

# ATC 800 R Series NPO Ceramic, High RF Power Lowest ESR Multilayer Capacitors

- Case R Size (.070" x .090")
- Rugged, reliable NPO dielectric
- Optimized for highest self resonant frequency
- Capacitance Range 1 pF to 100 pF
- Optimized for lowest ESR and superior heat transfer
- Capable of highest RF Power
- RoHS Compliant / Lead-Free

ATC's 800 R Series offers superb performance in demanding high RF power applications requiring consistent and reliable operation. The combination of optimized case geometry, highly conductive electrode formulations and proprietary dielectrics, yields the lowest ESR and superior heat transfer. 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 ensure that the 800 R Series products are your best choice for high RF power applications from UHF through microwave frequencies.

Typical applications: WiMAX/LTE\*, Homeland Security/Public Safety Radio (APCO-25), Satellite Systems, Avionics, Digital HD FM Transmitters, Digital HDTV Transmitters, Microwave Communications and Medical Electronics.

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

\* Long term evolution

## ENVIRONMENTAL TESTS

ATC 800 R 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:

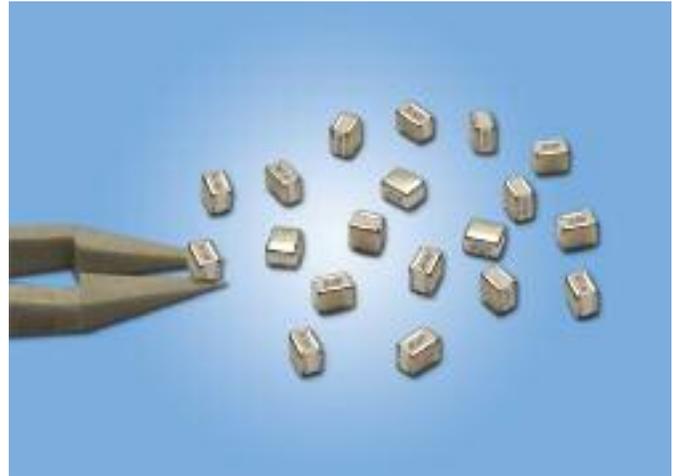
MIL-STD-202, Method 106

### LOW VOLTAGE HUMIDITY:

MIL-STD-202, Method 103, Condition A, with 1.5 Volts D.C. 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):** > 2,000 @ 1 MHz

