

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

- Case C Size (.250" x .250")
- Capacitance Range: 2.2 pF to 3000 pF
- High Q
- Ultra-Stable Performance
- Low ESR/ESL
- High RF Current/Voltage
- High RF Power
- High Reliability
- 3600 WVDC
- RoHS Compliant, Pb free

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

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

Typical circuit applications: HF/RF Power Amplifiers, Transmitters, Antenna Tuning, Plasma Chambers and Medical (MRI coils).

## ENVIRONMENTAL TESTS

ATC 800 C 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.

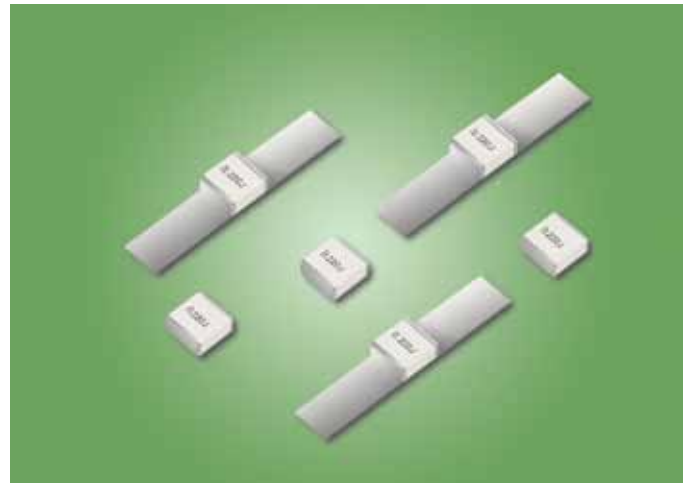
### LOW VOLTAGE HUMIDITY:

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. Voltage applied.

200% of WVDC for capacitors rated at 500 volts DC or less.  
120% of WVDC for capacitors rated at 1250 volts DC or less.  
100% of WVDC for capacitors rated above 1250 volts DC.



## ELECTRICAL AND MECHANICAL SPECIFICATIONS

### QUALITY FACTOR (Q):

Greater than 5,000 (2.2 pF to 1000 pF) @ 1 MHz.  
Greater than 5,000 (1100 pF to 3000 pF) @ 1 KHz.

### TEMPERATURE COEFFICIENT OF CAPACITANCE (TCC):

0 ±30 PPM/°C (-55°C to +125°C)

### INSULATION RESISTANCE (IR):

2.2 pF to 3000 pF:  
10<sup>5</sup> Megohms min. @ +25°C at rated WVDC.  
10<sup>4</sup> Megohms min. @ +125°C at rated WVDC.  
Max. test voltage is 500 VDC.

**WORKING VOLTAGE (WVDC):** See Capacitance Values Table, p 2.

### DIELECTRIC WITHSTANDING VOLTAGE (DWV):

250% of WVDC for capacitors rated at 500 volts DC or less for 5 seconds.  
150% of WVDC for capacitors rated above 500 volts DC and ≤1250 volts DC for 5 seconds.  
120% of WVDC for capacitors rated above 1250 volts DC for 5 seconds.

**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:

See Mechanical Configurations, page 3.

**TERMINAL STRENGTH:** Terminations for chips withstand a pull of 10 lbs. min., 20 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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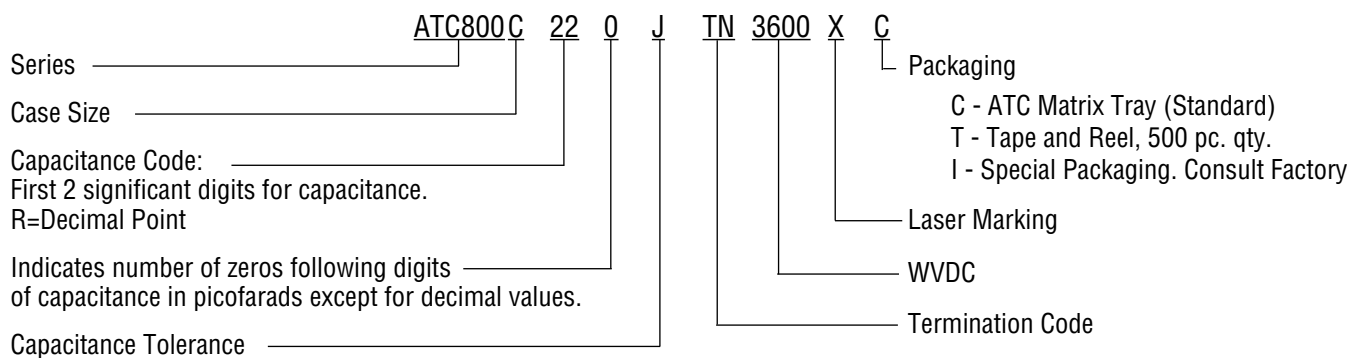
ATC # 001-1076 Rev. M; 1/14

