ATC 700 C Series NPO Porcelain High RF Power Multilayer Capacitors

- Case C Size (.250" x .250")
- Capacitance Range 1 pF to 2700 pF
- High Q
- Ultra-Stable Performance
- Low ESR/ESL
- High RF Current/Voltage
- High RF Power
- High Reliability
- Available with Encapsulation Option*

ATC, the industry leader, offers new improved ESR/ESL performance for the 700 C Series RF Capacitors. This high Q multilayer capacitor is ultra-stable under high RF current and voltage applications. High density porcelain construction provides a rugged, hermetic package.

ATC offers an encapsulation option for applications requiring extended protection against arc-over and corona.

Typical functional applications: Bypass, Coupling, Tuning, Impedance Matching and DC Blocking.

Typical circuit applications: VHF/UHF RF Power Amplifiers, Antenna Tuning, Plasma Chambers and Medical (MRI coils).

*For leaded styles only.

ENVIRONMENTAL TESTS
ATC 700 C Series Capacitors are designed and manufactured to 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:

LOW VOLTAGE HUMIDITY:
MIL-STD-202, Method 103, Condition A, with 1.5 Volts DC applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours min.

LIFE TEST:
200% of WVDC for capacitors rated at 500 volts DC or less.
120% of WVDC for capacitors rated at 1250 volts DC or less.
100% of WVDC for capacitors rated above 1250 volts DC.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

QUALITY FACTOR (Q):
Greater than 10,000 (1.0 pF to 1000 pF) @ 1 MHz.
Greater than 10,000 (1100 pF to 2700 pF) @ 1 KHz.

TEMPERATURE COEFFICIENT OF CAPACITANCE (TCC):
0 ±30 PPM/°C (-55°C to +125°C)

INSULATION RESISTANCE (IR):
1 pF to 2700 pF:
10^6 Megohms min. @ +25°C at rated WVDC.
10^4 Megohms min. @ +125°C at rated WVDC.
Max. test voltage is 500 VDC.

WORKING VOLTAGE (WVDC): See Capacitance Values Table, p 2.

DIELECTRIC WITHSTANDING VOLTAGE (DWV):
250% of WVDC for capacitors rated at 500 volts DC or less for 5 seconds.
150% of WVDC for capacitors rated at 1250 volts DC or less for 5 seconds.
120% of WVDC for capacitors rated above 1250 volts DC for 5 seconds.

RETRACE: Less than ±(0.02% or 0.02 pF), whichever is greater.

AGING EFFECTS: None

PIEZOELECTRIC EFFECTS: None
(No capacitance variation with voltage or pressure).

CAPACITANCE DRIFT: ±(0.02% or 0.02 pF), whichever is greater.

OPERATING TEMPERATURE RANGE:
From -55°C to +125°C (No derating of working voltage).

TERMINATION STYLES:
Available in various surface mount and leaded styles. See Mechanical Configurations, page 3.

TERMINAL STRENGTH: Terminations for chips and pellets withstand a pull of 10 lbs. min., 20 lbs. typical, for 5 seconds in direction perpendicular to the termination surface of the capacitor. Test per MIL-STD-202, method 211.
ATC 700 C Capacitance Values

VRMS = 0.707 x WVDC

- SPECIAL VALUES, TOLERANCES, HIGHER WVDC AND MATCHING AVAILABLE. • ENCAPSULATION OPTION AVAILABLE.

PLEASE CONSULT FACTORY.

<table>
<thead>
<tr>
<th>CAP. CODE</th>
<th>1R0</th>
<th>1R1</th>
<th>1R2</th>
<th>1R3</th>
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<th>3R9</th>
<th>4R3</th>
<th>4R7</th>
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<th>5R6</th>
<th>6R2</th>
<th>6R8</th>
<th>7R5</th>
<th>8R2</th>
<th>9R1</th>
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<th>110</th>
<th>120</th>
<th>130</th>
<th>150</th>
<th>160</th>
<th>180</th>
<th>200</th>
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<th>270</th>
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<th>330</th>
<th>360</th>
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<td>560</td>
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<td>680</td>
<td>750</td>
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<tr>
<td>RATED WVDC</td>
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<td>43</td>
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<td>51</td>
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CAPACITANCE TOLERANCE

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<tr>
<th>Code</th>
<th>C</th>
<th>B</th>
<th>D</th>
<th>F</th>
<th>G</th>
<th>J</th>
<th>K</th>
<th>M</th>
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<tbody>
<tr>
<td>Tol.</td>
<td>±0.25 pF</td>
<td>±0.1 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>

ATC PART NUMBER CODE

Series -
Case Size -
Capacitance Code:
First 2 significant digits for capacitance.
R=Decimal Point
Indicates number of zeros following digits
of capacitance in picofarads except for decimal values.
Capacitance Tolerance -

The above part number refers to a 700 C Series (case size C) 10 pF capacitor,
J tolerance (±5%), 2500 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and ATC Waffle-packaging.

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 (+1-631) 622-4700.

