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:
10^6 Megohms min. @ +25°C at rated WVDC.
10^5 Megohms min. @ +125°C at rated WVDC.
510 pF to 1000 pF:
10^5 Megohms min. @ +25°C at rated WVDC.
10^4 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 100 B Capacitance Values

CAP. CODE	CAP. (pF)	TOL.	RATED WVDC STD.	RATED WVDC EXT.	CAP. CODE	CAP. (pF)	TOL.	RATED WVDC STD.	RATED WVDC EXT.	CAP. CODE	CAP. (pF)	TOL.	RATED WVDC STD.	RATED WVDC EXT.	CAP. CODE	CAP. (pF)	TOL.	RATED WVDC STD.	RATED WVDC EXT.
0R1	0.1	B	500	EXTENDED VOLTAGE 1500 EXTENDED VOLTAGE	2R4	2.4	B, C, D	500	EXTENDED VOLTAGE 1500 EXTENDED VOLTAGE	200	20	F, G, J, K, M	500	EXTENDED VOLTAGE 1500 EXTENDED VOLTAGE 1000	151	150	F, G, J, K, M	300	EXT VOLT 1000 EXT VOLT
0R2	0.2				2R7	2.7				220	22				161	160			
0R3	0.3	B, C			3R0	3.0				240	24				181	180			
0R4	0.4				3R3	3.3				270	27				201	200			
0R5	0.5	B, C, D			3R6	3.6				300	30				221	220		200	EXT VOLT 600 EXT VOLT
0R6	0.6				3R9	3.9				330	33				241	240			
0R7	0.7				4R3	4.3				360	36				271	270			
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	B, C, J, K, M			560	56				431	430			
1R3	1.3				7R5	7.5				620	62				471	470			
1R4	1.4				8R2	8.2				680	68				511	510		100	EXT VOLT 300 EXT VOLT
1R5	1.5				9R1	9.1				750	75				561	560			
1R6	1.6				100	10	F, G, J, K, M			820	82				621	620			
1R7	1.7				110	11				910	91				681	680		50	
1R8	1.8				120	12				101	100				751	750			
1R9	1.9				130	13				111	110		300		821	820			
2R0	2.0				150	15				121	120				911	910			
2R1	2.1				160	16				131	130			1000	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

ATC100 B 91 0 J W 500 X T

- Series
- Case Size
- Capacitance Code: First 2 significant digits for capacitance. R=Decimal Point
- Indicates number of zeros following digits of capacitance in picofarads except for decimal values.
- Capacitance Tolerance
- Termination Code
- WVDC
- Laser Marking
- Packaging
  - 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%

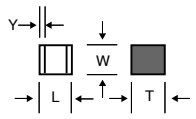
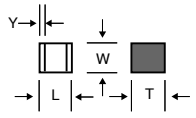
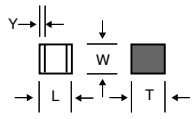
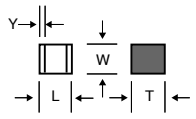
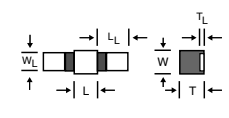
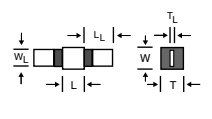
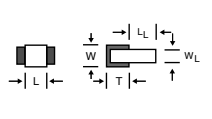
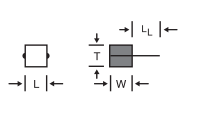
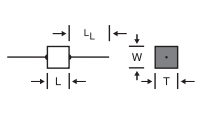
The above part number refers to a 100 B Series (case size B) 91 pF capacitor, J tolerance (±5%), 500 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and Tape and Reel packaging.

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.

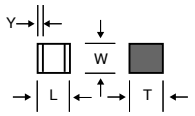
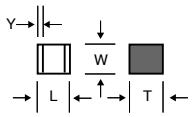
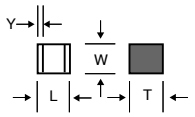
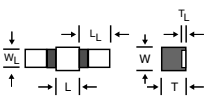
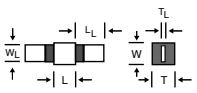
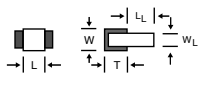
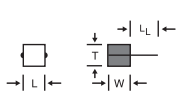
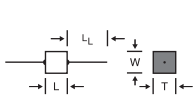
Consult factory for additional performance data.

