

ATC 700 B Series NPO Porcelain and Ceramic Multilayer Capacitors

- Case B Size (.110" x .110")
- Low ESR/ESL
- Low Noise
- Rugged Construction
- Available with Encapsulation Option*
- Capacitance Range 0.1 pF to 5100 pF
- Zero TCC
- High Self-Resonance
- Established Reliability (QPL)
- Extended WVDC up to 1500 VDC

ATC, the industry leader, is announcing new improved ESR/ESL performance for the 700 B Series RF/Microwave Capacitors. The superior high self-resonance and zero TCC characteristic of this Series provide excellent performance over a broad range of RF and microwave applications requiring minimum drift, including RF power. Porcelain and ceramic construction provide a rugged, hermetic package.

ATC offers an encapsulation option for applications requiring extended protection against arc-over and corona.

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

Typical circuit applications: Filters, Oscillators, Timing and RF Power Amplifiers.

*For leaded styles only.

ENVIRONMENTAL TESTS

ATC 700 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:

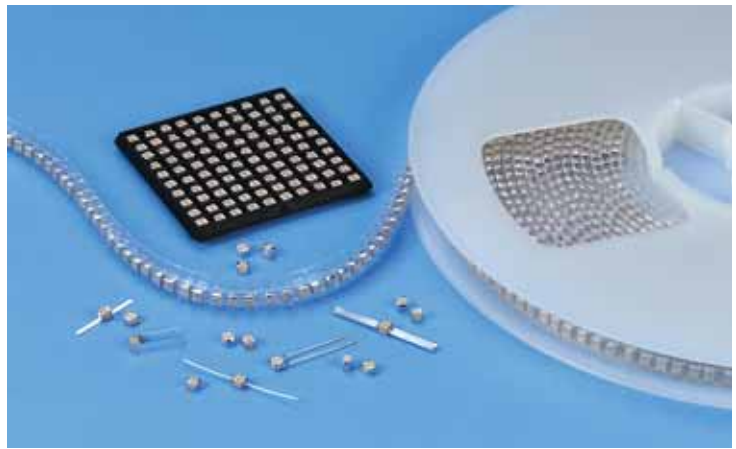
MIL-STD-202, Method 103, Condition A, with 1.5 Volts DC applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours min.

LIFE TEST:

MIL-STD-202, Method 108, for 2000 hours, at 125°C.
200% WVDC applied.

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 10,000 (0.1 pF to 200 pF) @ 1 MHz.
Greater than 2000 (220 pF to 1000 pF) @ 1 MHz.
Greater than 2000 (1100 pF to 5100 pF) @ 1 KHz.

TEMPERATURE COEFFICIENT OF CAPACITANCE (TCC):

0 ±30 PPM/°C (-55°C to +125°C)

INSULATION RESISTANCE (IR):

0.1 pF to 470 pF:

10⁶ Megohms min. @ +25°C at rated WVDC.

10⁵ Megohms min. @ +125°C at rated WVDC.

510 pF to 5100 pF:

10⁵ Megohms min. @ +25°C at rated WVDC.

10⁴ Megohms min. @ +125°C at rated WVDC.

WORKING VOLTAGE (WVDC): See Capacitance Values Table, page 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 at 1250 volts DC or less 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:

0.1 to 200 pF: from -55°C to +175°C

220 to 5100 pF: from -55°C to +125°C

TERMINATION STYLES:

Available in various surface mount and leaded styles.

See Mechanical Configurations, page 3.

TERMINAL STRENGTH: Terminations for chips and pellets 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.

