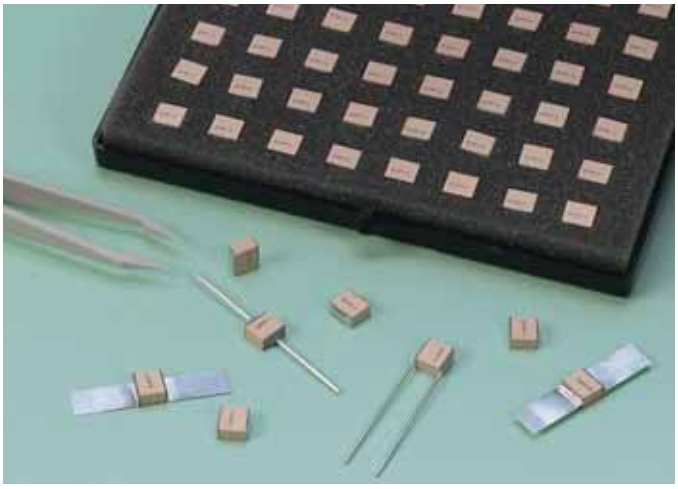
ATC 100 C Series Porcelain High RF Power Multilayer Capacitors



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

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.
1 pF to 470 pF: at WVDC
510 pF to 1200 pF: at 120% of WVDC
1500 pF to 2700 pF: at 200% of WVDC

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:
10^5 Megohms min. @ +25°C at rated WVDC.
10^4 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): *See page 2.

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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THE ENGINEERS' CHOICE™
ISO 9001 REGISTERED

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
1R0	1.0			5R1	5.1			390	39			301	300		
1R1	1.1			5R6	5.6			430	43			331	330		
1R2	1.2			6R2	6.2			470	47			361	360		1500
1R3	1.3			6R8	6.8	B, C, D		510	51			391	390		
1R4	1.4			7R5	7.5			560	56			431	430		
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	130	13		2500	101	100	F, G, J K, M	2500	751	750	F, G, J K, M	
2R1	2.1			150	15			111	110			821	820		1000
2R2	2.2			160	16			121	120			911	910		
2R4	2.4			180	18			131	130			102	1000		
2R7	2.7			200	20	F, G, J		151	150			112	1100		
3R0	3.0			220	22	K, M		161	160			122	1200		
3R3	3.3			240	24			181	180			152	1500		500
3R6	3.6			270	27			201	200			182	1800		
3R9	3.9			300	30			221	220			222	2200		300
4R3	4.3			330	33			241	240			272	2700		
4R7	4.7			360	36			271	270						

VRMS = 0.707 x WVDC

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

∗ **DWV:** 1 pF to 470 pF: 120% of rated WVDC for 5 secs. 510 pF to 1200 pF: 150% of rated WVDC for 5 secs. 1500 pF to 2700 pF: 250% of rated WVDC for 5 secs.

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

ATC100 C 10 0 J W 2500 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
  - C - ATC Matrix Tray (Standard)
  - T - Tape and Reel, 500 pc. qty.
  - I - Special Packaging. Consult Factory

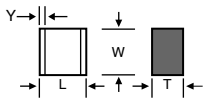
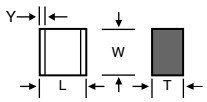
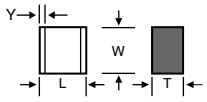
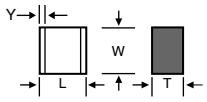
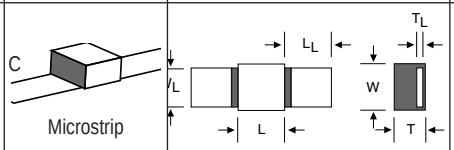
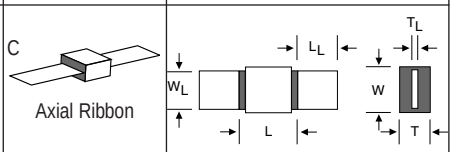
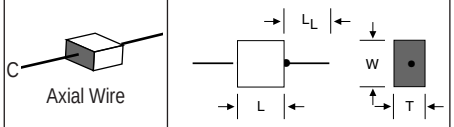
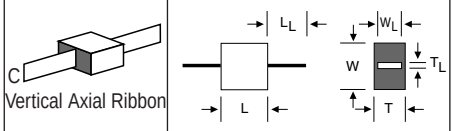
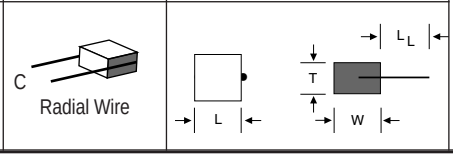
The above part number refers to a 100 C Series (case size C) 10 pF capacitor, J tolerance (±5%), 2500 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and ATC Waffle-packaging.

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 (631) 622-4700.

