

# ATC 800 B Series NPO Ceramic High RF Power Multilayer Capacitors

- Case B Size (.110" x .110")
- Rugged, reliable NPO dielectric
- Case optimized for highest self resonant frequency
- Capacitance Range 0.1 pF to 1000 pF
- Lowest ESR
- Capable of highest RF Power
- RoHS Compliant / Lead-Free

ATC's 800 B 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 B Series products are your best choice for high RF power applications from VHF through microwave frequencies.

Typical applications: VHF / UHF / HDTV Broadcast Transmitters, Wireless Communications, Public Safety Radio, Avionics, Telecom, WiMAX, Microwave Communication Systems 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 B 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:

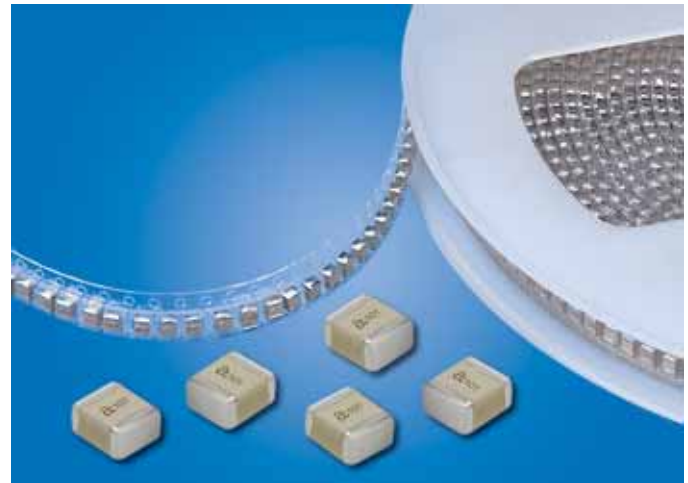
MIL-STD-202, Method 106

### 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 1000 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 B: 250% of rated WVDC for 5 secs

**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:

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.



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ATC # 001-1033 Rev. E 1/09

# ATC 800 B Capacitance Values

| CAP. CODE | CAP. (pF) | TOL.          | RATED WVDC | 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             | 500        | 2R4       | 2.4       | B, C, D | 500        | 200       | 20        | F, G, J, K, M | 500        | 151       | 150       | F, G, J, K, M | 300        |
| 0R2       | 0.2       | B, C          |            | 2R7       | 2.7       |         |            | 220       | 22        |               |            | 161       | 160       |               |            |
| 0R3       | 0.3       |               |            | 3R0       | 3.0       |         |            | 240       | 24        |               |            | 181       | 180       |               |            |
| 0R4       | 0.4       | B, C, D       |            | 3R3       | 3.3       |         |            | 270       | 27        |               |            | 201       | 200       |               |            |
| 0R5       | 0.5       |               |            | 3R6       | 3.6       |         |            | 300       | 30        |               |            | 221       | 220       |               |            |
| 0R6       | 0.6       |               |            | 3R9       | 3.9       |         |            | 330       | 33        |               |            | 241       | 240       |               |            |
| 0R7       | 0.7       |               |            | 4R3       | 4.3       |         |            | 360       | 36        |               |            | 271       | 270       |               |            |
| 0R8       | 0.8       |               |            | 4R7       | 4.7       |         |            | 390       | 39        |               |            | 301       | 300       |               |            |
| 0R9       | 0.9       |               |            | 5R1       | 5.1       |         |            | 430       | 43        |               |            | 331       | 330       |               |            |
| 1R0       | 1.0       |               |            | 5R6       | 5.6       |         |            | 470       | 47        |               |            | 361       | 360       |               |            |
| 1R1       | 1.1       |               | 6R2        | 6.2       | 510       | 51      | 391        | 390       |           |               |            |           |           |               |            |
| 1R2       | 1.2       | B, C, J, K, M | 6R8        | 6.8       | 560       | 56      | 431        | 430       |           |               |            |           |           |               |            |
| 1R3       | 1.3       |               | 7R5        | 7.5       | 620       | 62      | 471        | 470       |           |               |            |           |           |               |            |
| 1R4       | 1.4       | F, G, J, K, M | 8R2        | 8.2       | 680       | 68      | 511        | 510       |           |               |            |           |           |               |            |
| 1R5       | 1.5       |               | 9R1        | 9.1       | 750       | 75      | 561        | 560       |           |               |            |           |           |               |            |
| 1R6       | 1.6       | F, G, J, K, M | 100        | 10        | 820       | 82      | 621        | 620       |           |               |            |           |           |               |            |
| 1R7       | 1.7       |               | 110        | 11        | 910       | 91      | 681        | 680       |           |               |            |           |           |               |            |
| 1R8       | 1.8       | F, G, J, K, M | 120        | 12        | 101       | 100     | 751        | 750       |           |               |            |           |           |               |            |
| 1R9       | 1.9       |               | 130        | 13        | 111       | 110     | 821        | 820       |           |               |            |           |           |               |            |
| 2R0       | 2.0       | F, G, J, K, M | 150        | 15        | 121       | 120     | 911        | 910       |           |               |            |           |           |               |            |
| 2R1       | 2.1       |               | 160        | 16        | 131       | 130     | 102        | 1000      |           |               |            |           |           |               |            |
| 2R2       | 2.2       |               | 180        | 18        |           |         |            |           |           |               |            |           |           |               |            |

