

SUPER-HIQ SERIES ULTRA LOW ESR, NP0

RF CAPACITORS, ROHS & REACH COMPLIANT

DESCRIPTION

Lowest ESR in class
Highest working voltage in class – 1'500V
Standard EIA sizes
Laser Marked (optional)
High Self Resonance Frequencies



APPLICATIONS

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

CIRCUIT APPLICATIONS

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

I. Electrical specifications

Parameter	Value
Capacitance	0.2 to 1'000 pF
Tolerances	B, C, D below 10 pF (A up to 3.3pF) F, G, J, K above 10 pF
Working Voltage (WVDC)	see Capacitance Value chart
Temperature Coefficient	0 +/-30ppm/°C, -55°C to +125°C
Insulation Resistance	10 ⁵ MΩ min
Dielectric Withstanding (test voltage applied for 5 seconds)	2.5 x WVDC for WVDC ≤ 500V 1.5 x WVDC for WVDC > 500V
Aging	none
Piezo Effects	none

NB: the temperature range for the SHB up to 100pF is upgraded from +125°C to +175°C.
The temperature withstanding for SHF is 150°C for the all capacitance range.

II. Mechanical specifications

Parameter	Value	Comment
Case Size	L	0402
	A	0505
	S	0603
	F	0805
	N	1206
	T	1210
	B	1111

For each case size, the recommended terminations are listed below.

NB:

- all the terminations are backward compatible and lead-free.
- the non-magnetic terminations are all Magnetism-free Rated.

MR certified®

ITAR Free®

SUPER-HIQ SERIES ULTRA LOW ESR, NP0

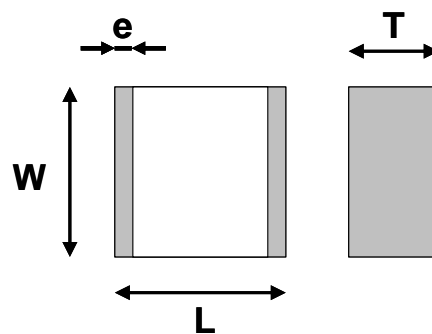
RF CAPACITORS, ROHS & REACH COMPLIANT

Termination Type	Code	SHL	SHS	SHA-SHF SHN-SHT	SHB
Standard (tin-plated nickel)	S	AVAILABLE	AVAILABLE	AVAILABLE	AVAILABLE
Non-magnetic (silver-palladium)	A			AVAILABLE ⁽¹⁾	
Non-magnetic (tin-plated copper)	C		AVAILABLE	AVAILABLE for SHA only	AVAILABLE

(1): limited range between 0.5pF and 150pF for SHF with silver-palladium terminations. For higher capacitance values, please consult factory.

III. Outline dimensions

Parameter	L (0402)	A (0505)	S (0603)	F (0805)	N (1206)	T (1210)	B (1111)
Length (L)	1.00 ±0.15mm	1.40 ±0.25mm	1.60 ±0.25mm	2.03 ±0.25mm	3.18 ±0.25mm	3.18 ±0.25mm	2.80 ±0.40mm
Width (W)	0.50 ±0.15mm	1.40 ±0.25mm	0.80 ±0.25mm	1.27 ±0.25mm	1.58 ±0.25mm	2.41 ±0.25mm	2.80 ±0.40mm
Thickness (T)	0.51 mm ±0.1mm	1.40 mm (max.)	0.90 mm (max.)	1.27 mm (max.)	1.27 mm (max.)	1.52 mm (max.)	2.60 mm (max.)
End-Band (e)	0.25 ±0.15mm	0.25 ±0.15mm	0.35 ±0.20mm	0.50 ±0.30mm	0.50 ±0.25mm	0.50 ±0.25mm	0.40 ±0.25mm



IV. Environmental specifications

Parameter	Value
Life Test	2'000 hours, +125°C at 2.0 x WVDC for SHB up to 100pF : 1'000 hours, +175°C at 500V
Moisture Resistance Test 1	240 hours, 85% relative humidity at +85°C (ESA/SCC n°3009)
Moisture Resistance Test 2	56 days, 93% relative humidity at +40°C 0V, 5V, WVDC

