • | | | | | | | | | F, G, J, K, M |
| 302 | 3000 pF | • | • | | | | | | | | | F, G, J, K, M |

**Notes**

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

• Plastic carrier tape

| SELECTION CHART | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | | | |
| STYLE | | VJ3838 | | | | | | | |
| CASE CODE | | 3838 | | | | | | | |
| VOLTAGE ($V_{DC}$) | | 300 | 500 | 1000 | 2500 | 3600 | 5000 | 7200 | TOLERANCE |
| VOLTAGE CODE | | D | E | G | O | W | M | S | |
| CAP. CODE | CAP. | | | | | | | | |
| 1R0 | 1.0 pF | • | • | • | • | • | • | • | B, C, D |
| 1R1 | 1.1 pF | • | • | • | • | • | • | • | B, C, D |
| 1R2 | 1.2 pF | • | • | • | • | • | • | • | B, C, D |
| 1R3 | 1.3 pF | • | • | • | • | • | • | • | B, C, D |
| 1R4 | 1.4 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 |
| 1R9 | 1.9 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, D |
| 7R5 | 7.5 pF | • | • | • | • | • | • | • | B, C, D |
| 8R2 | 8.2 pF | • | • | • | • | • | • | • | B, C, D |
| 9R1 | 9.1 pF | • | • | • | • | • | • | • | B, C, D |
| 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 |
| 160 | 16 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”

• Plastic carrier tape

| SELECTION CHART | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| DIELECTRIC (VISHAY CODE) | | C0G (D) | | | | | | | |
| STYLE | | VJ3838 | | | | | | | |
| CASE CODE | | 3838 | | | | | | | |
| VOLTAGE ($V_{DC}$) | | 300 | 500 | 1000 | 2500 | 3600 | 5000 | 7200 | TOLERANCE |
| VOLTAGE CODE | | D | E | G | O | W | M | S | |
| 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 |
| 161 | 160 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 | 1000 pF | • | • | • | | | | | F, G, J, K, M |
| 112 | 1100 pF | • | • | • | | | | | F, G, J, K, M |
| 122 | 1200 pF | • | • | • | | | | | F, G, J, K, M |
| 152 | 1500 pF | • | • | • | | | | | F, G, J, K, M |
| 182 | 1800 pF | • | • | • | | | | | F, G, J, K, M |
| 222 | 2200 pF | • | • | • | | | | | F, G, J, K, M |
| 242 | 2400 pF | • | • | • | | | | | F, G, J, K, M |
| 272 | 2700 pF | • | • | • | | | | | F, G, J, K, M |
| 302 | 3000 pF | • | • | • | | | | | F, G, J, K, M |
| 332 | 3300 pF | • | • | • | | | | | F, G, J, K, M |
| 362 | 3600 pF | • | • | • | | | | | F, G, J, K, M |
| 392 | 3900 pF | • | • | • | | | | | F, G, J, K, M |
| 432 | 4300 pF | • | • | • | | | | | F, G, J, K, M |
| 472 | 4700 pF | • | • | • | | | | | F, G, J, K, M |
| 512 | 5100 pF | • | • | • | | | | | F, G, J, K, M |
| 562 | 5600 pF | • | • | | | | | | F, G, J, K, M |
| 622 | 6200 pF | • | • | | | | | | F, G, J, K, M |
| 682 | 6800 pF | • | • | | | | | | F, G, J, K, M |
| 752 | 7500 pF | • | • | | | | | | F, G, J, K, M |
| 822 | 8200 pF | • | | | | | | | F, G, J, K, M |
| 912 | 9100 pF | • | | | | | | | F, G, J, K, M |
| 103 | 10 000 pF | • | | | | | | | F, G, J, K, M |
| 113 | 11 000 pF | • | | | | | | | F, G, J, K, M |
| 123 | 12 000 pF | • | | | | | | | F, G, J, K, M |