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) LENGTH (L)	WIDTH (W)	THICKNESS (T)	LEAD AND TERMINATION DIMENSIONS AND MATERIALS OVERLAP (Y)	MATERIALS
100B	W	CDR14BG	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
100B	P	CDR14BG	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
100B	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
100B	CA	CDR13BG	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
100B	MS	CDR21BG	B Microstrip		.135 ±.015 (3.43 ±0.38)	.110 ±.015 (2.79 ±0.38)	.120 (3.05) max.	N/A	Length (L_L) .250 (6.35) min. / Width (W_L) .093 ±.005 (2.36 ±0.13) / Thickness (T_L) .004 ±.001 (.102 ±.025)
100B	AR	CDR22BG	B Axial Ribbon				.102 (2.59) max.		
100B	RR	CDR24BG	B Radial Ribbon						
100B	RW	CDR23BG	B Radial Wire		.145 ±.020 (3.68 ±0.51)				.500 (12.7) min. / #26 AWG., .016 (.406) dia. nominal
100B	AW	CDR25BG	B Axial Wire						

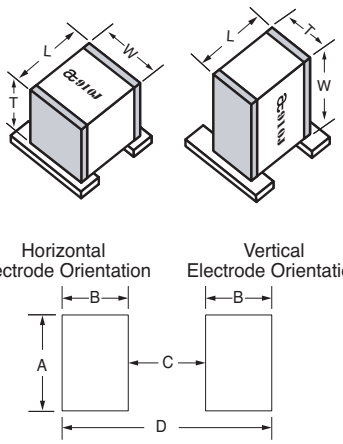
Additional lead styles available: Narrow Microstrip (NM), Narrow Axial Ribbon (NA) and Vertical Narrow Microstrip (H). Other lead lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are **RoHS** compliant. For a complete military catalog,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

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) LENGTH (L)	WIDTH (W)	THICKNESS (T)	LEAD AND TERMINATION DIMENSIONS AND MATERIALS OVERLAP (Y)	MATERIALS
100B	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
100B	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
100B	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
100B	MN	Meets Requirements	Non-Mag Microstrip		135 ±.015 (3.43 ±0.38)	.110 ±.015 (2.79 ±0.38)	.120 (3.05) max.	N/A	Length (L_L) .250 (6.35) min. / Width (W_L) .093 ±.005 (2.36 ±0.13) / Thickness (T_L) .004 ±.001 (.102 ±.025)
100B	AN	Meets Requirements	Non-Mag Axial Ribbon				.102 (2.59) max.		
100B	FN	Meets Requirements	B Non-Mag Radial Ribbon						
100B	RN	Meets Requirements	B Non-Mag Radial Wire		.145 ±.020 (3.68 ±0.51)				.500 (12.7) min. / #26 AWG., .016 (.406) dia. nominal
100B	BN	Meets Requirements	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 — Dimensions are in inches

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 — Dimensions are in inches

All values	Normal	.130	.050	.075	.175
	High Density	.110	.030	.075	.135

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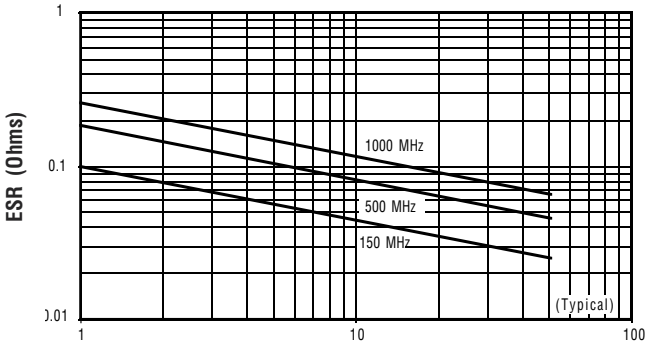
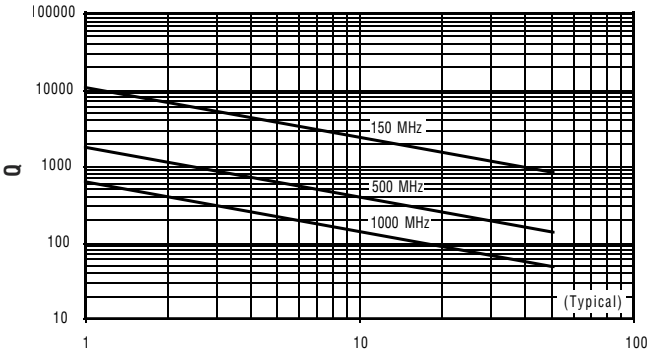
ATC 100 B Performance Data

