

# ATC 600F Series

## Ultra-Low ESR, High Q, NPO RF & Microwave Capacitors

### Features:

- **Lowest ESR in Class**
- Highest Working Voltage in class – 250V
- Standard EIA Size: 0805
- Laser Marking (Optional)
- High Self Resonance Frequencies

### Applications:

- Cellular Base Stations
- Wireless Communications
- Broadband Wireless Services
- Satellite Communications
- WiMAX (802.16)

### Circuit Applications:

- Filter Networks
- High Q Frequency Sources
- Matching Networks
- Tuning, Coupling, Bypass and DC Blocking



### ATC 600 SERIES OVERVIEW

ATC Series	ATC Case Size	EIA Case Size
600	L	0402
600	S	0603
<b>600</b>	<b>F</b>	<b>0805</b>

### Electrical Specifications

<b>Capacitance:</b>	0.1 to 240 pF
<b>Tolerances:</b>	See Cap Value Chart
<b>Working Voltage (WVDC):</b>	250 V
<b>Quality Factor (Q):</b>	> 2000 @ 1 MHz
<b>Operating Temperature Range:</b>	-55°C to +125°C (no derating of working voltage)
<b>Temperature coefficient of Capacitance (TCC):</b>	0 ± 30 ppm/°C, -55°C to +125°C
<b>Insulation Resistance:</b>	10 <sup>5</sup> MΩ min. at +25°C at rated WVDC 10 <sup>4</sup> MΩ min. at +125°C at rated WVDC
<b>Dielectric Withstanding Voltage (DWV):</b>	2.5 x WVDC for 5 seconds
<b>Aging:</b>	None
<b>Piezo Effects:</b>	None

### Mechanical Specifications

<b>Terminations:</b>	T = Tin Plated over Nickel Barrier* (Standard) TN = Tin Plated over Non-Magnetic Barrier* W = Tin/Lead Solder Plated over Nickel Barrier
<b>Solderability:</b>	Solder coverage > 90% of end termination
<b>Terminal Strength:</b>	4 lbs. Typ., 2 lbs. min.

### Environmental Specifications

<b>Life Test:</b>	2000 hours, +125°C at 2X WVDC
<b>Thermal Shock:</b>	5 cycles, -55°C to +125°C
<b>Moisture Resistance:</b>	MIL-STD-202, Method 106

### Military Approval

DSCC Drawing Number 05001



ATC 600 Series Capacitors are designed and manufactured to meet and exceed the requirements of EIA-198, MIL-PRF-55681 and MIL-PRF-123.



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ATC # 001-956  
Rev. N; 1/15

# ATC 600F Series Ultra-Low ESR, High Q NPO RF & Microwave Capacitors

## Capacitance Values\*

Value (pF)	Cap Code	Marking	Tolerances	Value (pF)	Cap Code	Marking	Tolerances	Value (pF)	Cap Code	Marking	Tolerances
0.1	0R1	A9	A, B	3.3	3R3	N0	A, B, C, D	30	300	M1	F, G, J, K, M
0.2	0R2	H9	A, B	3.6	3R6	P0	A, B, C, D	33	330	N1	F, G, J, K, M
0.3	0R3	M9	A, B, C	3.9	3R9	Q0	A, B, C, D	36	360	P1	F, G, J, K, M
0.4	0R4	d9	A, B, C	4.3	4R3	R0	A, B, C, D	39	390	Q1	F, G, J, K, M
0.5	0R5	f9	A, B, C	4.7	4R7	S0	A, B, C, D	43	430	R1	F, G, J, K, M
0.6	0R6	m9	A, B, C	5.1	5R1	T0	A, B, C, D	47	470	S1	F, G, J, K, M
0.7	0R7	n9	A, B, C	5.6	5R6	U0	A, B, C, D	51	510	T1	F, G, J, K, M
0.8	0R8	t9	A, B, C	6.2	6R2	V0	A, B, C, D	56	560	U1	F, G, J, K, M
0.9	0R9	y9	A, B, C	6.8	6R8	W0	B, C, J, K	62	620	V1	F, G, J, K, M
1.0	1R0	A0	A, B, C, D	7.5	7R5	X0	B, C, J, K	68	680	W1	F, G, J, K, M
1.1	1R1	B0	A, B, C, D	8.2	8R2	Y0	B, C, J, K	75	750	X1	F, G, J, K, M
1.2	1R2	C0	A, B, C, D	9.1	9R1	Z0	B, C, J, K	82	820	Y1	F, G, J, K, M
1.3	1R3	D0	A, B, C, D	10	100	A1	F, G, J, K, M	91	910	Z1	F, G, J, K, M
1.5	1R5	E0	A, B, C, D	11	110	B1	F, G, J, K, M	100	101	A2	F, G, J, K, M
1.6	1R6	F0	A, B, C, D	12	120	C1	F, G, J, K, M	110	111	B2	F, G, J, K, M
1.8	1R8	G0	A, B, C, D	15	150	E1	F, G, J, K, M	120	121	C2	F, G, J, K, M
2.0	2R0	H0	A, B, C, D	18	180	G1	F, G, J, K, M	150	151	E2	F, G, J, K, M
2.2	2R2	J0	A, B, C, D	20	200	H1	F, G, J, K, M	180	181	G2	F, G, J, K, M
2.4	2R4	K0	A, B, C, D	22	220	J1	F, G, J, K, M	200	201	H2	F, G, J, K, M
2.7	2R7	L0	A, B, C, D	24	240	K1	F, G, J, K, M	220	221	J2	F, G, J, K, M
3.0	3R0	M0	A, B, C, D	27	270	L1	F, G, J, K, M	240	241	K2	F, G, J, K, M

