

# ATC 400 Z Series Precision Tolerance NPO RF Microwave Capacitors

- EIA Case Size 0201
- Capacitance Range 0.1 pF to 22 pF
- Tolerances to  $\pm 0.02$  pF
- Ultra Stable Performance
- RoHS Compliant / Lead-Free

ATC's new 400Z Series Precision Tolerance, Thin Film, NPO RF Microwave Capacitor is manufactured with the highest quality materials to provide reliable and repeatable performance. The 400Z 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 400Z is built in an 0201 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-202, Method 106: 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  $\pm 5$ °C for 10 secs.



## ELECTRICAL AND MECHANICAL SPECIFICATIONS

### TEMPERATURE COEFFICIENT OF CAPACITANCE (TCC):

0  $\pm 30$  PPM/°C (-55°C to +125°C) 0.1 to 3.9 pF  
0  $\pm 60$  PPM/°C (-55°C to +125°C) 4.0 to 22 pF

### INSULATION RESISTANCE (IR):

10<sup>4</sup> 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  $\pm 5$ °C for 60 secs.

**ADHESION, MIL-STD-202F, METHOD 211A:** a force of 1.1 lbs. applied for 10 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



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# ATC 400 Z Capacitance Values

| CAP CODE | CAP (pF) | TOL.       | RATED WVDC | CAP CODE | CAP (pF) | TOL.       | RATED WVDC | CAP CODE | CAP (pF) | TOL.    | RATED WVDC |         |    |
|----------|----------|------------|------------|----------|----------|------------|------------|----------|----------|---------|------------|---------|----|
| 0R1      | 0.1      |            | 100        | 2R3      | 2.3      | Q, A, B, C |            | 4R5      | 4.5      | A, B, C |            |         |    |
| 0R2      | 0.2      |            |            | 2R4      | 2.4      |            |            | 4R6      | 4.6      |         |            |         |    |
| 0R3      | 0.3      |            |            | 2R5      | 2.5      |            |            | 4R7      | 4.7      |         |            |         |    |
| 0R4      | 0.4      |            |            | 2R6      | 2.6      |            |            | 5R1      | 5.1      |         |            |         |    |
| 0R5      | 0.5      |            |            | 2R7      | 2.7      |            |            | 5R6      | 5.6      |         |            |         |    |
| 0R6      | 0.6      | P, Q, A, B | 50         | 2R8      | 2.8      | A, B, C    | 25         | 6R2      | 6.2      | B, C    |            |         |    |
| 0R7      | 0.7      |            |            | 2R9      | 2.9      |            |            | 6R8      | 6.8      |         |            |         |    |
| 0R8      | 0.8      |            |            | 3R0      | 3.0      |            |            | 7R5      | 7.5      |         |            |         |    |
| 0R9      | 0.9      |            |            | 3R1      | 3.1      |            |            | 8R2      | 8.2      |         |            |         |    |
| 1R0      | 1.0      |            |            | 3R2      | 3.2      |            |            | 9R1      | 9.1      |         |            |         |    |
| 1R1      | 1.1      |            |            | 3R3      | 3.3      |            |            | 100      | 10       |         |            | F, G, J | 16 |
| 1R2      | 1.2      |            |            | 3R4      | 3.4      |            |            | 110      | 11       |         |            |         |    |
| 1R3      | 1.3      |            |            | 3R5      | 3.5      |            |            | 120      | 12       |         |            |         |    |
| 1R4      | 1.4      |            |            | 3R6      | 3.6      |            |            | 130      | 13       |         |            |         |    |
| 1R5      | 1.5      |            |            | 3R7      | 3.7      |            |            | 140      | 14       |         |            |         |    |
| 1R6      | 1.6      | 3R8        | 3.8        | 150      | 15       |            |            |          |          |         |            |         |    |
| 1R7      | 1.7      | 3R9        | 3.9        | 160      | 16       |            |            |          |          |         |            |         |    |
| 1R8      | 1.8      | 4R0        | 4.0        | 170      | 17       |            |            |          |          |         |            |         |    |
| 1R9      | 1.9      | 4R1        | 4.1        | 180      | 18       |            |            |          |          |         |            |         |    |
| 2R0      | 2.0      | Q, A, B, C | 25         | 4R2      | 4.2      | 190        | 19         |          |          |         |            |         |    |
| 2R1      | 2.1      |            |            | 4R3      | 4.3      | 200        | 20         | 10       |          |         |            |         |    |
| 2R2      | 2.2      |            |            | 4R4      | 4.4      | 210        | 21         |          |          |         |            |         |    |
|          |          |            |            |          |          | 220        | 22         |          |          |         |            |         |    |

**VRMS = 0.707 X WVDC**

### ATC PART NUMBER CODE



| CAPACITANCE TOLERANCE |          |          |          |         |          |     |     |     |
|-----------------------|----------|----------|----------|---------|----------|-----|-----|-----|
| Code                  | P        | Q        | A        | B       | C        | F   | G   | J   |
| Tol.                  | ±0.02 pF | ±0.03 pF | ±0.05 pF | ±0.1 pF | ±0.25 pF | ±1% | ±2% | ±5% |

The above part number refers to a 400 Z Series (0201) 1 pF capacitor, P tolerance (±0.02 pF), 50 WVDC, with T termination (Tin Plated over Nickel Barrier Termination), RoHS Compliant), 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.

## Mechanical Dimensions



## Outline Dimensions



## Suggested Mounting Pad Dimensions



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# ATC 400 Z Performance Data



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