ATC # 001-814 Rev. P 5/11



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ATC 700 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 | | | | | | | | | | | | |
|-----------|-----------|---------|------------|------|------------------|-----------|---------|------------|------|-----------------|------------------|-----------------|------------|------|-----------|-----------|-----------------|------------|------|----------|------|-----|-----|-----|------------------|-----|-----|----|-----|-----|
| | | | STD. | EXT. | | | | STD. | EXT. | | | | STD. | EXT. | | | | STD. | EXT. | | | | | | | | | | | |
| 0R1 | 0.1 | B | 500 | 1500 | 3R3 | 3.3 | B, C, D | 500 | 1500 | 330 | 33 | F, G, J K, M | 500 | 1500 | 331 | 330 | F, G, J K, M | 500 | 1500 | | | | | | | | | | | |
| 0R2 | 0.2 | | | | 3R6 | 3.6 | | | | 360 | 36 | | | | 331 | 360 | | | | | | | | | | | | | | |
| 0R3 | 0.3 | B, C | | | EXTENDED VOLTAGE | 3R9 | | | | 3.9 | EXTENDED VOLTAGE | | | | 390 | 39 | | | | EXT VOLT | 391 | 390 | 200 | 431 | 430 | | | | | |
| 0R4 | 0.4 | | | | | 4R3 | | | | 4.3 | | | | | 430 | 43 | | | | | 431 | 430 | | | | | | | | |
| 0R5 | 0.5 | B, C, D | | | | 4R7 | | | | 4.7 | | | | | 470 | 47 | | | | | 1000 | 471 | | 470 | EXTENDED VOLTAGE | 511 | 510 | 50 | 561 | 560 |
| 0R6 | 0.6 | | | | | 5R1 | | | | 5.1 | | | | | 510 | 51 | | | | | | 561 | | 560 | | | | | | |
| 0R7 | 0.7 | | | | | 5R6 | | | | 5.6 | | | | | 560 | 56 | | | | | | 621 | | 620 | | | | | | |
| 0R8 | 0.8 | | | | | 6R2 | | | | 6.2 | | | | | 620 | 62 | | | | | | 681 | | 680 | | | | | | |
| 0R9 | 0.9 | | | | | 6R8 | | | | 6.8 | | | | | 680 | 68 | | | | | | 751 | | 750 | | | | | | |
| 1R0 | 1.0 | | | | | 7R5 | | | | 7.5 | | | | | 750 | 75 | | | | | | 821 | | 820 | | | | | | |
| 1R1 | 1.1 | | 8R2 | 8.2 | | 820 | 82 | 911 | 910 | | | | | | | | | | | | | | | | | | | | | |
| 1R2 | 1.2 | | 9R1 | 9.1 | | 910 | 91 | 102 | 1000 | | | | | | | | | | | | | | | | | | | | | |
| 1R3 | 1.3 | | B, C, D | 100 | 10 | 101 | 100 | 112 | 1100 | F, G, J K, M | 112 | 1100 | N/A | 122 | 1200 | | | | | | | | | | | | | | | |
| 1R4 | 1.4 | | | 110 | 11 | 111 | 110 | 152 | 1500 | | | | | | | | | | | | | | | | | | | | | |
| 1R5 | 1.5 | 120 | | 12 | 121 | 120 | 182 | 1800 | | | | | | | | | | | | | | | | | | | | | | |
| 1R6 | 1.6 | 130 | | 13 | 131 | 130 | 222 | 2200 | | | | | | | | | | | | | | | | | | | | | | |
| 1R7 | 1.7 | 150 | | 15 | 151 | 150 | 272 | 2700 | | | | | | | | | | | | | | | | | | | | | | |
| 1R8 | 1.8 | 160 | | 16 | 161 | 160 | 302 | 3000 | | | | | | | | | | | | | | | | | | | | | | |
| 1R9 | 1.9 | 180 | | 18 | 181 | 180 | 332 | 3300 | | | | | | | | | | | | | | | | | | | | | | |
| 2R0 | 2.0 | 200 | | 20 | 201 | 200 | 392 | 3900 | | | | | | | | | | | | | | | | | | | | | | |
| 2R1 | 2.1 | 220 | | 22 | 221 | 220 | 472 | 4700 | | | | | | | | | | | | | | | | | | | | | | |
| 2R2 | 2.2 | 240 | | 24 | 241 | 240 | 512 | 5100 | | | | | | | | | | | | | | | | | | | | | | |
| 2R4 | 2.4 | 270 | 27 | 271 | 270 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2R7 | 2.7 | 300 | 30 | 301 | 300 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3R0 | 3.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

