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)**
- **Available with Encapsulation Option***
- **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.

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

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.

*For leaded styles only.

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.

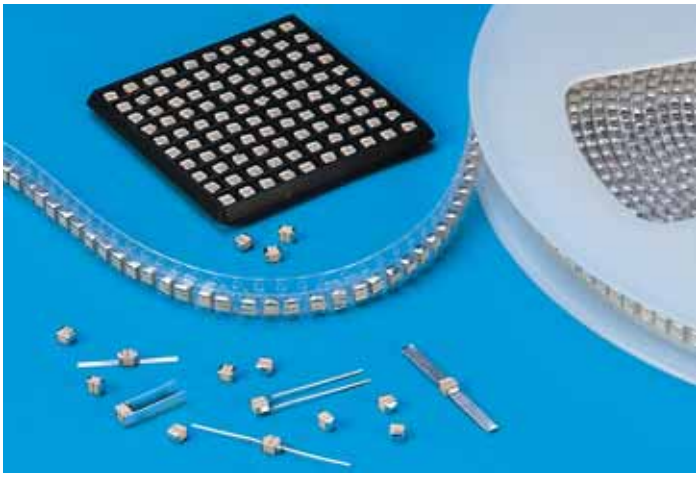
LOW VOLTAGE HUMIDITY:
MIL-STD-202, Method 103, Condition A, with 1.5 Volts DC applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours min.

LIFE TEST:

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

Extended Voltage Products:
Voltage Applied:

0.1 pF to 47 pF at WVDC
51 pF to 200 pF at 120% of WVDC



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% WVDC for WVDC $\leq$ 500 Volts
150% WVDC for WVDC $>$ 500 Volts or $\leq$ 1250 Volts
120% WVDC for WVDC $>$ 1250 Volts
Test voltage is applied for 5 secs.

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:
Standard WVDC:
0.1 to 330 pF: from -55°C to +175°C
360 to 1000 pF: from -55°C to +125°C
Extended WVDC:
0.1 to 1000 pF: from -55°C to +125°C
(No derating of working voltage).

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	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	N/A
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	
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				821	820			
2R0	2.0				150	15				121	120				911	910			
2R1	2.1				160	16				131	130		300		102	1000			
2R2	2.2				180	18													

VRMS = 0.707 X WVDC

• SPECIAL VALUES, TOLERANCES, HIGHER WVDC AND MATCHING AVAILABLE. • ENCAPSULATION OPTION 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 C

- 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.*
  - 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%

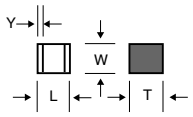
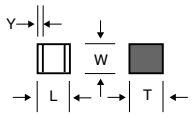
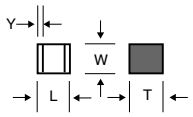
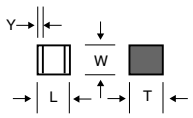
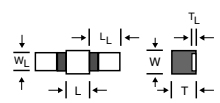
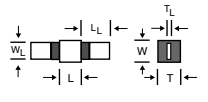
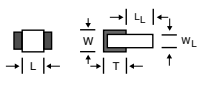
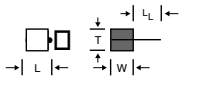
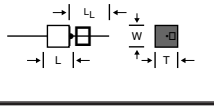
The above part number refers to a 100 B Series (case size B) 91 pF capacitor, J tolerance (±5%), 500 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and ATC Cap-Pac® packaging.

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 (631) 622-4700.

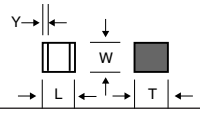
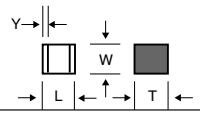
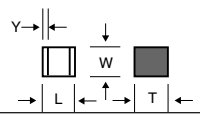
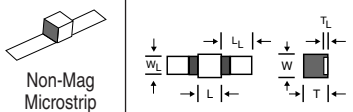
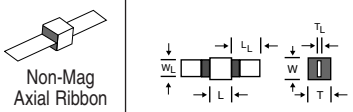
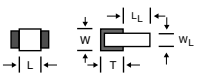
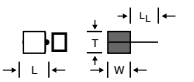
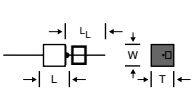
Consult factory for additional performance data.

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)			LEAD AND TERMINATION DIMENSIONS AND MATERIALS			
					LENGTH (L)	WIDTH (W)	THICKNESS (T)	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)	Width (W_L)	Thickness (T_L)
100B	AR	CDR22BG	B Axial Ribbon				.102 (2.59) max.		.250 (6.35) min.	.093 ±.005 (2.36 ±0.13)	.004 ±.001 (.102 ±.025)
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								