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SUPER-HIQ SERIES ULTRA LOW ESR, NP0

RF CAPACITORS, ROHS & REACH COMPLIANT

V. How to order

501	SH	B	100	J	S		L	E	ROHS
voltage	dielectric	case size	capacitance	tolerance code	termination code	mechanical code	marking code	tape and reel	
please refer to Volt. Code given in Capacitance Values chart		L A S F N T B	please refer to Cap. Code given in Capacitance Values chart	A=±0.05pF B=±0.1pF C=±0.25pF D=±0.5pF F=±1% G=±2% J=±5% K=±10%	please refer to Mechanical Specification chart	please refer to Mechanical Configuration chart leave blank if no mechanical requested	"L" means laser marking required leave blank if no marking requested	"E" means tape and reel required leave blank if no tape and reel requested	the RoHS tag is not part of the reference tag added at the end of P/N for information
250=25V 500=50V 101=100V 151=150V 201=200V 251=250V 301=301V 501=500V 601=600V 102=1000V 152=1500V									

NB:

- For capacitance values lower than 10pF, tolerances B, C and D apply and A Tolerance also applies for :
L case for capacitance values lower or equal to 1.9pF.
A case for capacitance values lower or equal to 4,7pF.
S case for capacitance values lower or equal to 9.1pF.
F case for capacitance values lower or equal to 2.2pF.
N case for capacitance values lower or equal to 1.8pF.
B case for capacitance values lower or equal to 3.3pF.
- For capacitance values equal to or higher than 10pF, tolerances F, G, J and K apply.

Please consult us for specific requirements.

- Marking is only available on A and B case sizes.

VI. Tape and Reel

The following chart gives the number of components per reel.

	SHL	SHA	SHS	SHF	SHN	SHT	SHB
Parts per Reel	10'000	3'000	4'000	4'000	3'000	3'000	1'000

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VII. Capacitance values

Value (pF)	Cap. Code	A (0505)	B (1111)	
			Standard	Extended
0,2	0R2	250V	500V	1500V
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			
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			
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			
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			
680	681			
750	751			
850	851			
920	921			
1 000	102			

Value (pF)	Cap. Code	L (0402)	S (0603)	F (0805)	N (1206)	T (1210)
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					
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					
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					
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					

NB: special values, tolerances, higher WVDC and matching available, please consult factory.

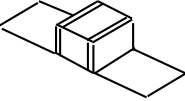
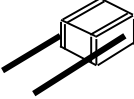
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RF CAPACITORS, ROHS & REACH COMPLIANT

VIII. Mechanical Configurations

VIII.1. Lead/Ribbon and Wire Types for 1111 case size (SHB)

Configuration Type	Code	Description
	1	Micro-strip Ribbon (2)
	6	Radial Wire

NB: when coding ribbons or wires, for the designation of the part, the termination has to be mentioned for MR_{certified} types to make sure 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

For specific configuration, please ask our factory.

VIII.2. Lead/Ribbon and Wire Matrix

Termination Type	Code	SHL/SHA/SHS SHF/SHN/SHT	SHB
Micro-strip Ribbon	1		AVAILABLE
Radial wire	6		AVAILABLE ⁽¹⁾

(1) Value 0R3 non available with this termination. Non ROHS terminations.

VIII.3. Lead/Ribbon and Wire Dimensions

Within each cell, first the length and then the width/diameter of any single ribbon or wire are given.

