



**FEATURES**

- Lowest ESR in class, High Self-Resonant Frequencies, RF capacitors
- Highest working voltage in class: 1,500V
- Standard EIA sizes: 0402 - 1111
- Capacitance range: 0.2pF - 1,000pF
- NPO, RoHS & REACH compliant
- Operating temperature up to 125°C\*
- Laser Marked (optional)

**APPLICATIONS**

- Cellular Base Station Equipments
- Broadband Wireless Service
- Point to Point / Multipoint Radios
- RF Generators (NMR...)

**CIRCUIT APPLICATIONS**

- Filter Networks
- Matching Networks
- Tuning, Coupling and DC Blocking

**PHYSICAL CHARACTERISTICS**

- Chip capacitors for surface mounting with:
  - Copper barrier and tinning or Silver/Palladium (non magnetic)
  - Nickel barrier and tinning
- Ribbon leads for surface mounting

**ELECTRICAL AND ENVIRONMENTAL SPECIFICATIONS**

Electrical specifications	
Parameter	Value
Capacitance	0.2pF - 1,000pF
Tolerances	A, B, C, D below 10pF F, G, J, K above 10pF
Working voltage (WVDC)	See capacitance range chart
Temperature coefficient	0 ± 30ppm/°C, -55°C to +125°C For SHF and SHS: 0 ± 30ppm/°C, -55°C to +150°C
Insulation Resistance	105 MΩ min.
Dielectric Withstanding (test voltage applied for 5 seconds)	2.5 x WVDC for WVDC ≤ 500V 1.8 x WVDC for extended range values ≥ 820pF 1.5 x WVDC for WVDC > 500V
Aging	none
Piezo Effect	none

Environmental specifications	
Parameter	Value
Life Test	2,000 hours, +125°C @ 2 x WVDC (standard WVDC range) And SHB up to 100pF: 1,000 hours, 125°C at 500V
Moisture Resistance Test 1	240 hours, 85% relative humidity @ 85°C (ESA/SCC n°3009)
Moisture Resistance Test 2	56 days, 93% relative humidity @ 40°C 0V, 5V, WVDC

\* The temperature range for the CHB up to 100pF is upgraded from +125°C to +175°C.  
The temperature withstanding for SHF and SHS is 150°C for the whole capacitance range.

**HOW TO ORDER**

501	SH	B	100	J	S	-	L	E	-RoHS
Voltage code	Dielectric	Size code	Capacitance code	Tolerance code	Termination code	Ribbon code	Marking code	Tape and reel	
250 = 25V 500 = 50V 101 = 100V 201 = 200V 251 = 250V 301 = 300V 501 = 500V 601 = 600V 102 = 1,000V 152 = 1,500V  Please refer to voltage given in capacitance range chart	SH = NPO: (0±30) ppm/°C	L = 0402 S = 0603 A = 0505 F = 0805 N = 1206 T = 1210 B = 1111	Please refer to Cap. Code given in capacitance range chart.	A = ±0.05pF B = ±0.1pF C = ±0.25pF D = ±0.5pF F = ±1% G = ±2% J = ±5% K = ±10%  See note 1	S = Standard: tin-plated nickel Available on sizes 0505, 0603 and 1111: C = Non-magnetic: tin-plated copper Available on sizes 0505, 0805 (from 0.5pF to 150pF, consult us for higher cap. value), 1206 and 1210: A = Non-magnetic: silver/palladium See note 2	-: no lead or ribbon  Available on size 1111: 1 = Micro-strip ribbons 6 = Radial Wires  See note 3	-: no marking  Available on sizes 0505 and 1111: L = laser marking	-: no tape and reel  E = Tape and reel packaging Number of components per reel: SHL: 10,000 SHA: 3,000 SHS: 4,000 SHF: 4,000 SHN: 3,000 SHT: 3,000 SHB: 1,000	The RoHS tag is not part of the reference  Tag added at the end of P/N for information

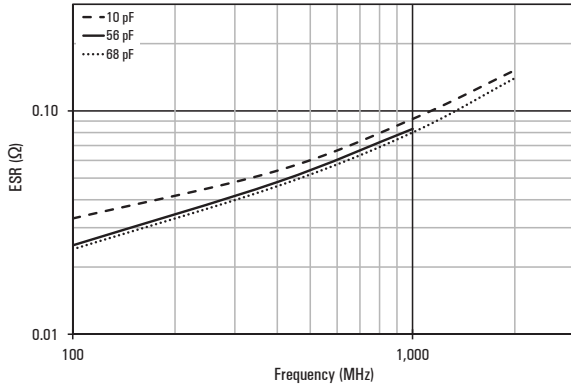
Note 1: For capacitance values less than 10pF, tolerances B, C and D available. Tolerance code A available for: L case for capacitance values of 0.2pF - 1.9pF. A case for capacitance values of 0.2pF - 4.7pF. S case for capacitance values of 0.2pF - 9.1pF. F case for capacitance values of 0.3pF - 2.2pF. N case for capacitance values of 0.5pF - 1.8pF. B case for capacitance values of 0.2pF - 3.3pF. For capacitance values of 10pF or higher, tolerances F, G, J and K available.