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

### INSULATION RESISTANCE (IR):

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):** 500 WVDC

### DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Case R: 250% of rated WVDC for 5 secs

**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

### 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 800 R Series NPO Ceramic Ultra-Low ESR Multilayer Capacitors

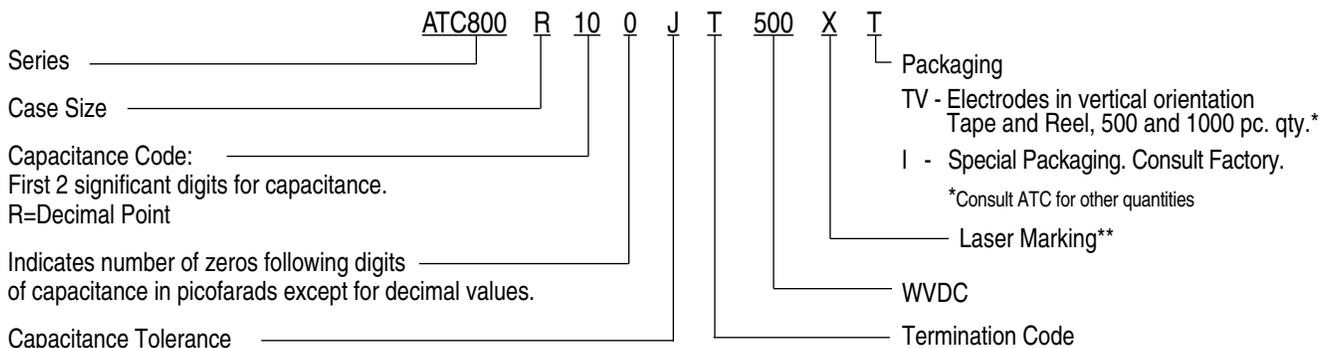
## ATC 800 R Capacitance Values

| CAP. CODE | CAP. (pF) | TOL.    | RATED WVDC | CAP. CODE | CAP. (pF) | TOL.    | RATED WVDC | CAP. CODE | CAP. (pF) | TOL.         | RATED WVDC |
|-----------|-----------|---------|------------|-----------|-----------|---------|------------|-----------|-----------|--------------|------------|
| 1R0       | 1.0       | B, C, D | 500        | 3R9       | 3.9       | B, C, D | 500        | 220       | 22        | G, J<br>K, M | 500        |
| 1R1       | 1.1       |         |            | 4R3       | 4.3       |         |            | 240       | 24        |              |            |
| 1R2       | 1.2       |         |            | 4R7       | 4.7       |         |            | 270       | 27        |              |            |
| 1R3       | 1.3       |         |            | 5R1       | 5.1       |         |            | 300       | 30        |              |            |
| 1R4       | 1.4       |         |            | 5R6       | 5.6       |         |            | 330       | 33        |              |            |
| 1R5       | 1.5       |         |            | 6R2       | 6.2       |         |            | 360       | 36        |              |            |
| 1R6       | 1.6       |         |            | 6R8       | 6.8       | 390     |            | 39        |           |              |            |
| 1R7       | 1.7       |         |            | 7R5       | 7.5       | 430     |            | 43        |           |              |            |
| 1R8       | 1.8       |         |            | 8R2       | 8.2       | 470     |            | 47        |           |              |            |
| 1R9       | 1.9       |         |            | 9R1       | 9.1       | 510     |            | 51        |           |              |            |
| 2R0       | 2.0       |         |            | 100       | 10        | 560     |            | 56        |           |              |            |
| 2R1       | 2.1       |         |            | 110       | 11        | 620     |            | 62        |           |              |            |
| 2R2       | 2.2       |         |            | 120       | 12        | 680     |            | 68        |           |              |            |
| 2R4       | 2.4       |         |            | 130       | 13        | 750     |            | 75        |           |              |            |
| 2R7       | 2.7       |         |            | 150       | 15        | 820     |            | 82        |           |              |            |
| 3R0       | 3.0       |         |            | 160       | 16        | 910     |            | 91        |           |              |            |
| 3R3       | 3.3       |         |            | 180       | 18        | 101     |            | 100       |           |              |            |
| 3R6       | 3.6       |         |            | 200       | 20        |         |            |           |           |              |            |

VRMS = 0.707 X WVDC

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

### ATC PART NUMBER CODE



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

The above part number refers to a 800 R Series (case size R) 10 pF capacitor, J tolerance (±5%), 500 WVDC, with T termination (Tin Plated over Nickel Barrier, RoHS Compliant), laser marked, and tape and reel packaging.

\*\*Laser Marking is optional.

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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# ATC 800 R Series NPO Ceramic Ultra-Low ESR Multilayer Capacitors

## ATC 800 R 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)                                     | MATERIALS  |
| 800R                   | T              | R<br>Solderable Nickel Barrier |  | .070 ±.015<br>(1.78 ±0.38)     | .090 ±.010<br>(2.29 ±0.25) | .115<br>(2.92)<br>max. | .010<br>+.010 - .005<br>(0.25)<br>+.025 - 0.13) | <b>RoHS Compliant</b><br>Tin Plated over<br>Nickel Barrier Termination |
| 800R                   | W              | R<br>Solder Plate              |  | .070 ±.015<br>(1.78 ±0.38)     | .090 ±.010<br>(2.29 ±0.25) | .115<br>(2.92)<br>max. | .010<br>+.010 - .005<br>(0.25)<br>+.025 - 0.13) | Tin/Lead, Solder Plated over<br>Nickel Barrier Termination             |

## ATC 800 R 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 DIMENSIONS AND MATERIALS   |  |
|------------------------|----------------|---------------------------------|--|--------------------------------|----------------------------|------------------------|---|--|
|                        |                |                                 |  | LENGTH (L)                     | WIDTH (W)                  | THICKNESS (T)          | OVERLAP (Y)                                     | MATERIALS  |
| 800R                   | TN             | R<br>Non-Mag Solderable Barrier |  | .070 ±.015<br>(1.78 ±0.38)     | .090 ±.010<br>(2.29 ±0.25) | .115<br>(2.92)<br>max. | .010<br>+.010 - .005<br>(0.25)<br>+.025 - 0.13) | <b>RoHS Compliant</b><br>Tin Plated over<br>Non-Magnetic Barrier Termination |