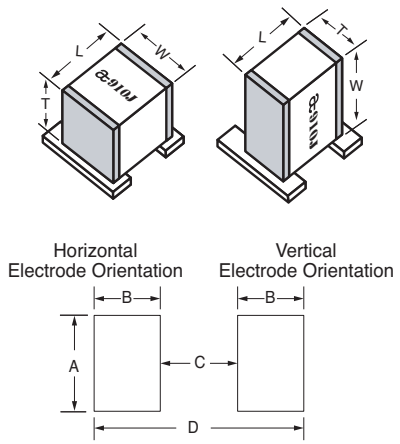
Additional lead styles available: Narrow Microstrip (NM), Narrow Axial Ribbon (NA) and Vertical Narrow Microstrip (H). Other lead lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are **RoHS** compliant. For a complete military catalog, 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 Require-ments	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 Require-ments	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 Require-ments	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 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_L) .250 (6.35) min. / Width (W_L) .093 ±.005 (2.36 ±0.13) / Thickness (T_L) .004 ±.001 (.102 ±.025)
100B	AN	Meets Require-ments	Non-Mag Axial Ribbon				.102 (2.59) max.		
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)			.500 (12.7) min.	#26 AWG., .016 (.406) dia. nominal
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

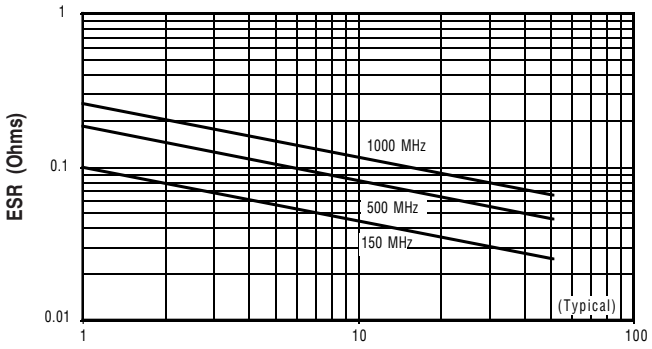
Cap Value	Pad Size	A Min.	B Min.	C Min.	D Min.
0.1 pF	Normal	.065	.050	.075	.175
	High Density	.045	.030	.075	.135
0.2 pF	Normal	.090	.050	.075	.175
	High Density	.070	.030	.075	.135
0.3 to 510 pF	Normal	.110	.050	.075	.175
	High Density	.090	.030	.075	.135
> 510 pF	Normal	.120	.050	.075	.175
	High Density	.100	.030	.075	.135

Horizontal Mount

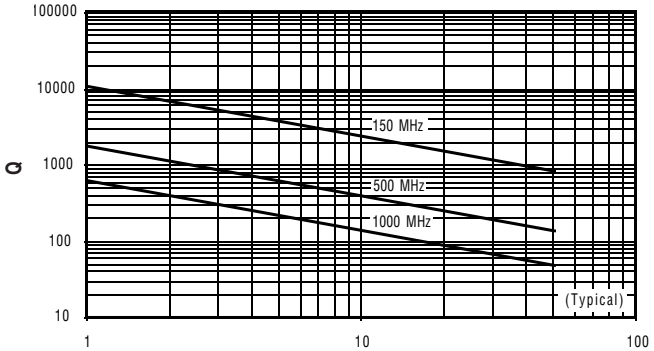
All values	Normal	.130	.050	.075	.175
	High Density	.110	.030	.075	.135

ATC 100 B Performance Data

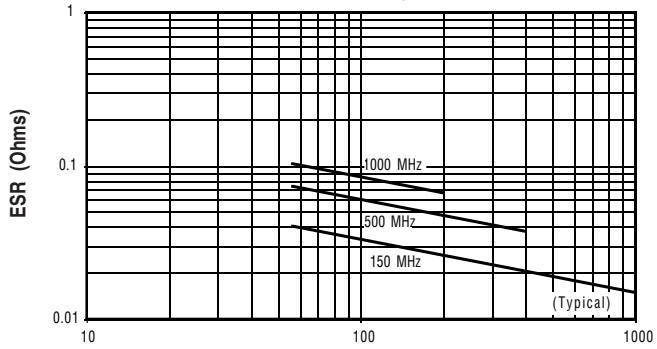
ESR VS. CAPACITANCE
ATC SERIES 100, CASE B



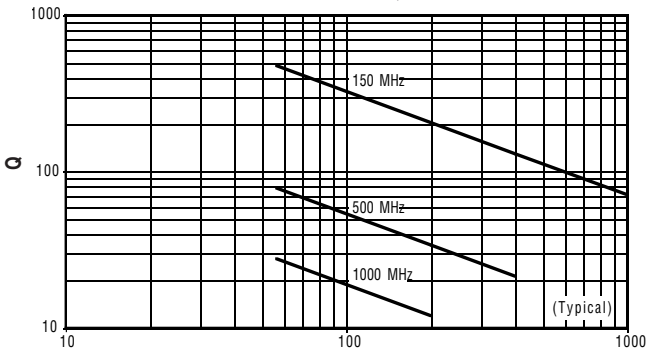
Q VS. CAPACITANCE
ATC SERIES 100, CASE B



