

# ATC 800 A Series NPO Ceramic, High RF Power Ultra-Low ESR Multilayer Capacitors

- Case A Size (.055" x .055")
- Rugged, reliable NPO dielectric
- Case optimized for highest self resonant frequency
- Capacitance Range 0.1 pF to 100 pF
- Lowest ESR
- Capable of highest RF Power
- RoHS Compliant / Lead Free

ATC's 800 A Series offers superb performance in demanding high RF power applications requiring consistent and reliable operation. The combination of highly conductive metal electrode systems, optimized case geometries, and proprietary dielectrics, yields the lowest ESR. 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 insure that the 800 A Series products are your best choice for high RF power applications from UHF through microwave frequencies.

Typical applications: UHF and Microwave Communications Systems, Wireless Communications, Public Safety Radio, Telecom, WiMAX, and Satellite Systems.

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

## ENVIRONMENTAL TESTS

ATC 800 A 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:

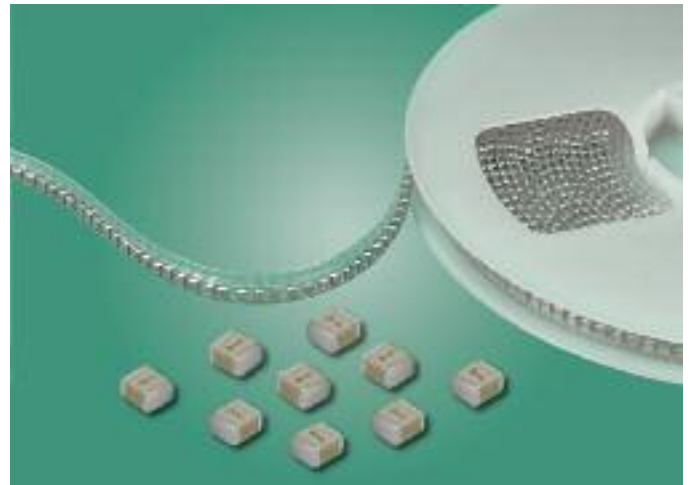
MIL-STD-202, Method 106

### LOW VOLTAGE HUMIDITY:

MIL-STD-202, Method 103, Condition A, with 1.5 Volts 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 200% WVDC applied



## ELECTRICAL AND MECHANICAL SPECIFICATIONS

**QUALITY FACTOR (Q):** > 2000 @ 1 MHz

### TEMPERATURE COEFFICIENT OF CAPACITANCE (TCC):

0 ±30 PPM/°C (-55°C to +125°C)

### INSULATION RESISTANCE (IR):

0.1 pF to 100 pF:

10<sup>5</sup> Megohms min. @ +25°C at rated WVDC

10<sup>4</sup> Megohms min. @ +125°C at rated WVDC

### WORKING VOLTAGE (WVDC):

See Capacitance Values Table, page 2

### DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Case A: 250% of rated WVDC for 5 secs. (625 VDC)

**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 STYLE:

RoHS Compliant and Solder Plate  
See Mechanical Configurations, page 3

**TERMINAL STRENGTH:** Terminations for chips withstand a pull of 5 lbs. min., 10 lbs. typical, for 5 seconds in direction perpendicular to the termination surface of the capacitor. Test per MIL-STD-202, method 211.



