

# ATC 100 C Series Porcelain High RF Power Multilayer Capacitors

- Case C Size (.250" x .250")
- High Q
- Low ESR/ESL
- High RF Power
- Available with Encapsulation Option\*
- Capacitance Range 1 pF to 2700 pF
- Ultra-Stable Performance
- High RF Current/Voltage
- High Reliability
- Extended WVDC up to 3600 VDC

ATC, the industry leader, offers new improved ESR/ESL performance for the 100 C Series RF Capacitors. This high Q multilayer capacitor is ultra-stable under high RF current and voltage applications. 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, Impedance Matching and DC Blocking.

Typical circuit applications: VHF/UHF RF Power Amplifiers, Antenna Tuning, Plasma Chambers and Medical (MRI coils).

\*For leaded styles only.

## ENVIRONMENTAL TESTS

ATC 100 C 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:

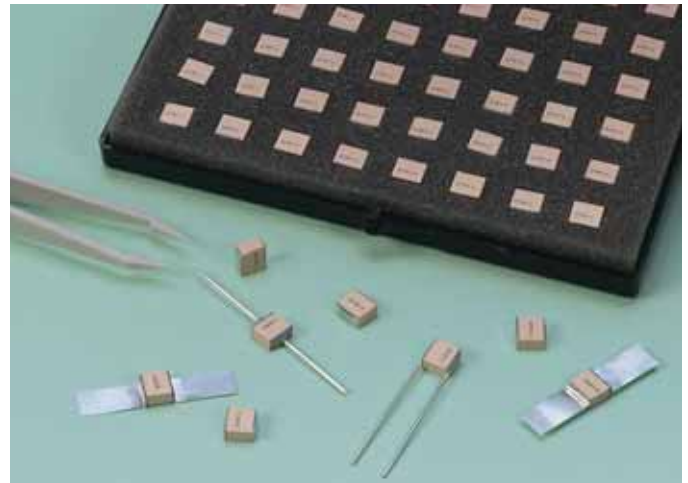
MIL-STD-202, Method 108, for 2000 hours, at 125°C.

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 (1.0 pF to 1000 pF) @ 1 MHz.

Greater than 10,000 (1100 pF to 2700 pF) @ 1 KHz.

### TEMPERATURE COEFFICIENT OF CAPACITANCE (TCC):

+90 ±30 PPM/°C (-55°C to +125°C)

### INSULATION RESISTANCE (IR):

1 pF to 2700 pF:

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

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

Max. test voltage is 500 VDC.

**WORKING VOLTAGE (WVDC):** See Capacitance Values Table, p 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:

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 10 lbs. min., 20 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 C 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.
1R0	1.0				5R1	5.1				390	39				301	300			
1R1	1.1			EXTENDED VOLTAGE	5R6	5.6				430	43				331	330			
1R2	1.2				6R2	6.2				470	47				361	360			
1R3	1.3				6R8	6.8	B, C,			510	51				391	390		1500	2000
1R4	1.4				7R5	7.5	D			560	56				431	430			EXT. VOLT.
1R5	1.5				8R2	8.2				620	62				471	470			
1R6	1.6				9R1	9.1				680	68				511	510			
1R7	1.7				100	10				750	75				561	560			
1R8	1.8				110	11				820	82				621	620			
1R9	1.9				120	12				910	91				681	680			
2R0	2.0	B, C, D	2500	3600	130	13		2500	3600	101	100	F, G, J K, M	2500	751	750	F, G, J K, M	1000	1500	
2R1	2.1				150	15				111	110			821	820				
2R2	2.2			EXTENDED VOLTAGE	160	16				121	120			911	910				
2R4	2.4				180	18				131	130			102	1000				
2R7	2.7				200	20				151	150			112	1100				
3R0	3.0				220	22	F, G, J K, M			161	160			122	1200				
3R3	3.3				240	24				181	180			152	1500		500	800	
3R6	3.6				270	27				201	200			182	1800				
3R9	3.9				300	30				221	220			222	2200				
4R3	4.3				330	33				241	240			242	2400		300	500	
4R7	4.7				360	36				271	270			272	2700				