## Suggested Mounting Pad Dimensions

Horizontal Electrode Orientation

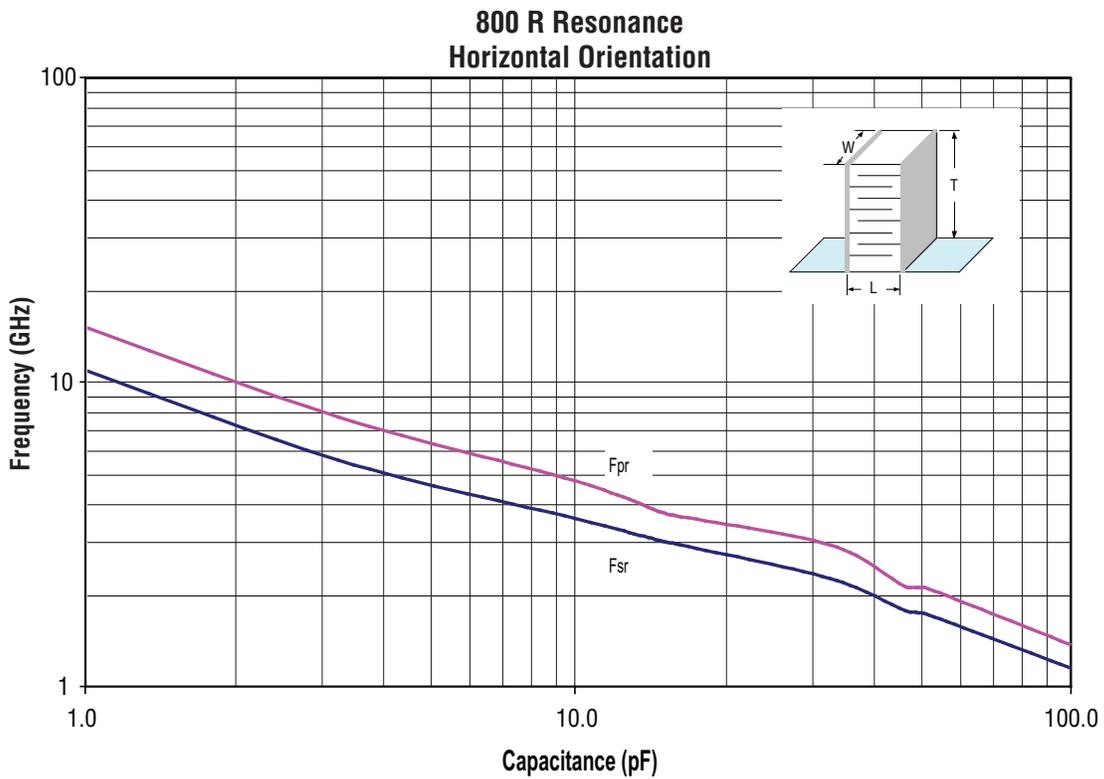
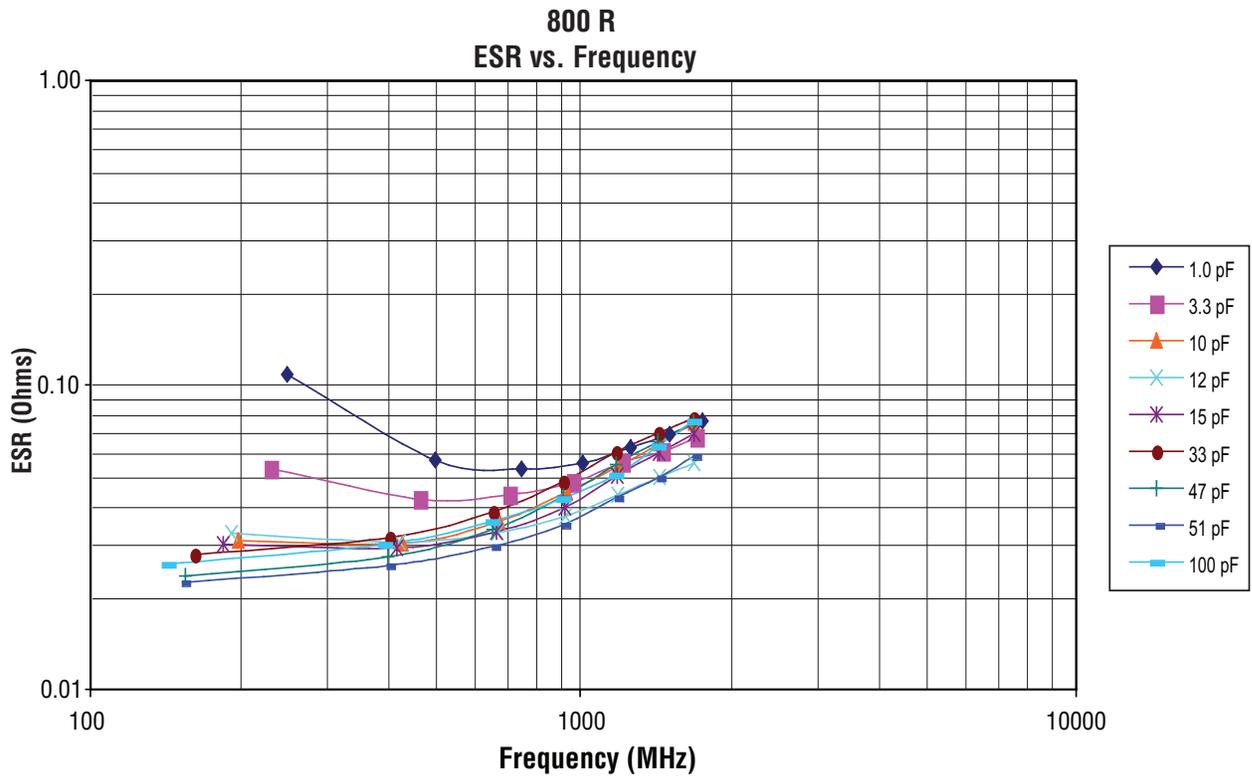
Vertical Electrode Orientation