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ATC # 001-1032 Rev. I, 6/13

# ATC 800 A Capacitance Values

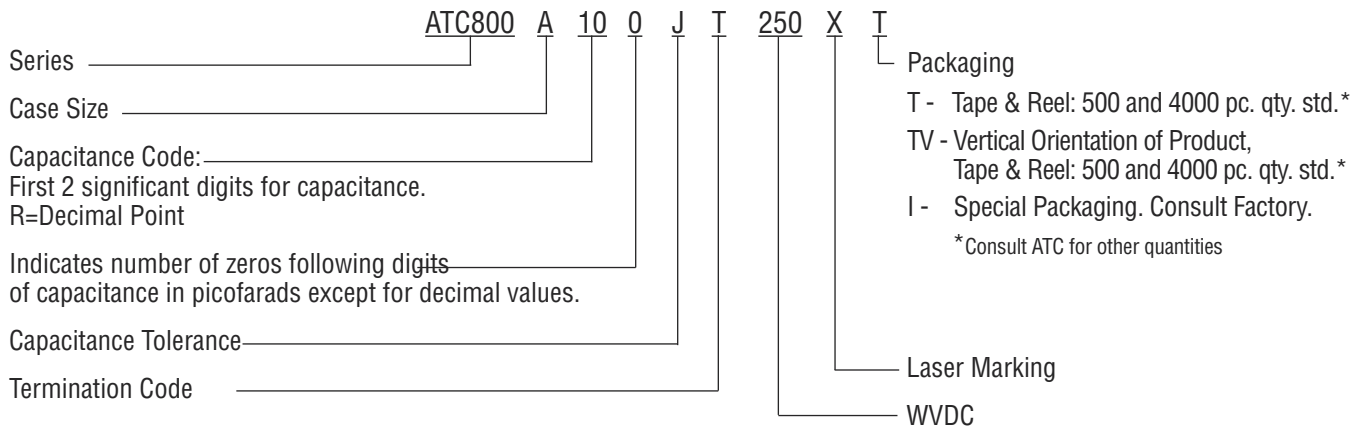
| CAP. CODE | CAP. (pF) | TOL.    | RATED WVDC | CAP. CODE     | CAP. (pF) | TOL.          | RATED WVDC | CAP. CODE | CAP. (pF) | TOL.          | RATED WVDC |
|-----------|-----------|---------|------------|---------------|-----------|---------------|------------|-----------|-----------|---------------|------------|
| 0R1       | 0.1       | B       | 250        | 2R2           | 2.2       | B, C, D       | 250        | 160       | 16        | F, G, J, K, M | 250        |
| 0R2       | 0.2       | B, C    |            | 2R4           | 2.4       |               |            | 180       | 18        |               |            |
| 0R3       | 0.3       |         |            | 2R7           | 2.7       |               |            | 200       | 20        |               |            |
| 0R4       | 0.4       |         |            | 3R0           | 3.0       |               |            | 220       | 22        |               |            |
| 0R5       | 0.5       | B, C, D |            | 3R3           | 3.3       |               |            | 240       | 24        |               |            |
| 0R6       | 0.6       |         |            | 3R6           | 3.6       |               |            | 270       | 27        |               |            |
| 0R7       | 0.7       |         |            | 3R9           | 3.9       |               |            | 300       | 30        |               |            |
| 0R8       | 0.8       |         |            | 4R3           | 4.3       |               |            | 330       | 33        |               |            |
| 0R9       | 0.9       |         |            | 4R7           | 4.7       |               |            | 360       | 36        |               |            |
| 1R0       | 1.0       |         |            | 5R1           | 5.1       |               |            | 390       | 39        |               |            |
| 1R1       | 1.1       |         |            | 5R6           | 5.6       |               |            | 430       | 43        |               |            |
| 1R2       | 1.2       |         |            | 6R2           | 6.2       |               |            | 470       | 47        |               |            |
| 1R3       | 1.3       |         |            | 6R8           | 6.8       | B, C, J, K, M |            | 510       | 51        |               |            |
| 1R4       | 1.4       |         |            | 7R5           | 7.5       |               |            | 560       | 56        |               |            |
| 1R5       | 1.5       |         |            | 8R2           | 8.2       |               |            | 620       | 62        |               |            |
| 1R6       | 1.6       |         |            | 9R1           | 9.1       |               |            | 680       | 68        |               |            |
| 1R7       | 1.7       |         |            | F, G, J, K, M | 100       | 10            |            | 750       | 75        |               |            |
| 1R8       | 1.8       |         |            |               | 110       | 11            |            | 820       | 82        |               |            |
| 1R9       | 1.9       |         |            |               | 120       | 12            |            | 910       | 91        |               |            |
| 2R0       | 2.0       |         |            |               | 130       | 13            |            | 101       | 100       |               |            |
| 2R1       | 2.1       |         |            |               | 150       | 15            |            |           |           |               |            |

$$V_{RMS} = 0.707 \times WVDC$$

**SPECIAL VALUES, TOLERANCES, HIGHER WVDC AND MATCHING AVAILABLE. PLEASE CONSULT FACTORY.**

| CAPACITANCE TOLERANCE |         |          |         |     |     |     |      |      |
|-----------------------|---------|----------|---------|-----|-----|-----|------|------|
| Code                  | B       | C        | D       | F   | G   | J   | K    | M    |
| Tol.                  | ±0.1 pF | ±0.25 pF | ±0.5 pF | ±1% | ±2% | ±5% | ±10% | ±20% |

## ATC PART NUMBER CODE



The above part number refers to a 800 A Series (case size A) 10 pF capacitor, J tolerance (±5%), 150 WVDC, with T termination (Tin Plated over Nickel Barrier, RoHS Compliant), laser marking 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.