VRMS = 0.707 x WVDC

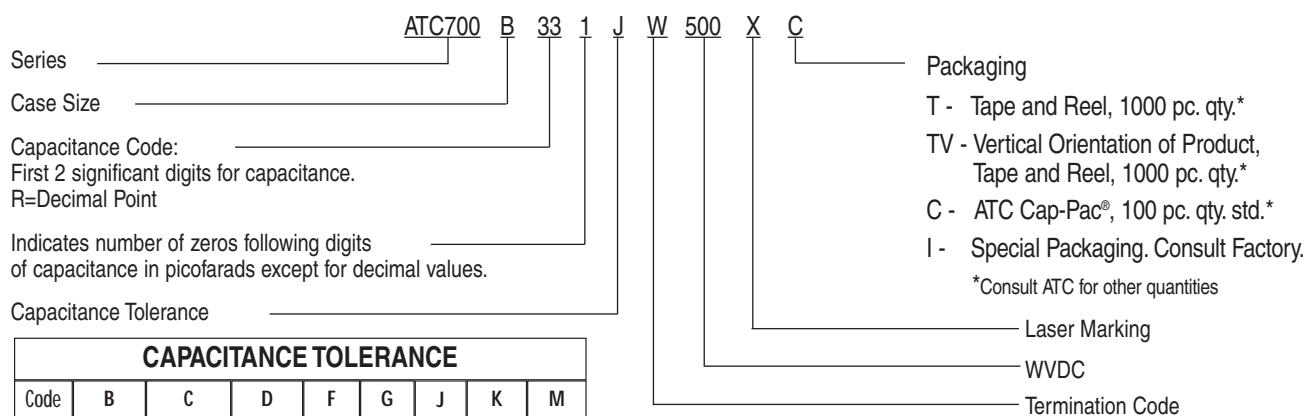
• SPECIAL VALUES, TOLERANCES, HIGHER WVDC AND MATCHING AVAILABLE. • ENCAPSULATION OPTION AVAILABLE. PLEASE CONSULT FACTORY.

Capacitance values in **bold** type indicate porcelain dielectric. All other capacitance values indicate ceramic dielectric.

All 700 B Capacitors are available laser marked with ATC's identification, capacitance code and tolerance.

NOTE: EXTENDED WVDC DOES NOT APPLY TO CDR PRODUCTS.

ATC PART NUMBER CODE



The above part number refers to a 700 B Series (case size B) 330 pF capacitor, J tolerance (±5%), 500 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and ATC Cap-Pac® 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 700 B Capacitors: Mechanical Configurations

| ATC SERIES & CASE SIZE | ATC TERM. CODE | MIL-PRF-55681 | CASE SIZE & TYPE | OUTLINES 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 | | |
| 700B | W | CDR14BP | B Solder Plate | | .110 +.020 -.010 (2.79 +0.51 -0.25) | .110 ±.015 (2.79 ±0.38) | .102 (2.59) max. | .015 (0.38) ±.010 (0.25) | Tin/Lead, Solder Plated over Nickel Barrier Termination | | |
| 700B | P | CDR14BP | B Pellet | | .110 +.035 -.010 (2.79 +0.89 -0.25) | .110 ±.015 (2.79 ±0.38) | | | Heavy Tin/Lead Coated, over Nickel Barrier Termination | | |
| 700B | T | N/A | B Solderable Nickel Barrier | | .110 +.020 -.010 (2.79 +0.51 -0.25) | .110 ±.015 (2.79 ±0.38) | | | RoHS Compliant Tin Plated over Nickel Barrier Termination | | |
| 700B | CA | CDR13BP | B Gold Chip | | .110 +.020 -.010 (2.79 +0.51 -0.25) | .110 ±.015 (2.79 ±0.38) | | | RoHS Compliant Gold Plated over Nickel Barrier Termination | | |
| 700B | MS | CDR21BP | B Microstrip | | .135 ±.015 (3.43 ±0.38) | .110 ±.015 (2.79 ±0.38) | .120 (3.05) max. | N/A | Length (L _L) | Width (W _L) | Thickness (T _L) |
| 700B | AR | CDR22BP | B Axial Ribbon | | | | | | .250 (6.35) min. | .093 ±.005 (2.36 ±0.13) | .004 ±.001 (.102 ±.025) |
| 700B | RR | CDR24BP | B Radial Ribbon | | .145 ±.020 (3.68 ±0.51) | .110 ±.015 (2.79 ±0.38) | .102 (2.59) max. | N/A | .500 (12.7) min. | #26 AWG., .016 (.406) dia. nominal | |
| 700B | RW | CDR23BP | B Radial Wire | | | | | | | | |
| 700B | AW | CDR25BP | B Axial Wire | | | | | | | | |

Additional lead styles available: Narrow Microstrip (NM), Narrow Axial Ribbon (NA) and Vertical Narrow Microstrip (H). Other lead lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are **RoHS** compliant. For a complete military catalog, request American Technical Ceramics document ATC 001-818.

