

# ATC 100 B Series Porcelain Superchip® Multilayer Capacitors

- Case B Size  
(.110" x .110")
- Capacitance Range  
0.1 pF to 1000 pF
- High Q
- Ultra-Stable Performance
- Low ESR/ESL
- High Self-Resonance
- Low Noise
- Established Reliability (QPL)
- Extended WVDC up to 1500 VDC

ATC, the industry leader, offers new improved ESR/ESL performance for the 100 B Series RF/Microwave Capacitors. This Series is now available with extended operating temperatures up to 175°C. High Density porcelain construction provides a rugged, hermetic package.

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

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

## ENVIRONMENTAL TESTS

ATC 100 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.

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 at 1 MHz.

### TEMPERATURE COEFFICIENT OF CAPACITANCE (TCC):

+90 ±20 PPM/°C (-55°C to +125°C)  
+90 ±30 PPM/°C (+125°C to +175°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 1000 pF:

10<sup>5</sup> Megohms min. @ +25°C at rated WVDC.

10<sup>4</sup> Megohms min. @ +125°C at rated WVDC.

IR above +125°C is derated by one order of magnitude.

**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 330 pF: from -55°C to +175°C

360 to 1000 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.



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ATC # 001-807 Rev. P 8/13

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# ATC 100 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	2R4	2.4	B, C, D	500	1500	200	20	F, G, J, K, M	500	1500	151	150	F, G, J, K, M	300	VOLT		
0R2	0.2				2R7	2.7				220	22				161	160					
0R3	0.3				B, C	3R0				3.0	240				24	181				180	1000
0R4	0.4					3R3				3.3	270				27	201				200	
0R5	0.5	B, C, D			3R6	3.6				300	30				221	220		200	VOLT		
0R6	0.6				3R9	3.9				330	33				241	240					
0R7	0.7				4R3	4.3				360	36				271	270				600	
0R8	0.8				4R7	4.7				390	39				301	300					
0R9	0.9				5R1	5.1				430	43				331	330					
1R0	1.0				5R6	5.6				470	47				361	360					
1R1	1.1				6R2	6.2				510	51				391	390					
1R2	1.2				6R8	6.8	560			56	431				430						
1R3	1.3				7R5	7.5	620			62	471				470						
1R4	1.4				8R2	8.2	680			68	511				510						
1R5	1.5				9R1	9.1	750			75	561				560						
1R6	1.6				100	10	820			82	621				620						
1R7	1.7				110	11	910			91	681				680						
1R8	1.8				120	12	101			100	751				750						
1R9	1.9				130	13	111			110	821				820						
2R0	2.0				150	15	121			120	911		910								
2R1	2.1				160	16	131			130	102		1000								
2R2	2.2				180	18															

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.

## ATC PART NUMBER CODE

Series ATC100 B 91 0 J W 500 X T Packaging

Case Size B

Capacitance Code: 91  
First 2 significant digits for capacitance.  
R=Decimal Point

Indicates number of zeros following digits of capacitance in picofarads except for decimal values. 0

Capacitance Tolerance J

Termination Code W

WVDC 500

Laser Marking X

Termination Code T

T - Tape and Reel, 1000 pc. qty.\*  
TV - Vertical Orientation of Product, Tape and Reel, 1000 pc. qty.\*  
I - Special Packaging. Consult Factory.  
\*Consult ATC for other quantities  
ATC Cap-Pac® packaging (100 pc. qty. std.) is also available.  
For this option, leave last field blank.

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 100 B Series (case size B) 91 pF capacitor, J tolerance (±5%), 500 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and 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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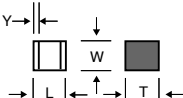

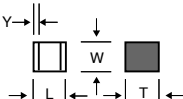

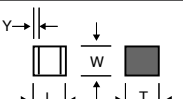

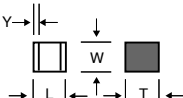

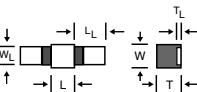

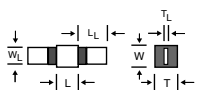

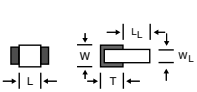

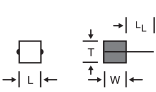

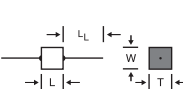
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# ATC 100 B Capacitors: Mechanical Configurations

