

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

## Features:

- **Lowest ESR in Class**
- Highest Working Voltage in class – 250V
- Standard EIA Size: 0603
- Laser Marking (Optional)
- RoHS Compliant
- 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
<b>600</b>	<b>S</b>	<b>0603</b>
600	F	0805

## Electrical Specifications

<b>Capacitance:</b>	0.1 to 100 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°
<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>	240 hours, 85% Relative Humidity at +85°C

## Military Approval

DSCC Drawing Number 05002



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 001-924; Rev. R, 12/09

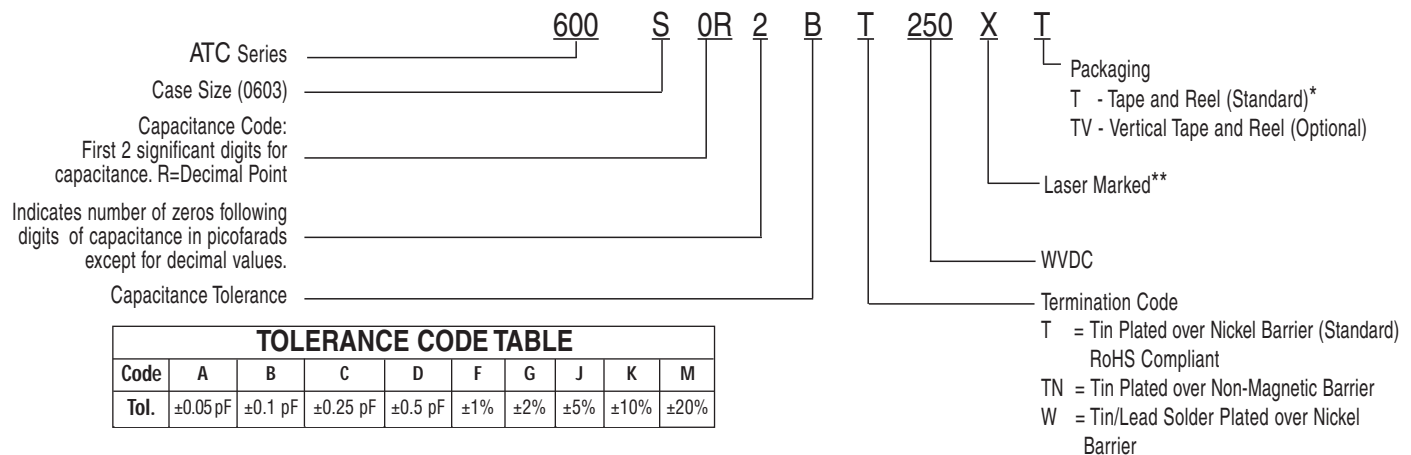
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## Capacitance Values

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

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

## ATC Part Number Code



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

The above part number refers to a 600S Series (case size S) 0.2 pF capacitor, B tolerance (±0.1pF), 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 (631) 622-4700.

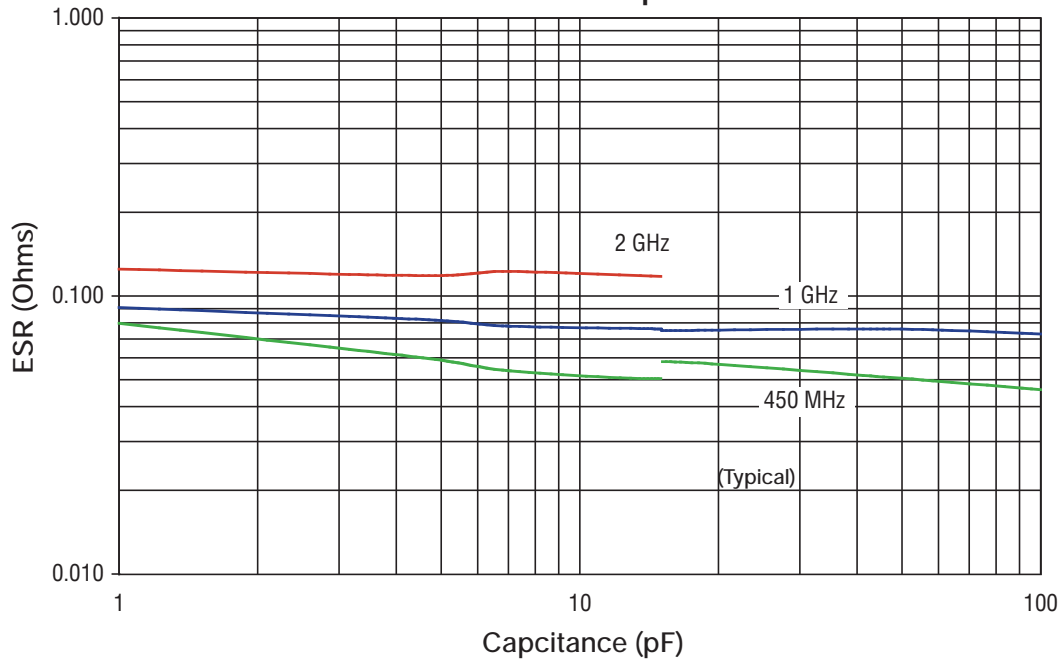
\*Consult factory for 500 piece reels for prototyping.  
 Consult factory for additional performance data.