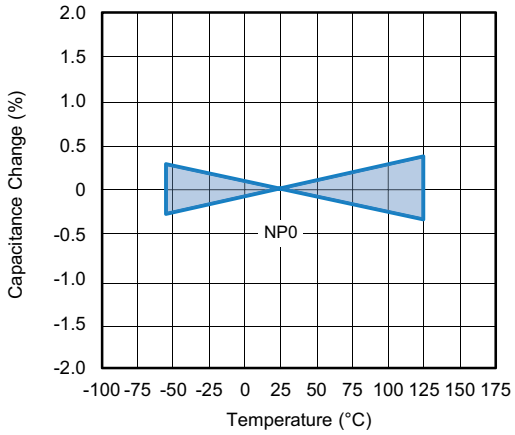
**Notes**

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

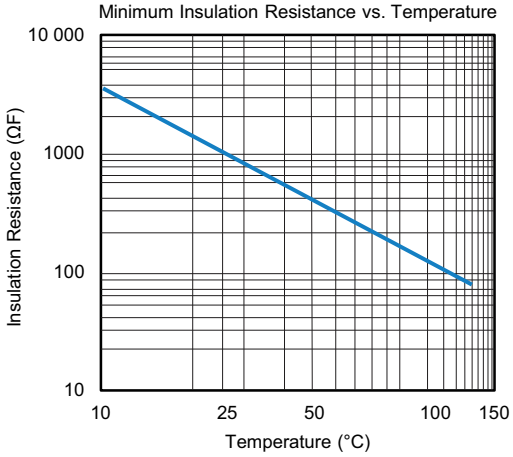
• Plastic carrier tape

## EIA SIZE / QUAD SIZE - TYPICAL PARAMETERS

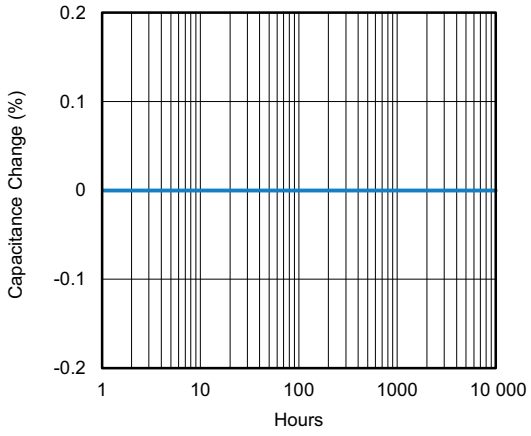
Temperature Coefficient of Capacitance



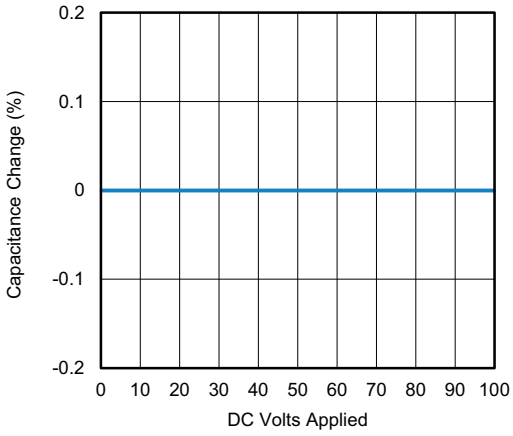

Minimum Insulation Resistance vs. Temperature




Aging Rate

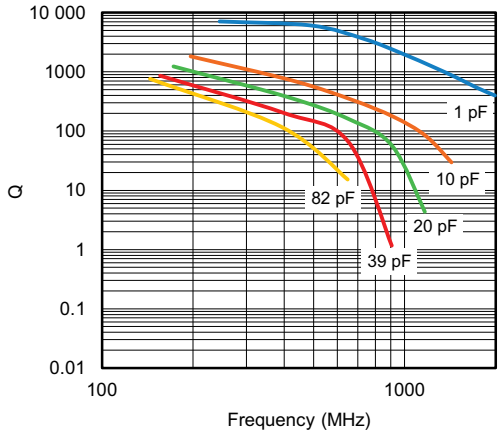



Voltage Coefficient of Capacitance

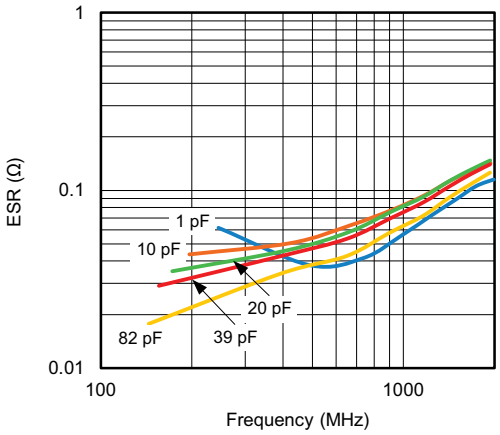


## EIA SIZE DIELECTRIC - TYPICAL PARAMETERS

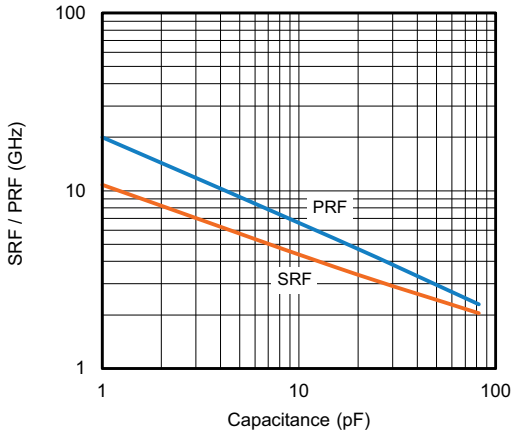
Typical Q Value vs. Frequency (Size 0402)



