ATC 800 R Series
NPO Ceramic, High RF Power
Lowest ESR
Multilayer Capacitors

• Case R Size (.070” x .090”)
• Rugged, reliable NPO dielectric
• Optimized for highest self resonant frequency
• Capacitance Range 1 pF to 100 pF
• Optimized for lowest ESR and superior heat transfer
• Capable of highest RF Power
• RoHS Compliant / Lead-Free

ATC’s 800 R Series offers superb performance in demanding high RF power applications requiring consistent and reliable operation. The combination of optimized case geometry, highly conductive electrode formulations and proprietary dielectrics, yields the lowest ESR and superior heat transfer. ATC’s new NPO low loss rugged dielectrics are designed to provide superior heat transfer in high RF power applications. Ultra-low ESR and superior thermal performance ensure that the 800 R Series products are your best choice for high RF power applications from UHF through microwave frequencies.


Typical circuit applications: High RF Power Filter Networks, Combiners, Couplers, Matching Networks, Output Coupling, Antenna Coupling, and DC Blocking and Bypassing.

* Long term evolution

ENVIRONMENTAL TESTS
ATC 800 R 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:
MIL-STD-202, Method 106

LOW VOLTAGE HUMIDITY:
MIL-STD-202, Method 103, Condition A, with 1.5 Volts D.C. 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
200% WVDC applied

ELECTRICAL AND MECHANICAL SPECIFICATIONS
QUALITY FACTOR (Q): > 2,000 @ 1 MHz

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

INSULATION RESISTANCE (IR):
1 pF to 100 pF:
10^5 Megohms min. @ +25°C at rated WVDC
10^4 Megohms min. @ +125°C at rated WVDC

WORKING VOLTAGE (WVDC): 500 WVDC

DIELECTRIC WITHSTANDING VOLTAGE (DWV):
Case R: 250% of rated WVDC for 5 secs

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

TERMINATION STYLES: RoHS Compliant and Solder Plate
See Mechanical Configurations, page 3

TERMINAL STRENGTH:
Terminations for chips 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 800 R Series NPO Ceramic Ultra-Low ESR Multilayer Capacitors

ATC 800 R Capacitance Values

<table>
<thead>
<tr>
<th>CAP. CODE</th>
<th>CAP. (pF)</th>
<th>CAP. TOL.</th>
<th>RATED WVDC</th>
<th>CAP. CODE</th>
<th>CAP. (pF)</th>
<th>CAP. TOL.</th>
<th>RATED WVDC</th>
<th>CAP. CODE</th>
<th>CAP. (pF)</th>
<th>CAP. TOL.</th>
<th>RATED WVDC</th>
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</thead>
<tbody>
<tr>
<td>1R0</td>
<td>1.0</td>
<td>3R9</td>
<td>3.9</td>
<td>220</td>
<td>22</td>
<td>500</td>
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<tr>
<td>1R1</td>
<td>1.1</td>
<td>4R3</td>
<td>4.3</td>
<td>240</td>
<td>24</td>
<td>500</td>
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<tr>
<td>1R2</td>
<td>1.2</td>
<td>4R7</td>
<td>4.7</td>
<td>270</td>
<td>27</td>
<td>500</td>
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<tr>
<td>1R3</td>
<td>1.3</td>
<td>5R1</td>
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<td>300</td>
<td>30</td>
<td>500</td>
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<tr>
<td>1R4</td>
<td>1.4</td>
<td>5R6</td>
<td>5.6</td>
<td>330</td>
<td>33</td>
<td>500</td>
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<tr>
<td>1R5</td>
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<td>6R2</td>
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<td>360</td>
<td>36</td>
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<td>1R6</td>
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<td>6R8</td>
<td>6.8</td>
<td>390</td>
<td>39</td>
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<td>1R7</td>
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<td>43</td>
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<td>1R8</td>
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<td>8R2</td>
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<td>470</td>
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<tr>
<td>1R9</td>
<td>1.9</td>
<td>9R1</td>
<td>9.1</td>
<td>510</td>
<td>51</td>
<td>500</td>
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<tr>
<td>2R0</td>
<td>2.0</td>
<td>100</td>
<td>10</td>
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<td>2R1</td>
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<td>11</td>
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<td>2R2</td>
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<td>2R4</td>
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<td>13</td>
<td>750</td>
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<td>2R7</td>
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<td>15</td>
<td>820</td>
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<td>3R0</td>
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<td>16</td>
<td>910</td>
<td>91</td>
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<td>3R3</td>
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<td>18</td>
<td>101</td>
<td>100</td>
<td>500</td>
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<td>3R6</td>
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</tbody>
</table>

VRMS = 0.707 X WVDC

SPECIAL VALUES, TOLERANCES AND MATCHING AVAILABLE. PLEASE CONSULT FACTORY.