\*Non-standard values and custom tolerances are available upon request.

## ATC Part Number Code

ATC Series 600 Case Size (0805) F Capacitance Code: 100 Indicates number of zeros following digits of capacitance in picofarads except for decimal values. Capacitance Tolerance J

250 X T

WVDC Termination Code  
 T = Tin Plated over Nickel Barrier (Standard) RoHS Compliant  
 TN = Tin Plated over Non-Magnetic Barrier  
 W = Tin/Lead Solder Plated over Nickel Barrier

Packaging  
 T - Tape and Reel (Standard)\*  
 TV - Vertical Tape and Reel (Optional)

Laser Marked\*\*

Code	A	B	C	D	F	G	J	K	M
Tol.	±0.05 pF	±0.1 pF	±0.25 pF	±0.5 pF	±1%	±2%	±5%	±10%	±20%

\*4,000 pieces on 7" reel and 500 pieces on prototype reel. Consult ATC for other options.

The above part number refers to a 600F Series (case size F) 10 pF capacitor, J tolerance (±5%), 250 WVDC, with T termination (Tin Plated over Nickel Barrier, RoHS Compliant), Laser Marking and Tape and Reel packaging.

\*\* Marking is optional.

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 500 piece reels for prototyping.

Consult factory for additional performance data.

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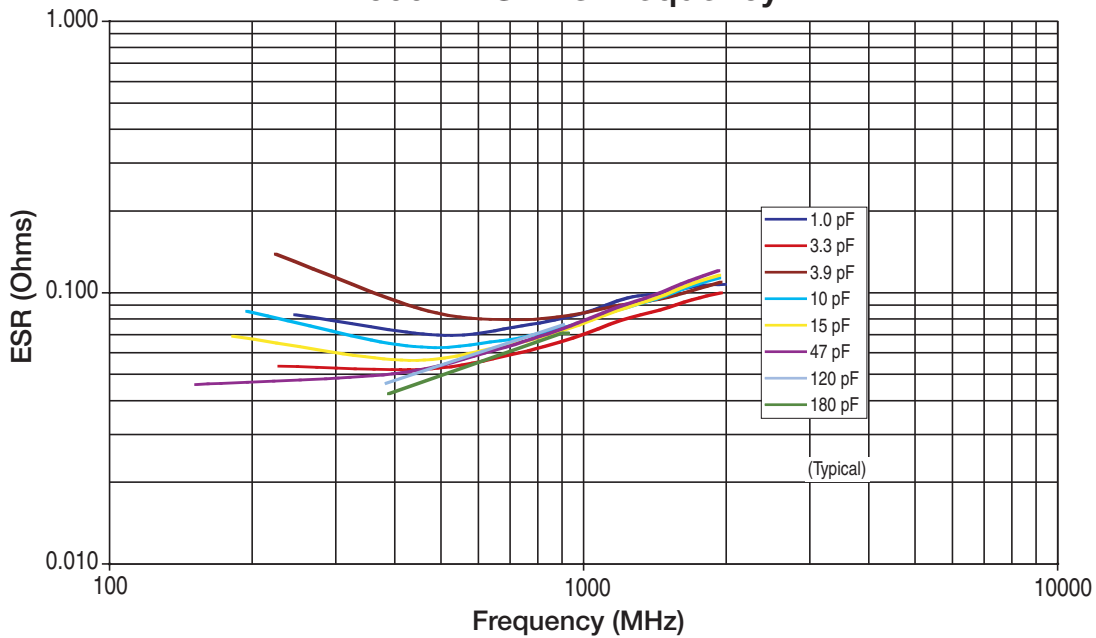
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# ATC 600F Series Ultra-Low ESR, High Q NPO RF & Microwave Capacitors