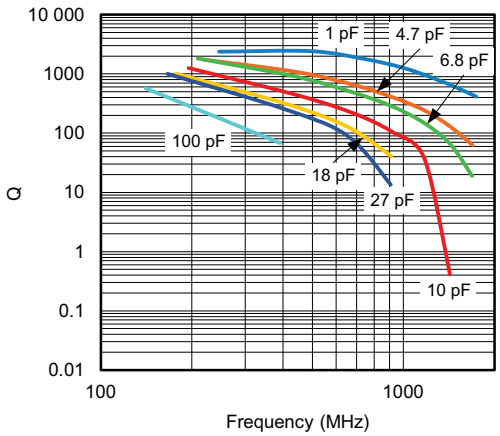

Typical ESR vs. Frequency (Size 0402)



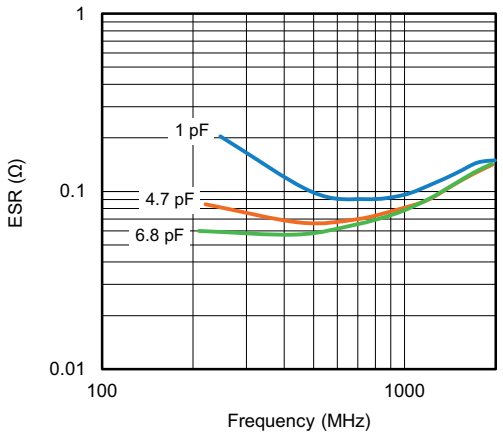

Typical SRF / PRF vs. Capacitance (Size 0402)



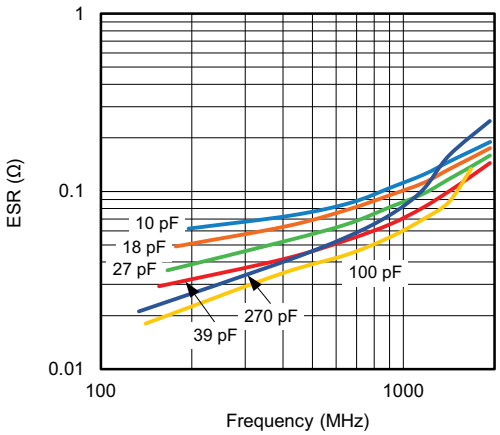

Typical Q Value vs. Frequency (Size 0603)




Typical ESR vs. Frequency (Size 0603)

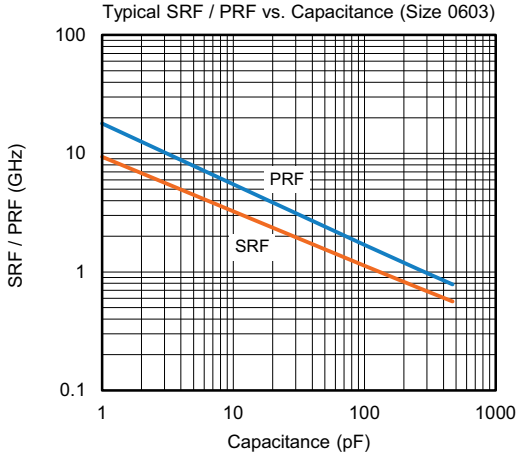



Typical ESR vs. Frequency (Size 0603)