# ATC 800 C Capacitance Values

| CAP CODE | CAP (pF) | TOL.       | RATED WVDC | CAP CODE | CAP (pF) | TOL.       | RATED WVDC | CAP CODE | CAP (pF) | TOL.       | RATED WVDC |
|----------|----------|------------|------------|----------|----------|------------|------------|----------|----------|------------|------------|
| 2R2      | 2.2      | B, C, D    | 3600       | 240      | 24       | F, G, J, K | 3600       | 241      | 240      | F, G, J, K | 1000       |
| 2R4      | 2.4      |            |            | 270      | 27       |            |            | 271      | 270      |            |            |
| 2R7      | 2.7      |            |            | 300      | 30       |            |            | 301      | 300      |            |            |
| 3R0      | 3.0      |            |            | 330      | 33       |            |            | 331      | 330      |            |            |
| 3R3      | 3.3      |            |            | 360      | 36       |            |            | 361      | 360      |            |            |
| 3R6      | 3.6      |            |            | 390      | 39       |            |            | 391      | 390      |            |            |
| 3R9      | 3.9      |            |            | 430      | 43       |            |            | 431      | 430      |            |            |
| 4R3      | 4.3      |            |            | 470      | 47       |            |            | 471      | 470      |            |            |
| 4R7      | 4.7      |            |            | 510      | 51       |            |            | 511      | 510      |            |            |
| 5R1      | 5.1      |            |            | 560      | 56       |            |            | 561      | 560      |            |            |
| 5R6      | 5.6      | 620        | 62         | 621      | 620      |            |            |          |          |            |            |
| 6R2      | 6.2      | 680        | 68         | 681      | 680      |            |            |          |          |            |            |
| 6R8      | 6.8      | 750        | 75         | 751      | 750      |            |            |          |          |            |            |
| 7R5      | 7.5      | 820        | 82         | 821      | 820      |            |            |          |          |            |            |
| 8R2      | 8.2      | 910        | 91         | 911      | 910      |            |            |          |          |            |            |
| 9R1      | 9.1      | 101        | 100        | 102      | 1000     |            |            |          |          |            |            |
| 100      | 10       | F, G, J, K | 2500       | 111      | 110      | F, G, J, K | 2500       | 112      | 1100     | F, G, J, K | 600        |
| 110      | 11       |            |            | 121      | 120      |            |            | 122      | 1200     |            |            |
| 120      | 12       |            |            | 131      | 130      |            |            | 152      | 1500     |            |            |
| 130      | 13       |            |            | 151      | 150      |            |            | 182      | 1800     |            |            |
| 150      | 15       |            |            | 161      | 160      |            |            | 222      | 2200     |            |            |
| 160      | 16       |            |            | 181      | 180      |            |            | 242      | 2400     |            |            |
| 180      | 18       |            |            | 201      | 200      |            |            | 272      | 2700     |            |            |
| 200      | 20       |            |            | 221      | 220      |            |            | 302      | 3000     |            |            |
| 220      | 22       |            |            |          |          |            |            |          |          |            |            |

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

## ATC PART NUMBER CODE



The above part number refers to a 800 C Series (case size C) 22 pF capacitor, J tolerance (±5%),3600 WVDC, with TN termination (RoHS Compliant, Tin Plated over Non-Magnetic Barrier Termination), laser marking and plastic Matrix Tray 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.


