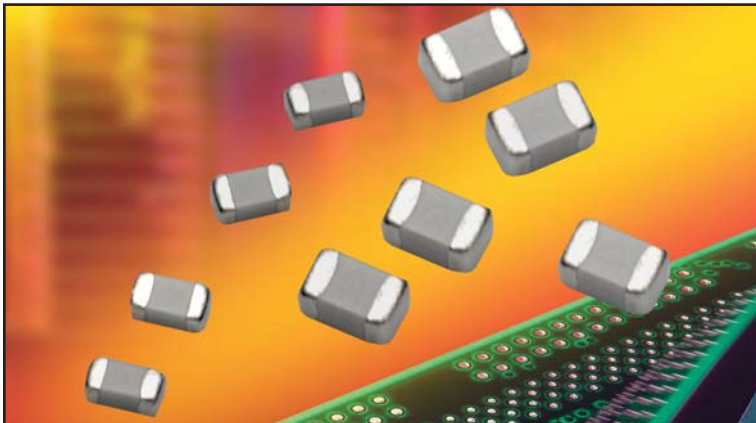


# Microwave MLC's



## SQCS (0603) SQCF (0805) Ultra Low ESR MLC



### FEATURES:

- Low ESR
- High Q
- High Self Resonance
- Capacitance Range 0.1 pF to 240 pF
- EIA Size

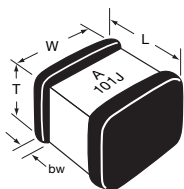
### APPLICATIONS:

- RF Power Amplifiers
- Low Noise Amplifiers
- Filter Networks
- Point to Point Radios

### HOW TO ORDER

|                                   |   |  |  |   |   |   |   |  |
|-----------------------------------|---|--|--|---|---|---|---|--|
| <p><b>SQ</b></p> <p>AVX Style</p> | <p><b>CS</b></p> <p>Case Size<br/>CS = 0603<br/>CF = 0805</p> | <p><b>V</b></p> <p>Voltage Code<br/>V = 250V</p> | <p><b>A</b></p> <p>Temperature Coefficient Code<br/>A = 0±30ppm/°C</p> | <p><b>100</b></p> <p>Capacitance<br/>EIA Capacitance Code in pF.<br/>First two digits = significant figures or "R" for decimal place.<br/>Third digit = number of zeros or after "R" significant figures.</p> | <p><b>J</b></p> <p>Capacitance Tolerance Code<br/>A = ±.05 pF<br/>B = ±.1 pF<br/>C = ±.25 pF<br/>D = ±.5 pF<br/>F = ±1%<br/>G = ±2%<br/>J = ±5%</p> | <p><b>A</b></p> <p>Failure Rate Code<br/>A = Not Applicable</p> | <p><b>T</b></p> <p>Termination Style Code<br/>**1 = Pd/Ag<br/>**7 = Ag/Ni/Au<br/>J = Nickel Barrier Sn/Pb (60/40)<br/>**T = 100% Tin (Standard)</p> | <p><b>1A</b></p> <p>Packaging Code<br/>1A = 7" Reel Unmarked<br/>ME = 7" Reel Marked</p> <p>* Vertical T&amp;R available<br/>* 500 piece reels available</p> |
|-----------------------------------|---|--|--|---|---|---|---|--|

**\*\*RoHS compliant**



### MECHANICAL DIMENSIONS: inches (millimeters)

| Case | Length (L)               | Width (W)                | Thickness (T)       | Band Width (bw)          |
|------|--------------------------|--------------------------|---------------------|--------------------------|
| SQCS | .063±.006<br>(1.60±.152) | .032±.006<br>(.813±.152) | .030 Max.<br>(.762) | .014±.006<br>(.357±.152) |
| SQCF | .079±.008<br>(2.01±.200) | .049±.008<br>(1.24±.200) | .045 Max.<br>(1.14) | .014±.006<br>(.357±.152) |

**TAPE & REEL:** All tape and reel specifications are in compliance with EIA RS481 (equivalent to IEC 286 part 3).

- 8mm carrier
- 7" reel = 4000 pcs (500 piece options)

**Not RoHS Compliant**



For RoHS compliant products, please select correct termination style.