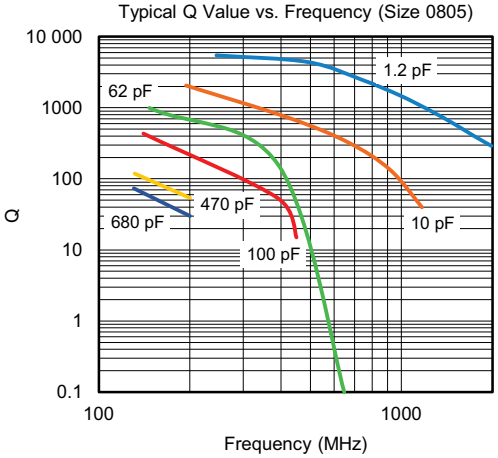


## EIA SIZE DIELECTRIC - TYPICAL PARAMETERS

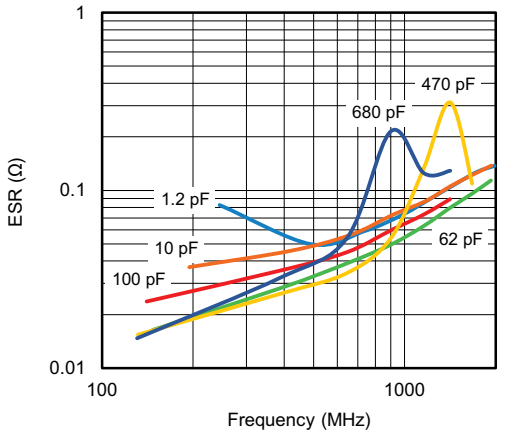
Typical SRF / PRF vs. Capacitance (Size 0603)



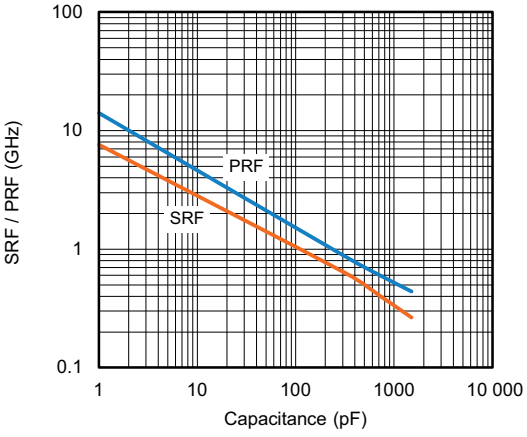

Typical Q Value vs. Frequency (Size 0805)




Typical ESR vs. Frequency (Size 0805)

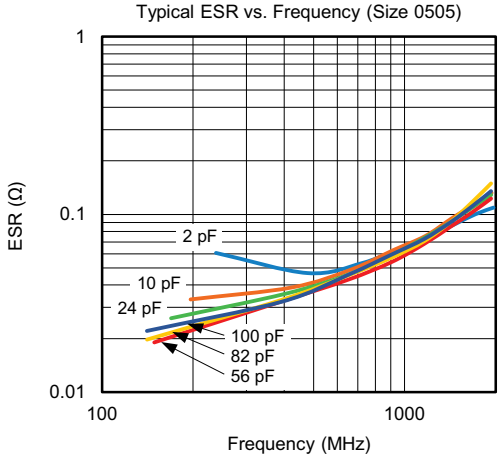



Typical SRF / PRF vs. Capacitance (Size 0805)

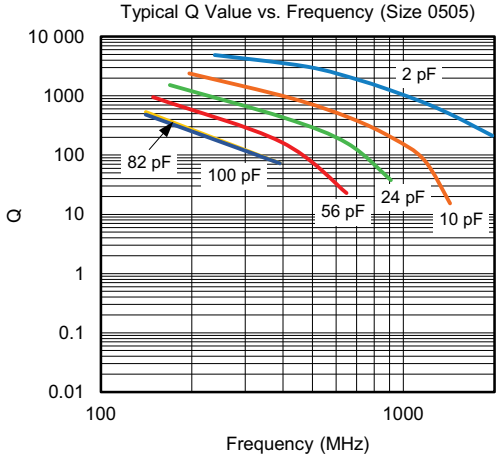


## QUAD SIZE DIELECTRIC - TYPICAL PARAMETERS

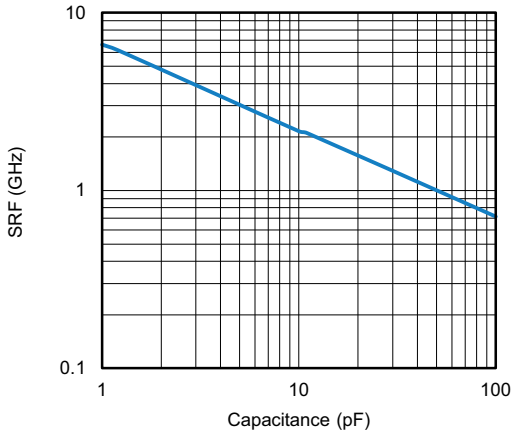
Typical ESR vs. Frequency (Size 0505)