ESR VS. CAPACITANCE
ATC SERIES 100, CASE B



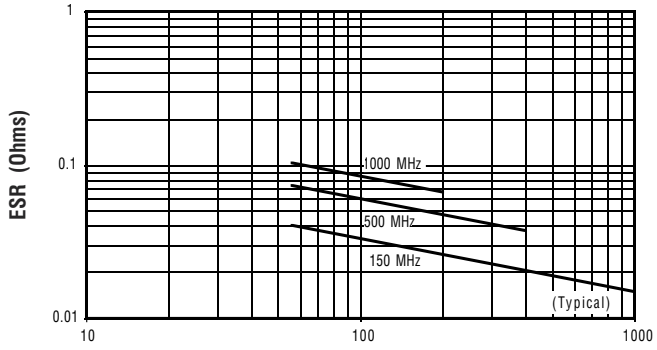
CAPACITANCE (pF)
(1.0 pF to 51 pF)

Q VS. CAPACITANCE
ATC SERIES 100, CASE B



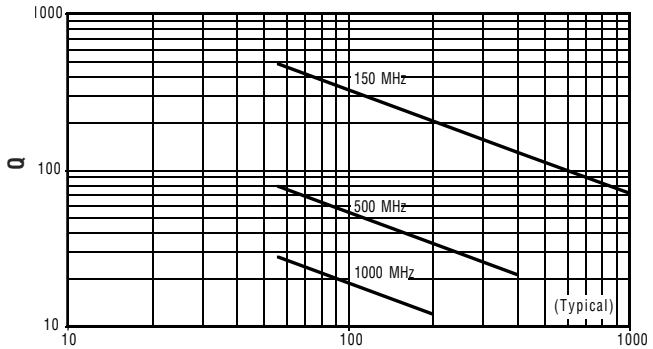
CAPACITANCE (pF)
(1.0 pF to 51 pF)

ESR VS. CAPACITANCE
ATC SERIES 100, CASE B



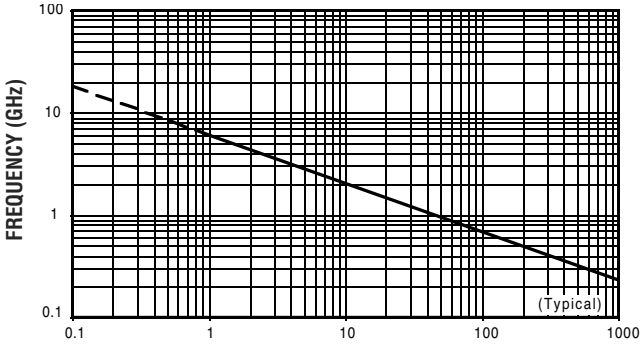
CAPACITANCE (pF)
(56 pF to 1000 pF)

Q VS. CAPACITANCE
ATC SERIES 100, CASE B



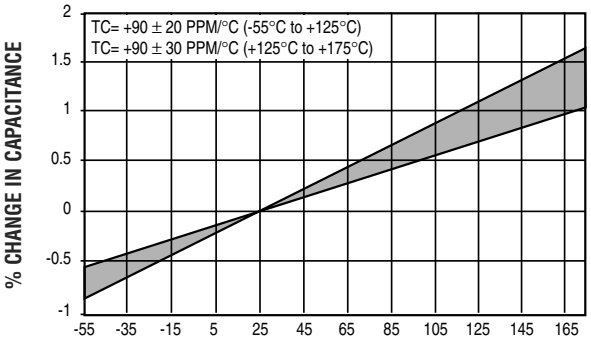
CAPACITANCE (pF)
(56 pF to 1000 pF)

SERIES RESONANCE VS. CAPACITANCE
ATC SERIES 100, CASE B



CAPACITANCE (pF)

