

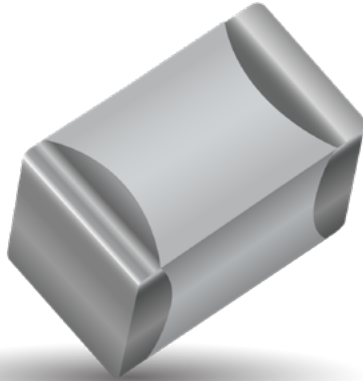


# THE DATASHEET OF 600F1R2AT250XT

# RF/Microwave Capacitors

## RF/Microwave Multilayer Capacitors (MLC)

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



#### FEATURES

- Lowest ESR in Class
- Highest Working Voltage in Class - 250 V
- Standard EIA Size: 0805
- 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

|                                       |                                                                                                           |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Temperature Coefficient (TCC)         | 0 ± 30 PPM/°C                                                                                             |
| Capacitance Range                     | 0.1 pF to 240 pF                                                                                          |
| Operating Temperature                 | -55°C to +125°C*                                                                                          |
| Quality Factor                        | Greater than 2,000 at 1 MHz<br>(Cap Values ≤10pf .0010 Max. @ 1MHz<br>Cap Values >10pf .0005 Max. @ 1MHz) |
| Insulation Resistance (IR)            | 10 <sup>5</sup> Megohms min. @ 25°C at rated WVDC<br>10 <sup>4</sup> Megohms min. @ 125°C at rated WVDC   |
| Working Voltage (WVDC)                | 250 V                                                                                                     |
| Dielectric Withstanding Voltage (DWV) | 250% of rated WVDC for 5 seconds                                                                          |
| Aging Effects                         | None                                                                                                      |
| Piezoelectric Effects                 | None                                                                                                      |

#### PACKAGING OPTIONS



Tape & Reel



Vertical Orientation Tape & Reel



#### ENVIRONMENTAL CHARACTERISTICS

|                     |                                          |
|---------------------|------------------------------------------|
| Thermal Shock       | 5 Cycles, -55°C to 125°C                 |
| Moisture Resistance | Mil-STD-202, Method 106                  |
| Life Test           | 2000 hours at 125°C at 2X WVDC           |
| Solderability       | Solder Coverage > 90% of end termination |
| Terminal Strength   | 4 lbs. typ., 2 lb. min.                  |
| Military Approval   | DSCC Drawing Number 05001                |

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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       | 3.3        | 3R3      | N0      | A, B, C, D    | 30         | 300      | M1      | F, G, J, K, M |
| 0.2        | 0R2      | H9      | A, B       | 3.6        | 3R6      | P0      | A, B, C, D    | 33         | 330      | N1      | F, G, J, K, M |
| 0.3        | 0R3      | M9      | A, B, C    | 3.9        | 3R9      | Q0      | A, B, C, D    | 36         | 360      | P1      | F, G, J, K, M |
| 0.4        | 0R4      | d9      | A, B, C    | 4.3        | 4R3      | R0      | A, B, C, D    | 39         | 390      | Q1      | F, G, J, K, M |
| 0.5        | 0R5      | f9      | A, B, C    | 4.7        | 4R7      | S0      | A, B, C, D    | 43         | 430      | R1      | F, G, J, K, M |
| 0.6        | 0R6      | m9      | A, B, C    | 5.1        | 5R1      | T0      | A, B, C, D    | 47         | 470      | S1      | F, G, J, K, M |
| 0.7        | 0R7      | n9      | A, B, C    | 5.6        | 5R6      | U0      | A, B, C, D    | 51         | 510      | T1      | F, G, J, K, M |
| 0.8        | 0R8      | t9      | A, B, C    | 6.2        | 6R2      | V0      | A, B, C, D    | 56         | 560      | U1      | F, G, J, K, M |
| 0.9        | 0R9      | y9      | A, B, C    | 6.8        | 6R8      | W0      | B, C, J, K    | 62         | 620      | V1      | F, G, J, K, M |
| 1.0        | 1R0      | A0      | A, B, C, D | 7.5        | 7R5      | X0      | B, C, J, K    | 68         | 680      | W1      | F, G, J, K, M |
| 1.1        | 1R1      | B0      | A, B, C, D | 8.2        | 8R2      | Y0      | B, C, J, K    | 75         | 750      | X1      | F, G, J, K, M |
| 1.2        | 1R2      | C0      | A, B, C, D | 9.1        | 9R1      | Z0      | B, C, J, K    | 82         | 820      | Y1      | F, G, J, K, M |
| 1.3        | 1R3      | D0      | A, B, C, D | 10         | 100      | A1      | F, G, J, K, M | 91         | 910      | Z1      | F, G, J, K, M |
| 1.5        | 1R5      | E0      | A, B, C, D | 11         | 110      | B1      | F, G, J, K, M | 100        | 101      | A2      | F, G, J, K, M |
| 1.6        | 1R6      | F0      | A, B, C, D | 12         | 120      | C1      | F, G, J, K, M | 110        | 111      | B2      | F, G, J, K, M |
| 1.8        | 1R8      | G0      | A, B, C, D | 15         | 150      | E1      | F, G, J, K, M | 120        | 121      | C2      | F, G, J, K, M |
| 2.0        | 2R0      | H0      | A, B, C, D | 18         | 180      | G1      | F, G, J, K, M | 150        | 151      | E2      | F, G, J, K, M |
| 2.2        | 2R2      | J0      | A, B, C, D | 20         | 200      | H1      | F, G, J, K, M | 180        | 181      | G2      | F, G, J, K, M |
| 2.4        | 2R4      | K0      | A, B, C, D | 22         | 220      | J1      | F, G, J, K, M | 200        | 201      | H2      | F, G, J, K, M |
| 2.7        | 2R7      | L0      | A, B, C, D | 24         | 240      | K1      | F, G, J, K, M | 220        | 221      | J2      | F, G, J, K, M |
| 3.0        | 3R0      | M0      | A, B, C, D | 27         | 270      | L1      | F, G, J, K, M | 240        | 241      | K2      | F, G, J, K, M |