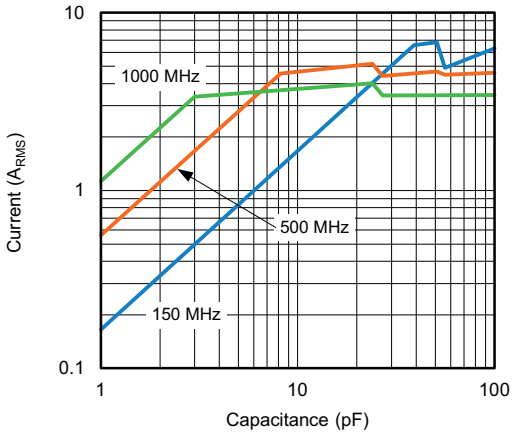

Typical Q Value vs. Frequency (Size 0505)



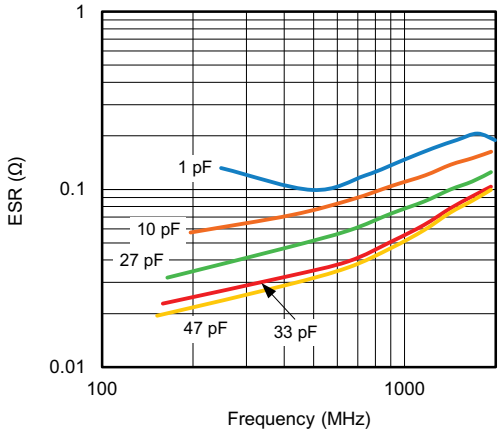

SRF vs. Capacitance (Size 0505)



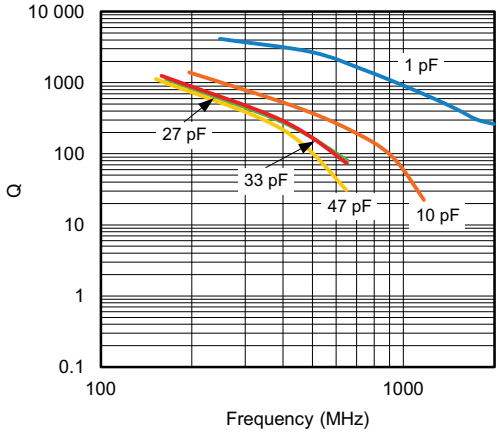

Current Rating (Size 0505, Ext. Voltage)




Typical ESR vs. Frequency (Size 1111)

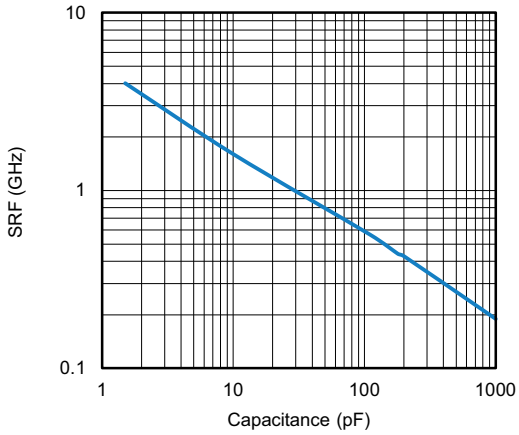



Typical Q Value vs. Frequency (Size 1111)

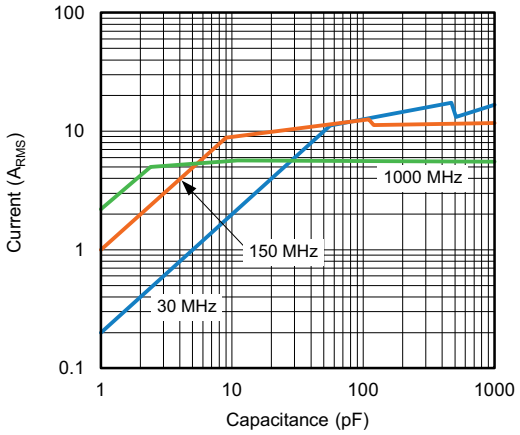


## QUAD SIZE DIELECTRIC - TYPICAL PARAMETERS

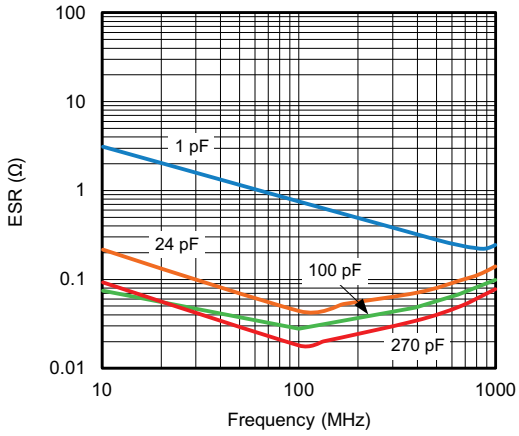
SRF vs. Capacitance (Size 1111)