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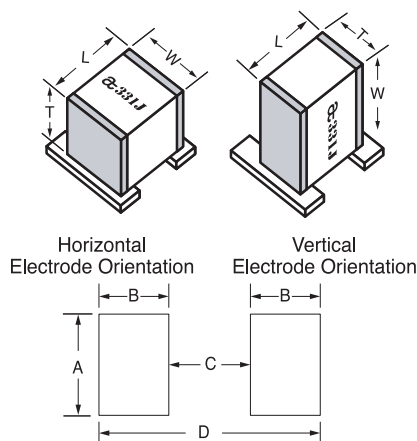
ATC 700 B Capacitors: Non-Magnetic Mechanical Configurations*

| ATC SERIES & CASE SIZE | ATC TERM. CODE | MIL-PRF-55681 | CASE SIZE & TYPE | OUTLINES 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 | | |
| 700B | WN | Meets Requirements | B Non-Mag Solder Plate | | .110 +.025 -.010 (2.79 +0.64 -0.25) | .110 ±.015 (2.79 ±0.38) | .102 (2.59) max. | .015 (0.38) ±.010 (0.25) | Tin/Lead, Solder Plated over Non-Magnetic Barrier Termination | | |
| 700B | PN | Meets Requirements | B Non-Mag Pellet | | .110 +.035 -.010 (2.79 +0.89 -0.25) | .110 ±.015 (2.79 ±0.38) | | | Heavy Tin/Lead Coated, over Non-Magnetic Barrier Termination | | |
| 700B | TN | Meets Requirements | B Non-Mag Solderable Barrier | | .110 +.025 -.010 (2.79 +0.64 -0.25) | .110 ±.015 (2.79 ±0.38) | | | RoHS Compliant Tin Plated over Non-Magnetic Barrier Termination | | |
| 700B | MN | Meets Requirements | B Non-Mag Microstrip | | .135 ±.015 (3.43 ±0.38) | .110 ±.015 (2.79 ±0.38) | .120 (3.05) max. | N/A | Length (L _L) | Width (W _L) | Thickness (T _L) |
| 700B | AN | Meets Requirements | B Non-Mag Axial Ribbon | | | | | | .250 (6.35) min. | .093 ±.005 (2.36 ±0.13) | .004 ±.001 (.102 ±.025) |
| 700B | FN | Meets Requirements | B Non-Mag Radial Ribbon | | | | | | .145 ±.020 (3.68 ±0.51) | .106 (2.69) max. | N/A |
| 700B | RN | Meets Requirements | B Non-Mag Radial Wire | | | | | | | | |
| 700B | BN | Meets Requirements | B Non-Mag Axial Wire | | | | | | | | |

*Capacitors with values greater than 200 pF contain a trace magnetic element that may exhibit weak magnetic properties.

Additional lead styles available: Narrow Microstrip (DN), Narrow Axial Ribbon (GN) and Vertical Narrow Microstrip (HN). Other lead lengths are available; consult factory; All leads are high purity silver attached with high temperature solder and are **RoHS compliant.

Suggested Mounting Pad Dimensions



Case B Vertical Mount

| Cap Value | | 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 | | 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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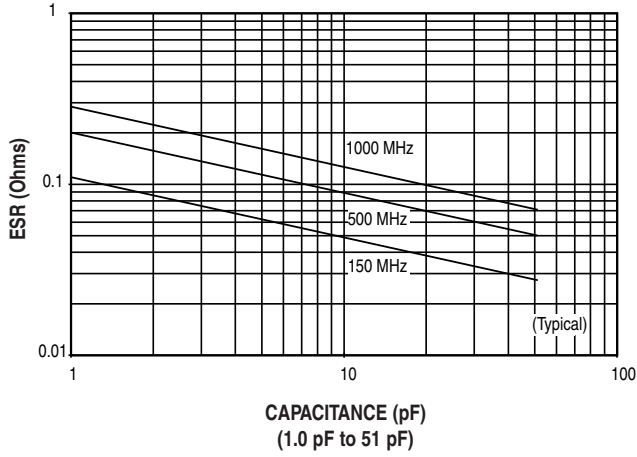
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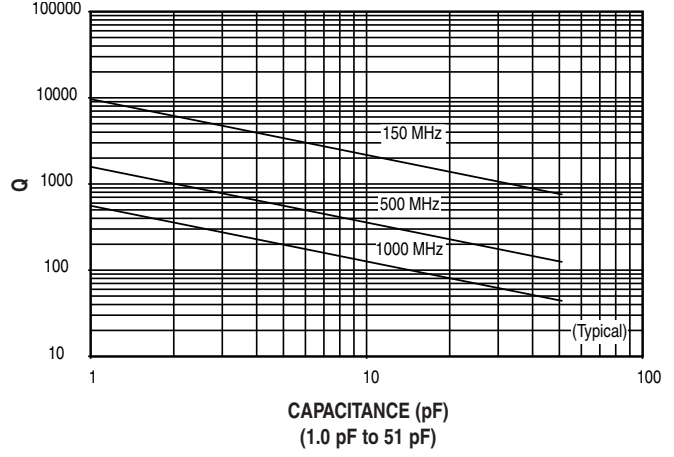
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ATC 700 B Performance Data

