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:
10⁶ Megohms min. @ +25°C at rated WVDC.
10⁷ Megohms min. @ +125°C at rated WVDC.
510 pF to 1000 pF:
10⁶ Megohms min. @ +25°C at rated WVDC.
10⁷ 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.

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:
0.1 to 330 pF: from -55°C to +175°C
360 to 1000 pF: from -55°C to +125°C

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 X WVDC**

* SPECIAL VALUES, TOLERANCES, HIGHER WVDC AND MATCHING 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.

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 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>OUTLINES</th>
<th>BODY DIMENSIONS (INCHES (mm))</th>
<th>LEAD AND TERMINATION DIMENSIONS AND MATERIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>100B W CDR14BG</td>
<td></td>
<td></td>
<td>Solder Plate</td>
<td><img src="solder_plate.png" alt="Image" /></td>
<td><img src="table.png" alt="Table" /></td>
<td>Tin/Lead, Solder Plated over Nickel Barrier Termination</td>
</tr>
<tr>
<td>100B P CDR14BG</td>
<td></td>
<td></td>
<td>Pellet</td>
<td><img src="pellet.png" alt="Image" /></td>
<td><img src="table.png" alt="Table" /></td>
<td>Heavy Tin/Lead Coated, over Nickel Barrier Termination</td>
</tr>
<tr>
<td>100B T N/A CDR13BG</td>
<td></td>
<td></td>
<td>Solderable Nickel Barrier</td>
<td><img src="solderable_nickel_barrier.png" alt="Image" /></td>
<td><img src="table.png" alt="Table" /></td>
<td>RoHS Compliant, Tin Plated over Nickel Barrier Termination</td>
</tr>
<tr>
<td>100B CA CDR13BG</td>
<td></td>
<td></td>
<td>Gold Chip</td>
<td><img src="gold_chip.png" alt="Image" /></td>
<td><img src="table.png" alt="Table" /></td>
<td>RoHS Compliant, Gold Plated over Nickel Barrier Termination</td>
</tr>
<tr>
<td>100B MS CDR21BG</td>
<td></td>
<td></td>
<td>Microstrip</td>
<td><img src="microstrip.png" alt="Image" /></td>
<td><img src="table.png" alt="Table" /></td>
<td>Length (L_L) 250 (6.35) min. Width (W_L) .093 ±.005 (2.36 ±0.13) Thickness (T_L) .004 ±.001 (.102 ±.025)</td>
</tr>
<tr>
<td>100B AR CDR22BG</td>
<td></td>
<td></td>
<td>Axial Ribbon</td>
<td><img src="axial_ribbon.png" alt="Image" /></td>
<td><img src="table.png" alt="Table" /></td>
<td>N/A</td>
</tr>
<tr>
<td>100B RR CDR24BG</td>
<td></td>
<td></td>
<td>Radial Ribbon</td>
<td><img src="radial_ribbon.png" alt="Image" /></td>
<td><img src="table.png" alt="Table" /></td>
<td>N/A</td>
</tr>
<tr>
<td>100B RW CDR23BG</td>
<td></td>
<td></td>
<td>Radial Wire</td>
<td><img src="radial_wire.png" alt="Image" /></td>
<td><img src="table.png" alt="Table" /></td>
<td>.500 (12.7) in. min. #26 AWG., .016 (.406) dia. nominal</td>
</tr>
<tr>
<td>100B AW CDR25BG</td>
<td></td>
<td></td>
<td>Axial Wire</td>
<td><img src="axial_wire.png" alt="Image" /></td>
<td><img src="table.png" alt="Table" /></td>
<td></td>
</tr>
</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.
**ATC 100 B Non-Magnetic Capacitors: Mechanical Configurations**