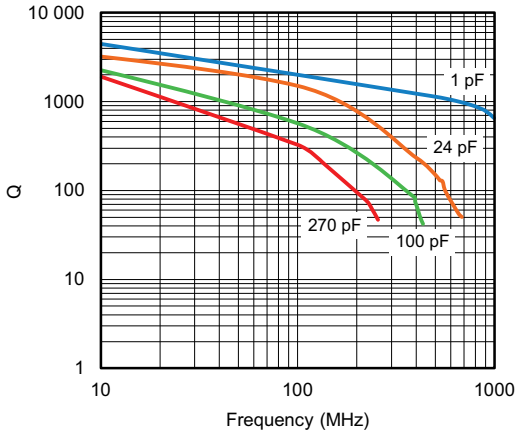

Current Rating (Size 1111, Ext. Voltage)



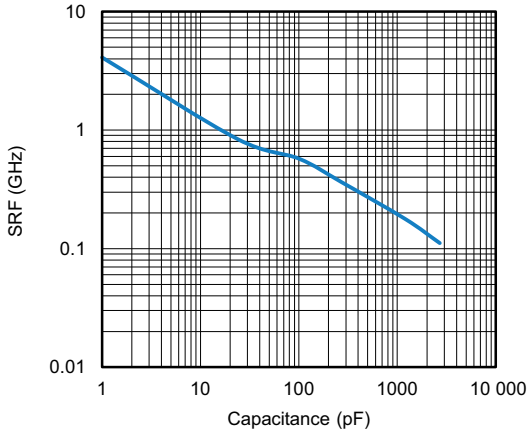

ESR vs. Frequency (Size 2525)



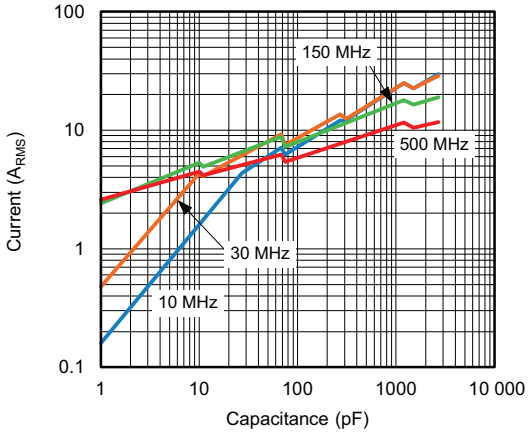

Q Value vs. Frequency (Size 2525)




SRF vs. Capacitance (Size 2525)

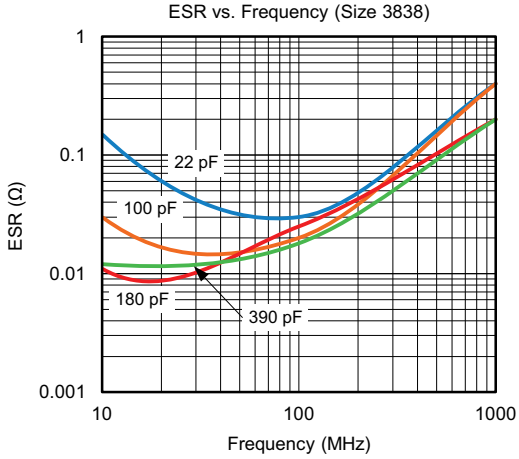



Current Rating (Size 2525, Ext. Voltage)

