

# ATC 100 A Series Porcelain Superchip<sup>®</sup> Multilayer Capacitors

- Case A Size (.055" x .055")
- Capacitance Range 0.1 pF to 100 pF
- High Q
- Ultra-Stable Performance
- Low ESR/ESL
- High Self-Resonance
- Low Noise
- Established Reliability (QPL)
- Extended WVDC up to 250 VDC

ATC, the industry leader, offers new improved ESR/ESL performance for the 100 A Series RF/Microwave Capacitors. This is ATC's most versatile high Q, high self resonant multilayer capacitor. High density porcelain construction provides a rugged, hermetic package.

Typical functional applications: Bypass, Coupling, Tuning, Feedback, Impedance Matching and DC Blocking.

Typical circuit applications: Microwave/RF/IF Amplifiers, Mixers, Oscillators, Low Noise Amplifiers, Filter Networks, Timing Circuits and Delay Lines.

## ENVIRONMENTAL TESTS

ATC 100 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:

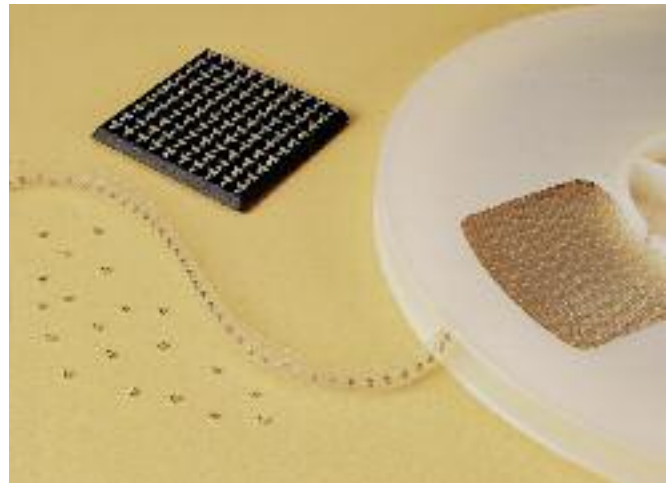
MIL-STD-202, Method 106.

### 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):** greater than 10,000 at 1 MHz.

**TEMPERATURE COEFFICIENT OF CAPACITANCE (TCC):**  
+90 ±20 PPM/°C (-55°C to +125°C)

### INSULATION RESISTANCE (IR):

0.1 pF to 100 pF:

10<sup>6</sup> Megohms min. @ +25°C at rated WVDC.

10<sup>5</sup> Megohms min. @ +125°C at rated WVDC.

### WORKING VOLTAGE (WVDC):

See Capacitance Values Table, page 2.

### DIELECTRIC WITHSTANDING VOLTAGE (DWV):

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:** Available in various surface mount styles. See Mechanical Configurations, page 3.

**TERMINAL STRENGTH:** Terminations for chips and pellets 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 # 001-806 Rev. L 9/12

