ATC 100 C Series
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* up to 3600 VDC

ATC, the industry leader, offers new improved ESR/ESL performance for the 100 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 100 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):
+90 ±30 PPM/°C (-55°C to +125°C)

INSULATION RESISTANCE (IR):
1 pF to 2700 pF:
10^5 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 PART NUMBER CODE

Series: ATC 100 C
Case Size: C
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 100 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 Matrix Tray 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 (631) 622-4700.

Consult factory for additional performance data.

### Capacitance Tolerance

<table>
<thead>
<tr>
<th>Code</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>
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</thead>
<tbody>
<tr>
<td>Tol.</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>
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### ATC 100 C Capacitance Values

<table>
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<tr>
<th>CAP. CODE</th>
<th>CAP. (pF)</th>
<th>TOL.</th>
<th>RATED WVDC STD. EXT.</th>
<th>CAP. CODE</th>
<th>CAP. (pF)</th>
<th>TOL.</th>
<th>RATED WVDC STD. EXT.</th>
<th>CAP. CODE</th>
<th>CAP. (pF)</th>
<th>TOL.</th>
<th>RATED WVDC STD. EXT.</th>
<th>CAP. CODE</th>
<th>CAP. (pF)</th>
<th>TOL.</th>
<th>RATED WVDC STD. EXT.</th>
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<tr>
<td>1R0</td>
<td>1.0</td>
<td></td>
<td></td>
<td>1R1</td>
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<td></td>
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<td>1.2</td>
<td></td>
<td></td>
<td>1R3</td>
<td>1.3</td>
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<tr>
<td>1R4</td>
<td>1.4</td>
<td></td>
<td></td>
<td>1R5</td>
<td>1.5</td>
<td></td>
<td></td>
<td>1R6</td>
<td>1.6</td>
<td></td>
<td></td>
<td>1R7</td>
<td>1.7</td>
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<tr>
<td>1R8</td>
<td>1.8</td>
<td></td>
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<td>1R9</td>
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<td>2.0</td>
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<td></td>
<td>2R1</td>
<td>2.1</td>
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<td>2R2</td>
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<td>2R3</td>
<td>2.3</td>
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<td>2.4</td>
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<td>2R5</td>
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<tr>
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<td>4.6</td>
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<td></td>
<td>5R9</td>
<td>5.9</td>
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</tr>
</tbody>
</table>

