

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
600	S	0603
600	F	0805

Capacitance:	0.1 to 100 pF
Tolerances:	See Cap Value Chart
Working Voltage (WVDC):	250 V
Quality Factor (Q):	> 2000 @ 1 MHz
Operating Temperature Range:	-55°C to +125°C (no derating of working voltage)
Temperature coefficient of Capacitance (TCC):	0 ± 30 ppm/°C, -55°C to +125°
Insulation Resistance:	10 ⁵ MΩ min. at +25°C at rated WVDC 10 ⁴ MΩ min. at +125°C at rated WVDC
Dielectric Withstanding Voltage (DWV):	2.5 x WVDC for 5 seconds
Aging:	None
Piezo Effects:	None

Terminations:	T = Tin Plated over Nickel Barrier* (Standard) TN = Tin Plated over Non-Magnetic Barrier* W = Tin/Lead Solder Plated over Nickel Barrier
Solderability:	Solder coverage > 90% of end termination
Terminal Strength:	4 lbs. Typ., 2 lbs. min.
Life Test:	2000 hours, +125°C at 2X WVDC
Thermal Shock:	5 cycles, -55°C to +125°C
Moisture Resistance:	240 hours, 85% Relative Humidity at +85°C

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.



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

ATC North America
+1-631-622-4700
sales@atceramics.com

ATC Europe
+46 8 6800410
sales@atceramics-europe.com

ATC Asia
+86-755-2396-8759
sales@atceramics-asia.com



www.atceramics.com

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Capacitance Values

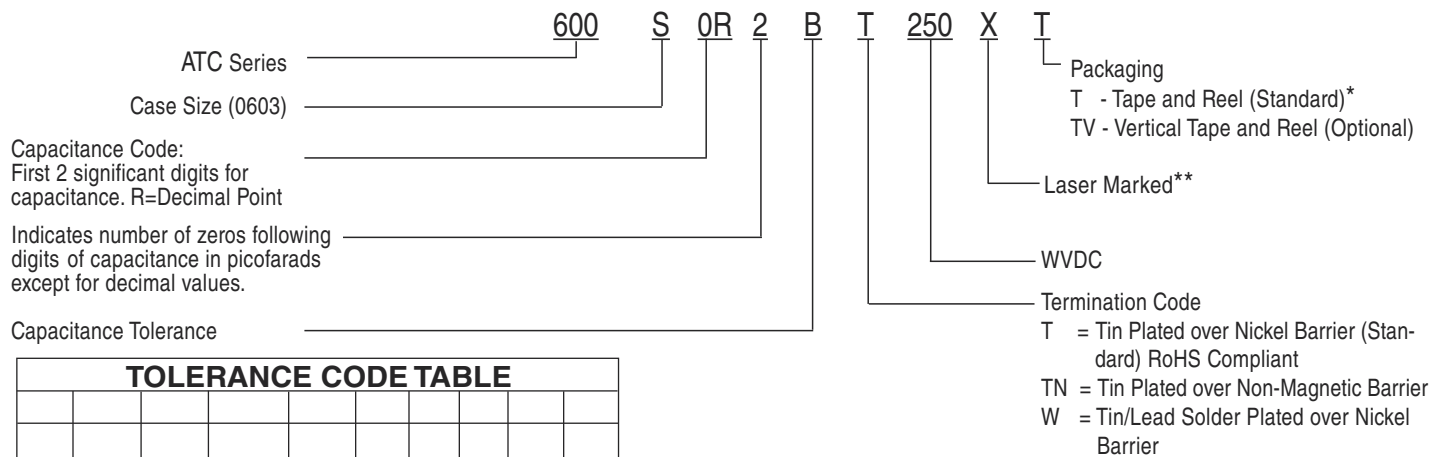
Value (pF)	Cap Code	Marking	Tolerances
0.1	0R1	A9	A, B
0.2	0R2	H9	A, B
0.3	0R3	M9	A, B, C
0.4	0R4	d9	A, B, C
0.5	0R5	f9	A, B, C
0.6	0R6	m9	A, B, C
0.7	0R7	n9	A, B, C
0.8	0R8	t9	A, B, C
0.9	0R9	y9	A, B, C
1.0	1R0	A0	A, B, C, D
1.1	1R1	B0	A, B, C, D
1.2	1R2	C0	A, B, C, D
1.3	1R3	D0	A, B, C, D
1.5	1R5	E0	A, B, C, D
1.6	1R6	F0	A, B, C, D
1.8	1R8	G0	A, B, C, D
2.0	2R0	H0	A, B, C, D
2.2	2R2	J0	A, B, C, D
2.4	2R4	K0	A, B, C, D

