



**THE DATASHEET OF  
600S1R0CT250XT**



# RF/Microwave Capacitors

## RF/Microwave Multilayer Capacitors (MLC)

### 600S Ultra-Low ESR, High Q, NPO Capacitors



## FEATURES

- Lowest ESR in Class
- Highest Working Voltage in Class - 250 V
- Standard EIA Size: 0603
- Laser Marking (Optional)
- High Self-Resonance Frequencies

## 600 SERIES OVERVIEW

| Series | Case Size | EIA Case Size |
|--------|-----------|---------------|
| 600    | L         | 0402          |
| 600    | S         | 0603          |
| 600    | F         | 0805          |

## APPLICATIONS

- Cellular Base Stations
- Broadband Wireless Services
- Satellite Communications
- Subscriber-based Wireless Devices
- WiFi (802.11)
- Public Safety Radio

## CIRCUIT APPLICATIONS

- Filter Networks
- High Q Frequency Sources
- Matching Networks
- Tuning, Coupling, Bypass and DC Blocking

## ELECTRICAL SPECIFICATIONS

|   |  |
|---|--|
| <b>Capacitance</b>                                  | 0.1 to 100 pF  |
| <b>Tolerances</b>                                   | See Cap Value Chart  |
| <b>Working Voltage (WVDC)</b>                       | 250 V  |
| <b>Quality Factor</b>                               | Greater than 2,000 at 1 MHz<br>(Cap Values $\leq 10\text{pf}$ .0010 Max. @ 1MHz<br>Cap Values $> 10\text{pf}$ .0005 Max. @ 1MHz) |
| <b>Operating Temperature Range</b>                  | -55°C to +125°C<br>(no derating of working voltage)  |
| <b>Temperature Coefficient of Capacitance (TCC)</b> | $0 \pm 30$ ppm/°C, -55°C to +125°C<br>$10^5$ MΩ min. at +25°C at rated WVDC<br>$10^4$ MΩ min. at +125°C at rated WVDC            |
| <b>Dielectric Withstanding Voltage (DWV)</b>        | 2.5 x WVDC for 5 seconds   |
| <b>Aging</b>  | None   |
| <b>Piezo Effects</b>                                | None   |

## PACKAGING OPTIONS



Tape & Reel



Vertical Orientation Tape & Reel



## ENVIRONMENTAL CHARACTERISTICS

|                            |  |
|----------------------------|--|
| <b>Thermal Shock</b>       | 5 Cycles, -55°C to 125°C                 |
| <b>Moisture Resistance</b> | Mil-STD-202, Method 106                  |
| <b>Life Test</b>           | 2000 hours at 125°C at 2X WVDC           |
| <b>Solderability</b>       | Solder Coverage > 90% of end termination |
| <b>Terminal Strength</b>   | 4 lbs. typ., 2 lb. min.                  |
| <b>Military Approval</b>   | DSCC Drawing Number 05002                |

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## CAPACITANCE VALUES

| Value (pF) | Cap Code | Marking | Tolerances | Value (pF) | Cap Code | Marking | Tolerances    | Value (pF) | Cap Code | Marking | Tolerances    |
|------------|----------|---------|------------|------------|----------|---------|---------------|------------|----------|---------|---------------|
| 0.1        | 0R1      | A9      | A, B       | 2.7        | 2R7      | L0      | A, B, C, D    | 20         | 200      | H1      | F, G, J, K, M |
| 0.2        | 0R2      | H9      | A, B       | 3.0        | 3R0      | M0      | A, B, C, D    | 22         | 220      | J1      | F, G, J, K, M |
| 0.3        | 0R3      | M9      | A, B, C    | 3.3        | 3R3      | N0      | A, B, C, D    | 24         | 240      | K1      | F, G, J, K, M |
| 0.4        | 0R4      | d9      | A, B, C    | 3.6        | 3R6      | P0      | A, B, C, D    | 27         | 270      | L1      | F, G, J, K, M |
| 0.5        | 0R5      | f9      | A, B, C    | 3.9        | 3R9      | Q0      | A, B, C, D    | 30         | 300      | M1      | F, G, J, K, M |
| 0.6        | 0R6      | m9      | A, B, C    | 4.3        | 4R3      | R0      | A, B, C, D    | 33         | 330      | N1      | F, G, J, K, M |
| 0.7        | 0R7      | n9      | A, B, C    | 4.7        | 4R7      | S0      | A, B, C, D    | 36         | 360      | P1      | F, G, J, K, M |
| 0.8        | 0R8      | t9      | A, B, C    | 5.1        | 5R1      | T0      | A, B, C, D    | 39         | 390      | Q1      | F, G, J, K, M |
| 0.9        | 0R9      | y9      | A, B, C    | 5.6        | 5R6      | U0      | A, B, C, D    | 43         | 430      | R1      | F, G, J, K, M |
| 1.0        | 1R0      | A0      | A, B, C, D | 6.2        | 6R2      | V0      | A, B, C, D    | 47         | 470      | S1      | F, G, J, K, M |
| 1.1        | 1R1      | B0      | A, B, C, D | 6.8        | 6R8      | W0      | B, C, J, K    | 51         | 510      | T1      | F, G, J, K, M |
| 1.2        | 1R2      | C0      | A, B, C, D | 7.5        | 7R5      | X0      | B, C, J, K    | 56         | 560      | U1      | F, G, J, K, M |
| 1.3        | 1R3      | D0      | A, B, C, D | 8.2        | 8R2      | Y0      | B, C, J, K    | 62         | 620      | V1      | F, G, J, K, M |
| 1.5        | 1R5      | E0      | A, B, C, D | 9.1        | 9R1      | Z0      | B, C, J, K    | 68         | 680      | W1      | F, G, J, K, M |
| 1.6        | 1R6      | F0      | A, B, C, D | 10         | 100      | A1      | F, G, J, K, M | 75         | 750      | X1      | F, G, J, K, M |
| 1.8        | 1R8      | G0      | A, B, C, D | 11         | 110      | B1      | F, G, J, K, M | 82         | 820      | Y1      | F, G, J, K, M |
| 2.0        | 2R0      | H0      | A, B, C, D | 12         | 120      | C1      | F, G, J, K, M | 91         | 910      | Z1      | F, G, J, K, M |
| 2.2        | 2R2      | J0      | A, B, C, D | 15         | 150      | E1      | F, G, J, K, M | 100        | 101      | A2      | F, G, J, K, M |
| 2.4        | 2R4      | K0      | A, B, C, D | 18         | 180      | G1      | F, G, J, K, M |            |          |         |               |

