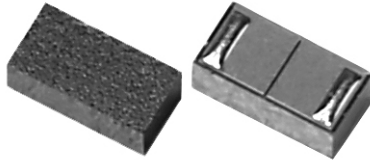


High Performance, High Precision Surface Mount 0603 Capacitor


PATENTED
ELECTRICAL SPECIFICATIONS

Operating Temperature: - 55 °C to + 125 °C
Temperature Coefficient of Capacitance (TCC): 0 ± 30 ppm/°C
Insulation Resistance: 10¹¹ Ω min
Voltage: 2.5 x rated voltage for 5 seconds
Ageing: none

ENVIRONMENTAL SPECIFICATIONS

Life Test: 1000 hours, + 125 °C at 2 x rated voltage
Thermal Shock: 100 Cycles, - 55 °C/+ 125 °C
Moisture Resistance: 240 hours, 85 % RH, + 85 °C

FEATURES

- New technology surface mount capacitor based on a special semiconductor process
- Construction reduces the parasitic inductance and brings the SRF values to ultra-high frequencies
- Capacitance is extremely stable in a wide range of frequencies from 1 MHz to several GHz.
- High Q and low ESR
- Tight tolerance to ± 1 % or 0.05 pF
- Ultra high SRF
- Low parasitic inductance (~ 0.046 nH)
- Capacitance range : 0.8 pF to 560 pF

APPLICATIONS

- Wireless communications
- Mobile phones
- Cordless phones
- GPS
- VCO
- Filter Networks
- Matching Networks
- Base station
- DC Blocking
- High speed circuitry

CAPACITANCE TOLERANCE CODE

| FOR LESS THAN 10 pF | | | FOR 10 pF AND HIGHER | | |
|---------------------|-----------|-----------|----------------------|-------|-------|
| A | B | C | F | G | J |
| ± 0.05 pF | ± 0.10 pF | ± 0.25 pF | ± 1 % | ± 2 % | ± 5 % |

ORDERING INFORMATION

| <u>HPC</u> | <u>0603</u> | <u>A</u> | <u>100</u> | <u>G</u> | <u>X</u> | <u>X</u> | <u>T5</u> |
|------------|-------------|----------|--|-----------------------|--|---|--|
| MODEL | SIZE | TYPE | CAPACITANCE VALUE | CAPACITANCE TOLERANCE | TERMINATION | VOLTAGE | PACKAGING |
| | | | The first two digits are significant, the third is a multiplier. An "R" indicates a decimal point. Examples: 101 = 100 pF 4R7 = 4.7 pF | see chart above | X = Tin/Lead termination W = Lead (Pb)-free termination | 1 = 6 V Z = 10 V Y = 16 V X = 25 V M = 50 V | T5 = 5000 pcs tape and reel T1 = 1000 pcs tape and reel |



| DIMENSIONS | | | |
|---|-----------|---------------|-------------|
| | DIMENSION | INCHES | MILLIMETERS |
| | L | 0.063 ± 0.002 | 1.60 ± 0.05 |
| | W | 0.031 ± 0.002 | 0.80 ± 0.05 |
| | T | 0.022 ± 0.002 | 0.56 ± 0.05 |
| | A | 0.008 ± 0.002 | 0.20 ± 0.05 |
| | B | 0.049 ± 0.002 | 1.24 ± 0.05 |
| | C | 0.025 ± 0.002 | 0.64 ± 0.05 |
| For PAD DESIGN, please see assembly/reflow recommendations page 21. | | | |