# Microwave MLC's

## Low ESR MLC Capacitors



### ELECTRICAL SPECIFICATIONS

|                                       |   |
|---------------------------------------|---|
| Temperature Coefficient (TCC)         | (A) 0 ± 30 PPM/°C   |
| Operating Temperature                 | -55°C to +125°C   |
| Quality Factor (Q)                    | Greater than 10,000 at 1 MHz  |
| Insulation Resistance (IR)            | 0.1 pF to 240 pF<br>10 <sup>9</sup> Megohms min. @ 25°C at rated WVDC<br>10 <sup>4</sup> Megohms min. @ 125°C at rated WVDC |
| Working Voltage (WVDC)                | See Capacitance Values table  |
| Dielectric Withstanding Voltage (DWV) | 250% of rated WVDC for 5 secs   |
| Aging Effects                         | None  |
| Piezoelectric Effects                 | None  |
| Capacitance Drift                     | ± (0.02% or 0.02 pF), whichever is greater  |

### ENVIRONMENTAL CHARACTERISTICS

AVX SQ will meet and exceed the requirements of EIA-198, MIL-PRF-55681 and MIL-PRF-123

|                           |   |
|---------------------------|---|
| Thermal Shock             | Mil-STD-202, Method 107, Condition A  |
| Moisture Resistance       | Mil-STD-202, Method 106   |
| Low Voltage Humidity      | Mil-STD-202, Method 103, condition A, with 1.5 VDC applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours |
| Life Test                 | Mil-STD-202, Method 108, for 2000 hours at 125°C  |
| Shock                     | Mil-STD-202, Method 213, Condition J  |
| Vibration                 | Mil-STD-202, Method 204, Condition B  |
| Immersion                 | Mil-STD-202, Method 104, Condition B  |
| Salt Spray                | Mil-STD-202, Method 101, Condition B  |
| Solderability             | Mil-STD-202, Method 208   |
| Terminal Strength         | Mil-STD-202, Method 211   |
| Temperature Cycling       | Mil-STD-202, Method 102, Condition C  |
| Barometric Pressure       | Mil-STD-202, Method 105, Condition B  |
| Resistance to Solder Heat | Mil-STD-202, Method 210, Condition C  |