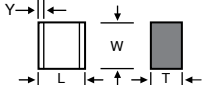
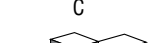
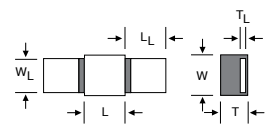

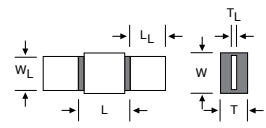
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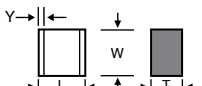

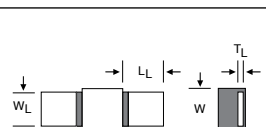

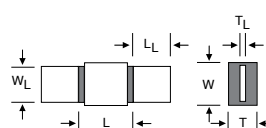
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## ATC 800 C Capacitors: Mechanical Configurations

| ATC SERIES & CASE SIZE <sup>Order.</sup> | ATC TERM. CODE | 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   |   |
| 800C                                     | T              | <br>C<br>Solderable Barrier |  | 230<br>+.025 -.010<br>(5.84<br>+0.64<br>-0.25) | 250 ±.015<br>(6.35 ±0.38) | 75 (4.45)<br>max. | .040 (1.02)<br>max.                           | <b>RoHS Compliant</b><br>Tin Plated over<br>Nickel Barrier Termination  |   |
| 800C                                     | MS             | <br>C<br>Microstrip         |  | 245 ±.025<br>(6.22 ±0.64)                      |                           |                   |   | Silver Leads<br>L <sub>L</sub> = .500 (12.7) min.<br>W <sub>L</sub> = * * See below<br>T <sub>L</sub> = .004 ±.001 (.102 ±.025) | High Purity Silver Leads<br>L <sub>L</sub> = .500 (12.7) min.<br>W <sub>L</sub> = .240 ±.005 (6.10 ±.127)<br>T <sub>L</sub> = .004 ±.001 (.102 ±.025)<br>Leads are Attached with<br>High Temperature Solder |
| 800C                                     | AR             | <br>C<br>Axial Ribbon       |  |  |                           |                   |   |   |   |

Custom lead styles and lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are **RoHS** compliant.  
 \*\*W<sub>L</sub> = .110 (2.79) for capacitance values ≤ 680 pF; W<sub>L</sub> = .130 (3.30) for capacitance values > 680 pF

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

| ATC SERIES & CASE SIZE <sup>Order.</sup> | ATC TERM. CODE | 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   |
| 800C                                     | TN             | <br>C<br>Non-Mag<br>Solderable Barrier. |  | 230<br>+.025 -.010<br>(5.84<br>+0.64<br>-0.25) | 50 ±.015<br>(6.35 ±0.38) | 75 (4.45)<br>max. | .040 (1.02)<br>max.                           | <b>RoHS Compliant</b><br>Tin Plated over<br>Non-Magnetic Barrier<br>Termination   |
| 800C                                     | MN             | <br>C<br>Non-Mag<br>Microstrip245       |  | ±.025<br>(6.22 ±0.64)                          |                          |                   |   | High Purity Silver Leads<br>L <sub>L</sub> = .500 (12.7) min.<br>W <sub>L</sub> = .240 ±.005 (6.10 ±.127)<br>T <sub>L</sub> = .004 ±.001 (.102 ±.025)<br>Leads are Attached with<br>High Temperature Solder |
| 800C                                     | AN             | <br>C<br>Non-Mag<br>Axial Ribbon        |  | 245 ±.025<br>(6.22 ±0.64)                      |                          |                   |   |   |

Custom lead styles and lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are **RoHS** compliant.  
 \*\*W<sub>L</sub> = .110 (2.79) for capacitance values ≤ 680 pF; W<sub>L</sub> = .130 (3.30) for capacitance values > 680 pF

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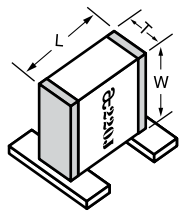
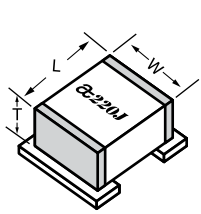
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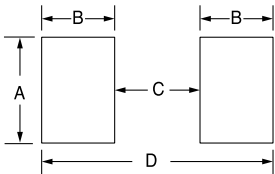
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# Suggested Mounting Pad Dimensions



Horizontal Electrode Orientation

Vertical Electrode Orientation



Case C Vertical Mount

| Cap Value  | Pad Size     | A Min. | B Min. | C Min. | D Min. |
|------------|--------------|--------|--------|--------|--------|
| All values | Normal       | .200   | .050   | .200   | .300   |
|            | High Density | .180   | .030   | .200   | .260   |

