**ATC 600F Series**  
**Ultra-Low ESR, High Q, NPO RF & Microwave Capacitors**

**Features:**
- **Lowest ESR in Class**
- Highest Working Voltage in class – 250V
- Standard EIA Size: 0805
- Laser Marking (Optional)
- High Self Resonance Frequencies

**Applications:**
- Cellular Base Stations
- Wireless Communications
- Broadband Wireless Services
- Satellite Communications
- WiMAX (802.16)

**Circuit Applications:**
- Filter Networks
- High Q Frequency Sources
- Matching Networks
- Tuning, Coupling, Bypass and DC Blocking

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**Electrical Specifications**

<table>
<thead>
<tr>
<th>Capacitance:</th>
<th>0.1 to 240 pF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerances:</td>
<td>See Cap Value Chart</td>
</tr>
<tr>
<td>Working Voltage (WVDC):</td>
<td>250 V</td>
</tr>
<tr>
<td>Quality Factor (Q):</td>
<td>&gt; 2000 @ 1 MHz</td>
</tr>
<tr>
<td>Operating Temperature Range:</td>
<td>-55°C to +125°C</td>
</tr>
<tr>
<td>Temperature coefficient of Capacitance (TCC):</td>
<td>0 ± 30 ppm/°C, -55°C to +125°C</td>
</tr>
<tr>
<td>Insulation Resistance:</td>
<td>$10^5$ MΩ min. at +25°C at rated WVDC</td>
</tr>
<tr>
<td></td>
<td>$10^4$ MΩ min. at +125°C at rated WVDC</td>
</tr>
<tr>
<td>Dielectric Withstanding Voltage (DWV):</td>
<td>2.5 x WVDC for 5 seconds</td>
</tr>
<tr>
<td>Aging:</td>
<td>None</td>
</tr>
<tr>
<td>Piezo Effects:</td>
<td>None</td>
</tr>
</tbody>
</table>

---

**Mechanical Specifications**

<table>
<thead>
<tr>
<th>Terminations:</th>
<th>T = Tin Plated over Nickel Barrier* (Standard)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TN = Tin Plated over Non-Magnetic Barrier*</td>
</tr>
<tr>
<td></td>
<td>W = Tin/Lead Solder Plated over Nickel Barrier</td>
</tr>
<tr>
<td>Solderability:</td>
<td>Solder coverage &gt; 90% of end termination</td>
</tr>
<tr>
<td>Terminal Strength:</td>
<td>4 lbs. Typ., 2 lbs. min.</td>
</tr>
</tbody>
</table>

**Environmental Specifications**

| Life Test: | 2000 hours, +125°C at 2X WVDC |
| Thermal Shock: | 5 cycles, -55°C to +125°C |

**Military Approval**

DSCC Drawing Number 05001

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*ATC 600 Series Capacitors are designed and manufactured to meet and exceed the requirements of EIA-198, MIL-PRF-55681 and MIL-PRF-123.*
**ATC 600F Series Ultra-Low ESR, High Q NPO RF & Microwave Capacitors**

