ATC 700 B Series NPO Porcelain and Ceramic Multilayer Capacitors

- Case B Size (.110" x .110")
- Capacitance Range 0.1 pF to 5100 pF
- Low ESR/ESL
- Zero TCC
- Low Noise
- High Self-Resonance
- Rugged Construction
- Established Reliability (QPL)
- Available with Extended WVDC up to 1500 VDC

ATC, the industry leader, is announcing new improved ESR/ESL performance for the 700 B Series RF/Microwave Capacitors. The superior high self-resonance and zero TCC characteristic of this Series provide excellent performance over a broad range of RF and microwave applications requiring minimum drift, including RF power. Porcelain and ceramic construction provide 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 and DC Blocking.

Typical circuit applications: Filters, Oscillators, Timing and RF Power Amplifiers.

*For leaded styles only.

ENVIRONMENTAL TESTS
ATC 700 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.

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:
High Rel Products: 200% WVDC applied.
Extended Voltage Products: Voltage Applied: 0.1 pF to 47 pF at WVDC 51 pF to 200 pF at 120% of WVDC

ELECTRICAL AND MECHANICAL SPECIFICATIONS
QUALITY FACTOR (Q):
Greater than 10,000 (0.1 pF to 200 pF) @ 1 MHz.
Greater than 2000 (220 pF to 1000 pF) @ 1 MHz.
Greater than 2000 (1100 pF to 5100 pF) @ 1 KHz.

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

INSULATION RESISTANCE (IR):
0.1 pF to 470 pF: 10^6 Megohms min. @ +25°C at rated WVDC.
10^5 Megohms min. @ +125°C at rated WVDC.
510 pF to 5100 pF: 10^5 Megohms min. @ +25°C at rated WVDC.
10^4 Megohms min. @ +125°C at rated WVDC.

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

DIELECTRIC WITHSTANDING VOLTAGE (DWV):
250% WVDC for WVDC ≤ 500 Volts
150% WVDC for WVDC > 500 Volts or ≤ 1250 Volts
120% WVDC for WVDC > 1250 Volts
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:
0.1 to 5100 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 # 001-814 Rev. N 1/08
### ATC 700 B Capacitance Values

<table>
<thead>
<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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</thead>
<tbody>
<tr>
<td>0R1</td>
<td>0.1</td>
<td>B</td>
<td></td>
<td>0R2</td>
<td>0.2</td>
<td>B</td>
<td></td>
<td>0R3</td>
<td>0.3</td>
<td>B, C</td>
<td></td>
<td>0R4</td>
<td>0.4</td>
<td>B, C</td>
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<td>0.7</td>
<td></td>
<td></td>
<td>0R8</td>
<td>0.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0R9</td>
<td>0.9</td>
<td></td>
<td></td>
<td>1R0</td>
<td>1.0</td>
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<td>1R1</td>
<td>1.1</td>
<td></td>
<td></td>
<td>1R2</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1R3</td>
<td>1.3</td>
<td></td>
<td>B, C, D</td>
<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>
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<td></td>
</tr>
<tr>
<td>1R7</td>
<td>1.7</td>
<td></td>
<td></td>
<td>1R8</td>
<td>1.8</td>
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<td>1R9</td>
<td>1.9</td>
<td></td>
<td></td>
<td>2R0</td>
<td>2.0</td>
<td></td>
<td></td>
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<tr>
<td>2R1</td>
<td>2.1</td>
<td></td>
<td></td>
<td>2R2</td>
<td>2.2</td>
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<td>2.4</td>
<td></td>
<td></td>
<td>2R7</td>
<td>2.7</td>
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<tr>
<td>3R0</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.

Capacitance values in **bold** type indicate porcelain dielectric. All other capacitance values indicate ceramic dielectric.

All 700 B Capacitors are available laser marked with ATC’s identification, capacitance code and tolerance.

**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 piconfards 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 700 B Series (case size B) 330 pF capacitor, 500 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and ATC Cap-Pac® 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.