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			
100B	W	CDR14BG	 Solder Plate		.110 +.020 -.010 (2.79 +0.51 -.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			
100B	P	CDR14BG	 Pellet		.110 +.035 -.010 (2.79 +0.89 -.025)	.110 ±.015 (2.79 ±0.38)			Heavy Tin/Lead Coated, over Nickel Barrier Termination			
100B	T	N/A	 Solderable Nickel Barrier		.110 +.020 -.010 (2.79 +0.51 -.025)	.110 ±.015 (2.79 ±0.38)			<b>RoHS Compliant</b> Tin Plated over Nickel Barrier Termination			
100B	CA	CDR13BG	 Gold Chip		.110 +.020 -.010 (2.79 +0.51 -.025)	.110 ±.015 (2.79 ±0.38)			<b>RoHS Compliant</b> Gold Plated over Nickel Barrier Termination			
100B	MS	CDR21BG	 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> )	
100B	AR	CDR22BG	 Axial Ribbon				.102 (2.59) max.					
100B	RR	CDR24BG	 Radial Ribbon									
100B	RW	CDR23BG	 Radial Wire		.145 ±.020 (3.68 ±0.51)							
100B	AW	CDR25BG	 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.


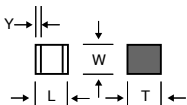

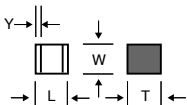

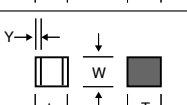

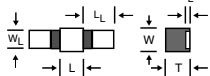

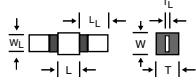

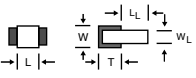

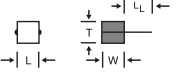

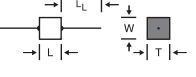
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# ATC 100 B Non-Magnetic Capacitors: Mechanical Configurations

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		
100B	WN	Meets Require- ments	 B Non-Mag Solder Plate		.110 +.025 -.010 (2.79 +.64 -.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		
100B	PN	Meets Require- ments	 B Non-Mag Pellet		.110 +.035 -.010 (2.79 +.89 -.25)	.110 ±.015 (2.79 ±0.38)			Heavy Tin/Lead Coated, over Non-Magnetic Barrier Termination		
100B	TN	Meets Require- ments	 B Non-Mag Solderable Barrier		.110 +.025 -.010 (2.79 +.64 -.25)	.110 ±.015 (2.79 ±0.38)			<b>RoHS Compliant</b> Tin Plated over Non-Magnetic Barrier Termination		
100B	MN	Meets Require- ments	 Non-Mag 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> )
100B	AN	Meets Require- ments	 Non-Mag Axial Ribbon				.102 (2.59) max.		.250 (6.35) min.	.093 ±.005 (2.36 ±0.13)	.004 ±.001 (.102 ±.025)
100B	FN	Meets Require- ments	 B Non-Mag Radial Ribbon								
100B	RN	Meets Require- ments	 B Non-Mag Radial Wire		.145 ±.020 (3.68 ±0.51)						
100B	BN	Meets Require- ments	 B Non-Mag Axial Wire								

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	Pad Size	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	

Dimensions are in inches.

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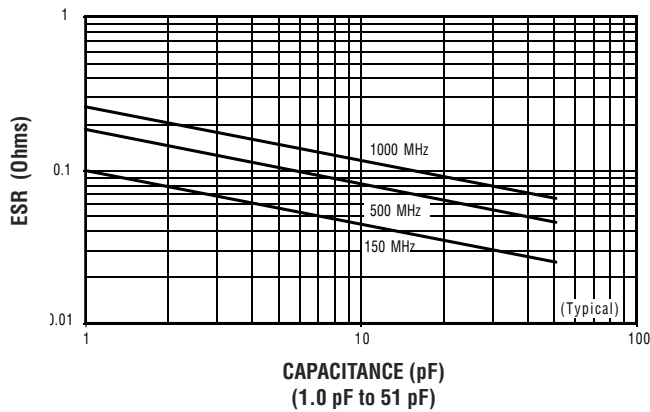
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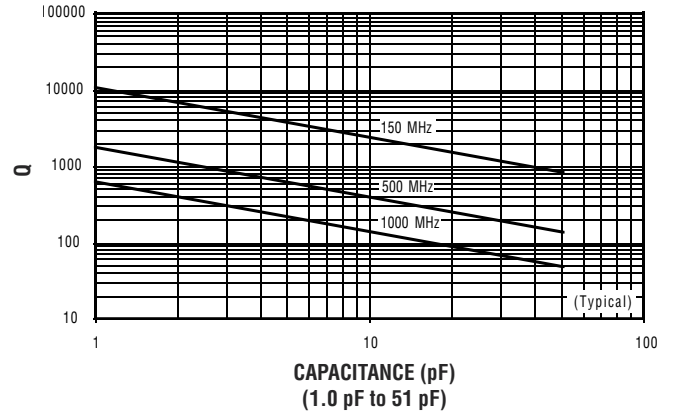
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# ATC 100 B Performance Data