### Capacitance Values*

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>0.1</td>
<td>0R1</td>
<td>A9</td>
<td>A, B</td>
<td>3.3</td>
<td>3R3</td>
<td>N0</td>
<td>A, B, C, D</td>
<td>30</td>
<td>300</td>
<td>M1</td>
<td>F, G, J, K, M</td>
</tr>
<tr>
<td>0.2</td>
<td>0R2</td>
<td>H9</td>
<td>A, B</td>
<td>3.6</td>
<td>3R6</td>
<td>P0</td>
<td>A, B, C, D</td>
<td>33</td>
<td>330</td>
<td>N1</td>
<td>F, G, J, K, M</td>
</tr>
<tr>
<td>0.3</td>
<td>0R3</td>
<td>M9</td>
<td>A, B, C</td>
<td>3.9</td>
<td>3R9</td>
<td>Q0</td>
<td>A, B, C, D</td>
<td>36</td>
<td>360</td>
<td>P1</td>
<td>F, G, J, K, M</td>
</tr>
<tr>
<td>0.4</td>
<td>0R4</td>
<td>d9</td>
<td>A, B, C</td>
<td>4.3</td>
<td>4R3</td>
<td>R0</td>
<td>A, B, C, D</td>
<td>39</td>
<td>390</td>
<td>Q1</td>
<td>F, G, J, K, M</td>
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<tr>
<td>0.5</td>
<td>0R5</td>
<td>f9</td>
<td>A, B, C</td>
<td>4.7</td>
<td>4R7</td>
<td>S0</td>
<td>A, B, C, D</td>
<td>43</td>
<td>430</td>
<td>R1</td>
<td>F, G, J, K, M</td>
</tr>
<tr>
<td>0.6</td>
<td>0R6</td>
<td>m9</td>
<td>A, B, C</td>
<td>5.1</td>
<td>5R1</td>
<td>T0</td>
<td>A, B, C, D</td>
<td>47</td>
<td>470</td>
<td>S1</td>
<td>F, G, J, K, M</td>
</tr>
<tr>
<td>0.7</td>
<td>0R7</td>
<td>n9</td>
<td>A, B, C</td>
<td>5.6</td>
<td>5R6</td>
<td>U0</td>
<td>A, B, C, D</td>
<td>51</td>
<td>510</td>
<td>T1</td>
<td>F, G, J, K, M</td>
</tr>
<tr>
<td>0.8</td>
<td>0R8</td>
<td>t9</td>
<td>A, B, C</td>
<td>6.2</td>
<td>6R2</td>
<td>V0</td>
<td>A, B, C, D</td>
<td>56</td>
<td>560</td>
<td>U1</td>
<td>F, G, J, K, M</td>
</tr>
<tr>
<td>0.9</td>
<td>0R9</td>
<td>y9</td>
<td>A, B, C</td>
<td>6.8</td>
<td>6R8</td>
<td>W0</td>
<td>B, C, J, K</td>
<td>62</td>
<td>620</td>
<td>V1</td>
<td>F, G, J, K, M</td>
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<tr>
<td>1.0</td>
<td>1R0</td>
<td>A0</td>
<td>A, B, C, D</td>
<td>7.5</td>
<td>7R5</td>
<td>X0</td>
<td>B, C, J, K</td>
<td>68</td>
<td>680</td>
<td>W1</td>
<td>F, G, J, K, M</td>
</tr>
<tr>
<td>1.1</td>
<td>1R1</td>
<td>B0</td>
<td>A, B, C, D</td>
<td>8.2</td>
<td>8R2</td>
<td>Y0</td>
<td>B, C, J, K</td>
<td>75</td>
<td>750</td>
<td>X1</td>
<td>F, G, J, K, M</td>
</tr>
<tr>
<td>1.2</td>
<td>1R2</td>
<td>C0</td>
<td>A, B, C, D</td>
<td>9.1</td>
<td>9R1</td>
<td>Z0</td>
<td>B, C, J, K</td>
<td>82</td>
<td>820</td>
<td>Y1</td>
<td>F, G, J, K, M</td>
</tr>
<tr>
<td>1.3</td>
<td>1R3</td>
<td>D0</td>
<td>A, B, C, D</td>
<td>10</td>
<td>100</td>
<td>A1</td>
<td>F, G, J, K, M</td>
<td>91</td>
<td>910</td>
<td>Z1</td>
<td>F, G, J, K, M</td>
</tr>
<tr>
<td>1.5</td>
<td>1R5</td>
<td>E0</td>
<td>A, B, C, D</td>
<td>11</td>
<td>110</td>
<td>B1</td>
<td>F, G, J, K, M</td>
<td>100</td>
<td>101</td>
<td>A2</td>
<td>F, G, J, K, M</td>
</tr>
<tr>
<td>1.8</td>
<td>1R8</td>
<td>G0</td>
<td>A, B, C, D</td>
<td>15</td>
<td>150</td>
<td>E1</td>
<td>F, G, J, K, M</td>
<td>120</td>
<td>121</td>
<td>C2</td>
<td>F, G, J, K, M</td>
</tr>
<tr>
<td>2.0</td>
<td>2R0</td>
<td>H0</td>
<td>A, B, C, D</td>
<td>18</td>
<td>180</td>
<td>G1</td>
<td>F, G, J, K, M</td>
<td>150</td>
<td>151</td>
<td>E2</td>
<td>F, G, J, K, M</td>
</tr>
</tbody>
</table>

*Non-standard values and custom tolerances are available upon request.

For additional information and catalogs contact your ATC representative or call direct at (631) 622-4700.

Consult factory for 500 piece reels for prototyping.

Consult factory for additional performance data.

---

**ATC Part Number Code**

ATC Series ____ Case Size (0603) ____ 600 ____ F ____ 10 ____ J ____ T ____ 250 ____ X ____ T

ATC accepts orders for our parts using designations with or without the "ATC" prefix. Both methods of defining the part number are equivalent, i.e., part numbers referenced with the "ATC" prefix are interchangeable to parts referenced without the "ATC" prefix. Customers are free to use either in specifying or procuring parts from American Technical Ceramics.