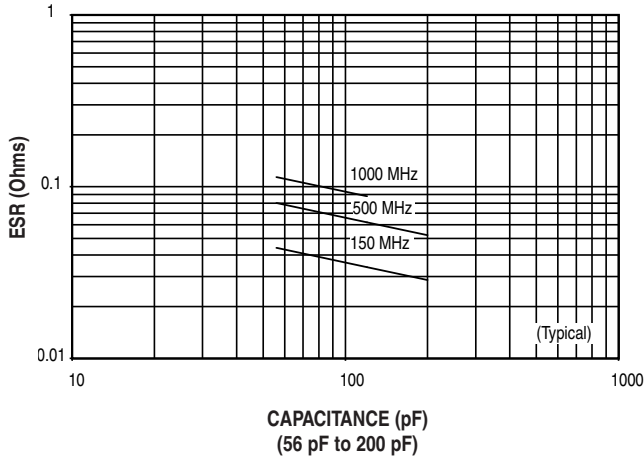
**ESR VS. CAPACITANCE
ATC SERIES 700, CASE B**



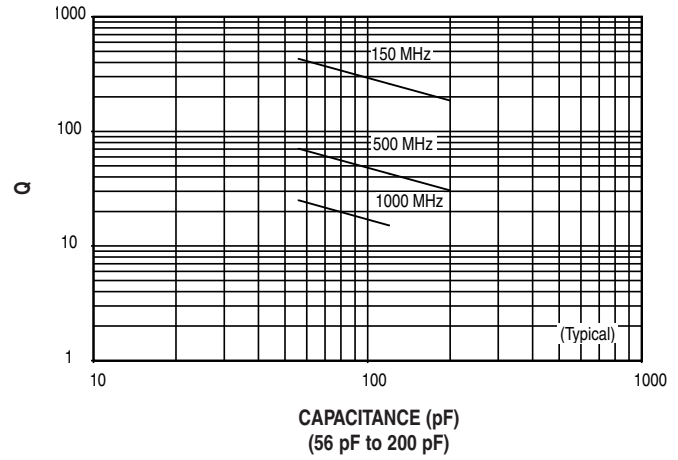
**Q VS. CAPACITANCE
ATC SERIES 700, CASE B**



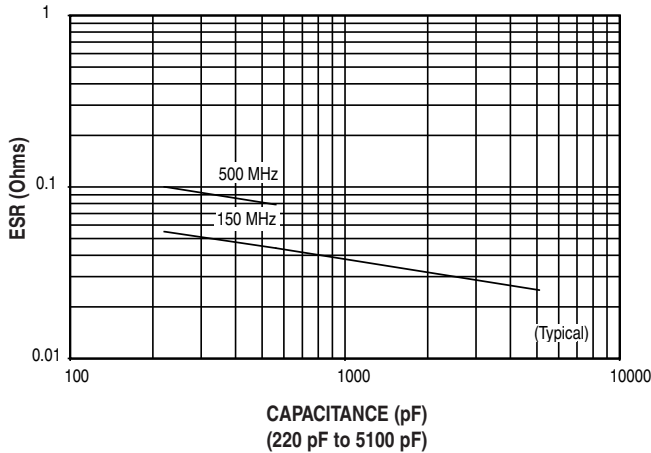
**ESR VS. CAPACITANCE
ATC SERIES 700, CASE B**