VRMS = 0.707 x WVDC

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

PLEASE CONSULT FACTORY.
**ATC 100 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></td>
<td>LENGTH (L)</td>
<td>WIDTH (W)</td>
</tr>
<tr>
<td>100C</td>
<td>W</td>
<td>Solder Plate</td>
<td>![Solder Plate Diagram]</td>
<td>.230 +.020 - .010 (5.84 +.051 -.25)</td>
<td>.040 (1.02) max.</td>
</tr>
<tr>
<td>100C</td>
<td>P</td>
<td>Pellet</td>
<td>![Pellet Diagram]</td>
<td>.230 +.025 - .010 (5.84 +.064 -.25)</td>
<td>.105 (.267) max.</td>
</tr>
<tr>
<td>100C</td>
<td>T</td>
<td>Solderable Nickel Barrie</td>
<td>![Solderable Nickel Barrie Diagram]</td>
<td>.230 +.020 - .010 (5.84 +.051 -.25)</td>
<td>.145 (3.68) max. for capacitance values ≤ 680 pF, .165 (4.19) max. for capacitance values &gt; 680 pF</td>
</tr>
<tr>
<td>100C</td>
<td>CA</td>
<td>Gold Chip</td>
<td>![Gold Chip Diagram]</td>
<td>.230 +.020 - .010 (5.84 +.051 -.25)</td>
<td>.135 (3.43) max. for capacitance values ≤ 680 pF, .155 (3.94) max. for capacitance values &gt; 680 pF</td>
</tr>
<tr>
<td>100C</td>
<td>MS</td>
<td>Microstrip</td>
<td>![Microstrip Diagram]</td>
<td>.250 +.015 (6.35 +.38)</td>
<td></td>
</tr>
<tr>
<td>100C</td>
<td>AR</td>
<td>Axial Ribbon</td>
<td>![Axial Ribbon Diagram]</td>
<td>.245 ± .025 (6.22 ± .64)</td>
<td></td>
</tr>
<tr>
<td>100C</td>
<td>AW</td>
<td>Axial Wire</td>
<td>![Axial Wire Diagram]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100C</td>
<td>VA</td>
<td>Vertical Axial Ribbon</td>
<td>![Vertical Axial Ribbon Diagram]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100C</td>
<td>RW</td>
<td>Radial Wire</td>
<td>![Radial Wire Diagram]</td>
<td></td>
<td></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. <br>W_L = .110 (2.79) for capacitance values ≤ 680 pF, W_L = .130 (3.30) for capacitance values > 680 pF
## ATC 100 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></td>
<td></td>
<td></td>
<td>W/T IS A TERMINATION SURFACE</td>
<td>LENGTH (L)</td>
<td>WIDTH (W)</td>
</tr>
<tr>
<td>100C WN</td>
<td>WN</td>
<td>Non-Mag Solder Plate</td>
<td><img src="image1.png" alt="Image" /></td>
<td>230 + .025 - .010 (5.84 + 0.64 - 0.25)</td>
<td></td>
</tr>
<tr>
<td>100C PN</td>
<td>PN</td>
<td>Non-Mag Pellet</td>
<td><img src="image2.png" alt="Image" /></td>
<td>230 + .035 - .010 (5.84 + 0.89 - 0.25)</td>
<td>.145 (3.68) max. for capacitance values ( \leq 680 \mu \text{F} )</td>
</tr>
<tr>
<td>100C TN</td>
<td>TN</td>
<td>Non-Mag Solderable Nickel Barrier</td>
<td><img src="image3.png" alt="Image" /></td>
<td>230 + .025 - .010 (5.84 + 0.64 - 0.25)</td>
<td>.250 ± .015 (6.35 ± 0.38)</td>
</tr>
<tr>
<td>100C MN</td>
<td>MN</td>
<td>Non-Mag Microstrip</td>
<td><img src="image4.png" alt="Image" /></td>
<td>245 ± .025 (6.22 ± 0.64)</td>
<td></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

<table>
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<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>( &lt; 680 \mu \text{F} )</td>
<td>Normal</td>
<td>.150</td>
<td>.050</td>
<td>.200</td>
<td>.300</td>
</tr>
<tr>
<td>High Density</td>
<td>.130</td>
<td>.030</td>
<td>.200</td>
<td>.260</td>
<td></td>
</tr>
<tr>
<td>( &gt; 680 \mu \text{F} )</td>
<td>Normal</td>
<td>.185</td>
<td>.050</td>
<td>.200</td>
<td>.300</td>
</tr>
<tr>
<td>High Density</td>
<td>.165</td>
<td>.030</td>
<td>.200</td>
<td>.260</td>
<td></td>
</tr>
</tbody>
</table>

#### Horizontal Mount

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

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**American Technical Ceramics**

ATC North America  
sales@atceramics.com  
ATC Europe  
saleseur@atceramics.com  
ATC Asia  
sales@atceramics-asia.com  

www.atceramics.com
ESR VS. CAPACITANCE
ATC SERIES 100, CASE C

Q VS. CAPACITANCE
ATC SERIES 100, CASE C

SERIES RESONANCE VS. CAPACITANCE
ATC SERIES 100, CASE C

CURRENT RATING VS. CAPACITANCE
ATC SERIES 100, CASE C

The current rating is based on a 65°C mounting surface and a device thermal resistance (R) of 15°C/W. A power dissipation of 4W will result in a case temperature of 125°C.

CAPACITANCE CHANGE VS. TEMPERATURE
ATC SERIES 100, CASE C

The current rating is limited by the power dissipation capability of the case. The solid line represents the voltage limited condition, while the dotted line indicates the power dissipation limited condition.

AMERICAN TECHNICAL CERAMICS
ATC North America
sales@atceramics.com
ATC Europe
saleseur@atceramics.com
ATC Asia
sales@atceramics-asia.com

www.atceramics.com
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