ATC 400 L Series
Precision Tolerance NPO
RF Microwave Capacitors

- EIA Case Size 0402
- Capacitance Range 0.1 pF to 68 pF
- Tolerances to ±0.01 pF
- Ultra Stable Performance
- RoHS Compliant / Lead-Free

ATC’s new 400L Series Precision Tolerance, Thin Film, NPO RF Microwave Capacitor is manufactured with the highest quality materials to provide reliable and repeatable performance. The 400L is constructed with a low loss silicon dioxide and silicon oxynitride dielectric along with high quality sputtered electrode materials to ensure superior performance.

High electrical and thermal conductivity and high stability over temperature make this device suitable for a variety of critical small and large signal RF and microwave applications. This Series offers the tightest tolerances available over a wide range of capacitance values.

The 400L is built in an 0402 SMT package and is fully compatible with high speed automated pick-and-place manufacturing. It is designed to meet the most stringent RF and Microwave requirements.

Typical applications: Filter Networks, Matching Networks, High Q Frequency Sources, Tuning, Coupling, Bypass and DC Blocking.

ENVIRONMENTAL TESTS

LIFE TEST:
MIL-STD-202F, Method 108A, for 1000 hours, at 125°C. 200% WVDC applied.

ACCELERATED DAMP HEAT STEADY STATE:
MIL-STD-202F, Method 103B: 85°C, 85% RH, at rated WVDC, 1000 hours

TEMPERATURE CYCLING:
MIL-STD-202F METHOD 107E: -55°C to +125°C, 15 cycles

RESISTANCE TO SOLDER HEAT IEC-68-2-58:
260°C ±5°C for 10 secs.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

TEMPERATURE COEFFICIENT OF CAPACITANCE (TCC):
0 ±30 PPM/°C (-55°C to +125°C) 0.1 pF to 12 pF
0 ±60 PPM/°C (-55°C to +125°C) 13 pF to 68 pF

INSULATION RESISTANCE (IR):
10⁶ Megohms min. @ +25°C at rated WVDC

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

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

AGING EFFECTS: None

DIELECTRIC ABSORPTION: 0.01%

SOLDERABILITY, IEC-68-2-58: Components completely immersed in a solder bath at 235°C for 2 secs.

LEACH RESISTANCE, IEC-68-2-58: Components completely immersed in a solder bath at 260 ±5°C for 60 secs.


OPERATING TEMPERATURE RANGE:
From -55°C to +125°C (No derating of working voltage)

TERMINAL STRENGTH IEC-68-2-21, AMEND. 2: a force of 1.1 lbs. applied for 10 secs.

STORAGE: 12 months minimum with components stored in “as received” packaging
# ATC 400 L Capacitance Values

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<th>CAP (pF)</th>
<th>TOL.</th>
<th>RATED WVDC</th>
<th>CAP CODE</th>
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VRMS = 0.707 x WVDC

## 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

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<tr>
<th>Code</th>
<th>P</th>
<th>Q</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>F</th>
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<td>±0.02 pF</td>
<td>±0.03 pF</td>
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<td>±0.1 pF</td>
<td>±0.25 pF</td>
<td>±1%</td>
<td>±2%</td>
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Z tolerance (±0.01 pF), 200 WVDC, with T termination (Tin Plated over Nickel Barrier Termination, RoHS Compliant), and tape and reel packaging.

- **Packaging**
  - T - Tape & Reel: 7” reel, 5000 pc. qty. std.*
  - *500 pc. prototype reel available.

- **Capacitance Tolerance**

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.
**Mechanical Dimensions**

![Mechanical Dimensions Diagram](image)

**Outline Dimensions**

![Outline Dimensions Diagram](image)

**Suggested Mounting Pad Dimensions**

![Suggested Mounting Pad Dimensions](image)

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ATC 400 L Performance Data

400 L ESR vs. Frequency

- ESR (mOhms)
- Frequency (MHz)
- Typical values for different Capacitance levels:
  - 0.8 pF
  - 1.2 pF
  - 1.8 pF
  - 2.2 pF
  - 3.3 pF
  - 4.7 pF

400 L FSR vs. Capacitance

- Frequency (GHz)
- Capacitance (pF)
- Typical values for different Frequency levels:
  - 0.8 pF
  - 1.2 pF
  - 1.8 pF
  - 2.2 pF
  - 3.3 pF
  - 4.7 pF