# Microwave MLC's



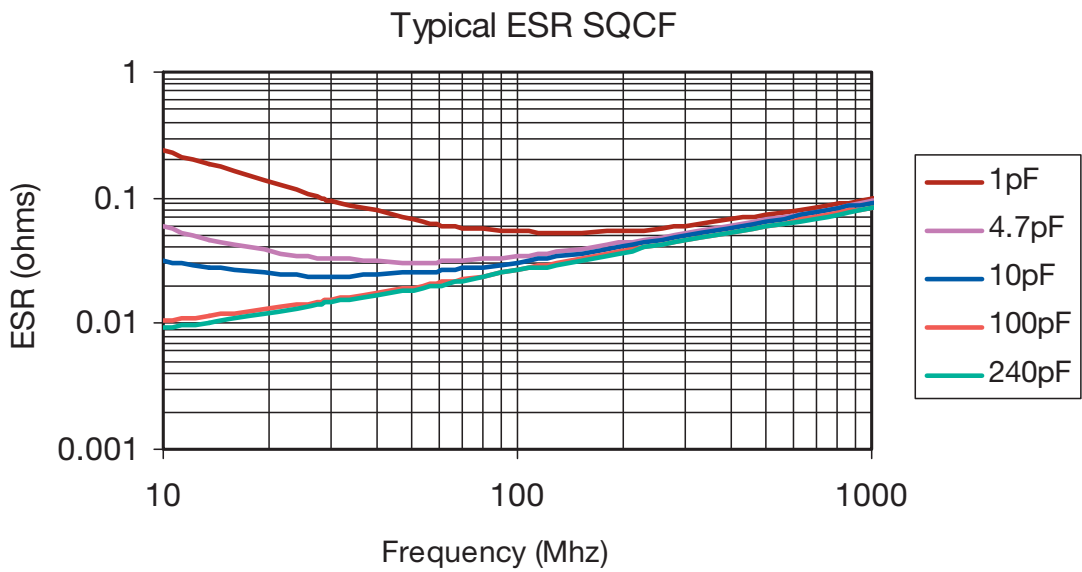
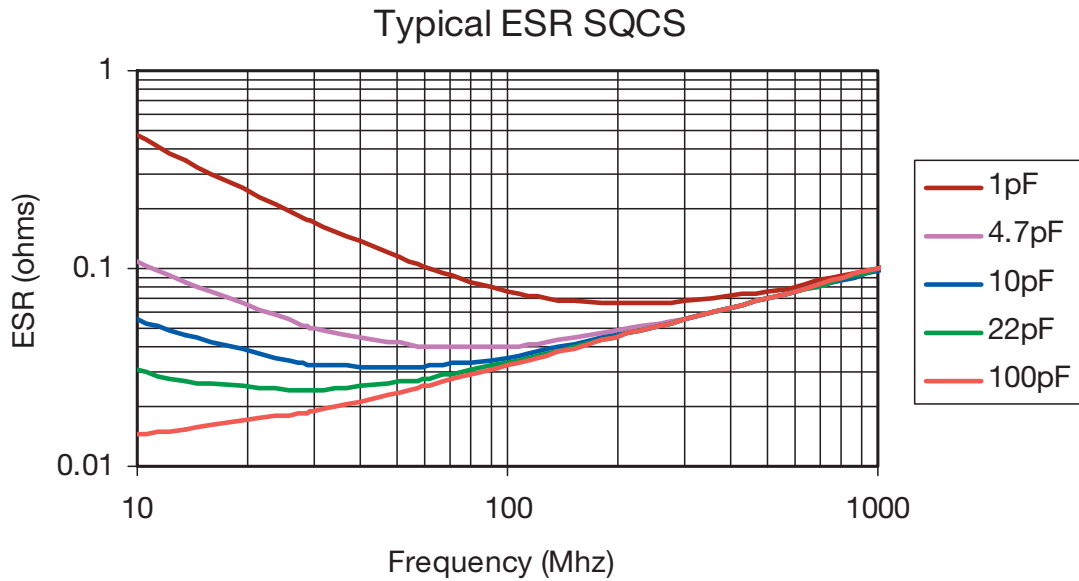
## SQ Series Available Capacitance/Size/WVDC/T.C.