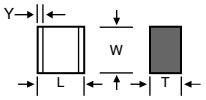
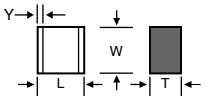
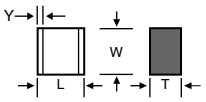
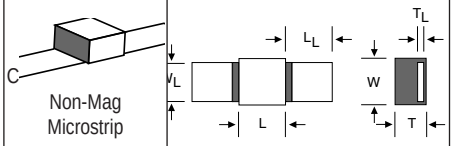
Consult factory for additional performance data.

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) LENGTH (L)	WIDTH (W)	THICKNESS (T)	LEAD AND TERMINATION DIMENSIONS AND MATERIALS OVERLAP (Y)	MATERIAL
100C	W	C Solder Plate		.230 +.020 -.010 (5.84 +0.51 -0.25)	.250 ±.015 (6.35 ±0.38)	.145 (3.68) max. for capacitance values ≤ 680 pF; .165 (4.19) max. for capacitance values > 680 pF.	.040 (1.02) max.	Tin/Lead, Solder Plated over Nickel Barrier Termination
100C	P	C Pellet		.230 +.025 -.010 (5.84 +0.64 -0.25)				Heavy Tin/Lead Coated, over Nickel Barrier Termination
100C	T	C Solderable Nickel Barrier		.230 +.020 -.010 (5.84 +0.51 -0.25)				***RoHS Compliant*** Tin Plated over Nickel Barrier Termination
100C	CA	C Gold Chip		.230 +.020 -.010 (5.84 +0.51 -0.25)				***RoHS Compliant*** Gold Plated over Nickel Barrier Termination
100C	MS	C Microstrip		.245 ±.025 (6.22 ±0.64)			N/A	High Purity Silver Leads L_L = .500 (12.7) min. W_L = .240 ±.005 (6.10 ±.127) T_L = .004 ±.001 (.102 ±.025) Leads are Attached with High Temperature Solder.
100C	AR	C Axial Ribbon						
100C	AW	C Axial Wire						Silver-plated Copper Leads L_L = 2.25 (57.15) min. Dia. = .032 ±.002 (0.81 ±0.05)
100C	VA	C Vertical Axial Ribbon						Silver Leads L_L = .500 (12.7) min. W_L = ** See below T_L = .004 ±.001 (.102 ±.025)
100C	RW	C Radial Wire						Silver-plated Copper Leads L_L = 1.0 (25.4) min. Dia. = .032 ±.002 (0.81 ±0.05)

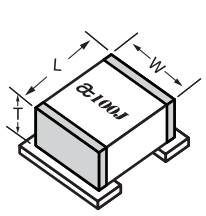
Custom lead styles and lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are **RoHS** compliant.
**W_L = .110 (2.79) for capacitance values ≤ 680 pF; W_L = .130 (3.30) for capacitance values > 680 pF

ATC 100 C Capacitors: Non-Magnetic Mechanical Configurations

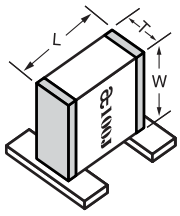
ATC SERIES & CASE SIZE	ATC TERM. CODE	CASE SIZE & TYPE	OUTLINES W/T IS A TERMINATION SURFACE	BODY DIMENSIONS INCHES (mm) LENGTH (L)	WIDTH (W)	THICKNESS (T)	LEAD AND TERMINATION DIMENSIONS AND MATERIALS OVERLAP (Y)	MATERIALS
100C	WN	C Non-Mag Solder Plate		.230 +.025 -.010 (5.84 +0.64 -0.25)	.250 ±.015 (6.35 ±0.38)	.145 (3.68) max. for capacitance values ≤ 680 pF; .165 (4.19) 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 +0.89 -0.25)				Heavy Tin/Lead Coated, over Non-Magnetic Barrier Termination
100C	TN	C Non-Mag Solderable Barrier		.230 +.025 -.010 (5.84 +0.64 -0.25)				***RoHS Compliant*** Tin Plated over Non-Magnetic Barrier Termination
100C	MN	C Non-Mag Microstrip		.245 ±.025 (6.22 ±0.64)				High Purity Silver Leads L_L = .500 (12.7) min. W_L = .240 ±.005 (6.10 ±.127) T_L = .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.

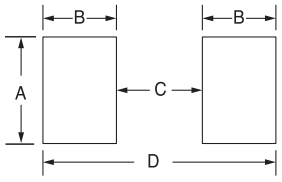
Suggested Mounting Pad Dimensions



Horizontal Electrode Orientation



Vertical Electrode Orientation



Case C Vertical Mount

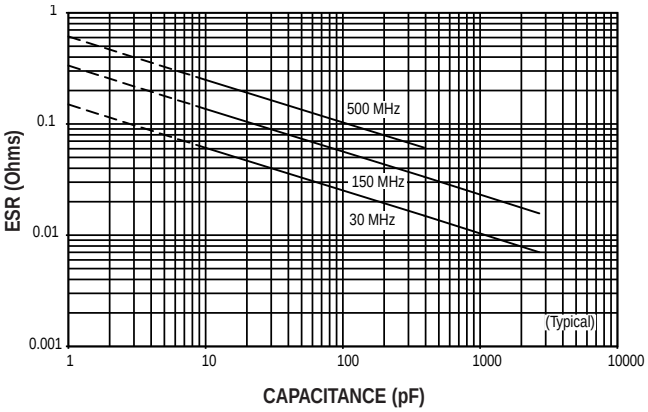
Cap Value	Pad Size	A Min.	B Min.	C Min.	D Min.
< 680 pF	Normal	.150	.050	.200	.300
	High Density	.130	.030	.200	.260
> 680 pF	Normal	.185	.050	.200	.300
	High Density	.165	.030	.200	.260

