ATC 100 B Series Porcelain Superchip® Multilayer Capacitors

- Case B Size (.110" x .110")
- Capacitance Range 0.1 pF to 1000 pF
- High Q
- Ultra-Stable Performance
- Low ESR/ESL
- High Self-Resonance
- Low Noise
- Established Reliability (QPL)
- Extended WVDC up to 1500 VDC

ATC, the industry leader, offers new improved ESR/ESL performance for the 100 B Series RF/Microwave Capacitors. This Series is now available with extended operating temperatures up to 175°C. High Density porcelain construction provides a rugged, hermetic package.

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


ENVIRONMENTAL TESTS
ATC 100 B 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.
- 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: MIL-STD-202, Method 108, for 2000 hours, at 125°C. Voltage Applied: 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 at 1 MHz.
- TEMPERATURE COEFFICIENT OF CAPACITANCE (TCC):
  +90 ±20 PPM/°C (-55°C to +125°C)
  +90 ±30 PPM/°C (+125°C to +175°C)
- INSULATION RESISTANCE (IR):
  0.1 pF to 470 pF: 10^6 Megohms min. @ +25°C at rated WVDC.
  0.1 pF to 470 pF: 10^5 Megohms min. @ +125°C at rated WVDC.
  510 pF to 1000 pF: 10^5 Megohms min. @ +25°C at rated WVDC.
  510 pF to 1000 pF: 10^4 Megohms min. @ +125°C at rated WVDC.
  IR above +125°C is derated by one order of magnitude.

- WORKING VOLTAGE (WVDC): See Capacitance Values Table, page 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. Test voltage is applied for 5 secs.

- 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:
  Standard WVDC:
  0.1 to 330 pF: from -55°C to +175°C
  360 to 1000 pF: from -55°C to +125°C
  Extended WVDC:
  0.1 to 1000 pF: 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 5 lbs. min., 15 lbs. typical, for 5 seconds in direction perpendicular to the termination surface of the capacitor. Test per MIL-STD-202, method 211.
### ATC 100 B Capacitance Values

**VRMS = 0.707 × WVDC**

- SPECIAL VALUES, TOLERANCES, HIGHER WVDC AND MATCHING AVAILABLE.
- ENCAPSULATION OPTION AVAILABLE. PLEASE CONSULT FACTORY.
- NOTE: EXTENDED WVDC DOES NOT APPLY TO CDR PRODUCTS.