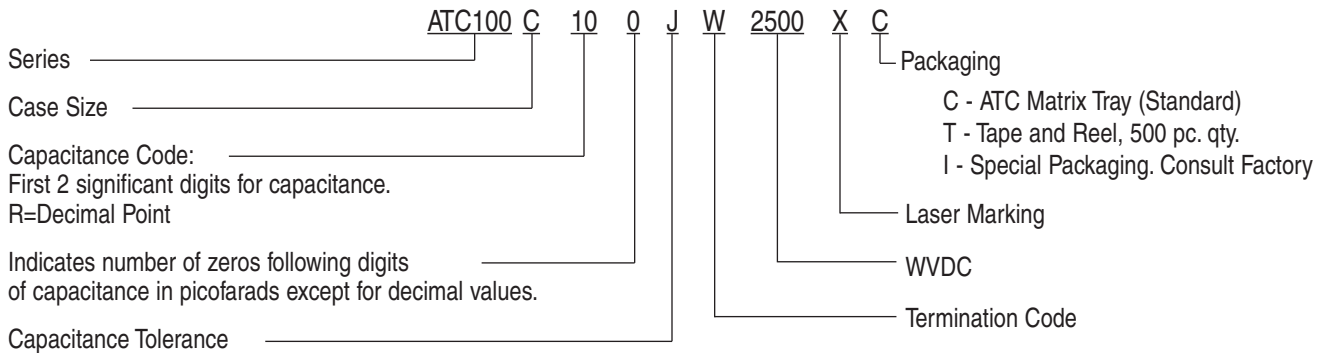
$VRMS = 0.707 \times WVDC$

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

### 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%

### ATC PART NUMBER CODE



The above part number refers to a 100 C Series (case size C) 10 pF capacitor,

J tolerance (±5%), 2500 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and ATC Waffle-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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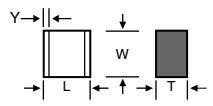
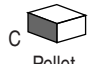
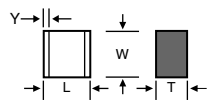

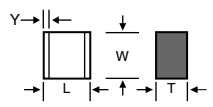
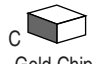
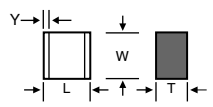
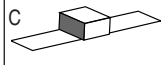
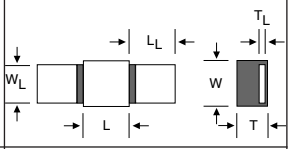

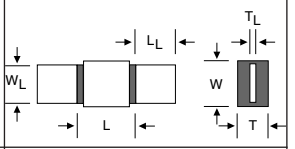
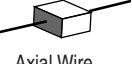
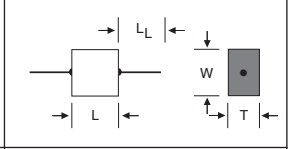
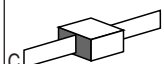
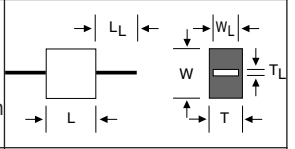
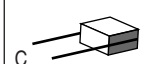
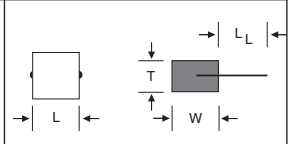
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# ATC 100 C Capacitors: Mechanical Configurations

ATC SERIES & CASE SIZE	ATC TERM. CODE	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)	MATERIAL				
100C	W	 C Solder Plate		.230 +0.020 -.010 (5.84 +0.51 -0.25)			.040 (1.02) max.	Tin/Lead, Solder Plated over Nickel Barrier Termination				
100C	P	 C Pellet		.230 +0.025 -.010 (5.84 +0.64 -0.25)				Heavy Tin/Lead Coated, over Nickel Barrier Termination				
100C	T	 C Solderable Nickel Barrier		.230 +0.020 -.010 (5.84 +0.51 -0.25)				<b>RoHS Compliant</b> Tin Plated over Nickel Barrier Termination				
100C	CA	 C Gold Chip		.230 +0.020 -.010 (5.84 +0.51 -0.25)				<b>RoHS Compliant</b> Gold Plated over Nickel Barrier Termination				
100C	MS	 C Microstrip		.250 ±0.015 (6.35 ±0.38)				High Purity Silver Leads $L_L = .500$ (12.7) min. $W_L = .240 \pm 0.005$ (6.10 ±.127) $T_L = .004 \pm 0.001$ (.102 ±.025) Leads are Attached with High Temperature Solder.				
100C	AR	 C Axial Ribbon						.245 ±0.025 (6.22 ±0.64)			N/A	Silver-plated Copper Leads $L_L = 2.25$ (57.15) min. Dia. = .032 ±.002 (0.81 ±0.05)
100C	AW	 C Axial Wire										Silver Leads $L_L = .500$ (12.7) min. $W_L = **$ See below $T_L = .004 \pm 0.001$ (.102 ±.025)
100C	VA	 C Vertical Axial Ribbon										
100C	RW	 C Radial Wire										

