

# 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.

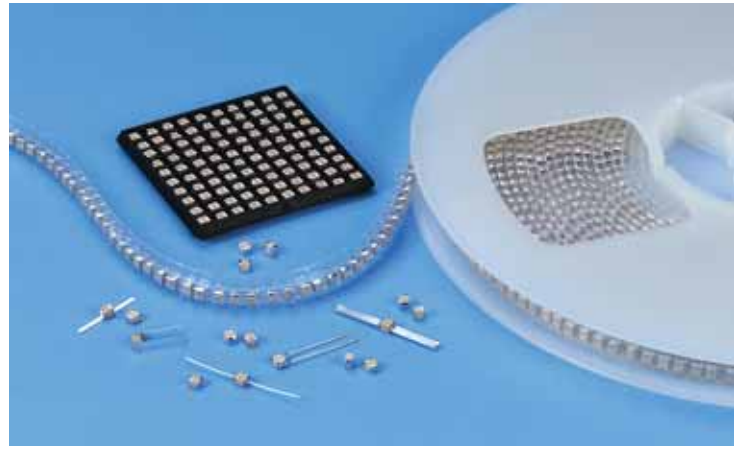
200% WVDC applied.

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:

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

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

510 pF to 5100 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):

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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TECHNICAL

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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	EXTENDED VOLTAGE	3R3	3.3	B, C, D	500	EXTENDED VOLTAGE	330	33	F, G, J K, M	500	1500	331	330	F, G, J K, M	200	N/A	
0R2	0.2	3R6			3.6	360				36	361				360					
0R3	0.3	B, C			3R9	3.9				390	39				391	390				
0R4	0.4				4R3	4.3				430	43				431	430				
0R5	0.5	B, C, D			4R7	4.7				470	47				471	470				
0R6	0.6				5R1	5.1				510	51				511	510				
0R7	0.7				5R6	5.6				560	56				561	560				
0R8	0.8				6R2	6.2				620	62				621	620				
0R9	0.9				6R8	6.8				680	68				681	680				
1R0	1.0				B, C, J K, M	7R5				7.5	750				75	751				750
1R1	1.1					8R2				8.2	820				82	821				820
1R2	1.2					9R1				9.1	910				91	911				910
1R3	1.3				B, C, D	100				10	101				100	102				1000
1R4	1.4	110				11	111			110	112		1100							
1R5	1.5	120				12	121			120	122		1200							
1R6	1.6	130				13	131			130	152		1500							
1R7	1.7	150				15	151			150	182		1800							
1R8	1.8	160				16	161			160	222		2200							
1R9	1.9	180				18	181			180	272		2700							
2R0	2.0	200				20	201			200	302		3000							
2R1	2.1	220				22	221			220	332		3300							
2R2	2.2	240				24	241			240	392		3900							
2R4	2.4	270				27	271			270	472		4700							
2R7	2.7	B, C, D			300	30	301			300	512		5100							
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

Series ATC700 Case Size B Capacitance Code: 33 First 2 significant digits for capacitance. R=Decimal Point

Indicates number of zeros following digits of capacitance in picofarads except for decimal values. 1

Capacitance Tolerance J

Termination Code W

WVDC 500

Laser Marking X

Packaging C

T - Tape and Reel, 1000 pc. qty.\*  
TV - Vertical Orientation of Product, Tape and Reel, 1000 pc. qty.\*  
C - ATC Cap-Pac®, 100 pc. qty. std.\*  
I - Special Packaging. Consult Factory.  
\*Consult ATC for other quantities

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%

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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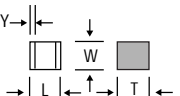

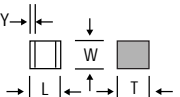

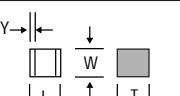

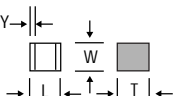
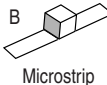
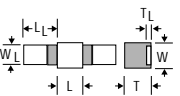
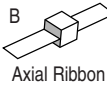
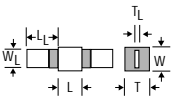

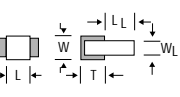
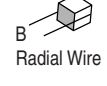
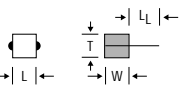

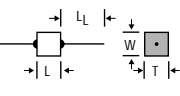
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# ATC 700 B Capacitors: Mechanical Configurations