Value (pF)	Cap Code	Marking	Tolerances
2.7	2R7	L0	A, B, C, D
3.0	3R0	M0	A, B, C, D
3.3	3R3	N0	A, B, C, D
3.6	3R6	P0	A, B, C, D
3.9	3R9	Q0	A, B, C, D
4.3	4R3	R0	A, B, C, D
4.7	4R7	S0	A, B, C, D
5.1	5R1	T0	A, B, C, D
5.6	5R6	U0	A, B, C, D
6.2	6R2	V0	A, B, C, D
6.8	6R8	W0	B, C, J, K
7.5	7R5	X0	B, C, J, K
8.2	8R2	Y0	B, C, J, K
9.1	9R1	Z0	B, C, J, K
10	100	A1	F, G, J, K, M
11	110	B1	F, G, J, K, M
12	120	C1	F, G, J, K, M
15	150	E1	F, G, J, K, M
18	180	G1	F, G, J, K, M

Value (pF)	Cap Code	Marking	Tolerances
20	200	H1	F, G, J, K, M
22	220	J1	F, G, J, K, M
24	240	K1	F, G, J, K, M
27	270	L1	F, G, J, K, M
30	300	M1	F, G, J, K, M
33	330	N1	F, G, J, K, M
36	360	P1	F, G, J, K, M
39	390	Q1	F, G, J, K, M
43	430	R1	F, G, J, K, M
47	470	S1	F, G, J, K, M
51	510	T1	F, G, J, K, M
56	560	U1	F, G, J, K, M
62	620	V1	F, G, J, K, M
68	680	W1	F, G, J, K, M
75	750	X1	F, G, J, K, M
82	820	Y1	F, G, J, K, M
91	910	Z1	F, G, J, K, M
100	101	A2	F, G, J, K, M

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

ATC Part Number Code



Code	Tolerance

*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 (± 0.1 pF), 250 WVDC, with T termination (Tin Plated over Nickel Barrier, RoHS Compliant), Laser Marking and Tape and Reel packaging.

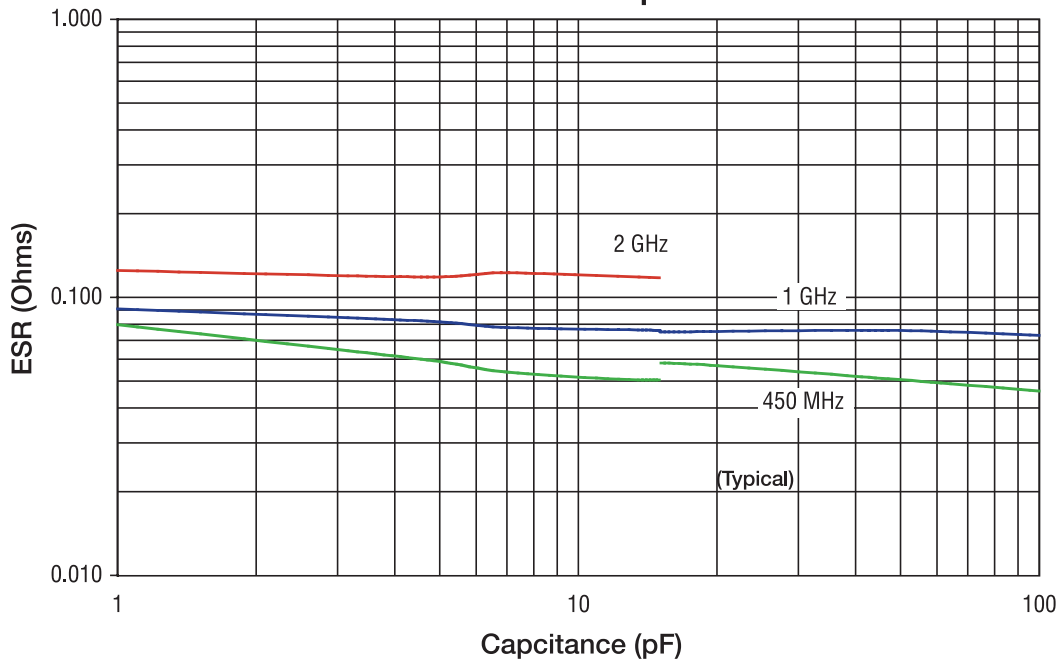
**Marking is optional.

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.