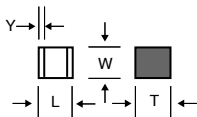
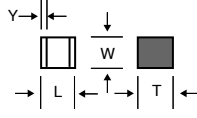
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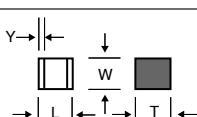
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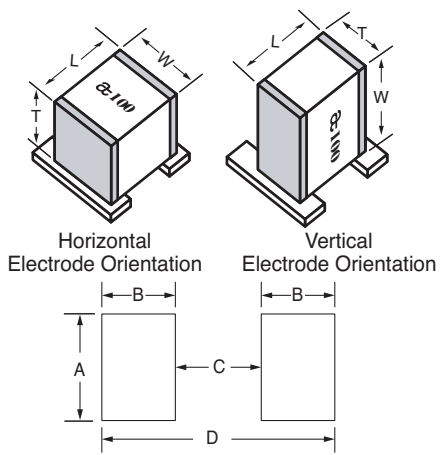
## ATC 800 A Capacitors: Mechanical Configurations

| ATC SERIES & CASE SIZE | ATC TERM. CODE | CASE SIZE & TYPE                                                                                              | OUTLINES<br>W/T IS A TERMINATION SURFACE                                          | BODY DIMENSIONS<br>Inches (mm)               |                               |                     | LEAD AND TERMINATION<br>DIMENSIONS AND MATERIALS |                                                                        |
|------------------------|----------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------|-------------------------------|---------------------|--------------------------------------------------|------------------------------------------------------------------------|
|                        |                |                                                                                                               |                                                                                   | LENGTH<br>(L)                                | WIDTH<br>(W)                  | THICKNESS<br>(T)    | OVERLAP<br>(Y)                                   | MATERIAL                                                               |
| 800A                   | T              | A  Solderable Nickel Barrier |  | .055<br>+.015 -.010<br>(1.40<br>+0.38 -0.25) | .055 ±.015<br>(1.40 ±0.38)    | .057 (1.45)<br>max. | .010<br>+.010 -.005<br>(0.25<br>+0.25 -0.13)     | <b>RoHS Compliant</b><br>Tin Plated over<br>Nickel Barrier Termination |
| 800A                   | W              | A  Solder Plate              |  | .055<br>+.015 -.010<br>(1.40<br>+0.38 -0.25) | .055 ±.015<br>(1.40<br>±0.38) | .057 (1.45)<br>max. | .010<br>+.010 -.005<br>(0.25<br>+0.25 -0.13)     | Tin/Lead Solder Plated over<br>Nickel Barrier Termination              |

## ATC 800 A Non-Magnetic Capacitors: Mechanical Configurations

| ATC SERIES & CASE SIZE | ATC TERM. CODE | CASE SIZE & TYPE                                                                                               | OUTLINES<br>W/T IS A TERMINATION SURFACE                                           | BODY DIMENSIONS<br>Inches (mm)               |                            |                     | LEAD AND TERMINATION<br>DIMENSIONS AND MATERIALS |                                                                              |
|------------------------|----------------|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------|----------------------------|---------------------|--------------------------------------------------|------------------------------------------------------------------------------|
|                        |                |                                                                                                                |                                                                                    | LENGTH<br>(L)                                | WIDTH<br>(W)               | THICKNESS<br>(T)    | OVERLAP<br>(Y)                                   | MATERIAL                                                                     |
| 800A                   | TN             | A  Non-Mag Solderable Barrier |  | .055<br>+.015 -.010<br>(1.40<br>+0.38 -0.25) | .055 ±.015<br>(1.40 ±0.38) | .057 (1.45)<br>max. | .010<br>+.010 -.005<br>(0.25<br>+0.25 -0.13)     | <b>RoHS Compliant</b><br>Tin Plated over<br>Non-Magnetic Barrier Termination |