## HOW TO ORDER

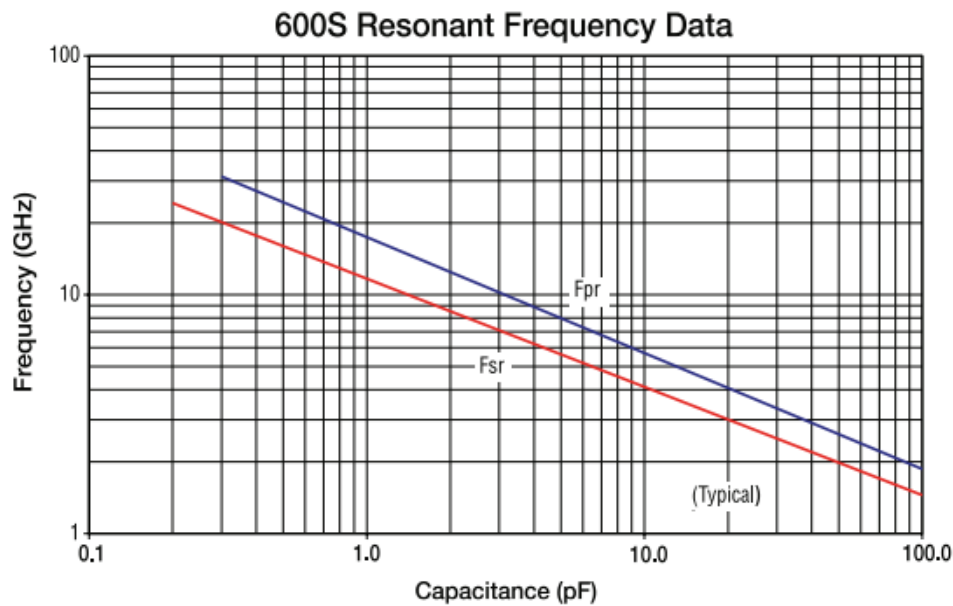
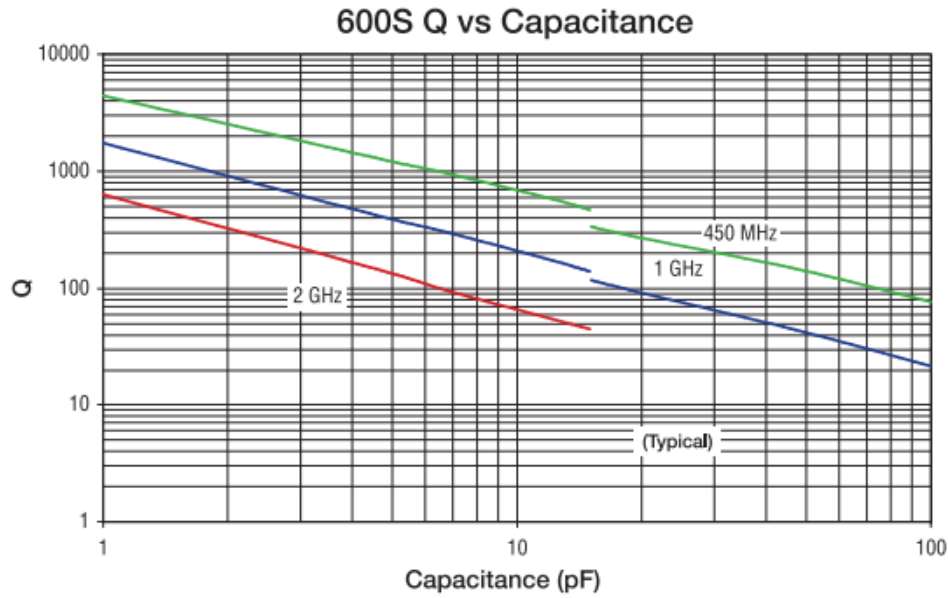
**Series** 600  
**Case Size** S  
 See mechanical dimensions below  
**Capacitance Code** 0R2  
 EIA Capacitance Code in pF.  
 Third digit = number of zeros or after "R" significant figures  
**Capacitance Tolerance Code** B  