#### 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**
  ```

#### 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>
</tr>
</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>
</tr>
</tbody>
</table>

The above part number refers to a 100 B Series (case size B) 91 pF capacitor, J tolerance (±5%), 500 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking, and Tape and Reel packaging.

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

Consult factory for additional performance data.
## ATC 100 B Capacitors: Mechanical Configurations

<table>
<thead>
<tr>
<th>ATC SERIES &amp; CASE SIZE</th>
<th>ATC TERM. CODE</th>
<th>MIL-PRF-55681</th>
<th>CASE SIZE &amp; TYPE</th>
<th>OUTLINE W/T IS A TERMINATION SURFACE</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>
<td>Thickness (T)</td>
</tr>
<tr>
<td>100B W</td>
<td>CDR14BG</td>
<td></td>
<td>B Solder Plate</td>
<td>.110 +.020 - .010 (2.79 + 0.51 -0.25)</td>
<td>.110 ±.015 (2.79 ±0.38)</td>
<td>Tin/Lead, Solder Plated over Nickel Barrier Termination</td>
</tr>
<tr>
<td>100B P</td>
<td>CDR14BG</td>
<td></td>
<td>B Pellet</td>
<td>.110 +.035 - .010 (2.79 + 0.89 -0.25)</td>
<td>.110 ±.015 (2.79 ±0.38)</td>
<td>Heavy Tin/Lead Coated, over Nickel Barrier Termination</td>
</tr>
<tr>
<td>100B T</td>
<td>N/A</td>
<td></td>
<td>B Solderable Nickel Barrier</td>
<td>.110 +.035 - .010 (2.79 + 0.89 -0.25)</td>
<td>.110 ±.015 (2.79 ±0.38)</td>
<td>RoHS Compliant Tin Plated over Nickel Barrier Termination</td>
</tr>
<tr>
<td>100B CA</td>
<td>CDR13BG</td>
<td></td>
<td>B Gold Chip</td>
<td>.110 +.020 - .010 (2.79 + 0.51 -0.25)</td>
<td>.110 ±.015 (2.79 ±0.38)</td>
<td>RoHS Compliant Gold Plated over Nickel Barrier Termination</td>
</tr>
<tr>
<td>100B MS</td>
<td>CDR21BG</td>
<td></td>
<td>B Microstrip</td>
<td>.120 (3.05) max.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100B AR</td>
<td>CDR22BG</td>
<td></td>
<td>B Axial Ribbon</td>
<td>.135 ±.015 (3.43 ±0.38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100B RR</td>
<td>CDR24BG</td>
<td></td>
<td>B Radial Ribbon</td>
<td>.110 ±.015 (2.79 ±0.38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100B RW</td>
<td>CDR23BG</td>
<td></td>
<td>B Radial Wire</td>
<td>.145 ±.020 (3.68 ±0.51)</td>
<td></td>
<td>#26 AWG, .016 (.406) dia. nominal</td>
</tr>
<tr>
<td>100B AW</td>
<td>CDR25BG</td>
<td></td>
<td>B Axial Wire</td>
<td></td>
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</tbody>
</table>

Additional lead styles available: Narrow Microstrip (NM), Narrow Axial Ribbon (NA) and Vertical Narrow Microstrip (H). Other lead lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are RoHS compliant. For a complete military catalog, request American Technical Ceramics document ATC 001-818.

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## ATC 100 B Non-Magnetic Capacitors: Mechanical Configurations

### OUTLINES

**W/T IS A TERMINATION SURFACE**

<table>
<thead>
<tr>
<th>ATC SERIES &amp; CASE SIZE</th>
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<th>BODY DIMENSIONS INCHES (mm)</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LENGTH (L</td>
<td>WIDTH (W)</td>
</tr>
<tr>
<td>100B 120B AN</td>
<td>MN</td>
<td>Meets Requirements</td>
<td>B Non-Mag Microstrip</td>
<td>.135 ±.015 (3.43 ±0.38)</td>
<td>.120 (3.05) max.</td>
</tr>
<tr>
<td>100B 120B BN</td>
<td>BN</td>
<td>Meets Requirements</td>
<td>B Non-Mag Radial Wire</td>
<td>.145 ±.020 (3.68 ±0.51)</td>
<td>.102 (2.59) max.</td>
</tr>
<tr>
<td>100B 120B FN</td>
<td>FN</td>
<td>Meets Requirements</td>