# ATC 100 A Capacitance Values

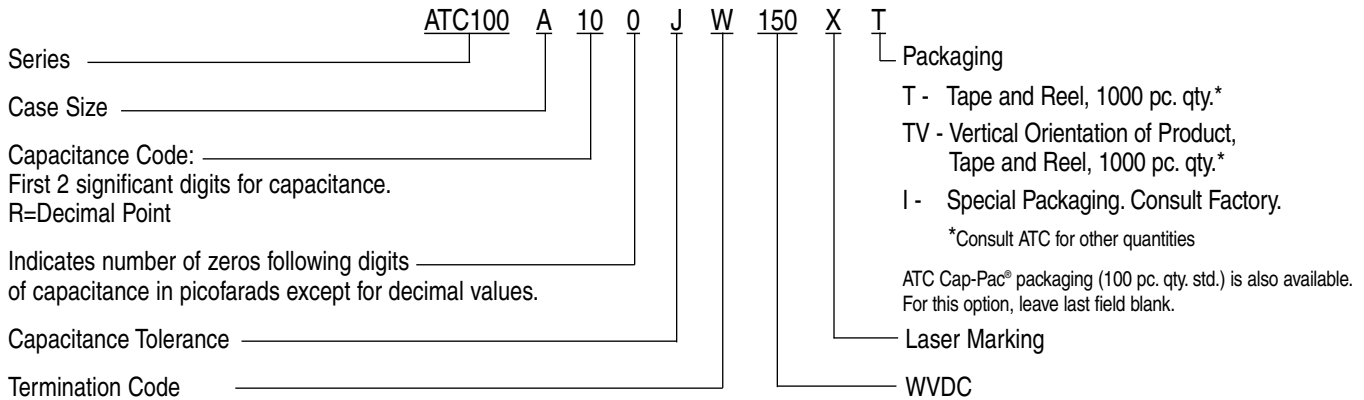
| CAP. CODE | CAP. (pF) | TOL.    | RATED WVDC |      | CAP. CODE | CAP. (pF) | TOL.    | RATED WVDC |      | CAP. CODE | CAP. (pF) | TOL.          | RATED WVDC |                  |
|-----------|-----------|---------|------------|------|-----------|-----------|---------|------------|------|-----------|-----------|---------------|------------|------------------|
|           |           |         | STD.       | EXT. |           |           |         | STD.       | EXT. |           |           |               | STD.       | EXT.             |
| 0R1       | 0.1       | B       | 150        | 250  | 2R2       | 2.2       | B, C, D | 150        | 250  | 160       | 16        | F, G, J, K, M | 150        | EXTENDED VOLTAGE |
| 0R2       | 0.2       |         |            |      | 2R4       | 2.4       |         |            |      | 180       | 18        |               |            |                  |
| 0R3       | 0.3       | B, C    |            |      | 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  | 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       | 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         |      |           |           |         |            |      |           |           |               |            |                  |

VRMS = 0.707 X WVDC

**SPECIAL VALUES, TOLERANCES, HIGHER WVDC AND MATCHING AVAILABLE. PLEASE CONSULT FACTORY.**  
**NOTE: EXTENDED WVDC DOES NOT APPLY TO CDR PRODUCTS.**

| 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 100 A Series (case size A) 10 pF capacitor,  
 J tolerance (±5%), 150 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and ATC 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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# ATC 100 A Capacitors: Mechanical Configurations

| ATC SERIES & CASE SIZE | ATC TERM. CODE | MIL-PRF-55681 | CASE SIZE & TYPE               | OUTLINES<br>W/T IS A TERMINATION SURFACE | BODY DIMENSIONS INCHES (mm)                     |                            |                     | LEAD AND TERMINATION DIMENSIONS AND MATERIALS |  |
|------------------------|----------------|---------------|--------------------------------|--|---|----------------------------|---------------------|---|--|
|                        |                |               |                                |  | LENGTH (L)                                      | WIDTH (W)                  | THICKNESS (T)       | OVERLAP (Y)                                   | MATERIALS  |
| 100A                   | W              | CDR12BG       | A<br>Solder Plate              |  | .055<br>+.015 -.010<br>(1.40<br>+0.38<br>-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)  | Tin/Lead, Solder Plated over Nickel Barrier Termination              |
| 100A                   | P              | CDR12BG       | A<br>Pellet                    |  | .055<br>+.025 -.010<br>(1.40<br>+0.64<br>-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)  | Heavy Tin/Lead Coated, over Nickel Barrier Termination               |
| 100A                   | T              | N/A           | A<br>Solderable Nickel Barrier |  | .055<br>+.015 -.010<br>(1.40<br>+0.38<br>-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 Nickel Barrier Termination  |
| 100A                   | CA             | CDR11BG       | A<br>Gold Chip                 |  | .055<br>+.015 -.010<br>(1.40<br>+0.38<br>-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>Gold Plated over Nickel Barrier Termination |

For a complete military catalog, request American Technical Ceramics document ATC 001-818.