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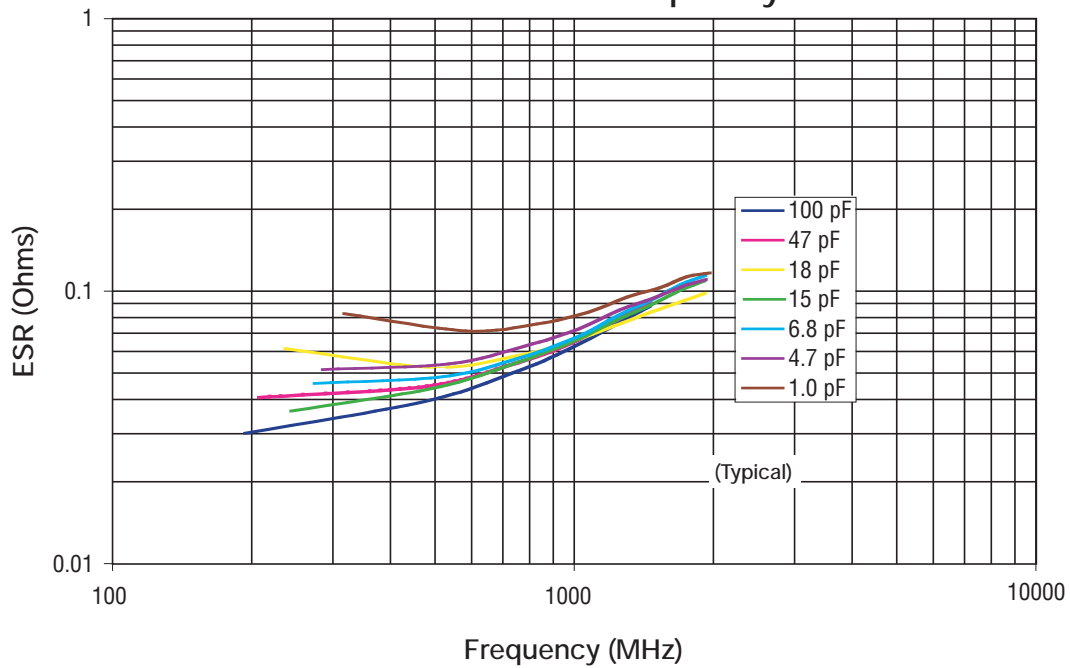
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Typical Performance Data

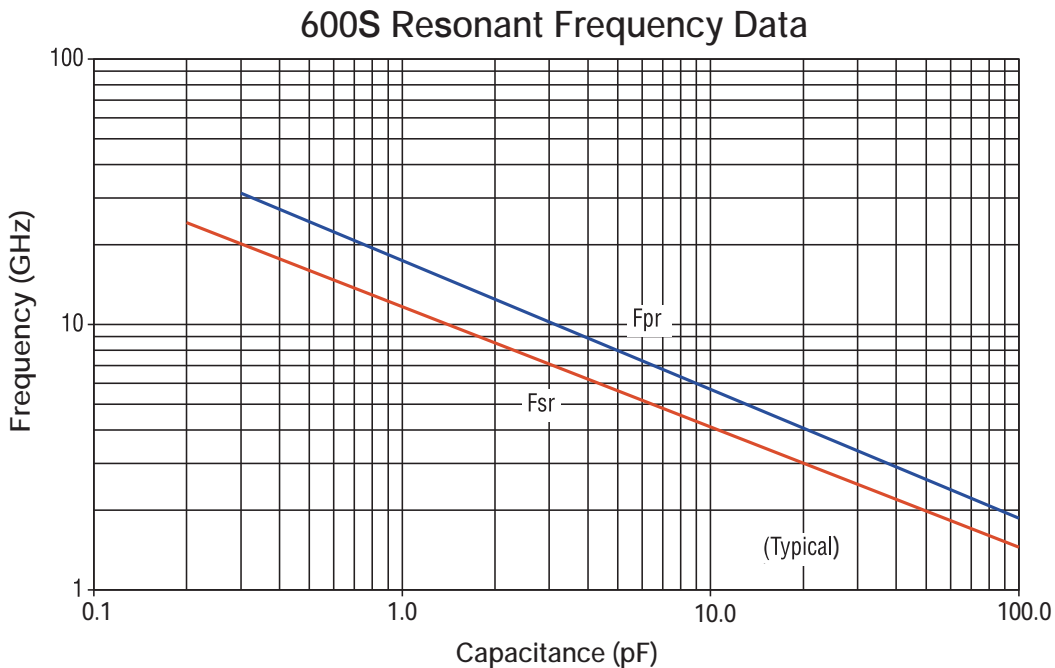
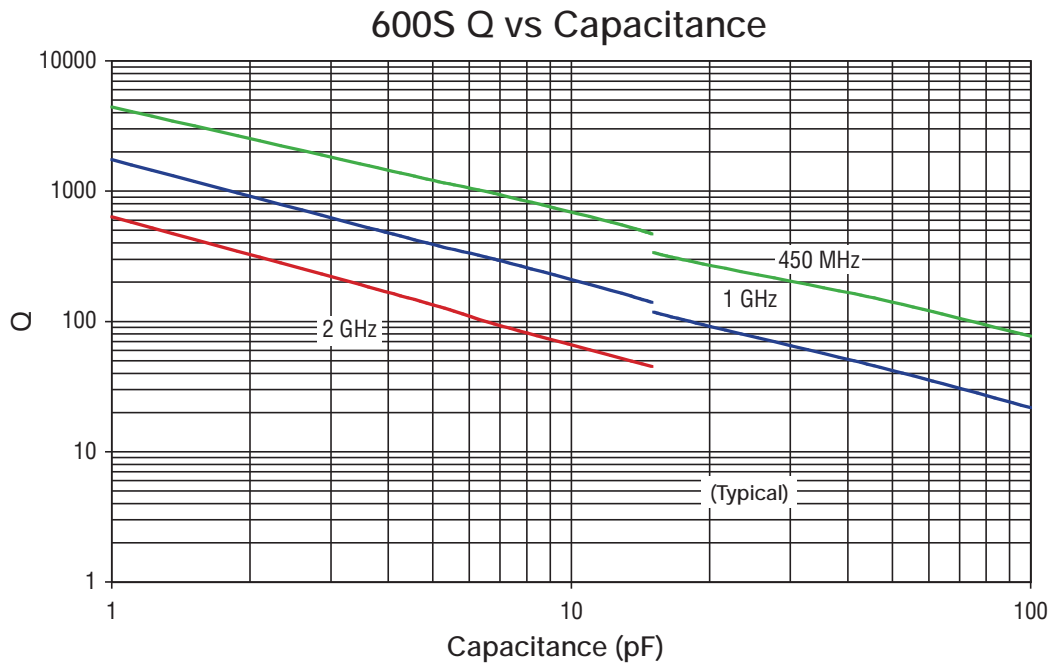
600S ESR vs Capacitance