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	 Solder Plate		.110 +.020 -.010 (2.79 +.051 -.025)	.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	 Pellet		.110 +.035 -.010 (2.79 +.089 -.025)	.110 ±.015 (2.79 ±0.38)			Heavy Tin/Lead Coated, over Nickel Barrier Termination			
700B	T	N/A	 Solderable Nickel Barrier		.110 +.020 -.010 (2.79 +.051 -.025)	.110 ±.015 (2.79 ±0.38)			<b>RoHS Compliant</b> Tin Plated over Nickel Barrier Termination			
700B	CA	CDR13BP	 Gold Chip		.110 +.020 -.010 (2.79 +.051 -.025)	.110 ±.015 (2.79 ±0.38)			<b>RoHS Compliant</b> Gold Plated over Nickel Barrier Termination			
700B	MS	CDR21BP	 Microstrip		.135 ±.015 (3.43 ±0.38)	.110 ±.015 (2.79 ±0.38)	.120 (3.05) max.	N/A	Length (L <sub>L</sub> )	Width (W <sub>L</sub> )	Thickness (T <sub>L</sub> )	
700B	AR	CDR22BP	 Axial Ribbon				.102 (2.59) max.		.250 (6.35) min.	.093 ±.005 (2.36 ±0.13)	.004 ±.001 (.102 ±.025)	
700B	RR	CDR24BP	 Radial Ribbon									
700B	RW	CDR23BP	 Radial Wire		.145 ±.020 (3.68 ±0.51)				.500 (12.7) min.	#26 AWG., .016 (.406) dia. nominal		
700B	AW	CDR25BP	 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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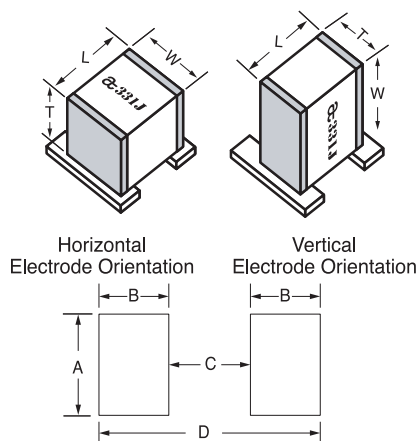
# ATC 700 B Capacitors: Non-Magnetic Mechanical Configurations\*

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 Require- ments	 B Non-Mag Solder Plate	 Y →     ← ↓ W →   L   ← ↑   T   ←	.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 Require- ments	 B Non-Mag Pellet	 Y →     ← ↓ W →   L   ← ↑   T   ←	.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 Require- ments	 B Non-Mag Solderable Barrier	 Y →     ← ↓ W →   L   ← ↑   T   ←	.110 +.025 -.010 (2.79 +0.64 -0.25)	.110 ±.015 (2.79 ±0.38)			<b><i>RoHS Compliant</i></b> Tin Plated over Non-Magnetic Barrier Termination		
700B	MN	Meets Require- ments	 B Non-Mag Microstrip	 Y →     ← ↓ W →   L   ← ↑   T   ←	.135 ±.015 (3.43 ±0.38)	.110 ±.015 (2.79 ±0.38)	.120 (3.05) max.	N/A	Length (L <sub>L</sub> )	Width (W <sub>L</sub> )	Thickness (T <sub>L</sub> )
700B	AN	Meets Require- ments	 B Non-Mag Axial Ribbon	 Y →     ← ↓ W →   L   ← ↑   T   ←			.106 (2.69) max.		.250 (6.35) min.	.093 ±.005 (2.36 ±0.13)	.004 ±.001 (.102 ±.025)
700B	FN	Meets Require- ments	 B Non-Mag Radial Ribbon	 Y →     ← ↓ W →   L   ← ↑   T   ←							
700B	RN	Meets Require- ments	 B Non-Mag Radial Wire	 Y →     ← ↓ W →   L   ← ↑   T   ←	.145 ±.020 (3.68 ±0.51)				.500 (12.7) min.	#26 AWG., .016 (.406) dia. nominal	
700B	BN	Meets Require- ments	 B Non-Mag Axial Wire	 Y →     ← ↓ W →   L   ← ↑   T   ←							

\*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	Normal	.130	.050	.075	.175
	High Density	.110	.030	.075	.135