| Code | A        | B       | C        | D       | F   | G   | J   | K    | M    |
|------|----------|---------|----------|---------|-----|-----|-----|------|------|
| Tol. | ±0.05 pF | ±0.1 pF | ±0.25 pF | ±0.5 pF | ±1% | ±2% | ±5% | ±10% | ±20% |

  
 The above part number refers to a 600F Series (case size F) 10 pF capacitor, J tolerance (±5%), 250 WVDC, with T termination (Tin Plated over Nickel Barrier, RoHS Compliant), Laser Marking and Tape and Reel packaging.  
**Termination Style Code** T  
 T = Tin Plated over Nickel Barrier (RoHS Compliant)  
 TN = Tin Plated Non-Magnetic Barrier  
 W = Tin/Lead Solder Nickel Barrier  
**Voltage Rating** 250  
**Laser Marking (Optional)** X\*\*  
**Packaging** T  
 T = Tape and Reel, 500 pcs  
 T4K = Tape and Reel, 4000 pcs  
 TV = Vertical Tape and Reel, 500 pcs

\*\*Laser Marking is optional





#### 600F Series Data Sheet Condition Description

Capacitors horizontally mounted on 13.3-mil thick Rogers R0435® softboard 29-mils wide 1/2 oz. Cu traces  
**FSR** = lowest frequency at which S11 response, referenced at capacitor edge, crosses real axis on Smith Chart.  
**FPR** = lowest frequency at which there is a notch in S21 magnitude response.

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#### OUTLINE DIMENSIONS



|                 |                                      |                                      |
|-----------------|--------------------------------------|--------------------------------------|
| <b>S (0603)</b> | L: $.063 \pm .006$ (1.60 $\pm$ 0.15) | T: $.035$ max (0.89 max)             |
|                 | W: $.032 \pm .006$ (.81 $\pm$ 0.15)  | Y: $.014 \pm .006$ (0.36 $\pm$ 0.15) |

inches (mm)

#### SUGGESTED MOUNTING PAD DIMENSIONS



#### Case Size L, S, and F

| Case Size          | A Min.          | B Min.          | C Min.          | D Min.          |
|--------------------|-----------------|-----------------|-----------------|-----------------|
| <b>0402 (1005)</b> | .0275<br>(0.70) | .0354<br>(0.90) | .0157<br>(0.40) | .0866<br>(2.20) |
| <b>0603 (1608)</b> | .0393<br>(1.00) | .0433<br>(1.10) | .0236<br>(0.60) | .110<br>(2.80)  |
| <b>0805 (2012)</b> | .0590<br>(1.50) | .0512<br>(1.30) | .0236<br>(0.60) | .1259<br>(3.20) |

inches (mm)



#### DESIGN KITS

| Kit #   | RoHS Compliant | Item #  | Description  | Cap. Value Range (pF) | Cap. Value (pF)   | Tol. (pF) | Price    |
|---------|----------------|---------|--|-----------------------|---|-----------|----------|
| Kit 25T |                | DK0025T | 600S Series Ultra-low ESR, High Q Microwave Capacitors<br>16 different values,<br>15 pcs. min. per value | 0.1 to 2.0            | 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9,<br>1.0, 1.1, 1.2, 1.5 ..... $\pm$ 0.1%<br>1.6, 1.8, 2.0 ..... $\pm$ 0.25%              |           | \$100.00 |
| Kit 26T |                | DK0026T | 600S Series Ultra-low ESR, High Q Microwave Capacitors<br>16 different values,<br>15 pcs. min. per value | 0.1 to 10             | 1.0, 1.2, 1.5, 1.8, 2.0, 2.2, 2.4, 2.7, 3.0, 3.3 ..... $\pm$ 0.1%<br>3.9, 4.7, 5.6, 6.8, 8.2 ..... $\pm$ 0.25%<br>10 ..... $\pm$ 5% |           | \$100.00 |
| Kit 27T |                | DK0027T | 600S Series Ultra-low ESR, High Q Microwave Capacitors<br>16 different values,<br>15 pcs. min. per value | 10 to 100             | 10, 12, 15, 18, 20, 22, 24, 27, 30, 33, 39, 47<br>56, 68, 82, 100 ..... $\pm$ 5%  |           | \$100.00 |

For Online Kit Orders, Catalog & Application Notes, Visit: [www.avx.com](http://www.avx.com)

## Looking for pricing, stock, or lifecycle information?

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-  [American Technical Ceramics](#) Information

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