Termination Type	Code	SHL/SHA/SHS SHF/SHN/SHT	SHB
Micro-strip Ribbon	1		8.00 2.40
Radial wire	6		20.00 0.60

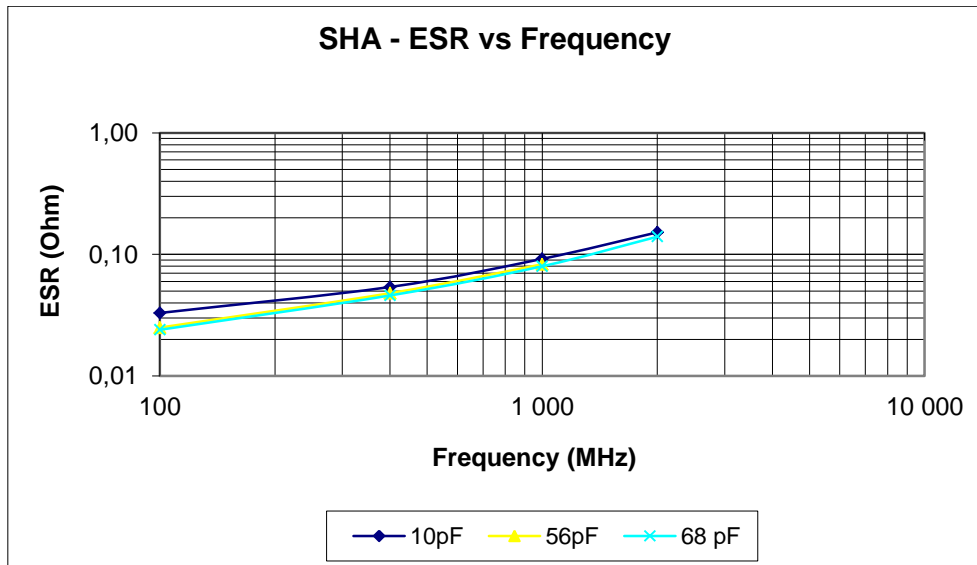
NB: dimensions are in mm, length is the minimum value.