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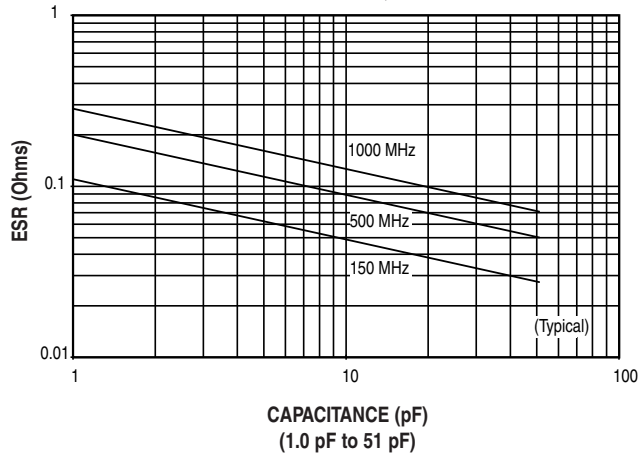
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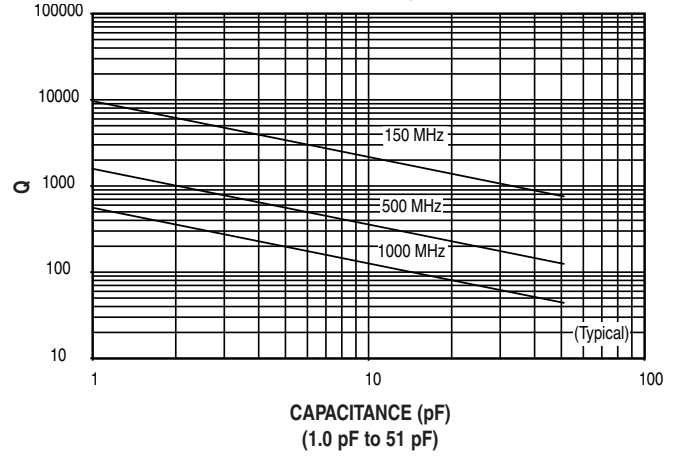
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# ATC 700 B Performance Data

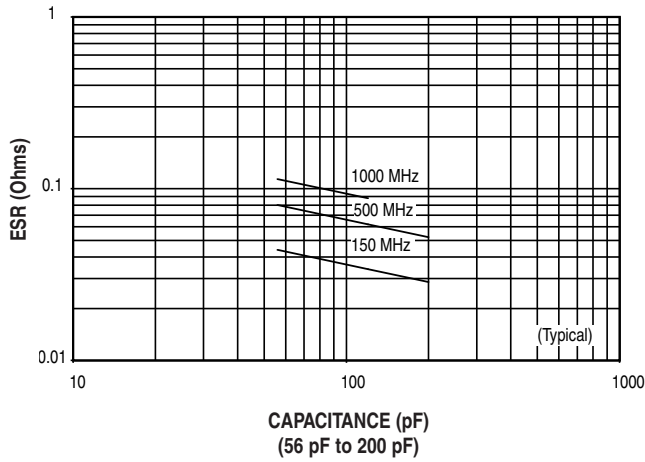
**ESR VS. CAPACITANCE**  
**ATC SERIES 700, CASE B**



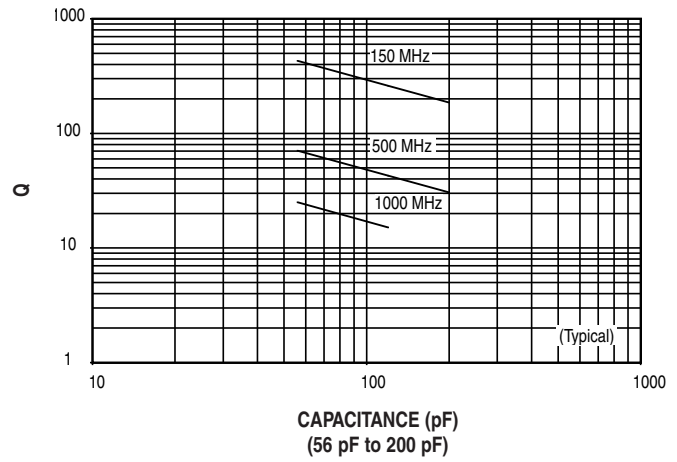
**Q VS. CAPACITANCE**  
**ATC SERIES 700, CASE B**