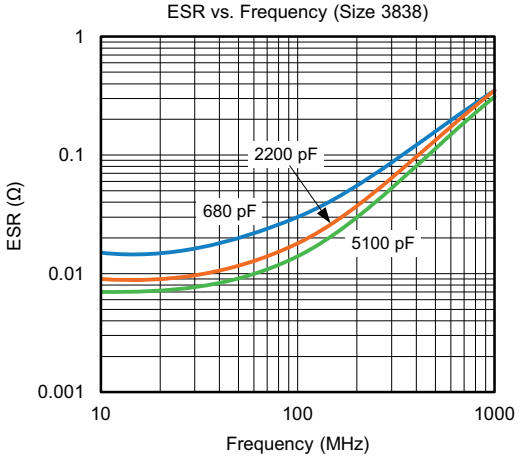


## QUAD SIZE DIELECTRIC - TYPICAL PARAMETERS

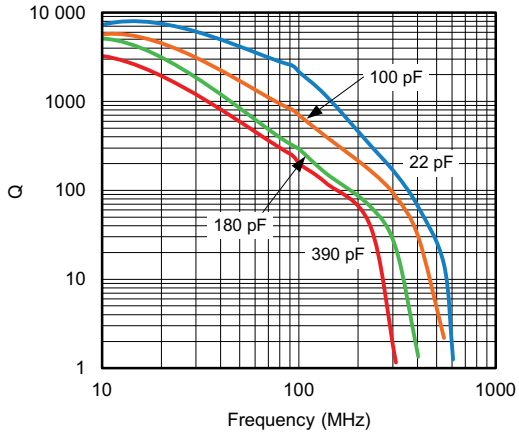
ESR vs. Frequency (Size 3838)



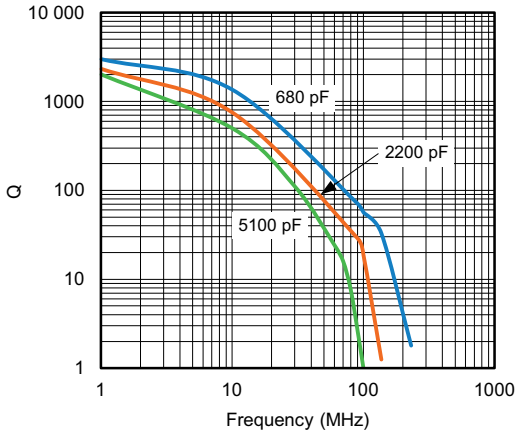

ESR vs. Frequency (Size 3838)



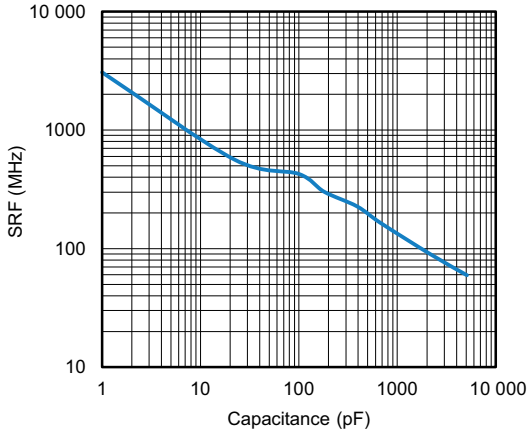

Q Value vs. Frequency (Size 3838)



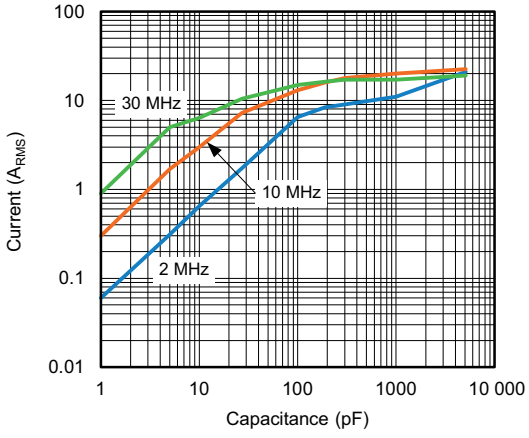

Q Value vs. Frequency (Size 3838)




SRF vs. Capacitance (Size 3838)




Current Rating (Size 3838, Ext. Voltage)



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

| CASE CODE | TAPE SIZE | 7" REEL QUANTITIES | | | 11 1/4" AND 13" REEL QUANTITIES | | WAFFLE PACK |
|---|---|---|---|---|---|---|---|
| | | 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" | PLASTIC WAFFLE PACK PACKAGING CODE "W" |
| 0402 | 8 mm | 5000 | n/a | 1000 | 10 000 | n/a | n/a |
| 0603 (4) | 8 mm | 4000 | 4000 | 1000 | 10 000 | 10 000 | n/a |
| 0805 (4) | 8 mm | n/a | 3000 | 1000 | n/a | 10 000 | n/a |
| 0505 | 8 mm | n/a | 3000 | 1000 | n/a | 10 000 | n/a |
| 1111 | 8 mm | n/a | 2500 | 1000 | n/a | 9000 | n/a |
| 2525 | 12 mm | n/a | 800 | 500 | n/a | n/a | 81 |
| 3838 | 16 mm | n/a | 400 | 100 | n/a | n/a | 35 |

**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

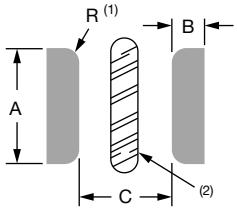
(1) Store the components at 5 °C to +40 °C ambient temperature and ≤ 70 % relative humidity conditions.
(2) The product is recommended to be used within a time-frame of 2 years after shipment.
Check solderability in case extended shelf life beyond the expiry date is needed.