VRMS = 0.707 X WVDC

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

## ATC PART NUMBER CODE

ATC800 B 91 0 J T 500 X T

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

Packaging  
 T - Tape & Reel: 500 and 1000 pc. qty. std.\*  
 TV - Vertical Orientation of Product,  
 Tape & Reel: 500 and 1000 pc. qty. std.\*  
 I - Special Packaging. Consult Factory.  
 \*Consult ATC for other quantities

Laser Marking  
 WVDC  
 Termination Code

The above part number refers to a 800 B Series (case size B) 91 pF capacitor, J tolerance (±5%), 500 WVDC, with T termination (Tin Plated over Nickel Barrier Termination, RoHS Compliant), laser marking and tape and reel packaging.

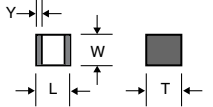
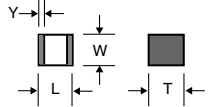
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For additional information and catalogs contact your ATC representative or call direct at (631) 622-4700.  
 Consult factory for additional performance data.

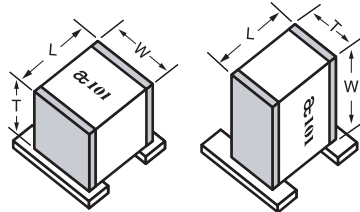
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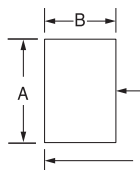
# ATC 800 B Capacitors: Mechanical Configurations

| 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 DIMENSIONS AND MATERIALS |  |
|------------------------|----------------|-----------------------------------|---|--|----------------------------|---------------------|---|--|
|                        |                |                                   |   | LENGTH (L)                                   | WIDTH (W)                  | THICKNESS (T)       | OVERLAP (Y)                                   | MATERIAL   |
| 800B                   | T              | B<br>Solderable<br>Nickel Barrier |  | .110<br>+.020 -.010<br>(2.79<br>+0.51 -.025) | .110 ±.015<br>(2.79 ±0.38) | .102 (2.59)<br>max. | .015 (0.38)<br>±.010 (0.25)                   | <b>RoHS Compliant</b><br>Tin Plated over<br>Nickel Barrier Termination |
| 800B                   | W              | B<br>Solder Plate                 |  | .110<br>+.020 -.010<br>(2.79<br>+0.51 -.025) | .110 ±.015<br>(2.79 ±0.38) | .102 (2.59)<br>max. | .015 (0.38)<br>±.010 (0.25)                   | Tin/Lead Solder Plated over<br>Nickel Barrier Termination              |

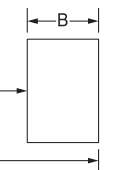
## Suggested Mounting Pad Dimensions



Horizontal Electrode Orientation



Vertical Electrode Orientation



Case B Vertical Mount

| Cap Value     | Pad Size     | A Min. | B Min. | C Min. | D Min. |
|---------------|--------------|--------|--------|--------|--------|
| 0.1 pF        | Normal       | .065   | .050   | .075   | .175   |
|               | High Density | .045   | .030   | .075   | .135   |
| 0.2 pF        | Normal       | .090   | .050   | .075   | .175   |
|               | High Density | .070   | .030   | .075   | .135   |
| 0.3 to 510 pF | Normal       | .110   | .050   | .075   | .175   |
|               | High Density | .090   | .030   | .075   | .135   |
| > 510 pF      | Normal       | .120   | .050   | .075   | .175   |
|               | High Density | .100   | .030   | .075   | .135   |

Horizontal Mount

| All values | Pad Size     | A Min. | B Min. | C Min. | D Min. |
|------------|--------------|--------|--------|--------|--------|
| All values | Normal       | .130   | .050   | .075   | .175   |
|            | High Density | .110   | .030   | .075   | .135   |