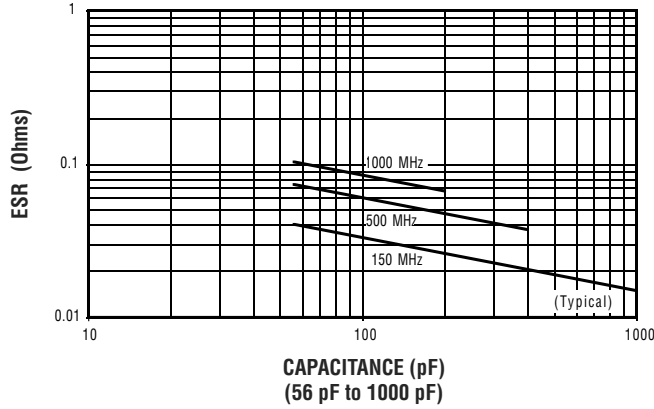
**ESR VS. CAPACITANCE**  
ATC SERIES 100, CASE B



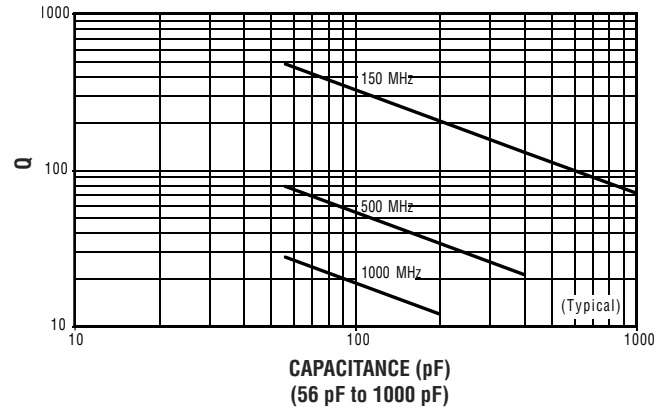
**Q VS. CAPACITANCE**  
ATC SERIES 100, CASE B



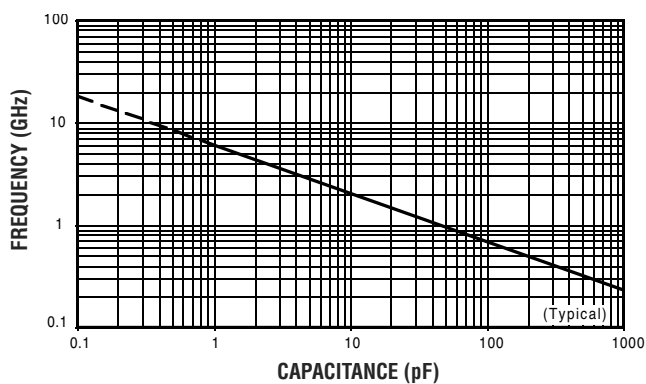
**ESR VS. CAPACITANCE**  
ATC SERIES 100, CASE B



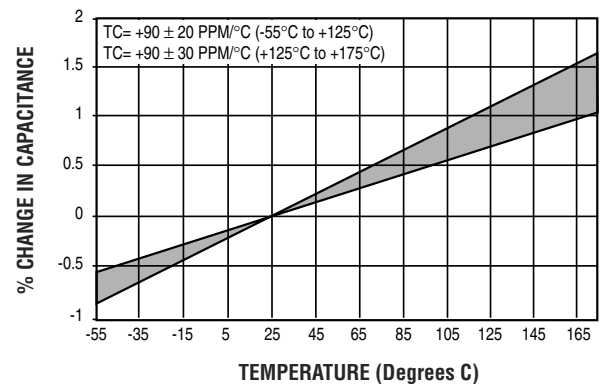
**Q VS. CAPACITANCE**  
ATC SERIES 100, CASE B