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www.atceramics.com
## ATC 700 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 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></td>
<td>LENGTH (L)</td>
<td>WIDTH (W)</td>
</tr>
<tr>
<td>700B</td>
<td>W</td>
<td>CDR14BP</td>
<td>B</td>
<td>Solder Plate</td>
<td>.110</td>
<td>.110 ±.015</td>
</tr>
<tr>
<td>700B</td>
<td>P</td>
<td>CDR14BP</td>
<td>B</td>
<td>Pellet</td>
<td>.110</td>
<td>.110 ±.015</td>
</tr>
<tr>
<td>700B</td>
<td>T</td>
<td>N/A</td>
<td>B</td>
<td>Solderable Nickel Barrier</td>
<td>.110</td>
<td>.110 ±.015</td>
</tr>
<tr>
<td>700B</td>
<td>CA</td>
<td>CDR13BP</td>
<td>B</td>
<td>Gold Chip</td>
<td>.110</td>
<td>.110 ±.015</td>
</tr>
<tr>
<td>700B</td>
<td>MS</td>
<td>CDR21BP</td>
<td>B</td>
<td>Microstrip</td>
<td>.135 ±.015</td>
<td>.120 (3.05) max.</td>
</tr>
<tr>
<td>700B</td>
<td>AR</td>
<td>CDR22BP</td>
<td>B</td>
<td>Axial Ribbon</td>
<td>.250 (6.35) min.</td>
<td>.093 ±.005</td>
</tr>
<tr>
<td>700B</td>
<td>RR</td>
<td>CDR24BP</td>
<td>B</td>
<td>Radial Ribbon</td>
<td>.110</td>
<td>.110 ±.015</td>
</tr>
<tr>
<td>700B</td>
<td>RW</td>
<td>CDR23BP</td>
<td>B</td>
<td>Radial Wire</td>
<td>.145 ±.020</td>
<td>.145 ±.020</td>
</tr>
<tr>
<td>700B</td>
<td>AW</td>
<td>CDR25BP</td>
<td>B</td>
<td>Axial Wire</td>
<td>.110</td>
<td>.110 ±.015</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 700 B Capacitors: Non-Magnetic Mechanical Configurations

**Capacitors with values greater than 200 pF contain a trace magnetic element that may exhibit weak magnetic properties.**

**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.**

<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></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>700B WN</td>
<td></td>
<td></td>
<td></td>
<td>B Non-Mag Solder Plate</td>
<td>.110 ±.025 (2.79)</td>
<td>.110 ±.015 (2.79)</td>
</tr>
<tr>
<td>700B PN</td>
<td></td>
<td></td>
<td></td>
<td>B Non-Mag Pellet</td>
<td>.110 ±.035 (2.79)</td>
<td>.110 ±.015 (2.79)</td>
</tr>
<tr>
<td>700B TN</td>
<td></td>
<td></td>
<td></td>
<td>B Non-Mag Solderable Barrier</td>
<td>.110 ±.025 (2.79)</td>
<td>.110 ±.015 (2.79)</td>
</tr>
<tr>
<td>700B MN</td>
<td></td>
<td></td>
<td></td>
<td>B Non-Mag Microstrip</td>
<td>.135 ±.015 (3.43)</td>
<td>.120 (3.07) max.</td>
</tr>
<tr>
<td>700B AN</td>
<td></td>
<td></td>
<td></td>
<td>B Non-Mag Axial Ribbon</td>
<td>.110 ±.025 (2.79)</td>
<td>.110 ±.015 (2.79)</td>
</tr>
<tr>
<td>700B FN</td>
<td></td>
<td></td>
<td></td>
<td>B Non-Mag Radial Ribbon</td>
<td>.110 ±.025 (2.79)</td>
<td>.110 ±.015 (2.79)</td>
</tr>
<tr>
<td>700B RN</td>
<td></td>
<td></td>
<td></td>
<td>B Non-Mag Radial Wire</td>
<td>.110 ±.025 (2.79)</td>
<td>.110 ±.015 (2.79)</td>
</tr>
<tr>
<td>700B BN</td>
<td></td>
<td></td>
<td></td>
<td>B Non-Mag Axial Wire</td>
<td>.110 ±.025 (2.79)</td>
<td>.110 ±.015 (2.79)</td>
</tr>
</tbody>
</table>

**Suggested Mounting Pad Dimensions**

- **Case B Vertical Mount**
  - **Cap Value**
    - Normal
    - High Density
  - **A Min.**
    - 0.1 pF Normal .065 .050 .075 .175
    - 0.1 pF High Density .045 .030 .075 .135
    - 0.2 pF Normal .090 .050 .075 .175
    - 0.2 pF High Density .070 .030 .075 .135
    - 0.3 to 510 pF Normal .110 .050 .075 .175
    - 0.3 to 510 pF High Density .090 .030 .075 .135
    - > 510 pF Normal .120 .050 .075 .175
    - > 510 pF High Density .100 .030 .075 .135

  - **Horizontal Mount**
    - Normal .130 .050 .075 .175
    - High Density .110 .030 .075 .135
ATC 700 B Performance Data

ESR VS. CAPACITANCE
ATC SERIES 700, CASE B

Q VS. CAPACITANCE
ATC SERIES 700, CASE B

CAPACITANCE (pF)
(1.0 pF to 51 pF)

CAPACITANCE (pF)
(56 pF to 200 pF)

CAPACITANCE (pF)
(220 pF to 5100 pF)
The current rating is based on a 65°C mounting surface and a device thermal resistance $\alpha$ of 20°C/W. A power dissipation of 3 W will result in a case temperature of 125°C.
The current rating is based on a 65 °C mounting surface with a device thermal resistance of 20 °C/W. A power dissipation of 3 W will result in a case temperature of 125 °C.

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