<table>
<thead>
<tr>
<th>ATC SERIES &amp; CASE SIZE</th>
<th>ATC TERM. CODE</th>
<th>MIL-PRF-56681</th>
<th>CASE SIZE &amp; TYPE</th>
<th>OUTLINES</th>
<th>BODY DIMENSIONS</th>
<th>LEAD AND TERMINATION DIMENSIONS AND MATERIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<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>100B WN</td>
<td>Meets Require- ments</td>
<td>B Non-Mag Solder Plate</td>
<td>.110 +.025 -.010 (2.79 +0.64 -0.25)</td>
<td>110 ±0.15 (2.79 ±0.38)</td>
<td>.102 (2.59) max</td>
<td>.015 (0.38) ±0.010 (0.25)</td>
</tr>
<tr>
<td>100B PN</td>
<td>Meets Require- ments</td>
<td>B Non-Mag Pellet</td>
<td>.110 +.035 -.010 (2.79 +0.89 -0.25)</td>
<td>110 ±0.15 (2.79 ±0.38)</td>
<td>.102 (2.59) max</td>
<td>.015 (0.38) ±0.010 (0.25)</td>
</tr>
<tr>
<td>100B TN</td>
<td>Meets Require- ments</td>
<td>B Non-Mag Solderable Barrier</td>
<td>.110 +.025 -.010 (2.79 +0.64 -0.25)</td>
<td>110 ±0.15 (2.79 ±0.38)</td>
<td>.102 (2.59) max</td>
<td>N/A</td>
</tr>
<tr>
<td>100B MN</td>
<td>Meets Require- ments</td>
<td>B Non-Mag Microstrip</td>
<td>.135 ±0.015 (3.43 ±0.38)</td>
<td>.120 (3.05) max</td>
<td>.250 (6.35) min</td>
<td>.093 ±0.005 (2.36 ±0.13)</td>
</tr>
<tr>
<td>100B AN</td>
<td>Meets Require- ments</td>
<td>B Non-Mag Axial Ribbon</td>
<td>.110 ±0.015 (2.79 ±0.38)</td>
<td>.102 (2.59) max</td>
<td>N/A</td>
<td>.500 (12.7) in. min</td>
</tr>
<tr>
<td>100B FN</td>
<td>Meets Require- ments</td>
<td>B Non-Mag Radial Ribbon</td>
<td>.145 ±0.020 (3.68 ±0.51)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>100B RN</td>
<td>Meets Require- ments</td>
<td>B Non-Mag Radial Wire</td>
<td>.145 ±0.020 (3.68 ±0.51)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>100B BN</td>
<td>Meets Require- ments</td>
<td>B Non-Mag Axial Wire</td>
<td>.145 ±0.020 (3.68 ±0.51)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

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.

### 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>.045</td>
<td>.030</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>.070</td>
<td>.030</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 |
ATC 100 B Performance Data

ESR vs. Capacitance
ATC SERIES 100, CASE B

CAPACITANCE (pF)
(1.0 pF to 51 pF)

0.01 0.1 1 10 100 1000
ESR (Ohms)
0.01 0.1 1 10 100 1000

Q vs. Capacitance
ATC SERIES 100, CASE B

CAPACITANCE (pF)
(1.0 pF to 51 pF)

0.01 0.1 1 10 100 1000
Q
0.01 0.1 1 10 100 1000

Series Resonance vs. Capacitance
ATC SERIES 100, CASE B

CAPACITANCE (pF)
(1.0 pF to 51 pF)

0.01 0.1 1 10 100 1000
FREQUENCY (GHz)
0.01 0.1 1 10 100 1000

Capacitance Change vs. Temperature
ATC SERIES 100, CASE B

% CHANGE IN CAPACITANCE
-1 -0.5 0 0.5 1 1.5 2
TEMPERATURE (Degrees C)
-55 -35 -15 5 25 45 65 85 105 125 145 165

American Technical Ceramics
www.atceramics.com
ATC North America
sales@atceramics.com
ATC Europe
saleseur@atceramics.com
ATC Asia
sales@atceramics-asia.com
ATC 100 B Performance Data

CURRENT RATING VS. CAPACITANCE
ATC SERIES 100, CASE B

Dotted line = Power dissipation limited
Solid line = Voltage limited (Vrms)

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

Dotted line = Power dissipation limited
Solid line = Voltage limited (Vrms)

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

Dotted line = Power dissipation limited
Solid line = Voltage limited (Vrms)

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.

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