Custom lead styles and lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are **RoHS** compliant.  
 \*\* $W_L = .110$  (2.79) for capacitance values  $\leq 680$  pF;  $W_L = .130$  (3.30) for capacitance values  $> 680$  pF

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# ATC 100 C Capacitors: Non-Magnetic Mechanical Configurations

ATC SERIES & CASE SIZE	ATC TERM. CODE	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
100C	WN	C Non-Mag Solder Plate		.230 +.025 -.010 (5.84 +.64 -.25)	.250 ±.015 (6.35 ±0.38)	.145 (3.68) max. for capacitance values ≤ 680 pF;	.040 (1.02) max.	Tin/Lead, Solder Plated over Non-Magnetic Barrier Termination
100C	PN	C Non-Mag Pellet		.230 +.035 -.010 (5.84 +.89 -.25)				Heavy Tin/Lead Coated, over Non-Magnetic Barrier Termination
100C	TN	C Non-Mag Solderable Barrier		.230 +.025 -.010 (5.84 +.64 -.25)				.165 (4.19) max. for capacitance values > 680 pF.
100C	MN	C Non-Mag Microstrip		.245 ±.025 (6.22 ±0.64)				High Purity Silver Leads L <sub>L</sub> = .500 (12.7) min. W <sub>L</sub> = .240 ±.005 (6.10 ±.127) T <sub>L</sub> = .004 ±.001 (.102 ±.025) Leads are Attached with High Temperature Solder.

Custom lead styles and lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are **RoHS** compliant.

## Suggested Mounting Pad Dimensions

Horizontal Electrode Orientation

Vertical Electrode Orientation

Case C Vertical Mount

Cap Value	Pad Size	A Min.	B Min.	C Min.	D Min.
< 680 pF	Normal	.150	.050	.200	.300
	High Density	.130	.030	.200	.260
> 680 pF	Normal	.185	.050	.200	.300
	High Density	.165	.030	.200	.260

Horizontal Mount

All values	Pad Size	A Min.	B Min.	C Min.	D Min.
All values	Normal	.280	.050	.200	.300
	High Density	.260	.030	.200	.260

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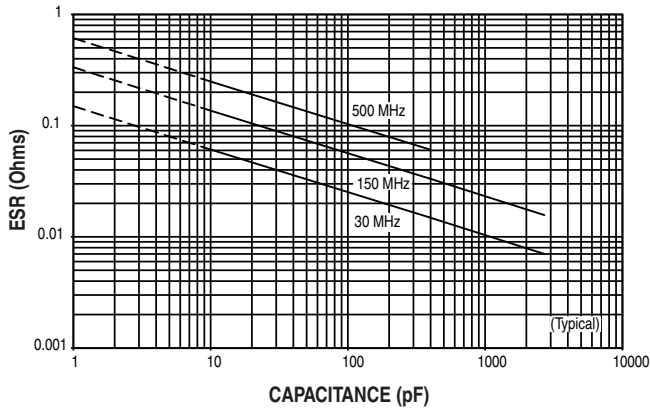
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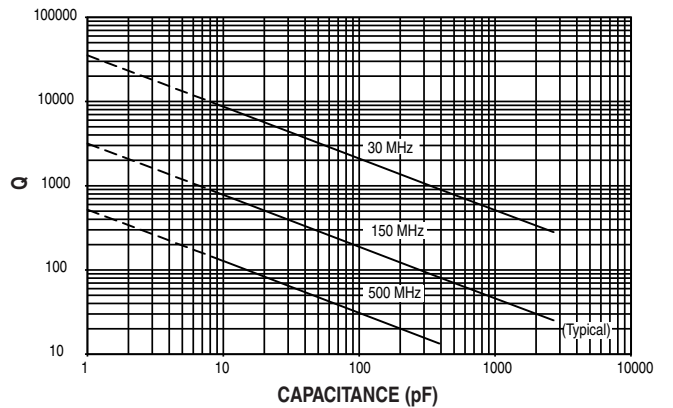
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# ATC 100 C Performance Data