Note 2: All terminations are backward compatible and lead-free. The non-magnetic terminations are all Magnetism-free Rated.

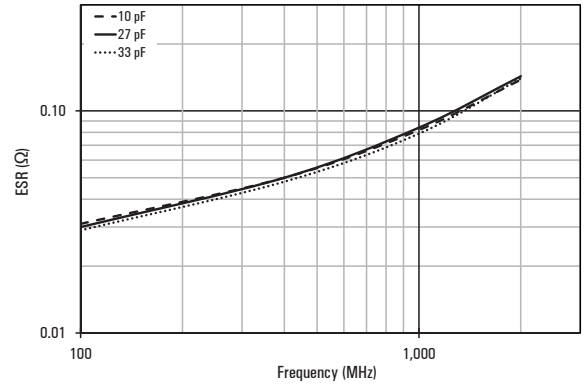
Note 3: When coding ribbons for the description of the part, the termination has to be mentioned for MRcertified types to ensure that only non-magnetic materials are used.

Examples: 501 SHB 470 J1L any termination material could be used. 501 SHB 470 JC1L only non-magnetic termination materials could be used. Please consult us for specific requirements.

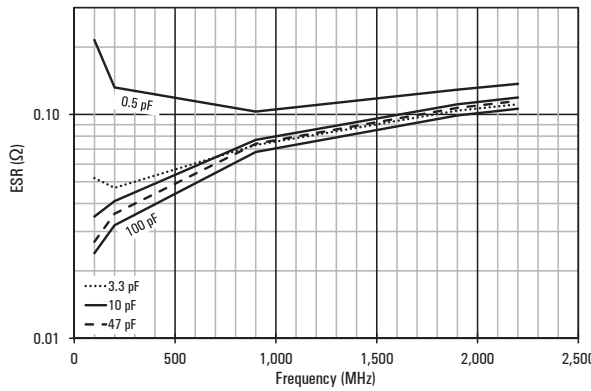
SHA (SIZE 0505): TYPICAL ESR VERSUS FREQUENCY