For additional information and catalogs contact your ATC representative or call direct at (631) 622-4700.

Consult factory for 500 piece reels for prototyping.

Consult factory for additional performance data.

---

**TOLERANCE CODE TABLE**

<table>
<thead>
<tr>
<th>Code</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
<th>G</th>
<th>J</th>
<th>K</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tol.</td>
<td>±0.05 pF</td>
<td>±0.1 pF</td>
<td>±0.25 pF</td>
<td>±0.5 pF</td>
<td>±1%</td>
<td>±2%</td>
<td>±5%</td>
<td>±10%</td>
<td>±20%</td>
</tr>
</tbody>
</table>

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**4,000 pieces on 7” reel and 500 pieces on prototype reel. Consult ATC for other options.**

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.

**Marking is optional.**
**ATC 600F Series Data Sheet Test Condition Description**

Capacitors horizontally mounted on 23.3-mil thick Rogers RO4350® softboard, 52-mil 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.

**ATC 600F Series Ultra-Low ESR, High Q NPO RF & Microwave Capacitors**

**ATC 600 F ESR vs Frequency**

**600 F Resonant Frequency Data**

Capacitors horizontally mounted on 23.3-mil thick Rogers RO4350® softboard, 52-mil 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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ATC Asia  
sales@atceramics-asia.com  

www.atceramics.com
ATC 600F Series Ultra-Low ESR, High Q NPO RF & Microwave Capacitors

Outline Dimensions

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td>0402 (1005)</td>
<td>.0275 (0.70)</td>
<td>.0354 (0.90)</td>
<td>.0157 (0.40)</td>
<td>.0866 (2.20)</td>
</tr>
<tr>
<td></td>
<td>0603 (1608)</td>
<td>.0393 (1.00)</td>
<td>.0433 (1.10)</td>
<td>.0236 (0.60)</td>
<td>.110 (2.80)</td>
</tr>
<tr>
<td></td>
<td>0805 (2012)</td>
<td>.0590 (1.50)</td>
<td>.0512 (1.30)</td>
<td>.0236 (0.60)</td>
<td>.1259 (3.20)</td>
</tr>
</tbody>
</table>

Inches (mm)

Suggested Mounting Pad Dimensions

<table>
<thead>
<tr>
<th>Electrode Orientation</th>
<th>Case Sizes L, S and F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>0402 (1005)</td>
</tr>
<tr>
<td></td>
<td>0603 (1608)</td>
</tr>
<tr>
<td></td>
<td>0805 (2012)</td>
</tr>
</tbody>
</table>

Inches (mm)

Design Kits  Each Kit contains a selection of standard capacitor values for circuit prototyping.

<table>
<thead>
<tr>
<th>Kit #</th>
<th>Item #</th>
<th>Description</th>
<th>Cap. Value Range (pF)</th>
<th>Cap. Values (pF)</th>
<th>Tol. (pF)</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kit 32T</td>
<td>DK0032T</td>
<td>600F Series Ultra-low ESR, High Q Microwave Capacitors</td>
<td>0.1 to 2.0</td>
<td>0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.5</td>
<td>±0.1</td>
<td>$90.00</td>
</tr>
<tr>
<td>Kit 33T</td>
<td>DK0033T</td>
<td>600F Series Ultra-low ESR, High Q Microwave Capacitors</td>
<td>1.0 to 10</td>
<td>1.0, 1.2, 1.5, 1.8, 2.0, 2.2, 2.4, 2.7, 3.0, 3.3</td>
<td>±0.1</td>
<td>$90.00</td>
</tr>
<tr>
<td>Kit 34T</td>
<td>DK0034T</td>
<td>600F Series Ultra-low ESR, High Q Microwave Capacitors</td>
<td>10 to 100</td>
<td>10, 12, 15, 18, 20, 22, 24, 27, 30, 33, 39, 47, 56, 68, 82, 100</td>
<td>±5%</td>
<td>$90.00</td>
</tr>
<tr>
<td>Kit 35T</td>
<td>DK0035T</td>
<td>600F Series Ultra-low ESR, High Q Microwave Capacitors</td>
<td>100 to 240</td>
<td>100, 120, 150, 180, 200, 220, 240</td>
<td>±5%</td>
<td>$50.00</td>
</tr>
</tbody>
</table>

For Online Kit Orders, Catalog & Application Notes, Visit: www.atceramics.com

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