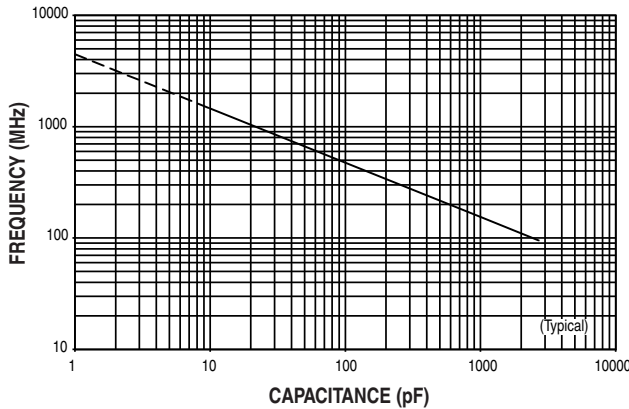
**ESR VS. CAPACITANCE**  
ATC SERIES 100, CASE C



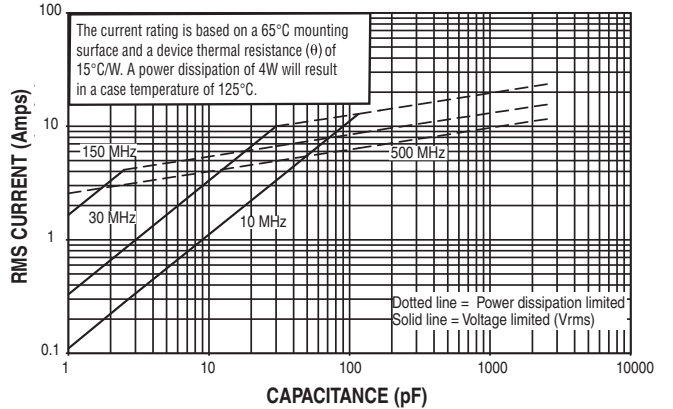
**Q VS. CAPACITANCE**  
ATC SERIES 100, CASE C



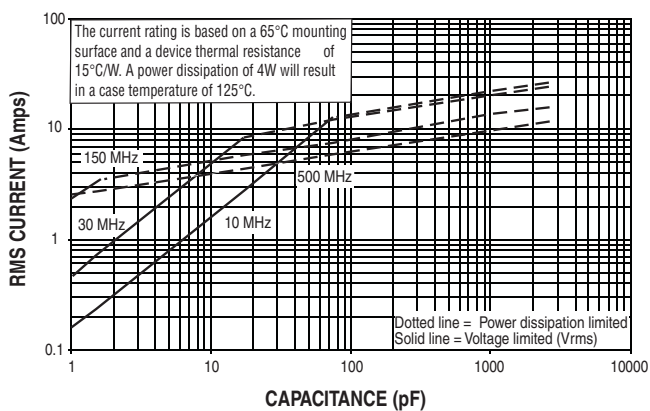
**SERIES RESONANCE VS. CAPACITANCE**  
ATC SERIES 100, CASE C



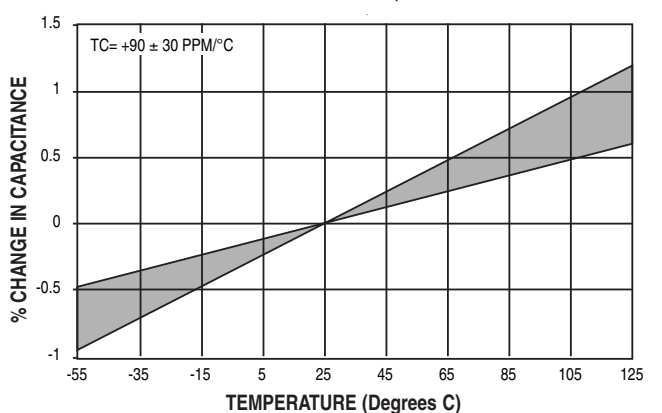
**CURRENT RATING VS. CAPACITANCE**  
ATC SERIES 100, CASE C



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



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



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