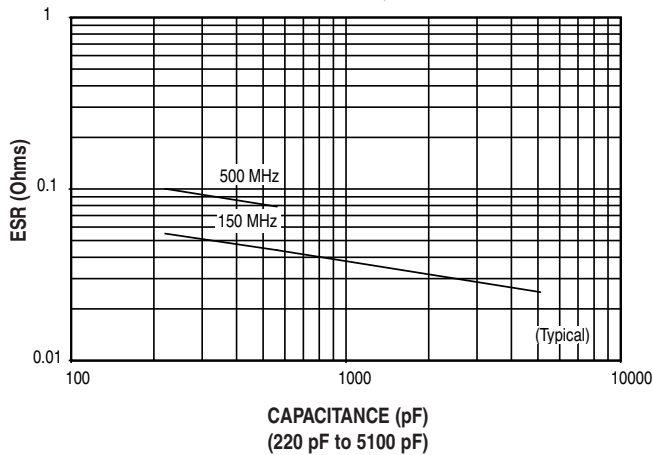
**ESR VS. CAPACITANCE**  
**ATC SERIES 700, CASE B**



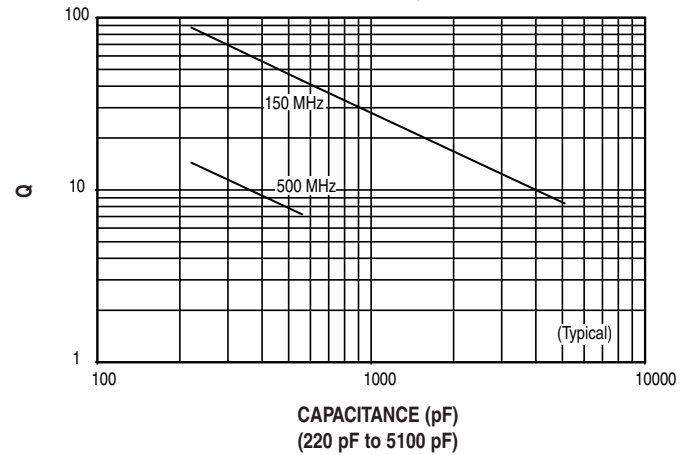
**Q VS. CAPACITANCE**  
**ATC SERIES 700, CASE B**



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



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



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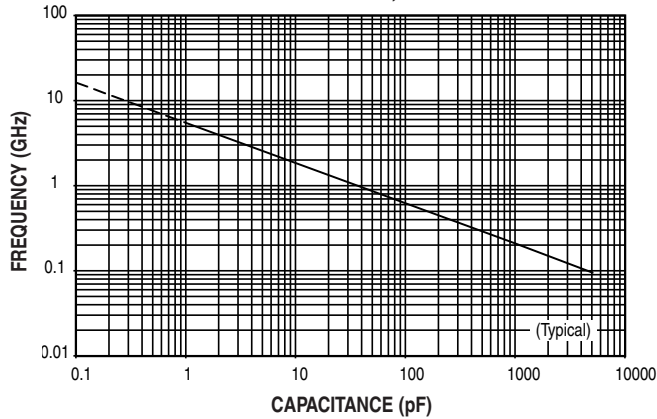
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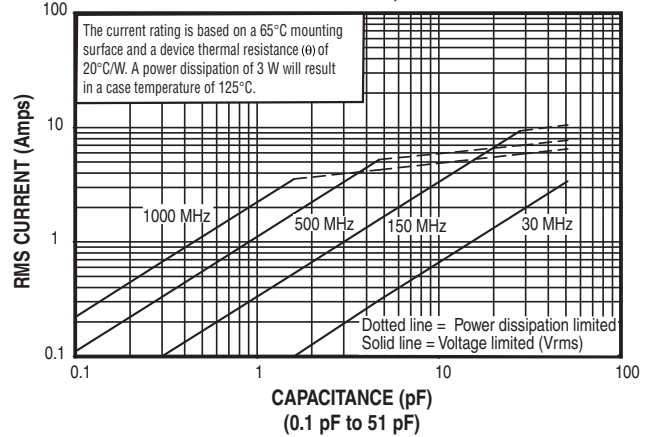
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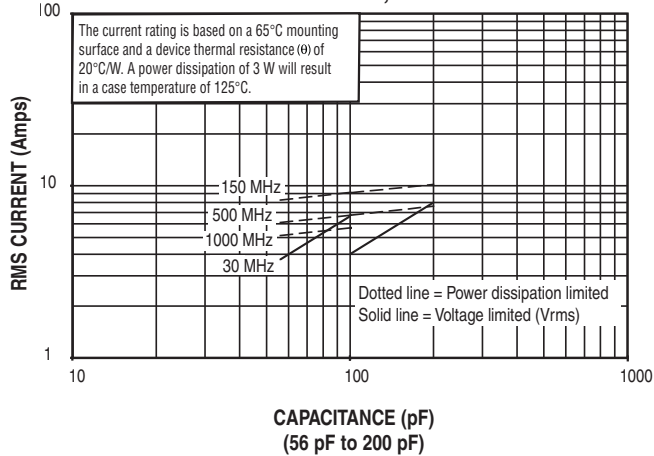
**SERIES RESONANCE VS. CAPACITANCE  
ATC SERIES 700, CASE B**