| CAPACITANCE RANGE AND VOLTAGE | | | | | | |
|-------------------------------|------------------|-------------|----|----|----|----|
| CAPACITANCE (pF) | CAPACITANCE CODE | VOLTAGE (V) | | | | |
| | | 6 | 10 | 16 | 25 | 50 |
| 0.8 | 0R8 | | | | | |
| 1.0 | 1R0 | | | | | |
| 1.2 | 1R2 | | | | | |
| 1.5 | 1R5 | | | | | |
| 1.8 | 1R8 | | | | | |
| 2.2 | 2R2 | | | | | |
| 2.7 | 2R7 | | | | | |
| 3.3 | 3R3 | | | | | |
| 3.9 | 3R9 | | | | | |
| 4.7 | 4R7 | | | | | |
| 5.6 | 5R6 | | | | | |
| 6.8 | 6R8 | | | | | |
| 8.2 | 8R2 | | | | | |
| 10 | 100 | | | | | |
| 12 | 120 | | | | | |
| 15 | 150 | | | | | |
| 18 | 180 | | | | | |
| 22 | 220 | | | | | |
| 27 | 270 | | | | | |
| 33 | 330 | | | | | |
| 39 | 390 | | | | | |
| 47 | 470 | | | | | |
| 56 | 560 | | | | | |
| 68 | 680 | | | | | |
| 82 | 820 | | | | | |
| 100 | 101 | | | | | |
| 120 | 121 | | | | | |
| 150 | 151 | | | | | |
| 180 | 181 | | | | | |
| 220 | 221 | | | | | |
| 270 | 271 | | | | | |
| 330 | 331 | | | | | |
| 390 | 391 | | | | | |
| 470 | 471 | | | | | |
| 560 | 561 | | | | | |