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.

# Solder Pad Dimensions for Vishay Surface-Mount Multilayer Ceramic Chip Capacitors

**DIMENSIONS** in millimeters




| CASE CODE | A | B | C |
|---|---|---|---|
| 0402 | 0.50 | 0.50 | 0.40 |
| 0505 | 1.35 | 1.00 | 0.60 |
| 0603 | 0.90 | 1.00 | 1.00 (3) |
| 0805 | 1.30 | 1.20 | 1.00 |
| 1111 | 2.90 | 1.30 | 1.75 |
| 1206 | 1.80 | 1.20 | 2.10 |
| 1210 | 2.80 | 1.30 | 1.90 |
| 1808 | 2.40 | 1.50 | 3.00 |
| 1812 | 3.60 | 1.50 | 3.00 |
| 1825 | 6.50 | 1.50 | 3.00 |
| 2008 | 2.70 | 1.50 | 4.08 |
| 2220 | 5.50 (4) | 1.50 | 4.20 |
| 2225 | 6.50 | 1.50 | 4.20 |
| 2525 | 6.60 | 1.50 | 4.50 |
| 3040 | 10.80 | 2.00 | 5.50 |
| 3640 | 10.80 | 2.00 | 7.00 |
| 3838 | 10.20 | 2.00 | 7.50 |
| 4044 | 12.30 | 2.00 | 8.00 |

**Notes**

(1) For safety capacitors and voltages above 3000 V, corner rounding (R) of 0.5 mm is recommended to suppress arcing
(2) Add a 1 mm slot in PCB between pads to allow cleaning and coating under MLCC
(3) For VJ HiFREQ Series, this dimension is 0.6 mm
(4) For safety capacitors, the A dimension should be 5.80 mm

## PRINTED CIRCUIT BOARD PCB DESIGN CONSIDERATIONS FOR HIGH VOLTAGE SURFACE-MOUNT MLCCS

Special assembly process and design considerations should be employed for today's high voltage rating MLCCs. As case sizes remain the same and voltage ratings increase, MLCC manufacturers must design, evaluate, and qualify their capacitors using methods that reduce the occurrence of corona discharge and arcover events. To meet similar capability in high voltage applications, users should employ similar cautionary design and assembly methods.

## MLCC PAD LAYOUT

A capacitor's arcover inception point can degrade due to factors such as the MLCC termination, PCB pad design, PCB cleanliness, solder flux residue, surface contamination / deposits and environmental conditions. PCB pads and their design affect the air gap distance between the opposing polarities of the MLCC termination. For voltage rating greater than 1500 $V_{DC}$ add a corner radius to the inward facing edge of the MLCC pads and as large a gap as possible between the pads. Too small of a pad gap distance will reduce the capacitor's own arcover inception voltage level. Refer to the Figure and Table Figure 1.0, MLCC Pad Layout and Table 1.0, Vishay MLCC Solder Pad Dimensions for the recommended MLCC solder pad dimensions.

## SLOT OR TRENCH BETWEEN PADS

PCB assembly can deposit dust, trap solder balls, or flux residue underneath the capacitors. These contaminants will reduce conductive clearances and the arcover inception level. Assembly methods must include a final PCB cleaning process. A slot or trench can be cut into the PCB in between the pads to allow cleaners to penetrate underneath the MLCC. The slot will also allow conformal or epoxy coatings to flow underneath the MLCC and build an insulative barrier between pads. Refer to Figure 1.0 MLCC Pad Layout for slot reference location.

## COATING PRINTED CIRCUIT BOARD

Coating a printed circuit board with materials such as acrylic, silicone and urethane resins provide a protective dielectric barrier that is non-conductive and will enhance the resistance to arcing. Various processes exist which include dipping, brushing, and spaying. Optimal performance will come from coating the MLCC on all sides, top and bottom. The PCB slot in between the pads should extend slightly beyond the width of the MLCC. Refer to Figure 1.0 MLCC Pad Layout for slot reference location.

# 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.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

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. 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.