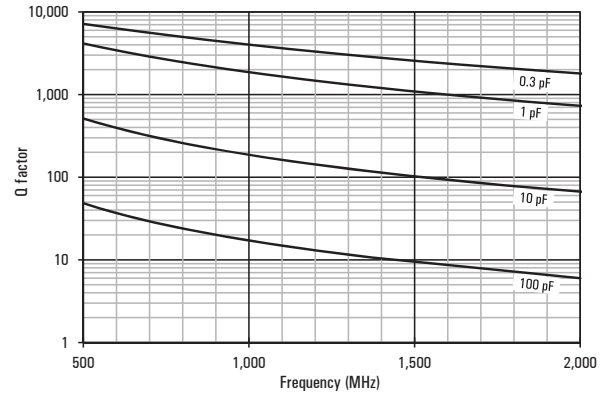
SHB (SIZE 1111): TYPICAL ESR VERSUS FREQUENCY



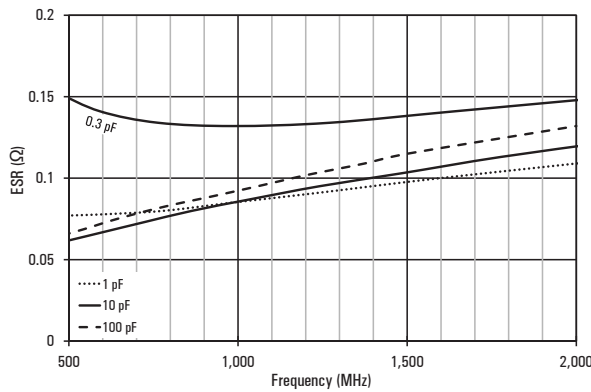
SHS (SIZE 0603): TYPICAL ESR VERSUS FREQUENCY



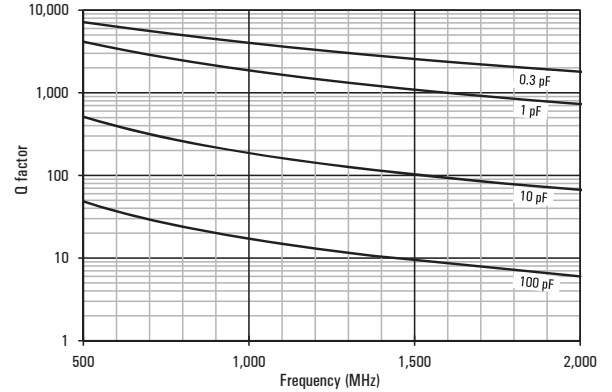
SHS (SIZE 0603): TYPICAL Q FACTOR VERSUS FREQUENCY



SHF (SIZE 0805): TYPICAL ESR VERSUS FREQUENCY

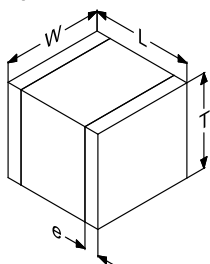


SHF (SIZE 0805): TYPICAL Q FACTOR VERSUS FREQUENCY

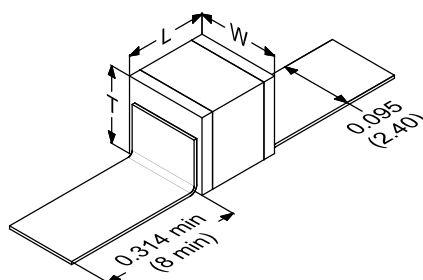


## DIMENSIONS in inches (mm)

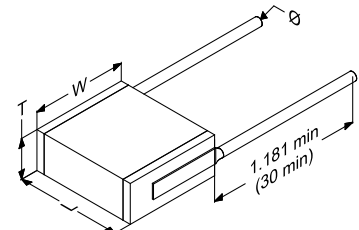
### Chips



### Micro-strip ribbon leads (Type 1)



### Radial leads: available on all sizes (Type 6)



STANDARD RATINGS

Size		0402	0603	0505	0805	1206	1210	1111	
Size code		L	S	A	F	N	T	B	
Dimensions inches (mm)	L	0.039 ± 0.006 (1 ± 0.15)	0.063 ± 0.01 (1.6 ± 0.25)	0.055 ± 0.01 (1.4 ± 0.25)	0.08 ± 0.01 (2.03 ± 0.25)	0.125 ± 0.01 (3.18 ± 0.25)	0.125 ± 0.01 (3.18 ± 0.25)	0.110 ± 0.016 (2.80 ± 0.40)	
	W	0.02 ± 0.006 (0.5 ± 0.15)	0.032 ± 0.01 (0.8 ± 0.25)	0.055 ± 0.01 (1.4 ± 0.25)	0.05 ± 0.01 (1.27 ± 0.25)	0.062 ± 0.01 (1.58 ± 0.25)	0.095 ± 0.01 (2.41 ± 0.25)	0.110 ± 0.016 (2.80 ± 0.40)	
	T	0.02 max (0.51 max)	0.036 max (0.9 max)	0.056 max (1.4 max)	0.05 max (1.27 max)	0.05 max (1.27 max)	0.06 max (1.52 max)	0.103 max (2.60 max)	
	e	0.01 ± 0.006 (0.25 ± 0.15)	0.014 ± 0.008 (0.35 ± 0.2)	0.01 ± 0.006 (0.25 ± 0.15)	0.02 ± 0.012 (0.5 ± 0.3)	0.02 ± 0.01 (0.5 ± 0.25)	0.02 ± 0.01 (0.5 ± 0.25)	0.016 ± 0.010 (0.40 ± 0.25)	
Value (pF)	Cap. Code	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Extended
0.2	0R2	50V 250V							
0.3	0R3								
0.4	0R4								
0.5	0R5								
0.6	0R6								
0.7	0R7								
0.8	0R8								
0.9	0R9								
1.0	1R0								
1.1	1R1								
1.2	1R2								
1.3	1R3								
1.4	1R4								
1.5	1R5								
1.6	1R6								
1.7	1R7								
1.8	1R8								
1.9	1R9								
2.0	2R0	250V		250V		500V			
2.1	2R1								
2.2	2R2								
2.4	2R4								
2.7	2R7								
3.0	3R0								
3.3	3R3								
3.6	3R6								
3.9	3R9								
4.3	4R3								
4.7	4R7								
5.1	5R1								
5.6	5R6								
6.2	6R2								
6.8	6R8								
7.5	7R5								
8.2	8R2								
9.1	9R1								
10	100	50 200V				500V			
11	110								
12	120								
15	150								
16	160								
18	180								
20	200								
22	220								
24	240								
27	270								
30	300								
33	330								
36	360								
39	390								
43	430								
47	470								
51	510								
56	560								
62	620								
68	680								
75	750								
82	820								
91	910								
100	101	25 - 50V							
110	111								
120	121								
130	131								
150	151								
160	161								
180	181								
200	201								
220	221								
240	241								
270	271								
300	301								
330	331								
360	361								
390	391								
430	431								
470	471								
510	511								
560	561								
620	621								
680	681								
750	751								
820	821								
910	911								
1,000	102								

Special values, tolerances, higher WWDC and matching available, please consult factory.