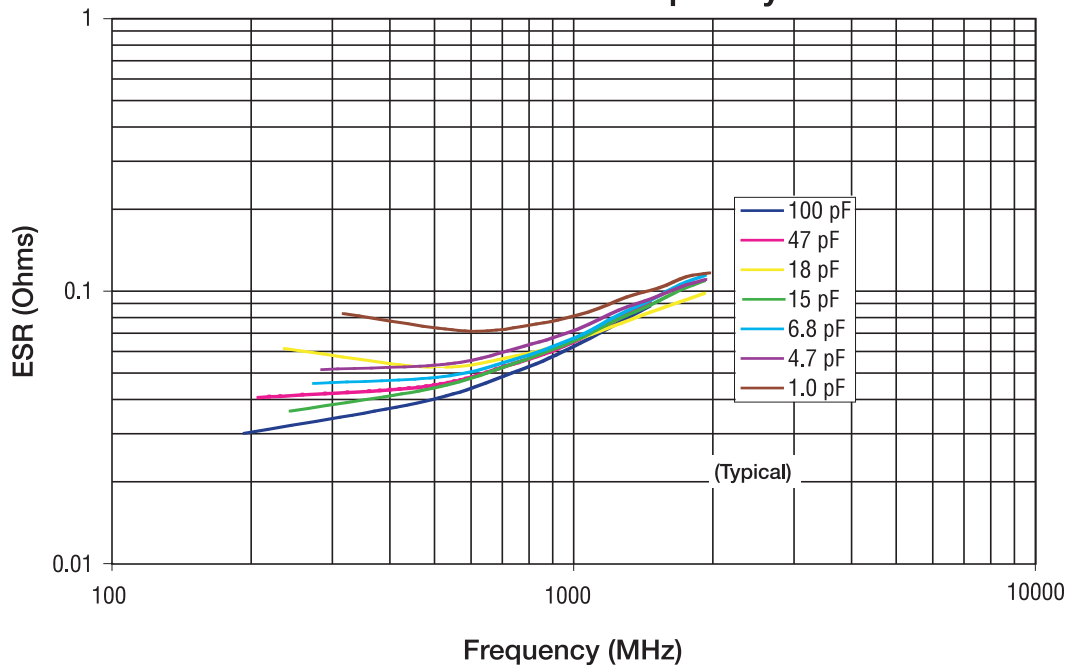
For additional information and catalogs contact your ATC representative or call direct at (631) 622-4700.
 *Consult factory for 500 piece reels for prototyping.
 Consult factory for additional performance data.