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# ATC 100 A Non-Magnetic Capacitors: Mechanical Configurations

| ATC SERIES & CASE SIZE | ATC TERM. CODE | MIL-PRF-55681      | CASE SIZE & TYPE                | OUTLINES<br>W/T IS A TERMINATION SURFACE | BODY DIMENSIONS INCHES (mm)                     |                            |                     | LEAD AND TERMINATION DIMENSIONS AND MATERIALS |   |
|------------------------|----------------|--------------------|---------------------------------|--|---|----------------------------|---------------------|---|---|
|                        |                |                    |                                 |  | LENGTH (L)                                      | WIDTH (W)                  | THICKNESS (T)       | OVERLAP (Y)                                   | MATERIALS   |
| 100A                   | WN             | Meets Requirements | A<br>Non-Mag Solder Plate       |  | .055<br>+.025 -.010<br>(1.40<br>+0.64<br>-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)  | Tin/Lead, Solder Plated over Non-Magnetic Barrier Termination             |
| 100A                   | PN             | Meets Requirements | A<br>Non-Mag Pellet             |  | .055<br>+.035 -.010<br>(1.40<br>+0.89<br>-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)  | Heavy Tin/Lead Coated, over Non-Magnetic Barrier Termination              |
| 100A                   | TN             | Meets Requirements | A<br>Non-Mag Solderable Barrier |  | .055<br>+.025 -.010<br>(1.40<br>+0.64<br>-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 Non-Magnetic Barrier Termination |

All 100 A Capacitors are available laser marked with ATC's identification, capacitance code and tolerance.

## 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   |

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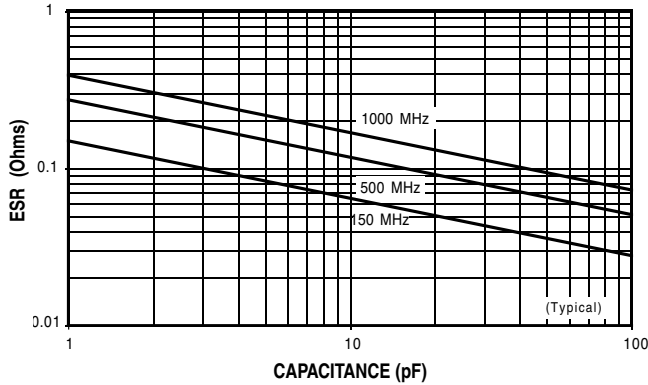
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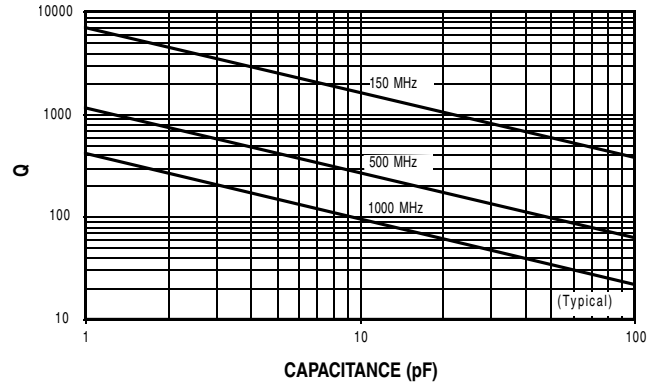
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# ATC 100 A Performance Data

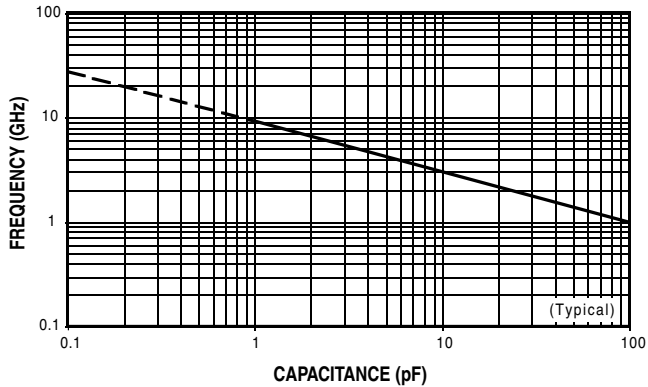
**ESR VS. CAPACITANCE  
ATC SERIES 100, CASE A**