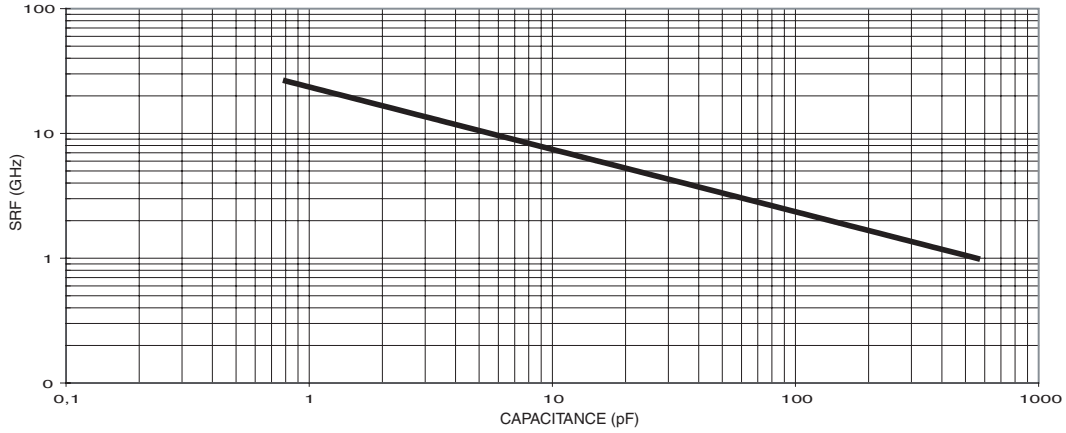


High Performance, High Precision
Surface Mount 0603 Capacitor

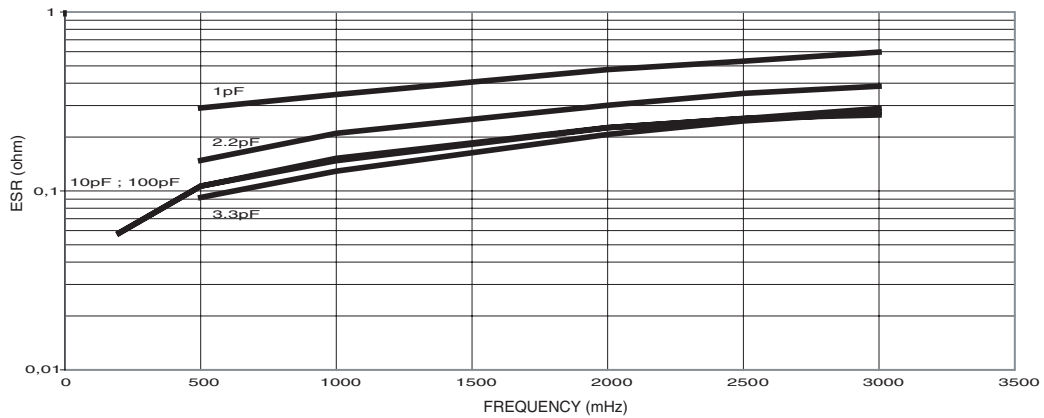
| ELECTRICAL SPECIFICATIONS* | | | | | | | | | | | | |
|------------------------------|---------------------|-------------------|--------------|------|--------------|------|--------------|-----|--------------|-----|--------------|-----|
| CAPACITANCE (pF) AT 1 MHz | TOLERANCE CODE** | SRF (GHz) TYP. | Ceff TYP. | Q | Ceff TYP. | Q | Ceff TYP. | Q | Ceff TYP. | Q | Ceff TYP. | Q |
| | | | 200 MHz | | 500 MHz | | 1000 MHz | | 2000 MHz | | 2500 MHz | |
| 0.8 | A,B,C | 26.4 | 0.80 | 6813 | 0.80 | 1491 | 0.80 | 519 | 0.80 | 174 | 0.81 | 124 |
| 1 | A,B,C | 23.6 | 1.00 | 5826 | 1.00 | 1275 | 1.00 | 443 | 1.01 | 148 | 1.01 | 105 |
| 1.2 | A,B,C | 21.5 | 1.20 | 5232 | 1.20 | 1145 | 1.20 | 398 | 1.21 | 133 | 1.22 | 95 |
| 1.5 | A,B,C | 19.2 | 1.50 | 4724 | 1.50 | 1033 | 1.50 | 359 | 1.52 | 120 | 1.53 | 85 |
| 1.8 | A,B,C | 17.6 | 1.80 | 4465 | 1.80 | 977 | 1.81 | 339 | 1.82 | 113 | 1.84 | 80 |
| 2.2 | A,B,C | 15.9 | 2.20 | 3947 | 2.20 | 863 | 2.21 | 300 | 2.24 | 100 | 2.26 | 70 |
| 2.7 | A,B,C | 14.3 | 2.70 | 3480 | 2.70 | 761 | 2.71 | 264 | 2.75 | 88 | 2.78 | 62 |
| 3.3 | A,B,C | 13.0 | 3.30 | 4157 | 3.30 | 909 | 3.32 | 315 | 3.38 | 104 | 3.43 | 73 |
| 3.6 | A,B,C | 12.4 | 3.60 | 3810 | 3.61 | 833 | 3.62 | 289 | 3.70 | 95 | 3.75 | 67 |
| 3.9 | A,B,C | 11.9 | 3.90 | 3517 | 3.91 | 769 | 3.93 | 266 | 4.01 | 88 | 4.08 | 62 |
| 4.3 | A,B,C | 11.4 | 4.30 | 3190 | 4.31 | 697 | 4.33 | 241 | 4.44 | 79 | 4.52 | 56 |
| 4.7 | A,B,C | 10.9 | 4.70 | 2918 | 4.71 | 638 | 4.74 | 221 | 4.86 | 72 | 4.96 | 51 |
| 5.1 | A,B,C | 10.4 | 5.10 | 2689 | 5.11 | 587 | 5.15 | 203 | 5.29 | 66 | 5.41 | 46 |
| 5.6 | A,B,C | 10.0 | 5.60 | 2449 | 5.61 | 535 | 5.66 | 185 | 5.84 | 60 | 5.98 | 42 |
| 6.2 | B,C | 9.5 | 6.20 | 2212 | 6.22 | 483 | 6.27 | 167 | 6.49 | 54 | 6.66 | 38 |
| 6.8 | B,C | 9.0 | 6.80 | 2017 | 6.82 | 440 | 6.88 | 152 | 7.15 | 49 | 7.36 | 34 |
| 7.5 | B,C | 8.6 | 7.50 | 1828 | 7.53 | 399 | 7.60 | 138 | 7.93 | 44 | 8.19 | 31 |
| 8.2 | B,C | 8.2 | 8.20 | 1672 | 8.23 | 365 | 8.32 | 126 | 8.71 | 40 | 9.03 | 28 |
| 9.1 | B,C | 7.8 | 9.11 | 1507 | 9.14 | 329 | 9.25 | 113 | 9.74 | 36 | 10.14 | 25 |
| 10 | F,G,J | 7.5 | 10.0 | 1371 | 10.0 | 299 | 10.2 | 103 | 10.8 | 33 | 11.3 | 22 |
| 11 | F,G,J | 7.1 | 11.0 | 1246 | 11.1 | 272 | 11.2 | 93 | 11.9 | 29 | 12.6 | 20 |
| 12 | F,G,J | 6.8 | 12.0 | 1142 | 12.1 | 249 | 12.3 | 85 | 13.1 | 27 | 13.9 | 18 |
| 13 | F,G,J | 6.5 | 13.0 | 1054 | 13.1 | 230 | 13.3 | 79 | 14.3 | 25 | 15.2 | 16 |
| 15 | F,G,J | 6.1 | 15.0 | 914 | 15.1 | 199 | 15.4 | 68 | 16.8 | 21 | 18.0 | 14 |
| 16 | F,G,J | 5.9 | 16.0 | 857 | 16.1 | 186 | 16.5 | 63 | 18.1 | 19 | 19.5 | 13 |