## 600 F ESR vs Frequency



## 600 F Resonant Frequency Data



### ATC 600F Series Data Sheet Test Condition Description

Capacitors horizontally mounted on 23.3-mil thick Rogers RO4350<sup>®</sup> softboard, 52-mil wide, 1/2 oz. Cu traces.

**FSR** = lowest frequency at which S11 response, referenced at capacitor edge, crosses real axis on Smith Chart.

**FPR** = lowest frequency at which there is a notch in S21 magnitude response.

**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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# ATC 600F Series Ultra-Low ESR, High Q NPO RF & Microwave Capacitors

## Outline Dimensions

	<b>F (0805)</b> L: $.079 \pm .008$ (2.01 $\pm$ 0.20) W: $.049 \pm .008$ (1.24 $\pm$ 0.20)	T: $.051$ max. (1.30 max.)
		Y: $.020 \pm 0.01$ (0.51 $\pm$ 0.25)
Inches (mm)		

## Suggested Mounting Pad Dimensions

	Case Sizes L, S and F																							
	<table border="1"> <thead> <tr> <th>Case Size</th> <th>A Min.</th> <th>B Min.</th> <th>C Min.</th> <th>D Min.</th> </tr> </thead> <tbody> <tr> <td>0402 (1005)</td> <td>.0275 (0.70)</td> <td>.0354 (0.90)</td> <td>.0157 (0.40)</td> <td>.0866 (2.20)</td> </tr> <tr> <td>0603 (1608)</td> <td>.0393 (1.00)</td> <td>.0433 (1.10)</td> <td>.0236 (0.60)</td> <td>.110 (2.80)</td> </tr> <tr> <td>0805 (2012)</td> <td>.0590 (1.50)</td> <td>.0512 (1.30)</td> <td>.0236 (0.60)</td> <td>.1259 (3.20)</td> </tr> </tbody> </table>	Case Size	A Min.	B Min.	C Min.	D Min.	0402 (1005)	.0275 (0.70)	.0354 (0.90)	.0157 (0.40)	.0866 (2.20)	0603 (1608)	.0393 (1.00)	.0433 (1.10)	.0236 (0.60)	.110 (2.80)	0805 (2012)	.0590 (1.50)	.0512 (1.30)	.0236 (0.60)	.1259 (3.20)	Inches (mm)		
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**Design Kits** Each Kit contains a selection of standard capacitor values for circuit prototyping.

Kit #	Item #	Description	Cap. Value Range (pF)	Cap. Values (pF)	Tol. (pF)	Price
Kit 32T	DK0032T 	600F Series Ultra-low ESR, High Q Microwave Capacitors 16 different values, 15 pcs. min. per value	0.1 to 2.0	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.5	$\pm 0.1$	\$90.00
				1.6, 1.8, 2.0	$\pm 0.25$	
Kit 33T	DK0033T 	600F Series Ultra-low ESR, High Q Microwave Capacitors 16 different values, 15 pcs. min. per value	1.0 to 10	1.0, 1.2, 1.5, 1.8, 2.0, 2.2, 2.4, 2.7, 3.0, 3.3	$\pm 0.1$	\$90.00
				3.9, 4.7, 5.6, 6.8, 8.2	$\pm 0.25$	
				10	$\pm 5\%$	
Kit 34T	DK0034T 	600F Series Ultra-low ESR, High Q Microwave Capacitors 16 different values, 15 pcs. min. per value	10 to 100	10, 12, 15, 18, 20, 22, 24, 27, 30, 33, 39, 47, 56, 68, 82, 100	$\pm 5\%$	\$90.00
Kit 35T	DK0035T 	600F Series Ultra-low ESR, High Q Microwave Capacitors 7 different values, 15 pcs. min. per value	100 to 240	100, 120, 150, 180, 200, 220, 240	$\pm 5\%$	\$50.00

For Online Kit Orders, Catalog & Application Notes, Visit: [www.atceramics.com](http://www.atceramics.com)

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