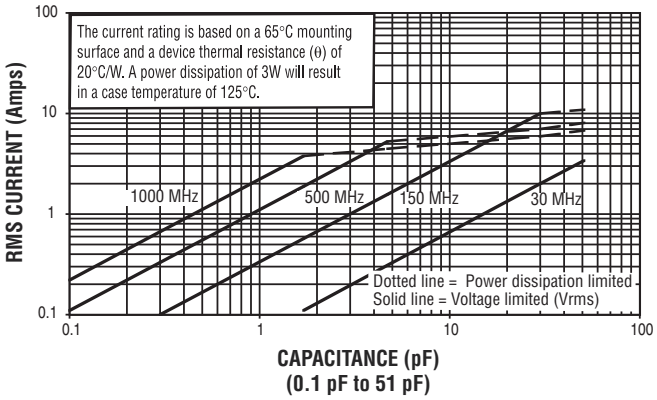
CAPACITANCE CHANGE VS. TEMPERATURE
ATC SERIES 100, CASE B



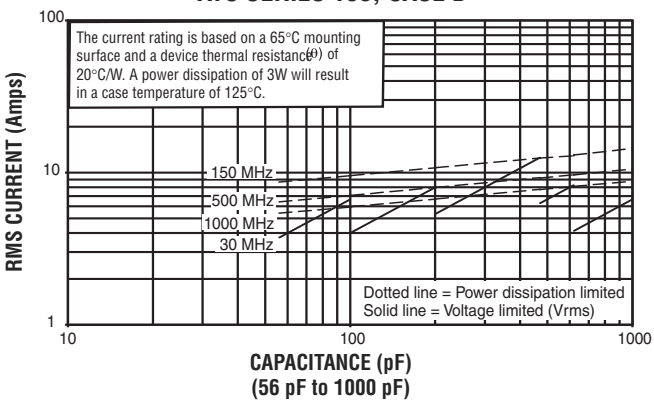
TEMPERATURE (Degrees C)

ATC 100 B Performance Data

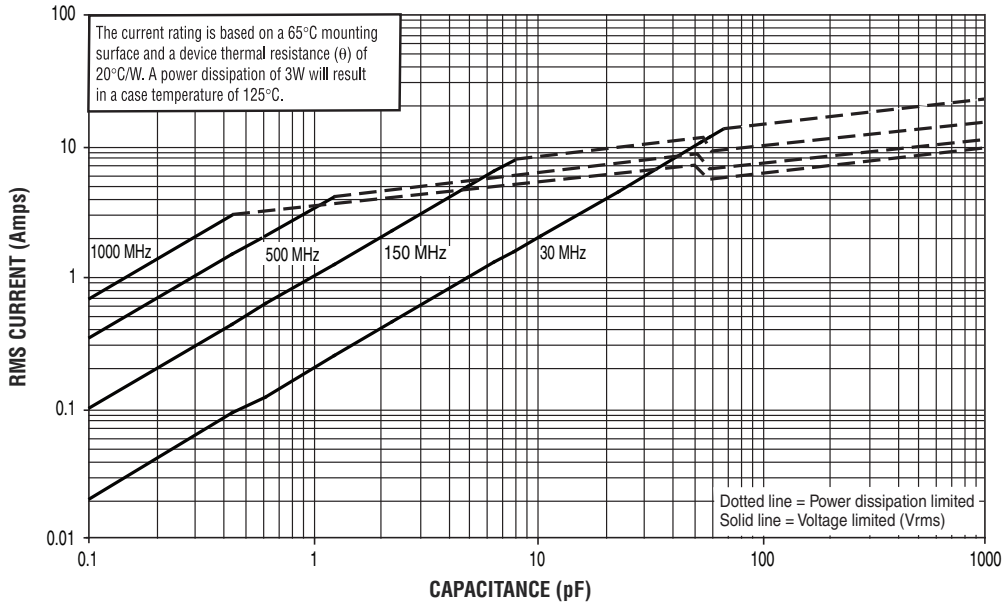
CURRENT RATING VS. CAPACITANCE
ATC SERIES 100, CASE B



CURRENT RATING VS. CAPACITANCE
ATC SERIES 100, CASE B



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



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