| 18 | F,G,J | 5.6 | 18.0 | 761 | 18.1 | 165 | 18.6 | 56 | 20.7 | 17 | 22.6 | 11 |
| 20 | F,G,J | 5.3 | 20.0 | 685 | 20.2 | 149 | 20.7 | 50 | 23.4 | 15 | 25.8 | 10 |
| 22 | F,G,J | 5.0 | 22.0 | 623 | 22.2 | 135 | 22.9 | 46 | 26.1 | 13 | 29.2 | 9 |
| 24 | F,G,J | 4.8 | 24.0 | 571 | 24.3 | 124 | 25.1 | 42 | 29.0 | 12 | 32.9 | 8 |
| 27 | F,G,J | 4.5 | 27.1 | 507 | 27.3 | 110 | 28.4 | 37 | 33.5 | 11 | 38.8 | 6 |
| 30 | F,G,J | 4.3 | 30.1 | 456 | 30.4 | 99 | 31.7 | 33 | 38.3 | 9 | 45.3 | 6 |
| 33 | F,G,J | 4.1 | 33.1 | 415 | 33.5 | 90 | 35.1 | 30 | 43.3 | 8 | 52.5 | 5 |
| 36 | F,G,J | 3.9 | 36.1 | 380 | 36.6 | 82 | 38.5 | 27 | 48.6 | 7 | 60.5 | 4 |
| 39 | F,G,J | 3.8 | 39.1 | 351 | 39.7 | 76 | 41.9 | 25 | 54.2 | 6 | 69.5 | 4 |
| 43 | F,G,J | 3.6 | 43.1 | 318 | 43.8 | 68 | 46.6 | 22 | 62.3 | 6 | 83.3 | 3 |
| 47 | F,G,J | 3.4 | 47.2 | 291 | 48.0 | 63 | 51.3 | 20 | 71.0 | 5 | 99.7 | 3 |
| 51 | F,G,J | 3.3 | 51.2 | 268 | 52.2 | 58 | 56.2 | 19 | 80.6 | 4 | 119.7 | 2 |
| 56 | F,G,J | 3.1 | 56.2 | 244 | 57.4 | 52 | 62.3 | 17 | 93.8 | 4 | 151.4 | 2 |
| 62 | F,G,J | 3.0 | 62.2 | 220 | 63.8 | 47 | 69.8 | 15 | 112.0 | 3 | 205.0 | 1 |
| 68 | F,G,J | 2.9 | 68.2 | 201 | 70.1 | 43 | 77.5 | 13 | 133.2 | 3 | 289.5 | 1 |
| 75 | F,G,J | 2.7 | 75.4 | 182 | 77.6 | 39 | 86.7 | 12 | 163.1 | 2 | 480.3 | 1 |
| 82 | F,G,J | 2.6 | 82.5 | 166 | 85.1 | 35 | 96.2 | 11 | 200.2 | 2 | | |
| 91 | F,G,J | 2.5 | 91.6 | 150 | 94.9 | 32 | 108.8 | 10 | 264.0 | 1 | | |
| 100 | F,G,J | 2.4 | 100.7 | 136 | 104.7 | 29 | 122.0 | 9 | 357.3 | 1 | | |
| 110 | F,G,J | 2.2 | 110.9 | 124 | 115.7 | 26 | 137.2 | 8 | 529.1 | 1 | | |
| 120 | F,G,J | 2.2 | 121.0 | 113 | 126.9 | 24 | 153.1 | 7 | | | | |
| 130 | F,G,J | 2.1 | 131.2 | 105 | 138.1 | 22 | 169.7 | 6 | | | | |
| 150 | F,G,J | 1.9 | 151.6 | 90 | 160.9 | 19 | 205.5 | 5 | | | | |
| 160 | F,G,J | 1.9 | 161.9 | 85 | 172.4 | 17 | 224.7 | 5 | | | | |
| 180 | F,G,J | 1.8 | 182.4 | 75 | 195.9 | 15 | 266.7 | 4 | | | | |
| 200 | F,G,J | 1.7 | 202.9 | 68 | 219.8 | 14 | 312.5 | 3 | | | | |
| 220 | F,G,J | 1.6 | 223.5 | 61 | 244.2 | 12 | 364.3 | 3 | | | | |
| 240 | F,G,J | 1.5 | 244.2 | 56 | 269.1 | 11 | 422.6 | 2 | | | | |
| 270 | F,G,J | 1.4 | 275.4 | 50 | 307.3 | 10 | 525.4 | 2 | | | | |
| 300 | F,G,J | 1.4 | 306.6 | 45 | 346.8 | 9 | 652.3 | 2 | | | | |
| 330 | F,G,J | 1.3 | 338.0 | 41 | 387.6 | 8 | 812.9 | 1 | | | | |
| 360 | F,G,J | 1.2 | 369.6 | 37 | 429.6 | 7 | 1022.9 | 1 | | | | |
| 390 | F,G,J | 1.2 | 401.3 | 34 | 473.0 | 6 | 1309.1 | 1 | | | | |
| 430 | F,G,J | 1.1 | 443.7 | 31 | 533.2 | 6 | 1903.4 | 1 | | | | |
| 470 | F,G,J | 1.1 | 486.5 | 28 | 596.1 | 5 | | | | | | |
| 510 | F,G,J | 1.0 | 529.4 | 26 | 661.9 | 5 | | | | | | |
| 560 | F,G,J | 1.0 | 583.5 | 24 | 748.7 | 4 | | | | | | |