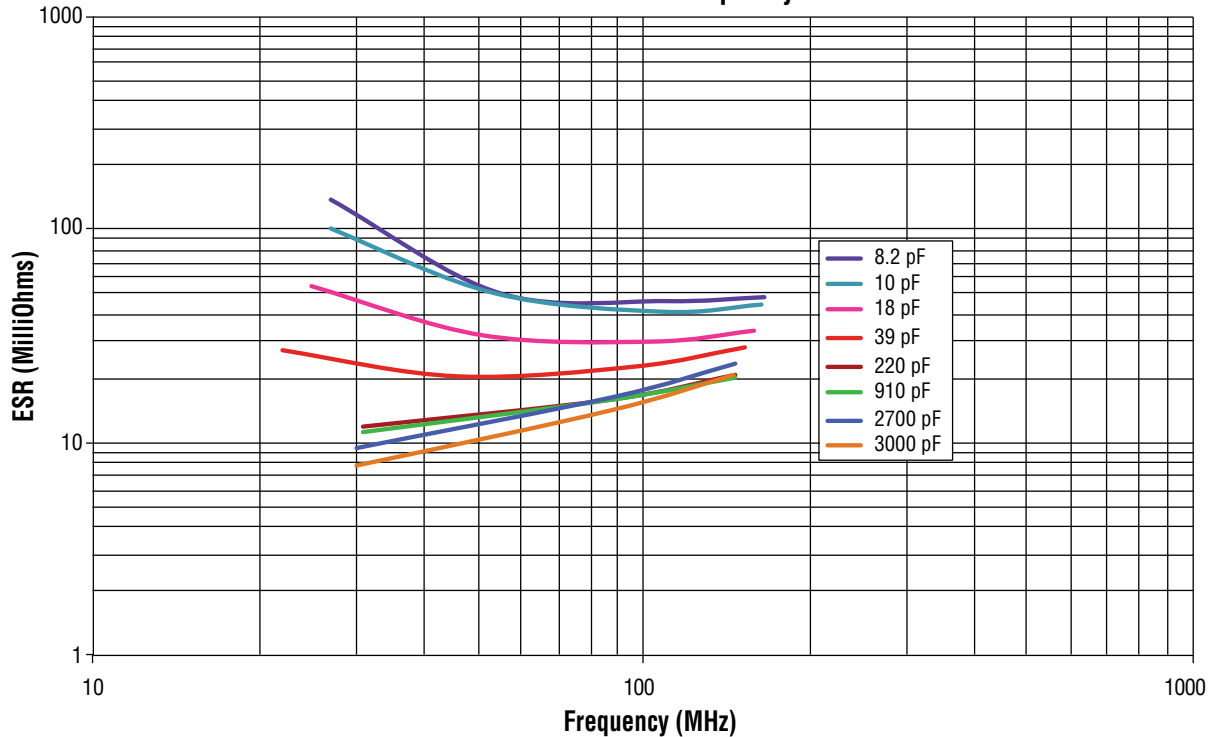
Horizontal Mount

|            |              |      |      |      |      |
|------------|--------------|------|------|------|------|
| All values | Normal       | .280 | .050 | .200 | .300 |
|            | High Density | .260 | .030 | .200 | .260 |