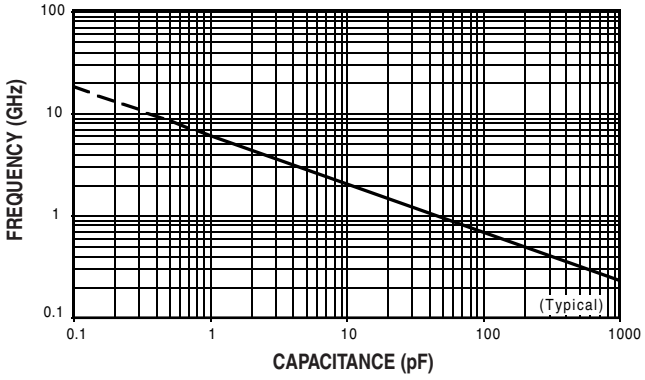
ESR VS. CAPACITANCE
ATC SERIES 100, CASE B



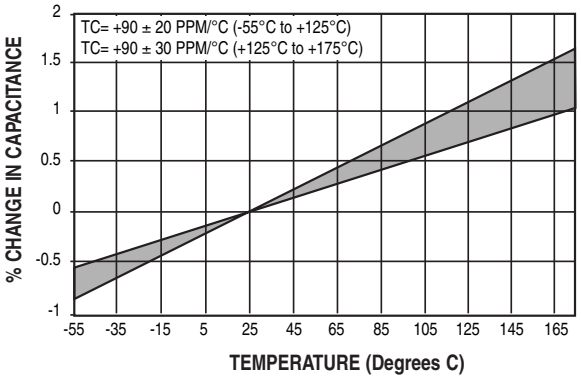
Q VS. CAPACITANCE
ATC SERIES 100, CASE B



SERIES RESONANCE VS. CAPACITANCE
ATC SERIES 100, CASE B

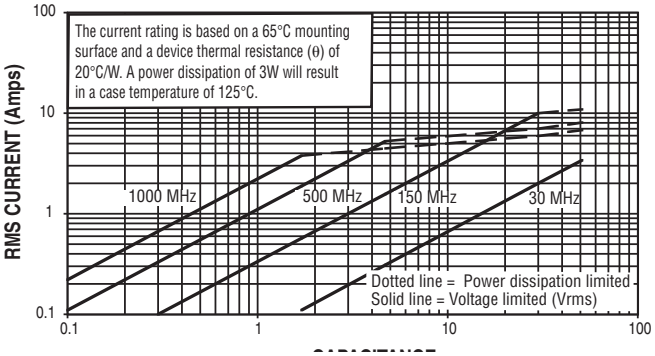


CAPACITANCE CHANGE VS. TEMPERATURE
ATC SERIES 100, CASE B

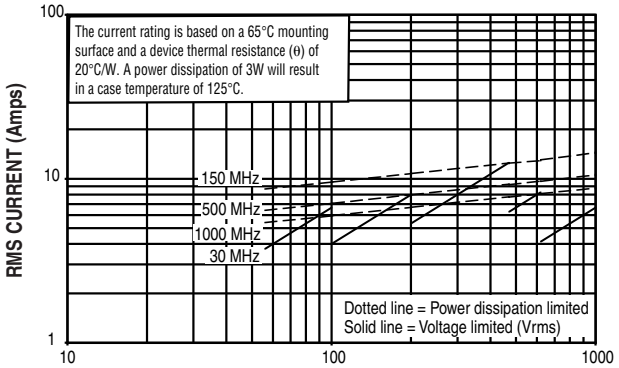


ATC 100 B Performance Data

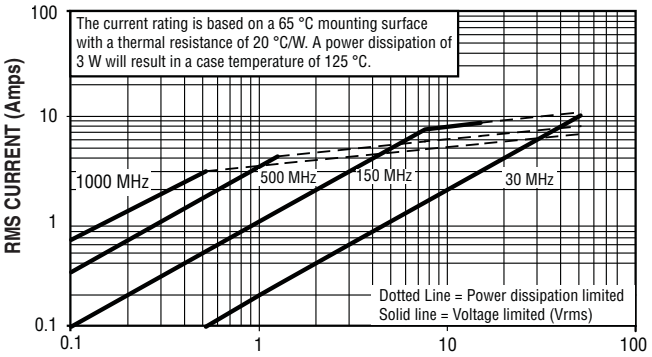
CURRENT RATING VS. CAPACITANCE
ATC SERIES 100, CASE B



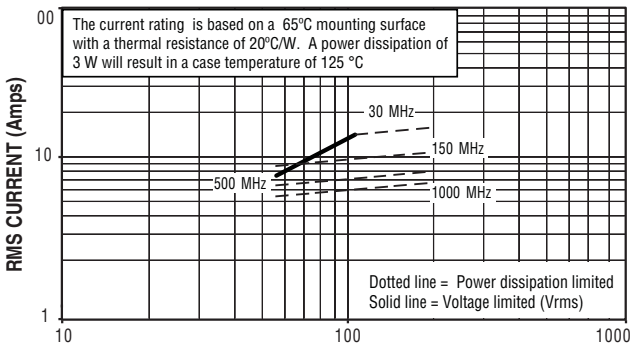
CURRENT RATING VS. CAPACITANCE
ATC SERIES 100, CASE B



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



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



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