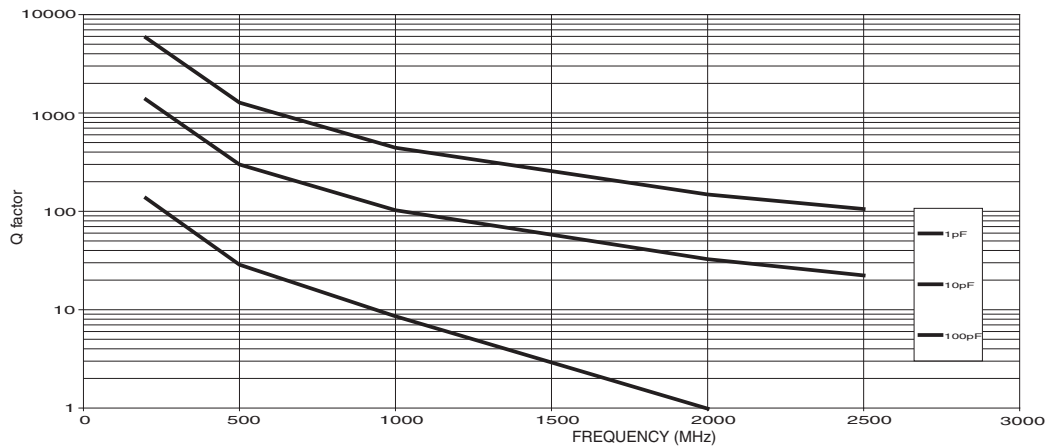
SRF VS. CAPACITANCE (TYPICAL)



ESR VS. FREQUENCY (TYPICAL)



Q VS. FREQUENCY (TYPICAL)





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