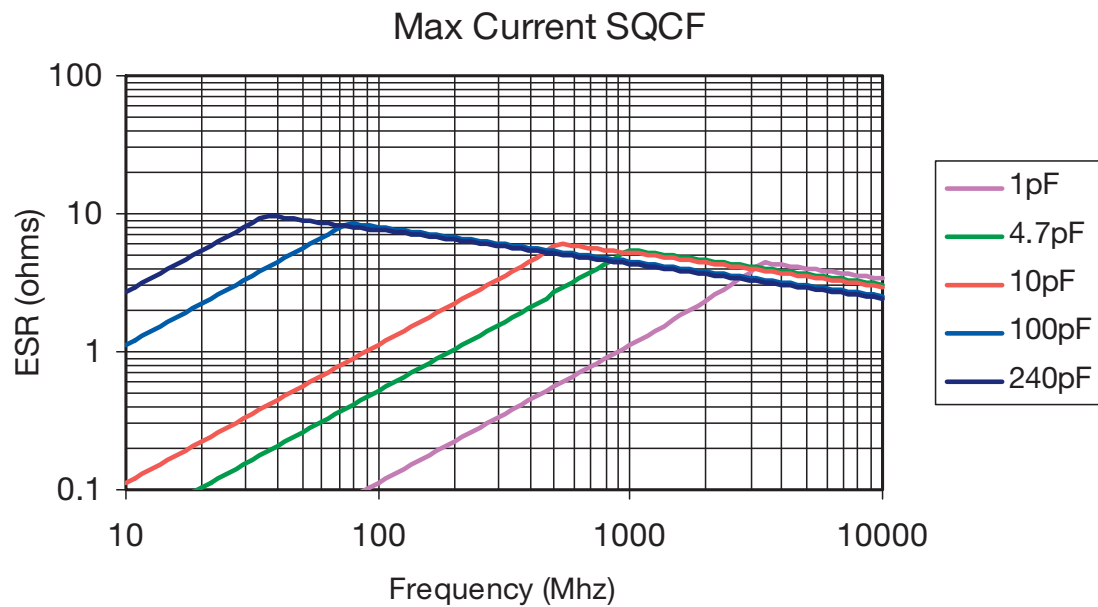
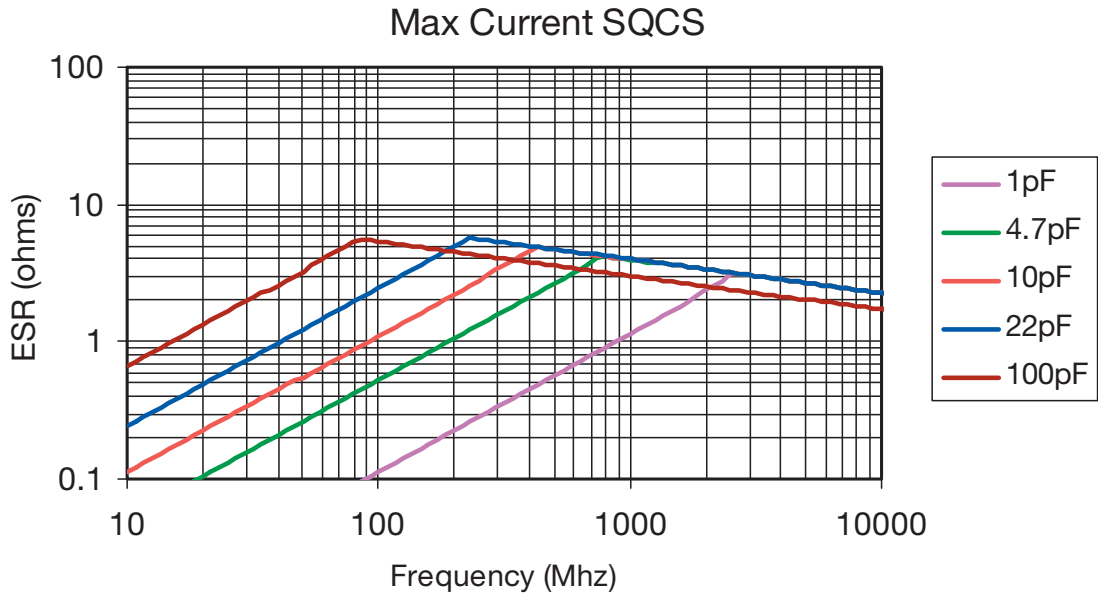
**TABLE I: TC: A (0±30PPM/°C) CASE SIZE S**