600S ESR vs Frequency



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



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

Capacitors horizontally mounted on 13.3-mil thick Rogers RO4350<sup>®</sup> softboard, 29-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**

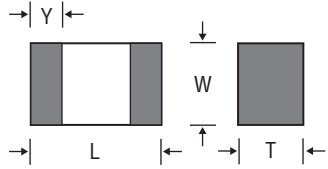
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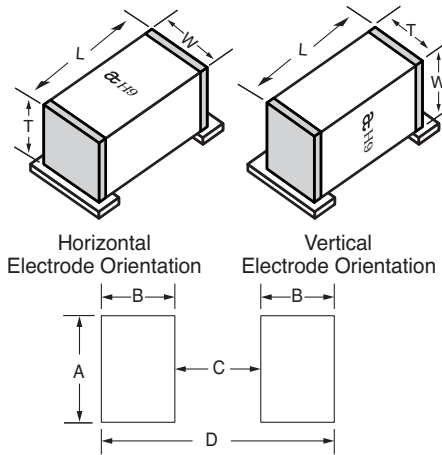
## Outline Dimensions



<b>S (0603)</b>	L: $.063 \pm .006$ (1.60 $\pm$ .15)	T: .035 max. (0.89 max.)
	W: $.032 \pm .006$ (.81 $\pm$ .15)	Y: $.014 \pm .006$ (0.36 $\pm$ 0.15)

Inches (mm)




## Suggested Mounting Pad Dimensions



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)

**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 25T	DK0025T 	600S 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 26T	DK0026T 	600S 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 27T	DK0027T 	600S 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

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

**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**

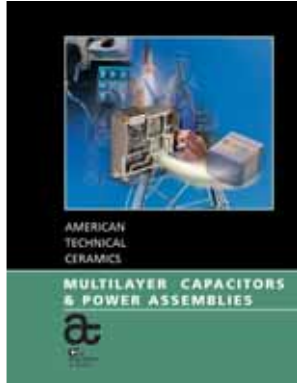
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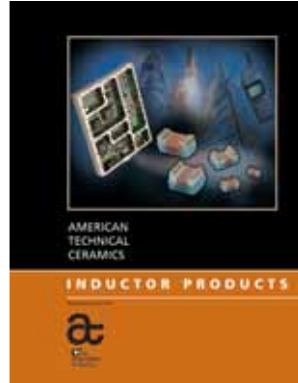
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## Other ATC Product Catalogs



Multilayer Capacitors  
& Power Assemblies



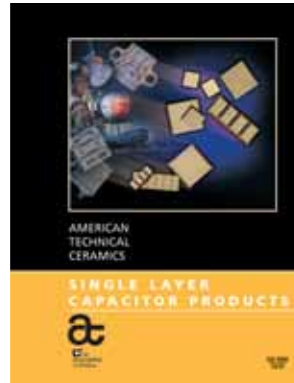
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