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>Cap. Code</th>
<th>B</th>
<th>C</th>
<th>D</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>±2%</td>
<td>±5%</td>
<td>±10%</td>
<td>±20%</td>
</tr>
</tbody>
</table>

The above part number refers to an 800 R Series (case size R) 10 pF capacitor, J tolerance (±5%), 500 WVDC, with T termination (Tin Plated over Nickel Barrier, RoHS Compliant), laser marked, and tape and reel packaging.

*Consult ATC for other quantities. **Laser Marking is optional.

For additional information and catalogs contact your ATC representative or call direct at (+1-631) 622-4700.

Consult factory for additional performance data.
## ATC 800 R 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></td>
<td></td>
</tr>
<tr>
<td>800R T</td>
<td>R T</td>
<td>Solderable Nickel Barrier</td>
<td><img src="image1.png" alt="Diagram" /></td>
<td>LENGTH (L) = 0.070 ± 0.015 (1.78 ± 0.38)</td>
<td>OVERLAP (Y) = 0.10 (0.25)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>WIDTH (W) = 0.090 ± 0.010 (2.29 ± 0.25)</td>
<td>RoHS Compliant</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>THICKNESS (T) = 0.115 (2.92) max.</td>
<td>Tin Plated over Nickel Barrier Termination</td>
</tr>
<tr>
<td></td>
<td>W R</td>
<td>Solder Plate</td>
<td><img src="image2.png" alt="Diagram" /></td>
<td>LENGTH (L) = 0.070 ± 0.015 (1.78 ± 0.38)</td>
<td>OVERLAP (Y) = 0.10 (0.25)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>WIDTH (W) = 0.090 ± 0.010 (2.29 ± 0.25)</td>
<td>RoHS Compliant</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>THICKNESS (T) = 0.115 (2.92) max.</td>
<td>Tin/Lead, Solder Plated over Nickel Barrier Termination</td>
</tr>
</tbody>
</table>

## ATC 800 R Non-Magnetic 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></td>
<td></td>
</tr>
<tr>
<td>800R R T</td>
<td>R T</td>
<td>Non-Mag Solderable Barrier</td>
<td><img src="image3.png" alt="Diagram" /></td>
<td>LENGTH (L) = 0.070 ± 0.015 (1.78 ± 0.38)</td>
<td>OVERLAP (Y) = 0.10 (0.25)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>WIDTH (W) = 0.090 ± 0.010 (2.29 ± 0.25)</td>
<td>RoHS Compliant</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>THICKNESS (T) = 0.115 (2.92) max.</td>
<td>Tin Plated over Non-Magnetic Barrier Termination</td>
</tr>
</tbody>
</table>

## Suggested Mounting Pad Dimensions

<table>
<thead>
<tr>
<th>Case R</th>
<th>Pad Size</th>
<th>A Min.</th>
<th>B Min.</th>
<th>C Min.</th>
<th>D Min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Mount</td>
<td>Normal</td>
<td>.125</td>
<td>.050</td>
<td>.030</td>
<td>.130</td>
</tr>
<tr>
<td></td>
<td>High Density</td>
<td>.115</td>
<td>.030</td>
<td>.030</td>
<td>.090</td>
</tr>
<tr>
<td>Horizontal Mount</td>
<td>Normal</td>
<td>.110</td>
<td>.050</td>
<td>.030</td>
<td>.130</td>
</tr>
<tr>
<td></td>
<td>High Density</td>
<td>.090</td>
<td>.030</td>
<td>.030</td>
<td>.090</td>
</tr>
</tbody>
</table>

Dimensions are in inches.
ATC 800 R Series NPO Ceramic Ultra-Low ESR Multilayer Capacitors

800 R
ESR vs. Frequency

Frequency (MHz)

ESR (Ohms)

1.0 pF
3.3 pF
10 pF
12 pF
15 pF
33 pF
47 pF
51 pF
100 pF

800 R Resonance
Vertical and Horizontal Orientation

Frequency (GHz)

Capacitance (pF)

Vertical Fpr
Horizontal Fpr
Vertical & Horizontal Fsr

Vertical Orientation
Horizontal Orientation

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800R Capacitance Change vs. Temperature

TCC = 0 ±30 PPM/C

% Change in Capacitance

Temperature (Degrees C)