Dimensions are in inches

## ATC 800 C Performance Data

800 C ESR vs. Frequency



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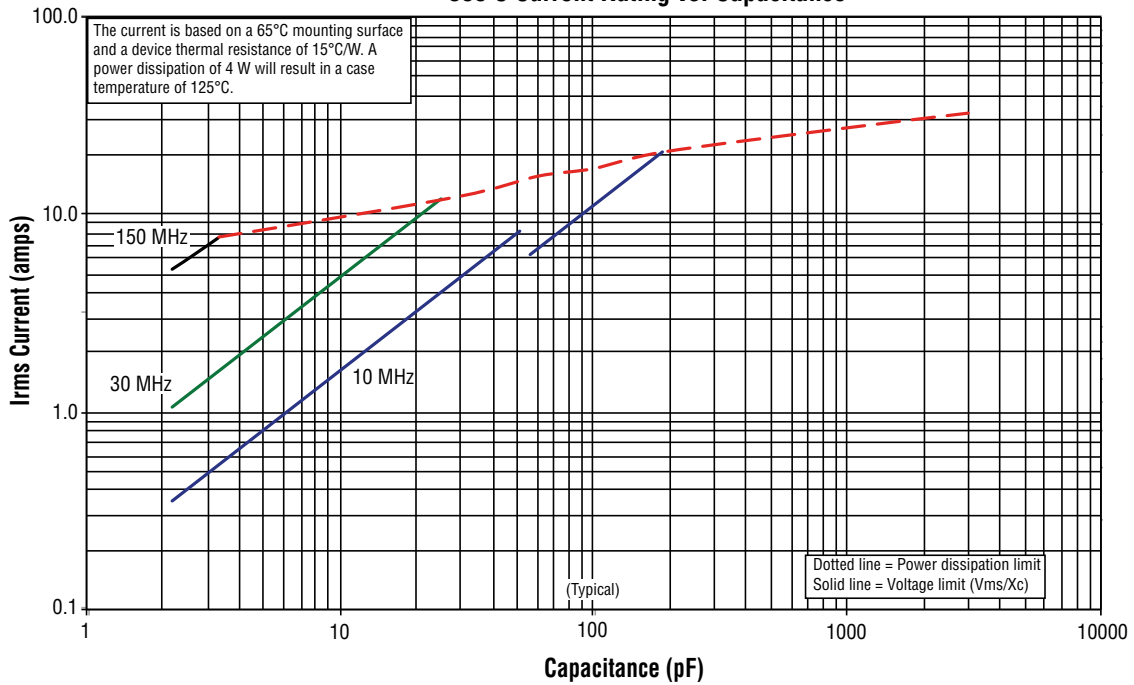
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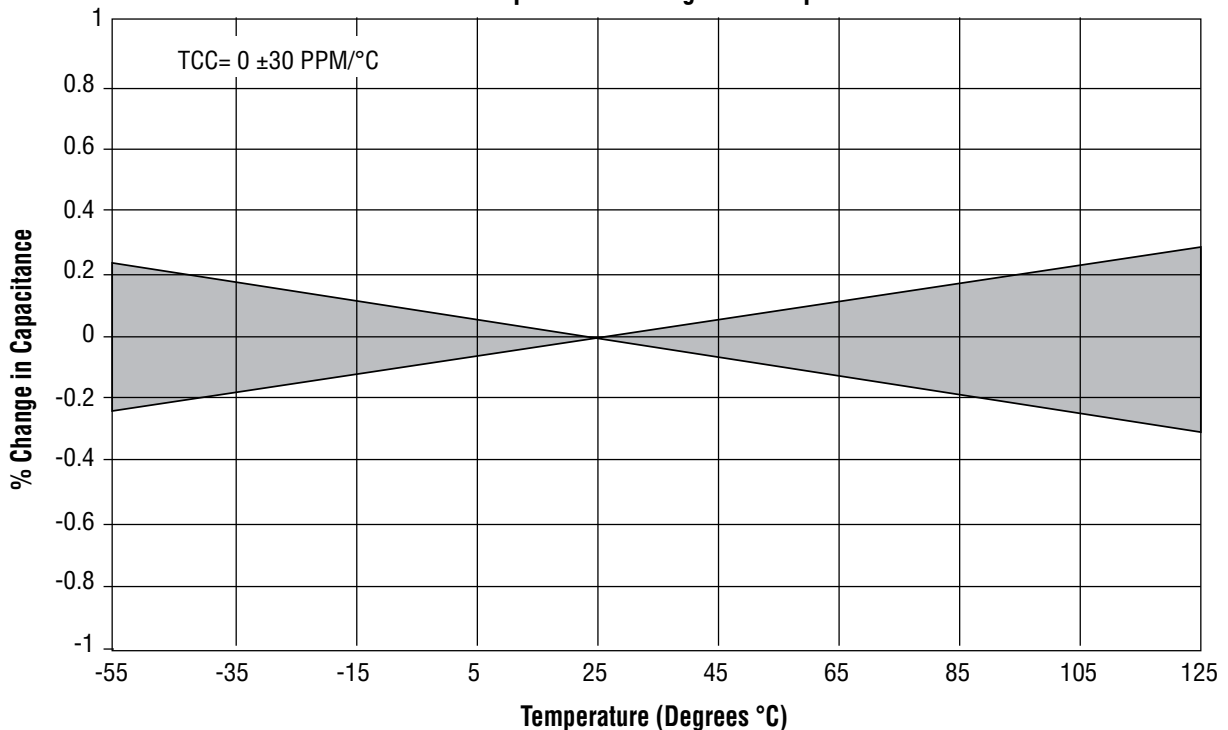
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# ATC 800 C Performance Data

## 800 C Current Rating vs. Capacitance



## 800C Capacitance Change vs. Temperature



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