Horizontal Mount

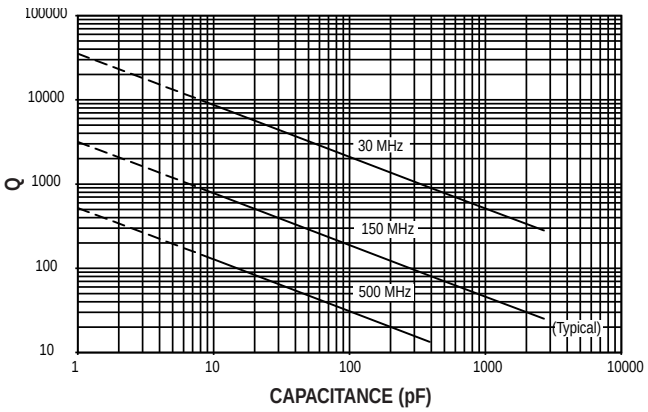
All values	Normal	.280	.050	.200	.300
	High Density	.260	.030	.200	.260

ATC 100 C Performance Data

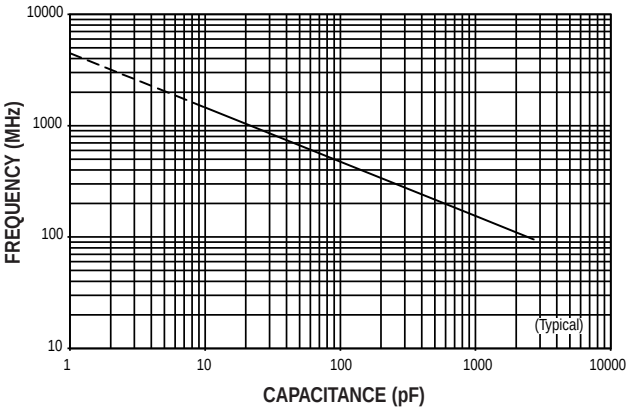
ESR VS. CAPACITANCE
ATC SERIES 100, CASE C



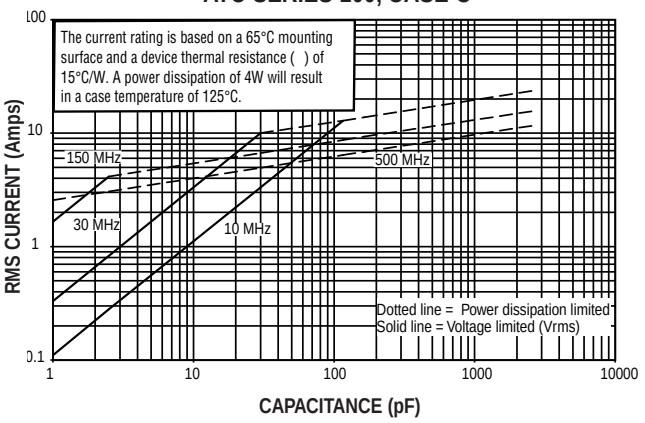
Q VS. CAPACITANCE
ATC SERIES 100, CASE C



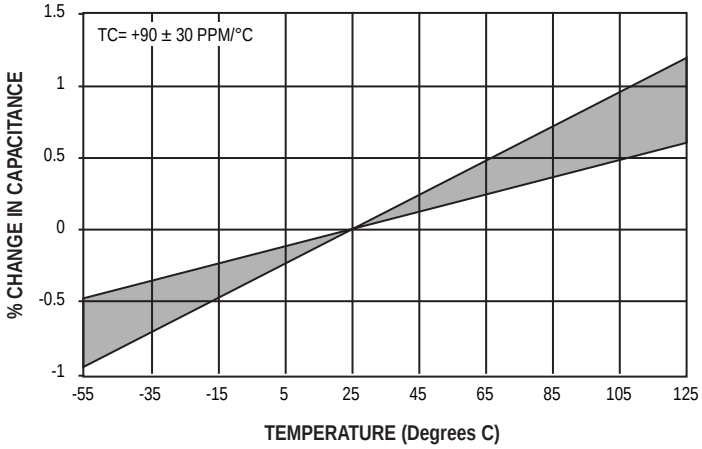
SERIES RESONANCE VS. CAPACITANCE
ATC SERIES 100, CASE C



CURRENT RATING VS. CAPACITANCE
ATC SERIES 100, CASE C



CAPACITANCE CHANGE VS. TEMPERATURE
ATC SERIES 100, CASE C



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ATC # 001-808 Rev. J 9/07

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