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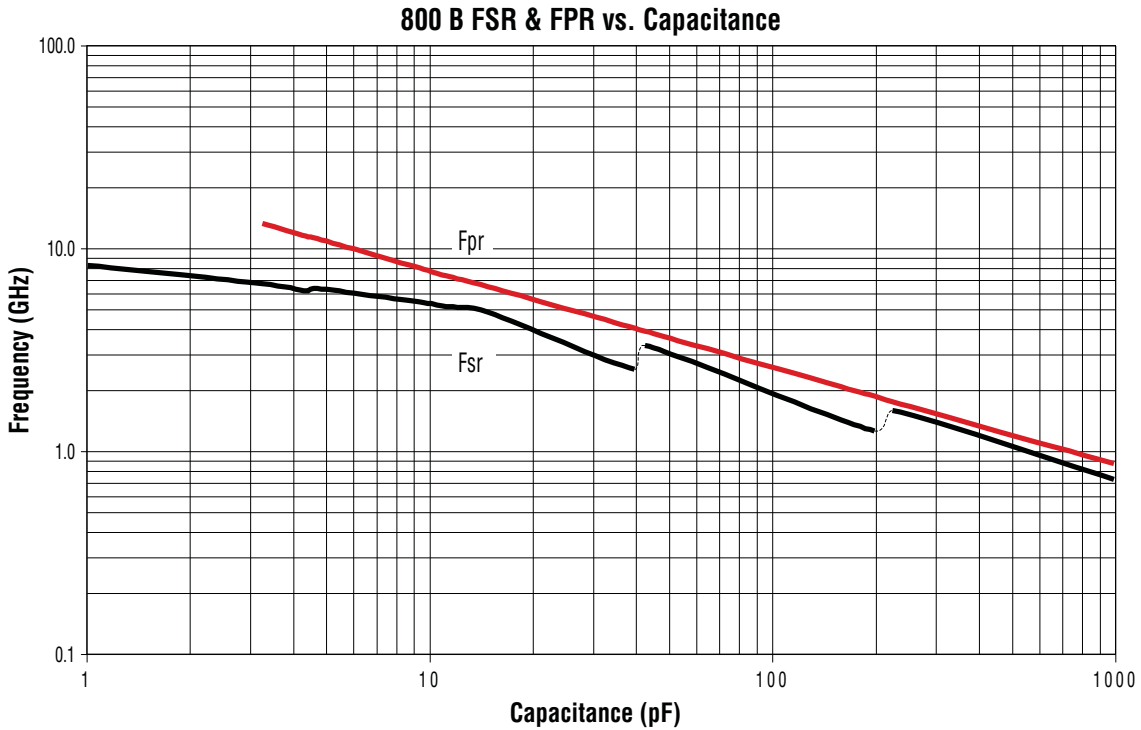
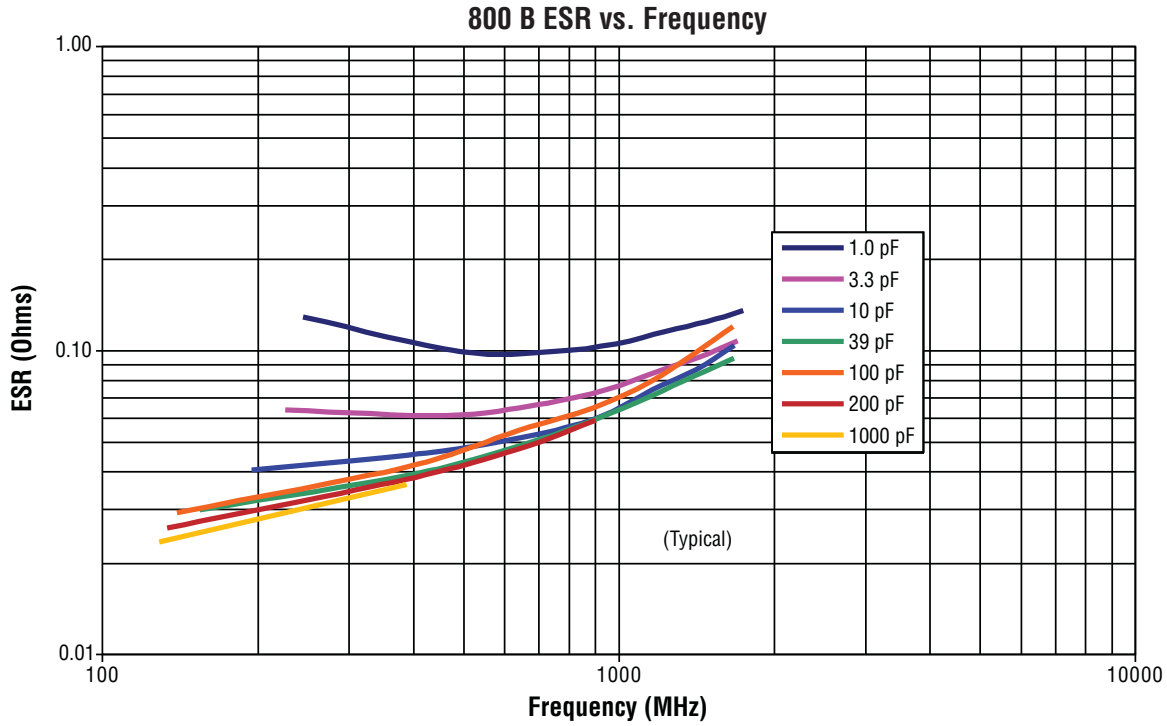
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# ATC 800 B Performance Data



#### ATC 800 B Series Data Sheet Test Condition Description

Capacitors vertically 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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