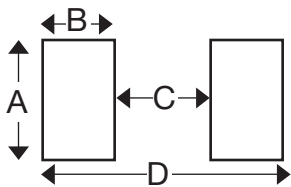
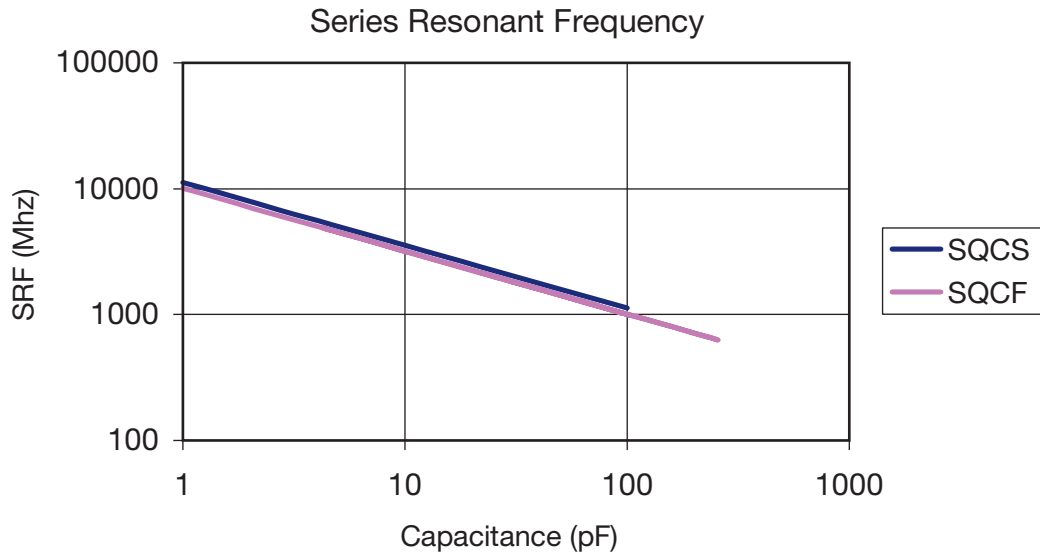
| Cap. pF | Cap. Tol. | WVDC | Cap. pF | Cap. Tol. | WVDC | Cap. pF | Cap. Tol. | WVDC |
|---------|-----------|------|---------|-----------|------|---------|-----------|------|
| 0.1     | A, B      | 250  | 2.4     | A, B, C   | 250  | 18      | F, G, J   | 250  |
| 0.2     | A, B      | 250  | 2.7     | A, B, C   | 250  | 20      | F, G, J   | 250  |
| 0.3     | A, B      | 250  | 3.0     | A, B, C   | 250  | 22      | F, G, J   | 250  |
| 0.4     | A, B      | 250  | 3.3     | A, B, C   | 250  | 24      | F, G, J   | 250  |
| 0.5     | A, B, C   | 250  | 3.6     | A, B, C   | 250  | 27      | F, G, J   | 250  |
| 0.6     | A, B, C   | 250  | 3.9     | A, B, C   | 250  | 30      | F, G, J   | 250  |
| 0.7     | A, B, C   | 250  | 4.3     | A, B, C   | 250  | 33      | F, G, J   | 250  |
| 0.8     | A, B, C   | 250  | 4.7     | A, B, C   | 250  | 36      | F, G, J   | 250  |
| 0.9     | A, B, C   | 250  | 5.1     | A, B, C   | 250  | 39      | F, G, J   | 250  |
| 1.0     | A, B, C   | 250  | 5.6     | A, B, C   | 250  | 43      | F, G, J   | 250  |
| 1.1     | A, B, C   | 250  | 6.2     | A, B, C   | 250  | 47      | F, G, J   | 250  |
| 1.2     | A, B, C   | 250  | 6.8     | B, C, D   | 250  | 51      | F, G, J   | 250  |
| 1.3     | A, B, C   | 250  | 7.5     | B, C, D   | 250  | 56      | F, G, J   | 250  |
| 1.4     | A, B, C   | 250  | 8.2     | B, C, D   | 250  | 62      | F, G, J   | 250  |
| 1.5     | A, B, C   | 250  | 9.1     | B, C, D   | 250  | 68      | F, G, J   | 250  |
| 1.6     | A, B, C   | 250  | 10      | F, G, J   | 250  | 75      | F, G, J   | 250  |
| 1.7     | A, B, C   | 250  | 11      | F, G, J   | 250  | 82      | F, G, J   | 250  |
| 1.8     | A, B, C   | 250  | 12      | F, G, J   | 250  | 91      | F, G, J   | 250  |
| 1.9     | A, B, C   | 250  | 13      | F, G, J   | 250  | 100     | F, G, J   | 250  |
| 2.0     | A, B, C   | 250  | 15      | F, G, J   | 250  |         |           |      |
| 2.2     | A, B, C   | 250  | 16      | F, G, J   | 250  |         |           |      |