## Suggested Mounting Pad Dimensions



Horizontal Electrode Orientation

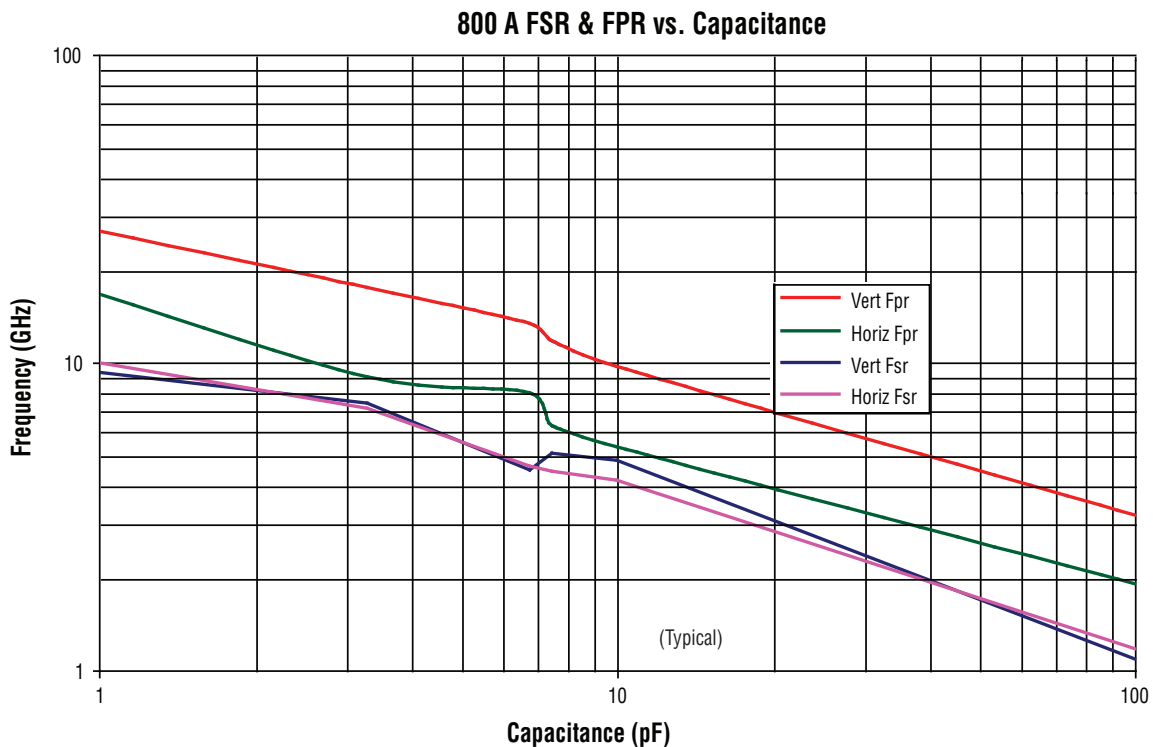
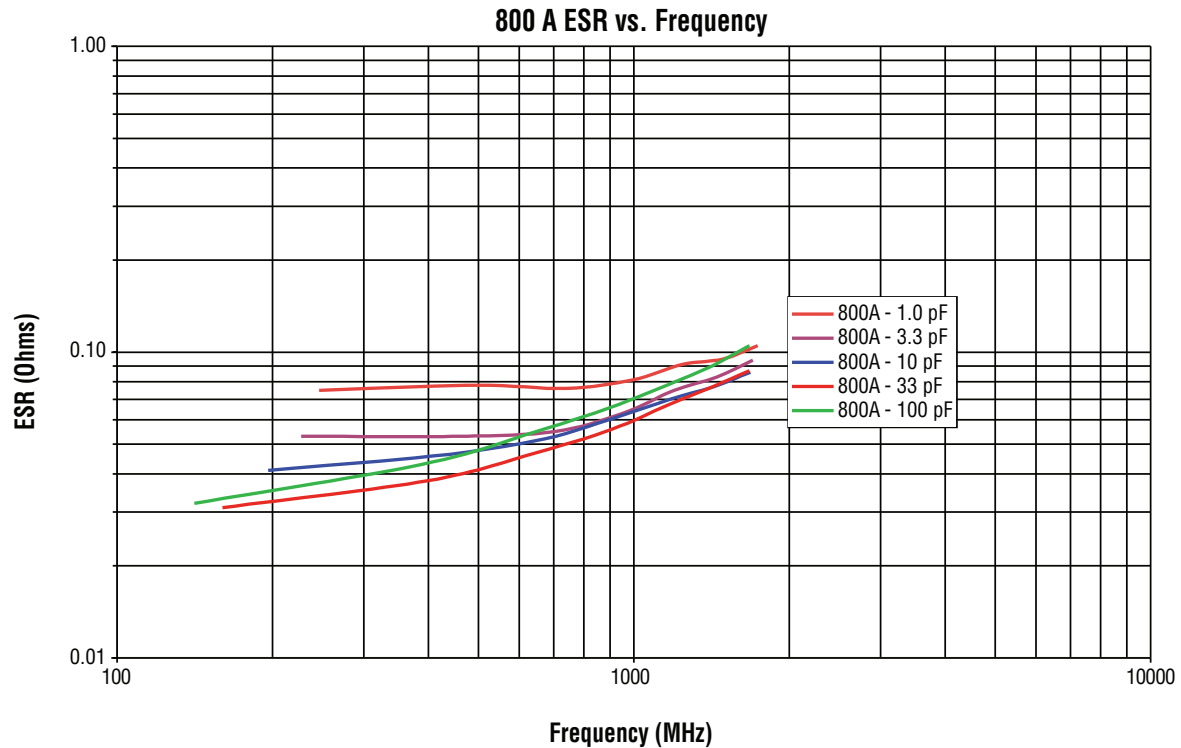
Vertical Electrode Orientation

