**ATC 700 E Series NPO Porcelain High RF Power Multilayer Capacitors**

- **Case E Size** (.380” x .380”)
- **Capacitance Range** (1 pF to 2200 pF)
- **High Q**
- **Low ESR/ESL**
- **High RF Power**
- **Extended WVDC** up to 7200 VDC
- **Ultra-Stable NPO Performance**
- **High RF Current/Voltage**
- **High Reliability**
- **Available with Encapsulation Option**

ATC, the industry leader, offers new improved ESR/ESL performance for the 700 E Series RF Capacitors. This high Q multilayer capacitor is ultra-stable under high RF current and voltage applications with NPO performance. 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: HF/RF Power Amplifiers, Transmitters, Antenna Tuning, Plasma Chambers and Medical (MRI coils).

*For leaded styles only*

**ENVIRONMENTAL TESTS**

ATC 700 E 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:**
MIL-STD-202, Method 108, for 2000 hours, at 125°C.
Voltage applied.
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 pF to 1000 pF) @ 1 MHz.
Greater than 10,000 (1100 pF to 2200 pF) @ 1 KHz.

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

**INSULATION RESISTANCE (IR):**
1 pF to 2200 pF:
10⁵ Megohms min. @ +25°C at 500 VDC.
10⁴ Megohms min. @ +125°C at 500 VDC.

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

**DIELECTRIC WITHSTANDING VOLTAGE (DWV):**
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., 25 lbs. typical, for 5 seconds in direction perpendicular to the termination surface of the capacitor.
Test per MIL-STD-202, method 211.
### ATC 700 E Capacitance Values

<table>
<thead>
<tr>
<th>CAP. CODE</th>
<th>CAP. (pF)</th>
<th>TOL.</th>
<th>RATED WVDC</th>
<th>ST.</th>
<th>EXT.</th>
<th>CAP. CODE</th>
<th>CAP. (pF)</th>
<th>TOL.</th>
<th>RATED WVDC</th>
<th>ST.</th>
<th>EXT.</th>
<th>CAP. CODE</th>
<th>CAP. (pF)</th>
<th>TOL.</th>
<th>RATED WVDC</th>
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</table>

VRMS = 0.707 x WVDC

- SPECIAL VALUES, TOLERANCES, MATCHING, AND CAPACITOR ASSEMBLIES ARE AVAILABLE.
- ATC’s CUSTOM POWER CAPACITOR ASSEMBLY CATALOG, ATC # 001-900 LISTS ASSEMBLY OPTIONS.
- EXTENDED WORKING VOLTAGES ARE AVAILABLE FOR COMMERCIAL ORDERS ONLY.
- ENCAPSULATION OPTION AVAILABLE. PLEASE CONSULT FACTORY.

### 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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<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>

### ATC PART NUMBER CODE

- **Series**: 700
- **Case Size**: E
- **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**: K tolerance (±10%), 3600 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and ATC Matrix Tray packaging.

The above part number refers to a 700 E Series (case size E) 390 pF capacitor, K tolerance (±10%), 3600 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and ATC Matrix Tray packaging.

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

Consult factory for additional performance data.
### ATC 700 E Capacitors: Mechanical Configurations

<table>
<thead>
<tr>
<th>ATC SERIES &amp; CASE SIZE</th>
<th>ATC TERM. CODE</th>
<th>CASE SIZE &amp; TYPECASE 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>700E</td>
<td>W</td>
<td>E</td>
<td><img src="attachment" alt="Image" /></td>
<td>.380 +.015 -.010 (9.65 +.38 -0.25)</td>
<td>Tin / Lead, Solder Plated over Nickel Barrier Termination</td>
</tr>
<tr>
<td>700E</td>
<td>P</td>
<td>E</td>
<td><img src="attachment" alt="Image" /></td>
<td>.380 +.040 -.010 (9.65 +1.02 -0.25)</td>
<td>Heavy Tin / Lead Coated, over Nickel Barrier Termination</td>
</tr>
<tr>
<td>700E</td>
<td>T</td>
<td>E</td>
<td><img src="attachment" alt="Image" /></td>
<td>.380 +.015 -.010 (9.65 +.38 -0.25)</td>
<td><strong>RoHS Compliant</strong> Tin Plated over Nickel Barrier Termination</td>
</tr>
<tr>
<td>700E</td>
<td>CA</td>
<td>E</td>
<td><img src="attachment" alt="Image" /></td>
<td>.380 ±.010 (9.65 ±.25) max.</td>
<td><strong>RoHS Compliant</strong> Gold Plated over Nickel Barrier Termination</td>
</tr>
</tbody>
</table>
| 700E                   | MS             | E                                | ![Image](attachment)                      | 170 (4.32)                   | High Purity Silver Leads  
L_L = .750 (19.05) min.  
W_L = .350 ±.010 (8.89 ±.25)  
T_L = .010 ±.005 (0.25 ±.013)  
Leads are Attached with High Temperature Solder |
| 700E                   | AR             | E                                | ![Image](attachment)                      | N/A.                         | Silver-plated Copper Leads  
Dia. = .032 ±.002 (.813 ±.051)  
L_L = 2.25 (57.2) min. |
| 700E                   | AW             | E                                | ![Image](attachment)                      | N/A.                         | Silver-plated Copper Leads  
Dia. = .032 ±.002 (.813 ±.051)  
L_L = 1.0 (25.4) min. |