Consult factory for additional performance data.
### ATC 700 C Capacitors: Mechanical Configurations

<table>
<thead>
<tr>
<th>ATC SERIES &amp; CASE SIZE</th>
<th>ATC TERM. CODE</th>
<th>CASE SIZE &amp; TYPE</th>
<th>OUTLINES</th>
<th>BODY DIMENSIONS (INCHES (mm))</th>
<th>LEAD AND TERMINATION DIMENSIONS AND MATERIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>W/T IS A TERMINATION SURFACE</td>
<td>LENGTH (L) / WIDTH (W) / THICKNESS (T)</td>
<td>OVERLAP (Y) / MATERIALS</td>
</tr>
<tr>
<td>700C W</td>
<td></td>
<td>Solder Plate</td>
<td><img src="image" alt="Solder Plate" /></td>
<td>.230 / .250 ±.015 / .145 ± .025</td>
<td>.040 (1.02) max. / Tin/Lead, Solder Plated over Nickel Barrier Termination</td>
</tr>
<tr>
<td>700C P</td>
<td></td>
<td>Pellet</td>
<td><img src="image" alt="Pellet" /></td>
<td>.230 / .250 ±.010 / .165 (4.19) max. for capacitance values &gt; 680 pF</td>
<td>.040 (1.02) max. / Heavy Tin/Lead Coated, over Nickel Barrier Termination</td>
</tr>
<tr>
<td>700C T</td>
<td></td>
<td>Solderable Nickel Barrier</td>
<td><img src="image" alt="Solderable Nickel Barrier" /></td>
<td>.230 / .250 ±.010 / .145 (3.68) max. for capacitance values ≤ 680 pF</td>
<td>.040 (1.02) max. / RoHS Compliant Tin Plated over Nickel Barrier Termination</td>
</tr>
<tr>
<td>700C MS</td>
<td></td>
<td>Microstrip</td>
<td><img src="image" alt="Microstrip" /></td>
<td>.245 ±.025 / .250 ±.015 / .165 (4.19) max. for capacitance values &gt; 680 pF</td>
<td>N/A / High Purity Silver Leads</td>
</tr>
<tr>
<td>700C AR</td>
<td></td>
<td>Axial Ribbon</td>
<td><img src="image" alt="Axial Ribbon" /></td>
<td>.245 ±.025 / .250 ±.015 / .165 (4.19) max. for capacitance values &gt; 680 pF</td>
<td>N/A / High Purity Silver Leads</td>
</tr>
</tbody>
</table>

Custom lead styles and lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are RoHS compliant.
**ATC 700 C Capacitors: Non-Magnetic Mechanical Configurations**

<table>
<thead>
<tr>
<th>ATC SERIES &amp; CASE SIZE</th>
<th>ATC TERM. CODE</th>
<th>CASE SIZE &amp; TYPE</th>
<th>OUTLINES</th>
<th>BODY DIMENSIONS INCHES (mm)</th>
<th>LEAD AND TERMINATION DIMENSIONS AND MATERIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>700C</td>
<td>WN</td>
<td>Non-Magnetic Solder Plate</td>
<td><img src="non-mag_solder_plate.png" alt="Image" /></td>
<td>LENGTH (L)</td>
<td>WIDTH (W)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.230</td>
<td>.020 - .010 (5.84) + .51 - .25)</td>
</tr>
<tr>
<td>700C</td>
<td>PN</td>
<td>Non-Magnetic Pellet</td>
<td><img src="non-mag_pellet.png" alt="Image" /></td>
<td>.230</td>
<td>.025 - .010 (5.84) + .64 - .25)</td>
</tr>
<tr>
<td>700C</td>
<td>TN</td>
<td>Non-Magnetic Solderable Barrier</td>
<td><img src="non-mag_solderable_barrier.png" alt="Image" /></td>
<td>.230</td>
<td>.020 - .010 (5.84) + .51 - .25)</td>
</tr>
<tr>
<td>700C</td>
<td>MN</td>
<td>Non-Magnetic Microstrip</td>
<td><img src="non-mag_microstrip.png" alt="Image" /></td>
<td>.245 ± .025 (6.22 ± .64)</td>
<td>N/A</td>
</tr>
<tr>
<td>700C</td>
<td>AN</td>
<td>Non-Magnetic Axial Ribbon</td>
<td><img src="non-mag_axial_ribbon.png" alt="Image" /></td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Custom lead styles and lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are RoHS compliant.

### Suggested Mounting Pad Dimensions

#### Case C Vertical Mount

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</thead>
<tbody>
<tr>
<td>&lt; 680 pF</td>
<td>Normal</td>
<td>.150</td>
<td>.050</td>
<td>.200</td>
<td>.300</td>
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<tr>
<td></td>
<td>High Density</td>
<td>.130</td>
<td>.030</td>
<td>.200</td>
<td>.260</td>
</tr>
<tr>
<td>&gt; 680 pF</td>
<td>Normal</td>
<td>.185</td>
<td>.050</td>
<td>.200</td>
<td>.300</td>
</tr>
<tr>
<td></td>
<td>High Density</td>
<td>.165</td>
<td>.030</td>
<td>.200</td>
<td>.260</td>
</tr>
</tbody>
</table>

#### Horizontal Mount

| All values     | Normal   | .280   | .050   | .200   | .300   |
|                | High Density | .260   | .030   | .200   | .260   |

Dimensions are in inches.
ATC 700 C Performance Data

ESR VS. CAPACITANCE
ATC SERIES 700, CASE C

Q VS. CAPACITANCE
ATC SERIES 700, CASE C

SERIES RESONANCE VS. CAPACITANCE
ATC SERIES 700, CASE C

CURRENT RATING VS. CAPACITANCE
ATC SERIES 700, CASE C

The current rating is based on a 65°C mounting surface and a device thermal resistance (Rt) of 12°C/W. A power dissipation of 4W will result in a case temperature of 125°C.

CAPACITANCE CHANGE VS. TEMPERATURE
ATC SERIES 700, CASE C

TC = 0 ± 30 PPM/°C

% CHANGE IN CAPACITANCE

TEMPERATURE (Degrees C)