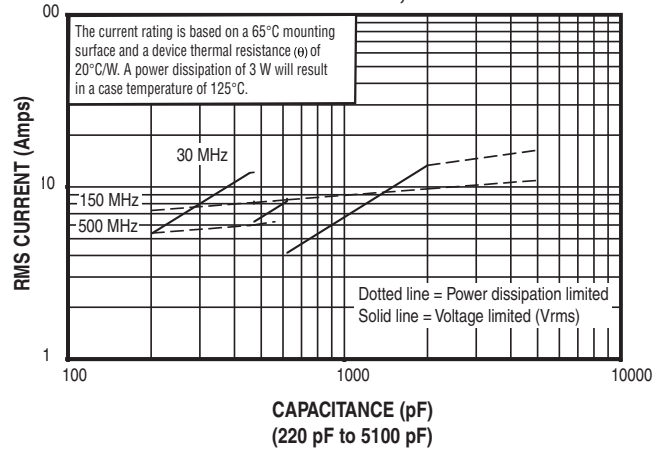
**CURRENT RATING VS. CAPACITANCE  
ATC SERIES 700, CASE B**



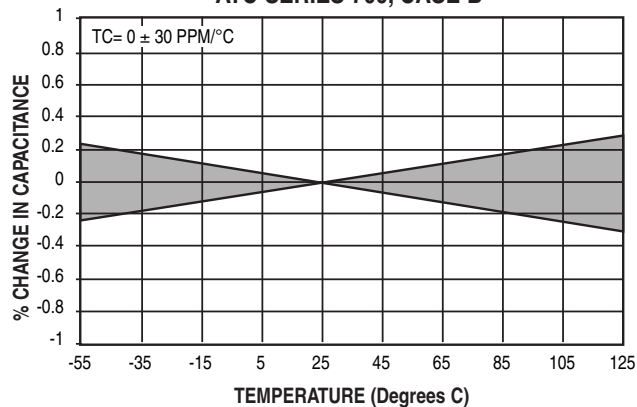
**CURRENT RATING VS. CAPACITANCE  
ATC SERIES 700, CASE B**



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



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



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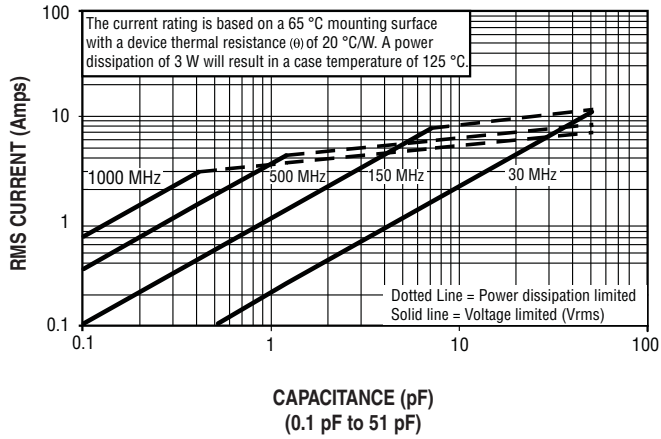
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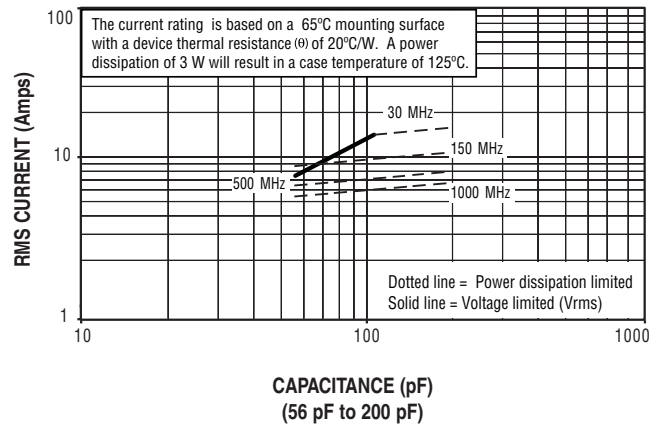
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# ATC 700 B Performance Data

**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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