Custom lead styles and lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are **RoHS** compliant.
### ATC 700 E 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>
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<td></td>
<td>W/T IS A TERMINATION SURFACE</td>
<td>LENGTH (L)</td>
<td>WIDTH (W)</td>
</tr>
<tr>
<td>100E WN</td>
<td>WN E</td>
<td>Non-Mag Solder Plate</td>
<td>![Image]</td>
<td>.380 +.015 - .010 (9.65 +.038 - .25)</td>
<td>Tin/Lead, Solder Plated over Non-Magnetic Barrier Termination</td>
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<tr>
<td>100E PN</td>
<td>PN E</td>
<td>Non-Mag Pellet</td>
<td>![Image]</td>
<td>.390 +.040 - .010 (9.65 +.102 - .25)</td>
<td>Heavy Tin/Lead Coated, over Non-Magnetic Barrier Termination</td>
</tr>
<tr>
<td>100E TN</td>
<td>TN E</td>
<td>Non-Mag Solderable Barrier</td>
<td>![Image]</td>
<td>.380 +.015 - .010 (9.65 +.038 - .25)</td>
<td>RoHS Compliant Tin Plated over Non-Magnetic Barrier Termination</td>
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<tr>
<td>100E AN</td>
<td>AN E</td>
<td>Non-Mag Axial Ribbon</td>
<td>![Image]</td>
<td>.380 +.025 - .010 (9.65 +.089 - .25)</td>
<td>N.A.</td>
</tr>
<tr>
<td>100E BN</td>
<td>BN E</td>
<td>Non-Mag Axial Wire</td>
<td>![Image]</td>
<td>.380 ±.010 (9.65 ±.25)</td>
<td>Silver-plated Copper Leads Dia. = .032 ±.002 (.813 ±.051) L_L = 2.25 (57.2) min.</td>
</tr>
<tr>
<td>100E RN</td>
<td>RN E</td>
<td>Non-Mag Radial Wire</td>
<td>![Image]</td>
<td>.380 ±.010 (9.65 ±.25)</td>
<td>Silver-plated Copper Leads Dia. = .032 ±.002 (.813 ±.051) L_L = 1.0 (25.4) min.</td>
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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

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<tr>
<th>Case E</th>
<th>Vertical Mount</th>
<th>Horizontal Mount</th>
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<tbody>
<tr>
<td>Normal</td>
<td>.185</td>
<td>.050</td>
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<tr>
<td>High Density</td>
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<td>.030</td>
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<tr>
<td>Normal</td>
<td>.405</td>
<td>.050</td>
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<tr>
<td>High Density</td>
<td>.385</td>
<td>.030</td>
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Dimensions are in inches.
ATC 700 E Performance Data

ESR VS. CAPACITANCE
ATC SERIES 700, CASE E

Q VS. CAPACITANCE
ATC SERIES 700, CASE E

ESR (Ohms)
30 MHz
(Typical)

CAPACITANCE (pF)
(1.0 pF to 400 pF)

ESR VS. CAPACITANCE
ATC SERIES 700, CASE E

Q VS. CAPACITANCE
ATC SERIES 700, CASE E

ESR (Ohms)
30 MHz
(Typical)

CAPACITANCE (pF)
(430 pF to 2200 pF)

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

www.atceramics.com
ATC 700 E Performance Data

SERIES RESONANCE VS. CAPACITANCE
ATC SERIES 700, CASE E

CURRENT RATING VS. CAPACITANCE
ATC SERIES 700, CASE E

CAPACITANCE CHANGE VS. TEMPERATURE
ATC SERIES 700, CASE E

The current rating is based on a 65°C mounting surface with a device thermal resistance of 12°C/W. A power dissipation of 5 W will result in a case temperature of 125°C.

CURRENT RATING VS. CAPACITANCE
ATC SERIES 700, CASE E, EXTENDED VOLTAGE

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