#### HOW TO ORDER

**Series** 600

**Case Size** F

See mechanical dimensions below

**Capacitance Code** 100

EIA Capacitance Code in pF.  
Third digit = number of zeros or after "R" significant figures

**Capacitance Tolerance Code** J

| 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% |

**Packaging** T

T = Tape and Reel, 500 pcs  
T4K = Tape and Reel, 4000 pcs  
TV = Vertical Tape and Reel, 500 pcs

**Laser Marking (Optional)** X\*\*

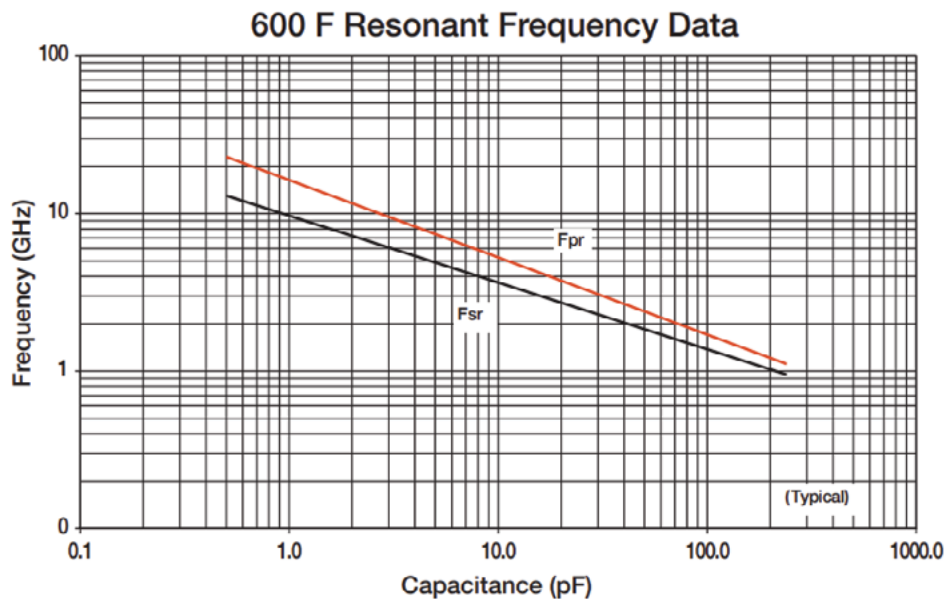
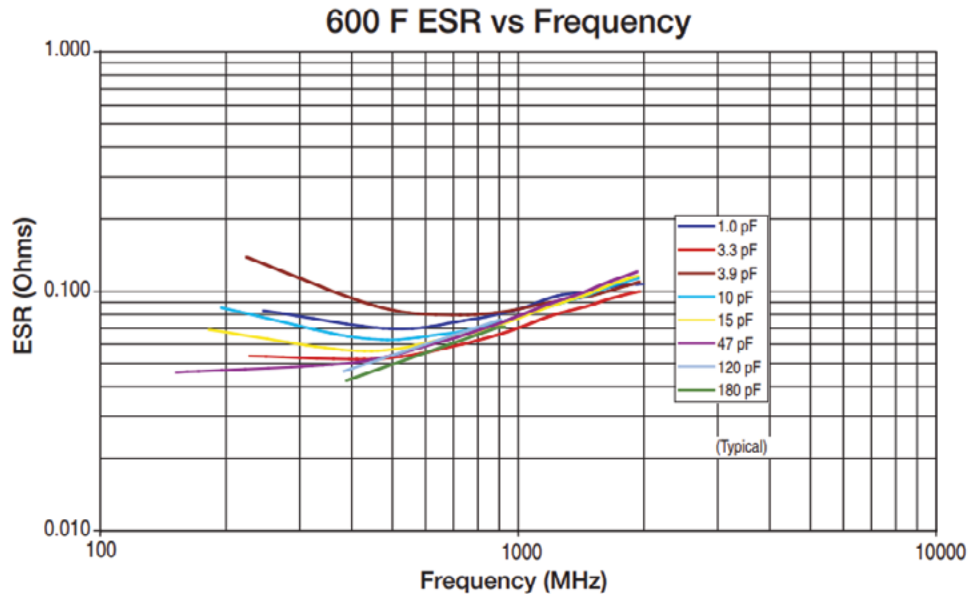
**Voltage Rating** 250