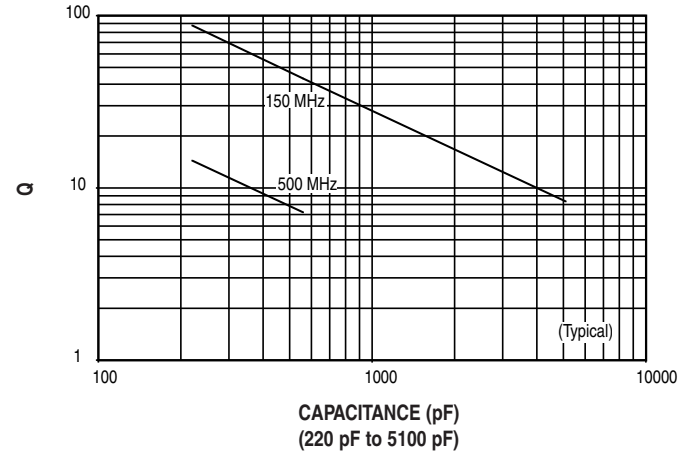
**Q VS. CAPACITANCE
ATC SERIES 700, CASE B**



**ESR VS. CAPACITANCE
ATC SERIES 700, CASE B**



**Q VS. CAPACITANCE
ATC SERIES 700, CASE B**



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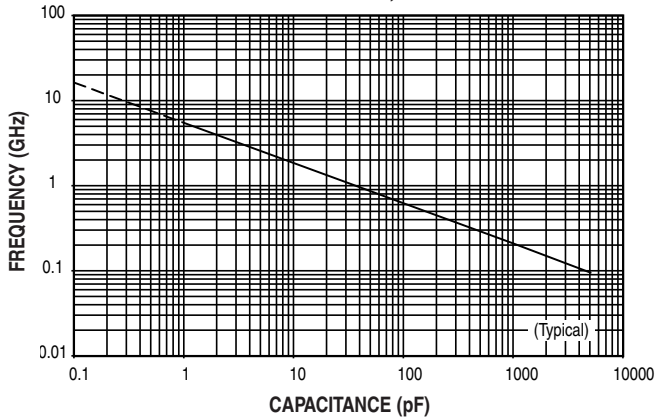
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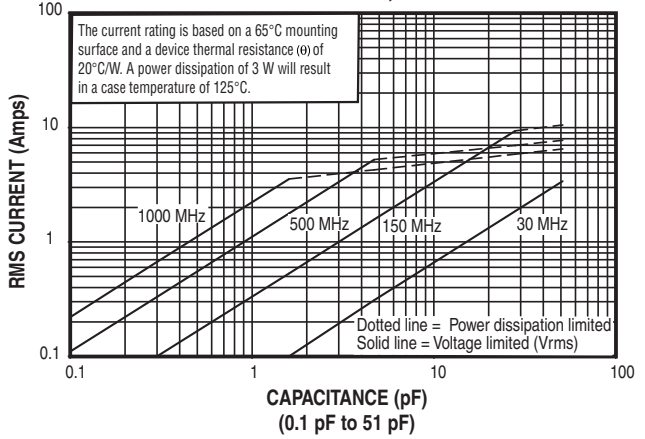
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ATC 700 B Performance Data