Case R

|                  | Pad Size     | A Min. | B Min. | C Min. | D Min. |
|------------------|--------------|--------|--------|--------|--------|
| Vertical Mount   | Normal       | .095   | .050   | .030   | .130   |
|                  | High Density | .075   | .030   | .030   | .090   |
| Horizontal Mount | Normal       | .110   | .050   | .030   | .130   |
|                  | High Density | .090   | .030   | .030   | .090   |

Dimensions are in inches.

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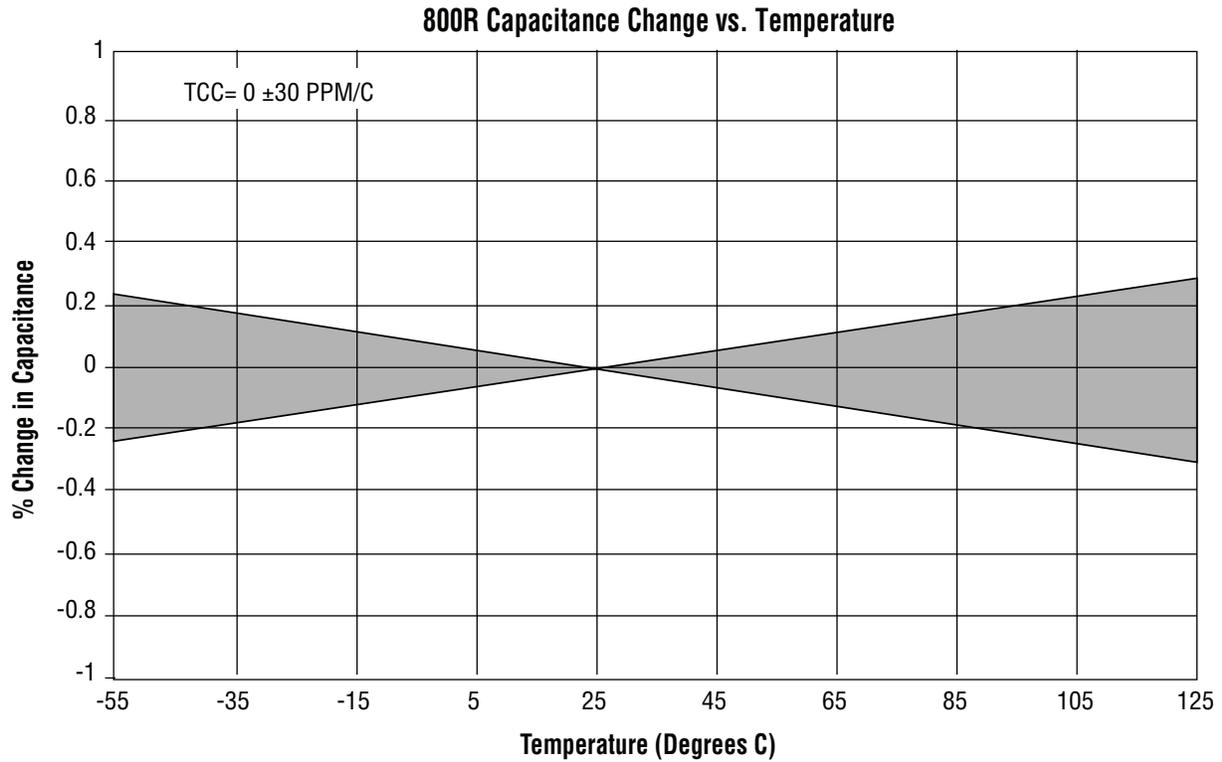
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# ATC 800 R Performance Data



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