**TABLE II: TC: A (0±30PPM/°C) CASE SIZE F**

| Cap. pF | Cap. Tol. | WVDC | Cap. pF | Cap. Tol. | WVDC | Cap. pF | Cap. Tol. | WVDC | Cap. pF | Cap. Tol. | WVDC |
|---------|-----------|------|---------|-----------|------|---------|-----------|------|---------|-----------|------|
| 0.1     | A, B      | 250  | 2.4     | A, B, C   | 250  | 18      | F, G, J   | 250  | 150     | F, G, J   | 250  |
| 0.2     | A, B      | 250  | 2.7     | A, B, C   | 250  | 20      | F, G, J   | 250  | 180     | F, G, J   | 250  |
| 0.3     | A, B      | 250  | 3.0     | A, B, C   | 250  | 22      | F, G, J   | 250  | 200     | F, G, J   | 250  |
| 0.4     | A, B      | 250  | 3.3     | A, B, C   | 250  | 24      | F, G, J   | 250  | 220     | F, G, J   | 250  |
| 0.5     | A, B, C   | 250  | 3.6     | A, B, C   | 250  | 27      | F, G, J   | 250  | 240     | F, G, J   | 250  |
| 0.6     | A, B, C   | 250  | 3.9     | A, B, C   | 250  | 30      | F, G, J   | 250  |         |           |      |
| 0.7     | A, B, C   | 250  | 4.3     | A, B, C   | 250  | 33      | F, G, J   | 250  |         |           |      |
| 0.8     | A, B, C   | 250  | 4.7     | A, B, C   | 250  | 36      | F, G, J   | 250  |         |           |      |
| 0.9     | A, B, C   | 250  | 5.1     | A, B, C   | 250  | 39      | F, G, J   | 250  |         |           |      |
| 1.0     | A, B, C   | 250  | 5.6     | A, B, C   | 250  | 43      | F, G, J   | 250  |         |           |      |
| 1.1     | A, B, C   | 250  | 6.2     | A, B, C   | 250  | 47      | F, G, J   | 250  |         |           |      |
| 1.2     | A, B, C   | 250  | 6.8     | B, C, D   | 250  | 51      | F, G, J   | 250  |         |           |      |
| 1.3     | A, B, C   | 250  | 7.5     | B, C, D   | 250  | 56      | F, G, J   | 250  |         |           |      |
| 1.4     | A, B, C   | 250  | 8.2     | B, C, D   | 250  | 62      | F, G, J   | 250  |         |           |      |
| 1.5     | A, B, C   | 250  | 9.1     | B, C, D   | 250  | 68      | F, G, J   | 250  |         |           |      |
| 1.6     | A, B, C   | 250  | 10      | F, G, J   | 250  | 75      | F, G, J   | 250  |         |           |      |
| 1.7     | A, B, C   | 250  | 11      | F, G, J   | 250  | 82      | F, G, J   | 250  |         |           |      |
| 1.8     | A, B, C   | 250  | 12      | F, G, J   | 250  | 91      | F, G, J   | 250  |         |           |      |
| 1.9     | A, B, C   | 250  | 13      | F, G, J   | 250  | 100     | F, G, J   | 250  |         |           |      |
| 2.0     | A, B, C   | 250  | 15      | F, G, J   | 250  | 110     | F, G, J   | 250  |         |           |      |
| 2.2     | A, B, C   | 250  | 16      | F, G, J   | 250  | 120     | F, G, J   | 250  |         |           |      |







### MOUNTING PAD DIMENSIONS: inches (millimeters)

| Case | A min         | B min         | C min         | D min         |
|------|---------------|---------------|---------------|---------------|
| SQCA | 0.082 (2.083) | 0.051 (1.295) | 0.032 (0.813) | 0.130 (3.302) |
| SQCB | 0.131 (3.327) | 0.051 (1.295) | 0.074 (1.880) | 0.177 (4.496) |
| SQCS | 0.038 (0.965) | 0.043 (1.092) | 0.025 (0.635) | 0.112 (2.845) |
| SQCF | 0.059 (1.499) | 0.051 (1.295) | 0.024 (0.610) | 0.125 (3.175) |

### SQCS & SQCF ENGINEERING KITS

| PN           | Series | Diel | Term     | Range       | Different Values | # per value |
|--------------|--------|------|----------|-------------|------------------|-------------|
| Kit SQ1800LF | SQCF   | C0G  | 100% Tin | .1 to 10pF  | 27               | 15          |
| Kit SQ1900LF |        |      | RoHS     | 10 to 240pF | 22               |             |
| Kit SQ1500LF | SQCS   | C0G  | 100% Tin | .1 to 10pF  | 27               | 15          |
| Kit SQ1600LF |        |      | RoHS     | 10 to 100pF | 16               |             |

| Tolerance per PF: |                  |
|-------------------|------------------|
| B from .1 to 3.3  | J from 10 to 240 |
| C from 3.9 to 8.2 |                  |