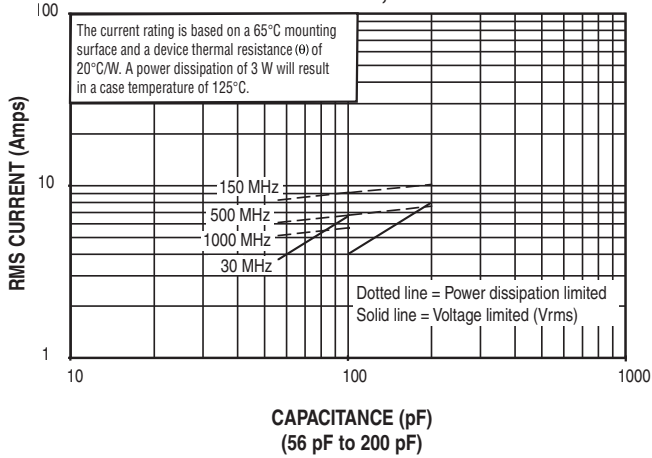
**SERIES RESONANCE VS. CAPACITANCE
ATC SERIES 700, CASE B**



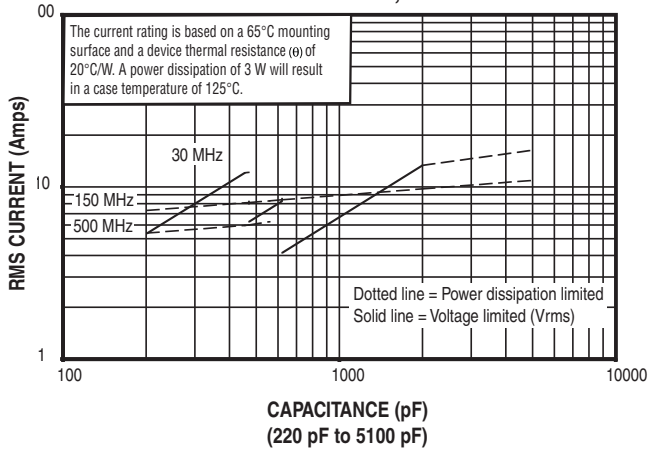
**CURRENT RATING VS. CAPACITANCE
ATC SERIES 700, CASE B**



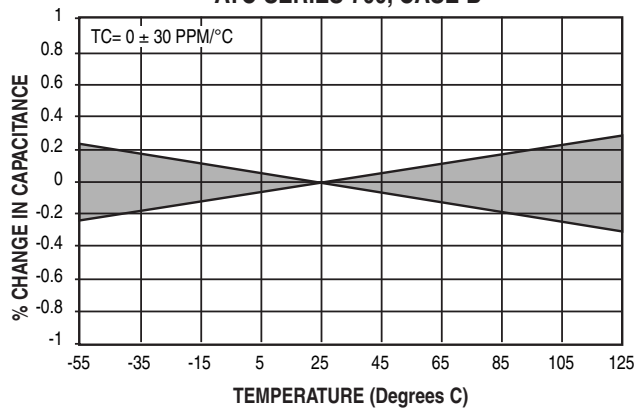
**CURRENT RATING VS. CAPACITANCE
ATC SERIES 700, CASE B**



**CURRENT RATING VS. CAPACITANCE
ATC SERIES 700, CASE B**



**CAPACITANCE CHANGE VS. TEMPERATURE
ATC SERIES 700, CASE B**



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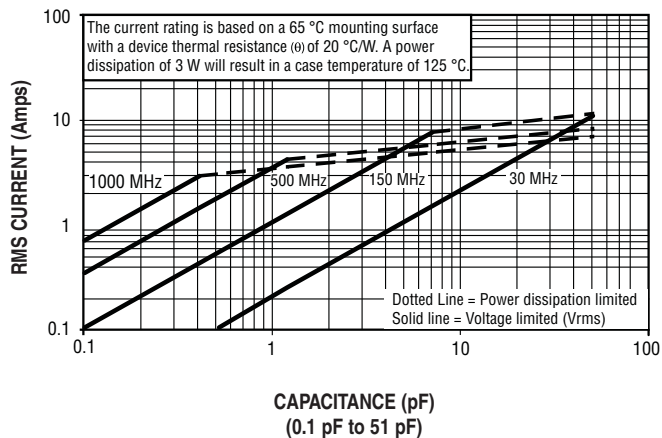
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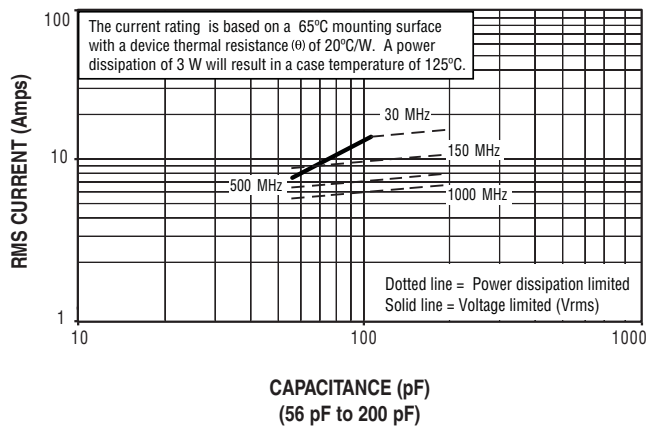
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ATC 700 B Performance Data

CURRENT RATING VS. CAPACITANCE
ATC SERIES 700, CASE B, EXTENDED VOLTAGE



CURRENT RATING VS. CAPACITANCE
ATC SERIES 700, CASE B, EXTENDED VOLTAGE



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