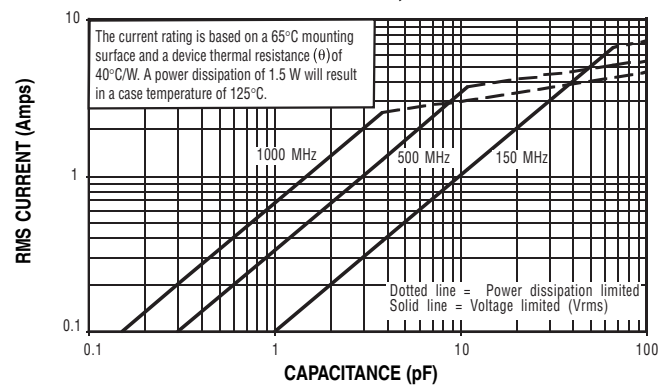
**Q VS. CAPACITANCE  
ATC SERIES 100, CASE A**



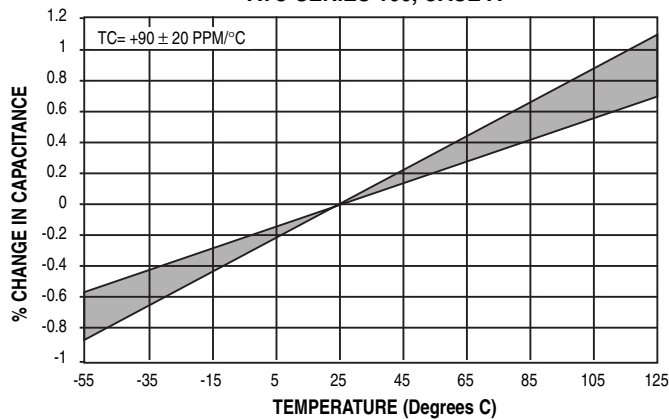
**SERIES RESONANCE VS. CAPACITANCE  
ATC SERIES 100, CASE A**



**CURRENT RATING VS. CAPACITANCE  
ATC SERIES 100, CASE A**



**CAPACITANCE CHANGE VS. TEMPERATURE  
ATC SERIES 100, CASE A**



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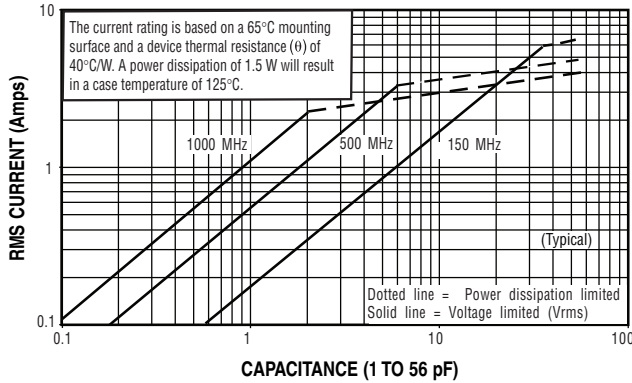
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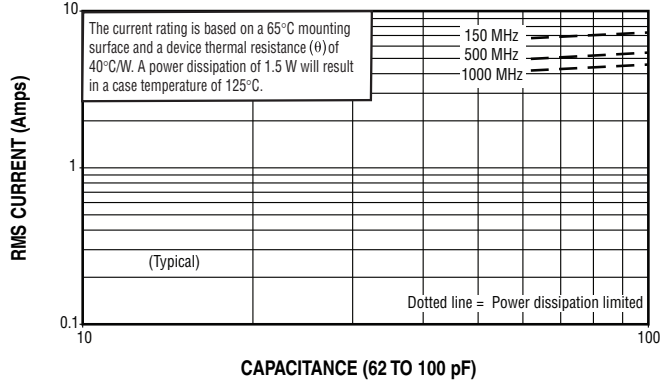
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# ATC 100 A Performance Data

**CURRENT RATING VS. CAPACITANCE**  
**ATC SERIES 100, CASE A, EXTENDED VOLTAGE**



**CURRENT RATING VS. CAPACITANCE**  
**ATC SERIES 100, CASE A, EXTENDED VOLTAGE**



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