<td>B Non-Mag Axial Wire</td>
<td>.102 (2.59)</td>
<td>.110 ±.015 (2.79 ±0.38)</td>
</tr>
<tr>
<td>100B 120B BN</td>
<td>MN</td>
<td>Meets Requirements</td>
<td>B Non-Mag Microstrip</td>
<td>.135 ±.015 (3.43 ±0.38)</td>
<td>.120 (3.05) max.</td>
</tr>
<tr>
<td>100B 120B AN</td>
<td>AN</td>
<td>Meets Requirements</td>
<td>B Non-Mag Axial Ribbon</td>
<td>.135 ±.015 (3.43 ±0.38)</td>
<td>.120 (3.05) max.</td>
</tr>
<tr>
<td>100B 120B BN</td>
<td>BN</td>
<td>Meets Requirements</td>
<td>B Non-Mag Radial Wire</td>
<td>.145 ±.020 (3.68 ±0.51)</td>
<td>.102 (2.59) max.</td>
</tr>
<tr>
<td>100B 120B FN</td>
<td>FN</td>
<td>Meets Requirements</td>
<td>B Non-Mag Axial Wire</td>
<td>.102 (2.59)</td>
<td>.110 ±.015 (2.79 ±0.38)</td>
</tr>
<tr>
<td>100B 120B BN</td>
<td>MN</td>
<td>Meets Requirements</td>
<td>B Non-Mag Microstrip</td>
<td>.135 ±.015 (3.43 ±0.38)</td>
<td>.120 (3.05) max.</td>
</tr>
</tbody>
</table>

### Suggested Mounting Pad Dimensions

**Case B Vertical Mount**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 pF</td>
<td>Normal</td>
<td>.065</td>
<td>.050</td>
<td>.075</td>
<td>.175</td>
</tr>
<tr>
<td></td>
<td>High Density</td>
<td>.065</td>
<td>.050</td>
<td>.075</td>
<td>.135</td>
</tr>
<tr>
<td>0.2 pF</td>
<td>Normal</td>
<td>.090</td>
<td>.050</td>
<td>.075</td>
<td>.175</td>
</tr>
<tr>
<td></td>
<td>High Density</td>
<td>.090</td>
<td>.050</td>
<td>.075</td>
<td>.135</td>
</tr>
<tr>
<td>0.3 to 510 pF</td>
<td>Normal</td>
<td>.110</td>
<td>.050</td>
<td>.075</td>
<td>.175</td>
</tr>
<tr>
<td></td>
<td>High Density</td>
<td>.090</td>
<td>.030</td>
<td>.075</td>
<td>.135</td>
</tr>
<tr>
<td>&gt; 510 pF</td>
<td>Normal</td>
<td>.120</td>
<td>.050</td>
<td>.075</td>
<td>.175</td>
</tr>
<tr>
<td></td>
<td>High Density</td>
<td>.100</td>
<td>.030</td>
<td>.075</td>
<td>.135</td>
</tr>
</tbody>
</table>

**Horizontal Mount**

| All values | Normal | .130 | .050 | .075 | .175 |
|            | High Density | .110 | .030 | .075 | .135 |

Additional lead styles available: Narrow Microstrip (DN), Narrow Axial Ribbon (GN) and Vertical Narrow Microstrip (HN). Other lead lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are RoHS compliant.

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**For more information:**
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- ATC Asia: sales@atceramics-asia.com

**www.atceramics.com**
ATC 100 B Performance Data

ESR VS. CAPACITANCE
ATC SERIES 100, CASE B

Q VS. CAPACITANCE
ATC SERIES 100, CASE B

SERIES RESONANCE VS. CAPACITANCE
ATC SERIES 100, CASE B

CAPACITANCE CHANGE VS. TEMPERATURE
ATC SERIES 100, CASE B

ESR (Ohms)

CAPACITANCE (pF)
(1.0 pF to 51 pF)

CAPACITANCE (pF)
(56 pF to 1000 pF)

FREQUENCY (GHz)

% CHANGE IN CAPACITANCE

TEMPERATURE (Degrees C)
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ATC 100 B Performance Data

CURRENT RATING VS. CAPACITANCE
ATC SERIES 100, CASE B

The current rating is based on a 65°C mounting surface and a device thermal resistance (θ) of 20°C/W. A power dissipation of 3W will result in a case temperature of 125°C.

CURRENT RATING VS. CAPACITANCE
ATC SERIES 100, CASE B

The current rating is based on a 65°C mounting surface and a device thermal resistance (θ) of 20°C/W. A power dissipation of 3W will result in a case temperature of 125°C.

CURRENT RATING VS. CAPACITANCE
ATC SERIES 100, CASE B, EXTENDED VOLTAGE

The current rating is based on a 65°C mounting surface and a device thermal resistance (θ) of 20°C/W. A power dissipation of 3W will result in a case temperature of 125°C.