Typical Performance Data

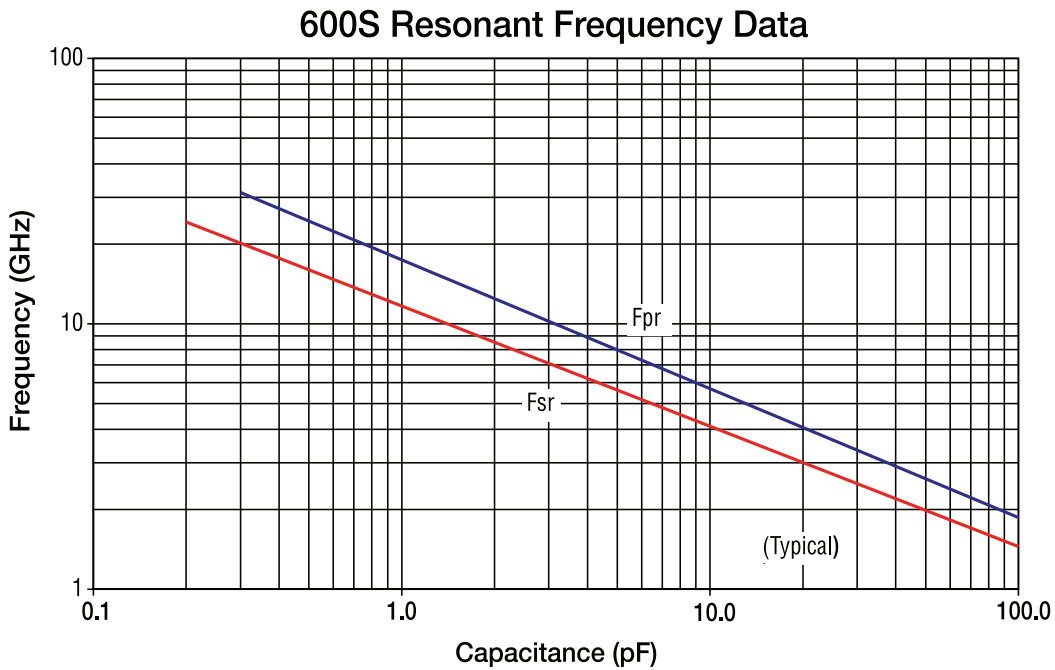
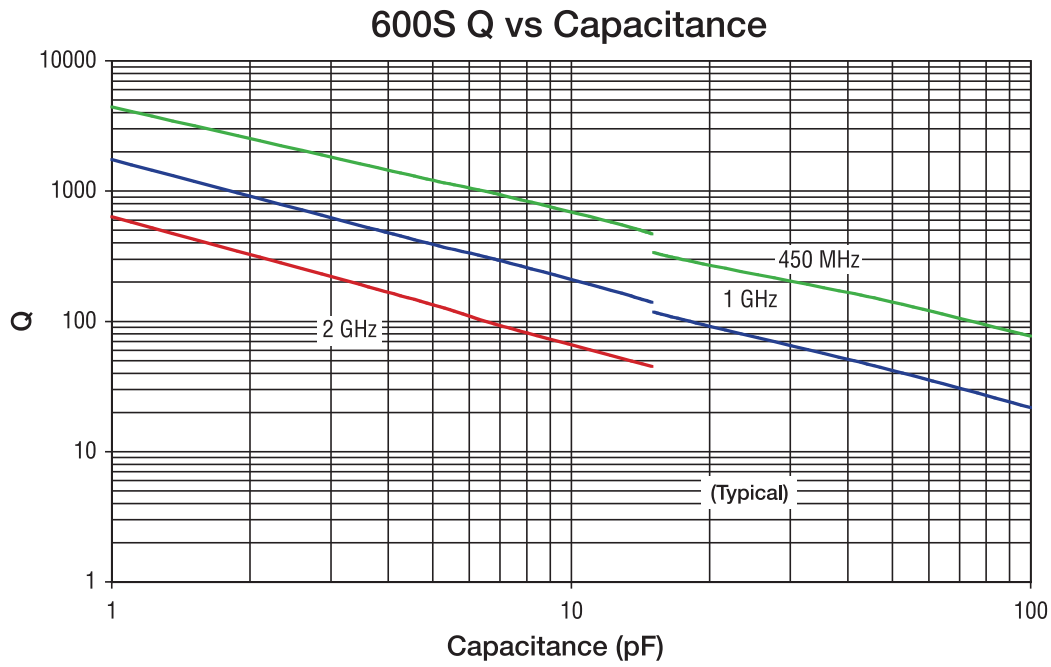
600S ESR vs Capacitance



600S ESR vs Frequency



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



ATC 600 Series Data Sheet Test Condition Description

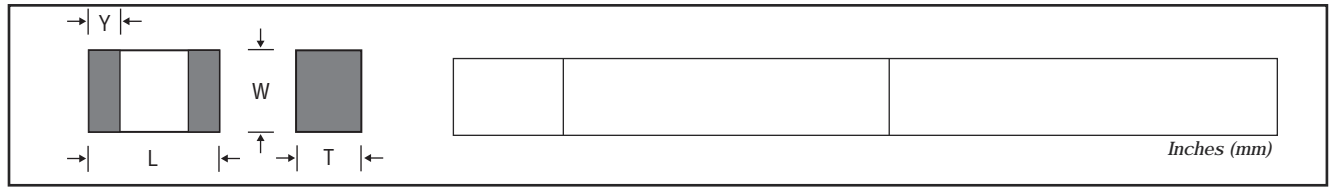
Capacitors horizontally mounted on 13.3-mil thick Rogers RO4350[®] softboard, 29-mil wide, 1/2 oz. Cu traces.

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.

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Outline Dimensions



Suggested Mounting Pad Dimensions

Horizontal Electrode Orientation

Vertical Electrode Orientation

Case Sizes L, S and F

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	±0.1	\$90.00
				1.6, 1.8, 2.0	±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	±0.1	\$90.00
				3.9, 4.7, 5.6, 6.8, 8.2	±0.25	
				10	±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	±5%	\$90.00

For Online Kit Orders, Catalog & Application Notes,



Multilayer Capacitors
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Inductor
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Single Layer
Capacitors

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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

ATC North America
+1-631-622-4700
sales@atceramics.com

ATC Europe
+46 8 6800410
sales@atceramics-europe.com

ATC Asia
+86-755-2396-8759
sales@atceramics-asia.com



www.atceramics.com