**Termination Style Code** T

T = Tin Plated over Nickel Barrier (RoHS Compliant)  
TN = Tin Plated Non-Magnetic Barrier  
W = Tin/Lead Solder Nickel Barrier

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.

\*\*Laser Marking is optional



### 600F Series Data Sheet Condition Description

Capacitors horizontally mounted on 23.3 -mil thick Rogers R0435® softboard 52-mils wide 1/2 oz. Cu traces

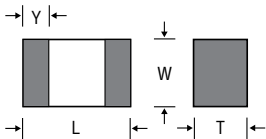
**FSR** = lowest frequency at which S11 response, referenced at capacitor edge, crosses real axis on Smith Chart.

**FPR** = lowest frequency at which there is a notch in S21 magnitude response.

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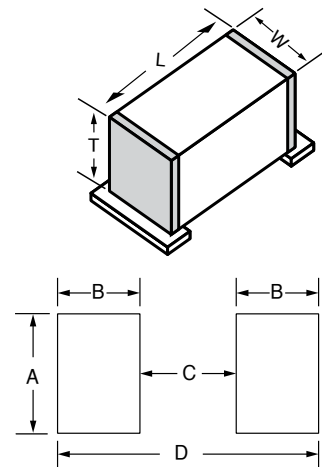
OUTLINE DIMENSIONS



|          |                              |                              |
|----------|------------------------------|------------------------------|
| F (0805) | L: .079 ± .008 (2.01 ± 0.20) | T: .051 max (1.30 max)       |
|          | W: .049 ± .008 (1.24 ± 0.20) | Y: .020 ± 0.01 (0.51 ± 0.25) |

inches (mm)

SUGGESTED MOUNTING PAD DIMENSIONS



Case Size L, S, and F

|   | Case Size   | A Min.          | B Min.          | C Min.          | D Min.          |
|---|-------------|-----------------|-----------------|-----------------|-----------------|
| L | 0402 (1005) | .0275<br>(0.70) | .0354<br>(0.90) | .0157<br>(0.40) | .0866<br>(2.20) |
| S | 0603 (1608) | .0393<br>(1.00) | .0433<br>(1.10) | .0236<br>(0.60) | .110<br>(2.80)  |
| F | 0805 (2012) | .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 32T |                | DK0032T | 600F 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 .....±0.1%<br>1.6, 1.8, 2.0 .....±0.25%        |           | \$100.00 |
| Kit 33T |                | DK0033T | 600F 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 .....±0.1%<br>3.9, 4.7, 5.6, 6.8, 8.2 .....±0.25%<br>10 .....±5% |           | \$100.00 |
| Kit 34T |                | DK0034T | 600F Series Ultra-low ESR, High Q Microwave Capacitors<br>16 different values,<br>15 pcs. min. per value | 10 to 27              | 10, 12, 15, 18, 20, 22, 24, 27 .....±5%                                                                           |           | \$100.00 |
| Kit 35T |                | DK0035T | 600F Series Ultra-low ESR, High Q Microwave Capacitors<br>7 different values,<br>15 pcs. min. per value  | 100 to 240            | 100, 120, 150, 180, 200, 220, 240 .....±5                                                                         |           | \$55.00  |

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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