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



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



**A M E R I C A N   T E C H N I C A L   C E R A M I C S**

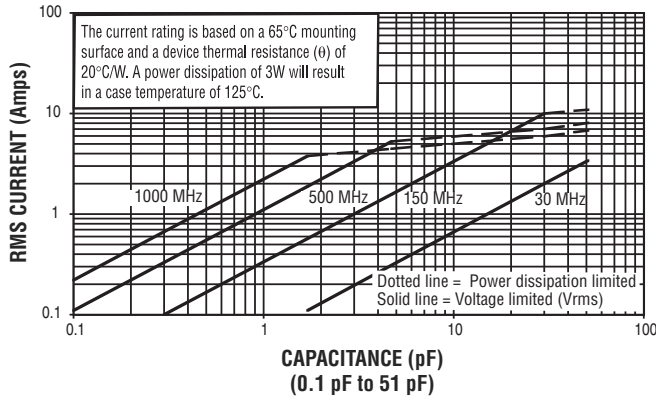
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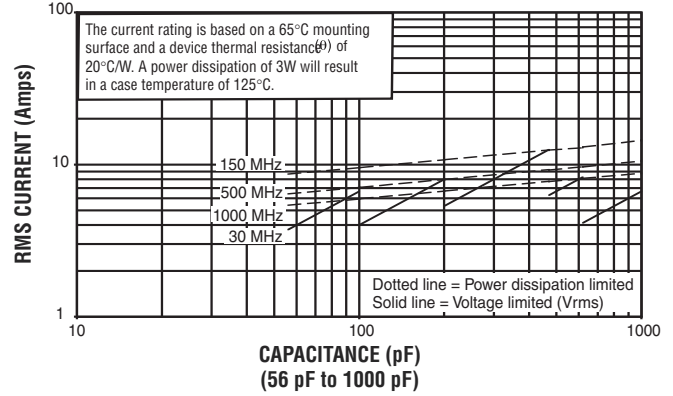
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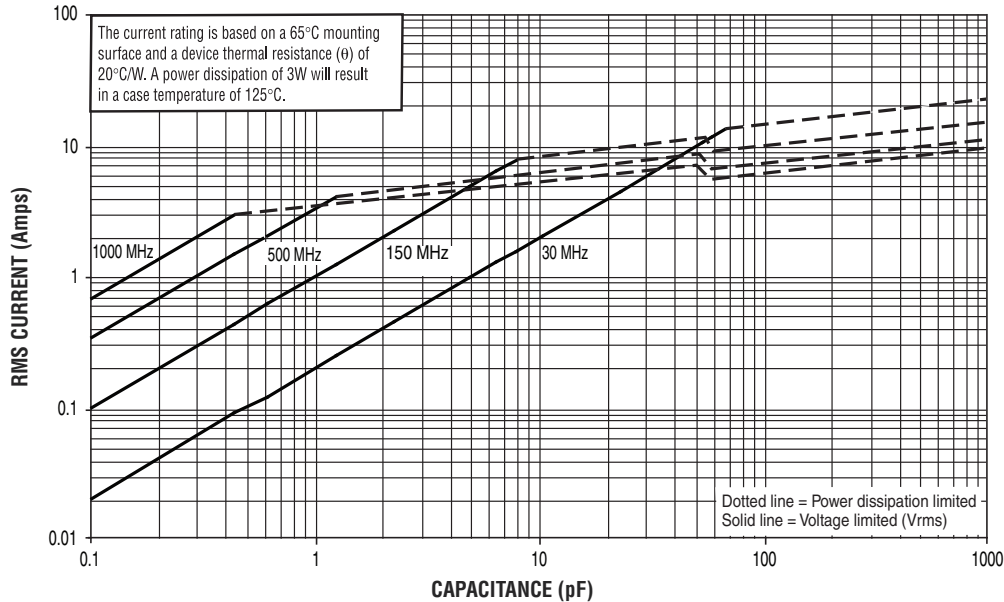
**CURRENT RATING VS. CAPACITANCE  
ATC SERIES 100, CASE B**



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



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



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