Case A

|                  | Pad Size     | A Min. | B Min. | C Min. | D Min. |
|------------------|--------------|--------|--------|--------|--------|
| Vertical Mount   | Normal       | .070   | .050   | .030   | .130   |
|                  | High Density | .050   | .030   | .030   | .090   |
| Horizontal Mount | Normal       | .080   | .050   | .030   | .130   |
|                  | High Density | .060   | .030   | .030   | .090   |

Dimensions are in inches.

# ATC 800 A Performance Data



## ATC 800 A Series Data Sheet Test Condition Description

Capacitors horizontally mounted in series microstrip configuration on 23.3-mil thick Rogers RO4350<sup>®</sup> softboard, 52-mils wide 1/2 oz. Cu traces.

**FSR** = lowest frequency at which S11 response, referenced at capacitor edge, crosses real axis on Smith Chart.

**FPR** = lowest frequency at which there is a notch in S21 magnitude response.

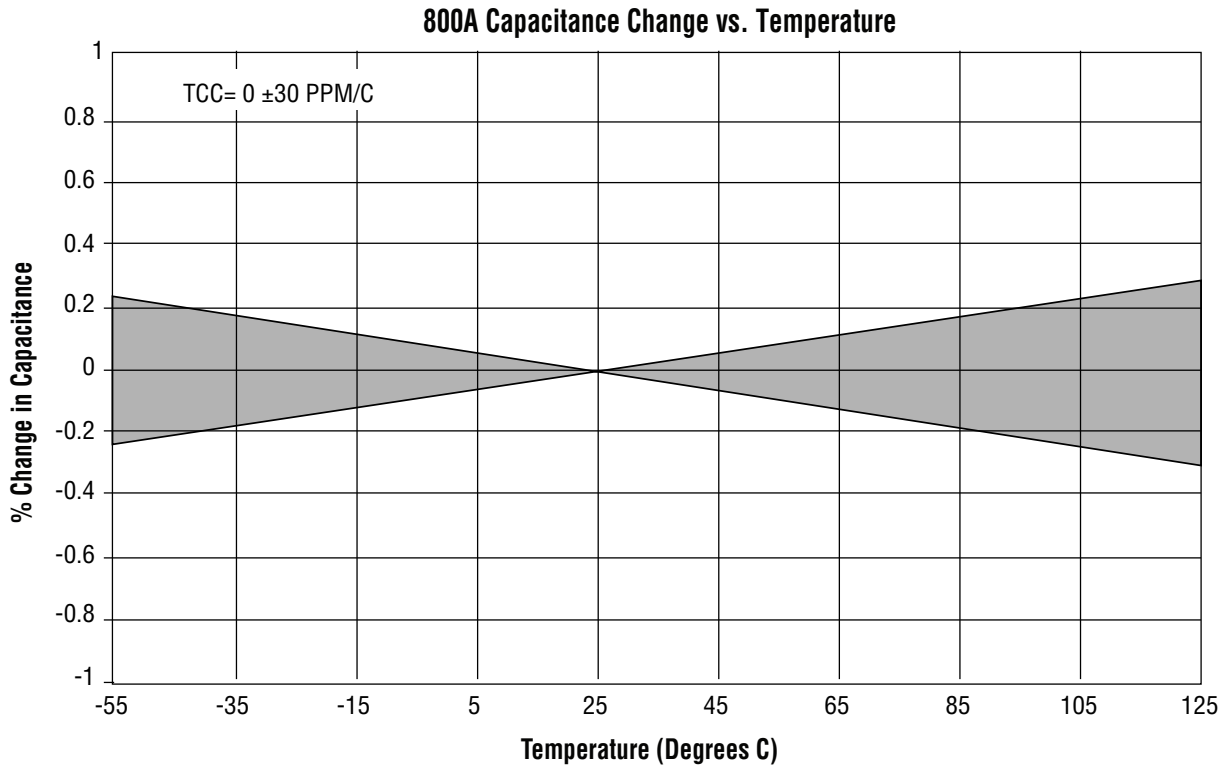
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# ATC 800 A Performance Data



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