SUPER-HIQ SERIES ULTRA LOW ESR, NP0

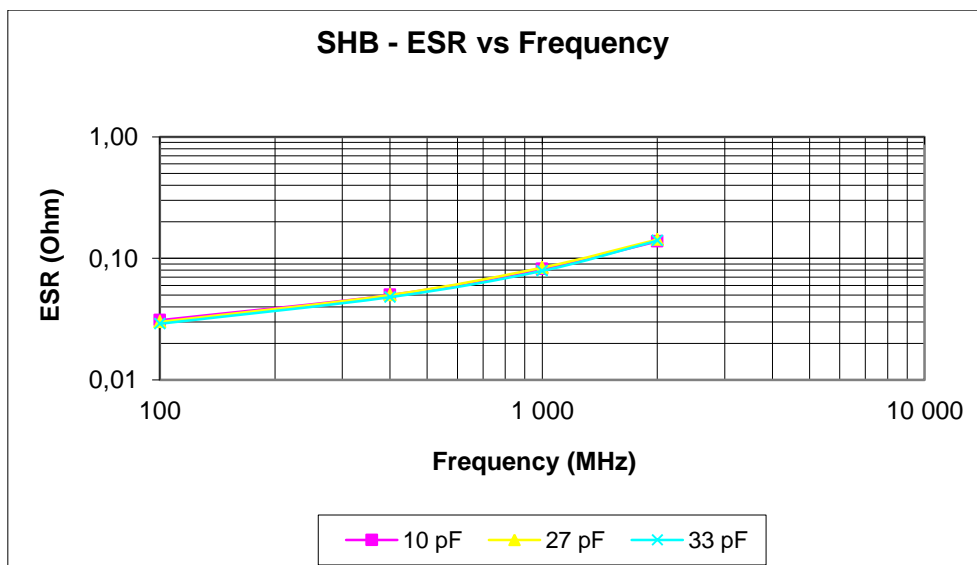
RF CAPACITORS, ROHS & REACH COMPLIANT

IX. Typical performance data

IX.1. CAPACITANCE IN A SIZE (0505): SUPER-HIQ SERIES



IX.2. CAPACITANCE IN B SIZE (1111): SUPER-HIQ SERIES

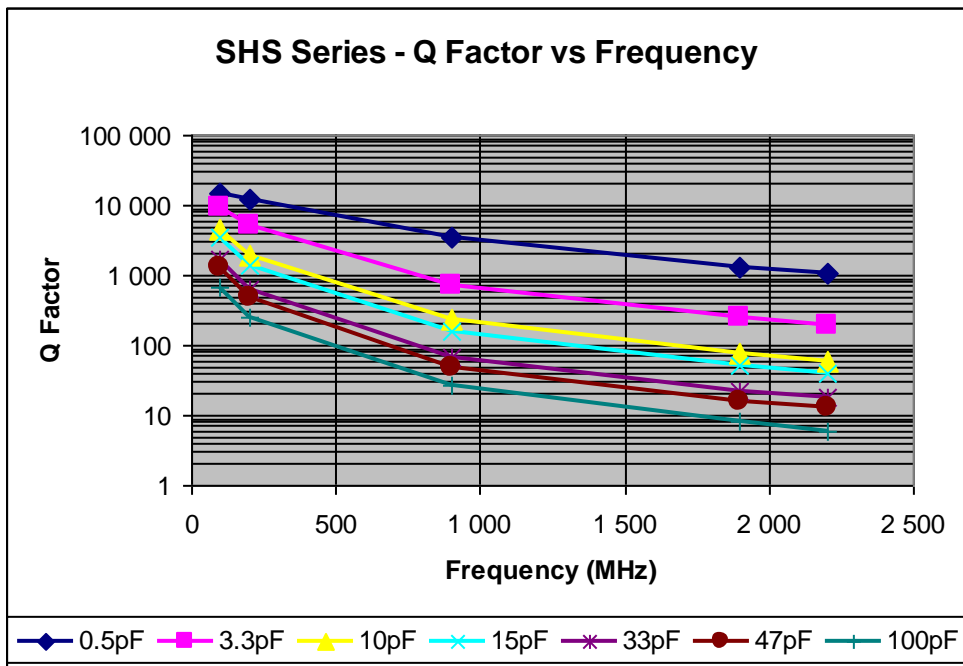
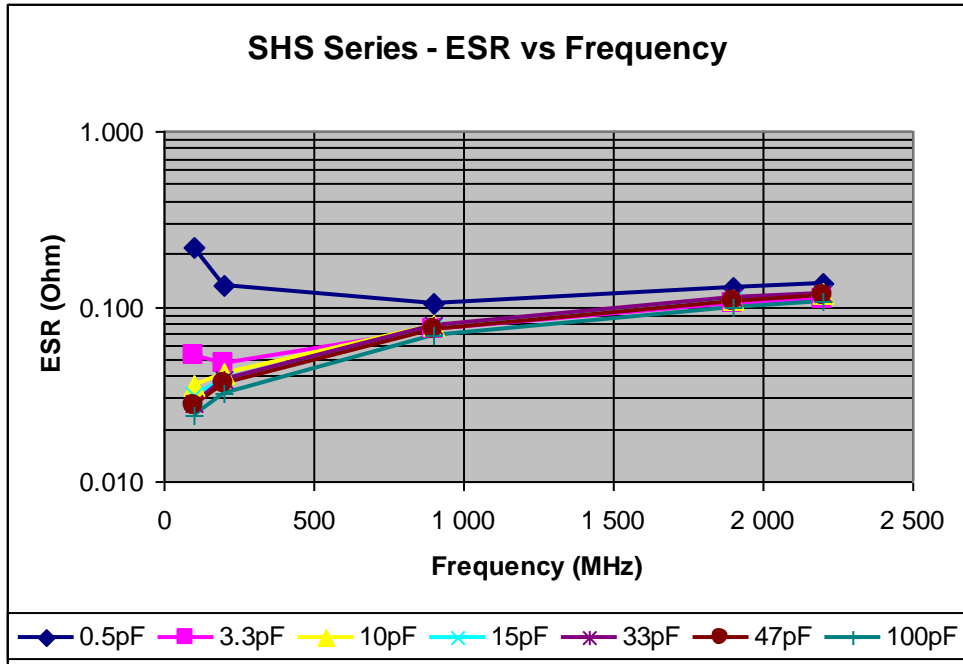


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RF CAPACITORS, ROHS & REACH COMPLIANT

IX.3. CAPACITANCE IN S SIZE (0603): SUPER-HIQ SERIES

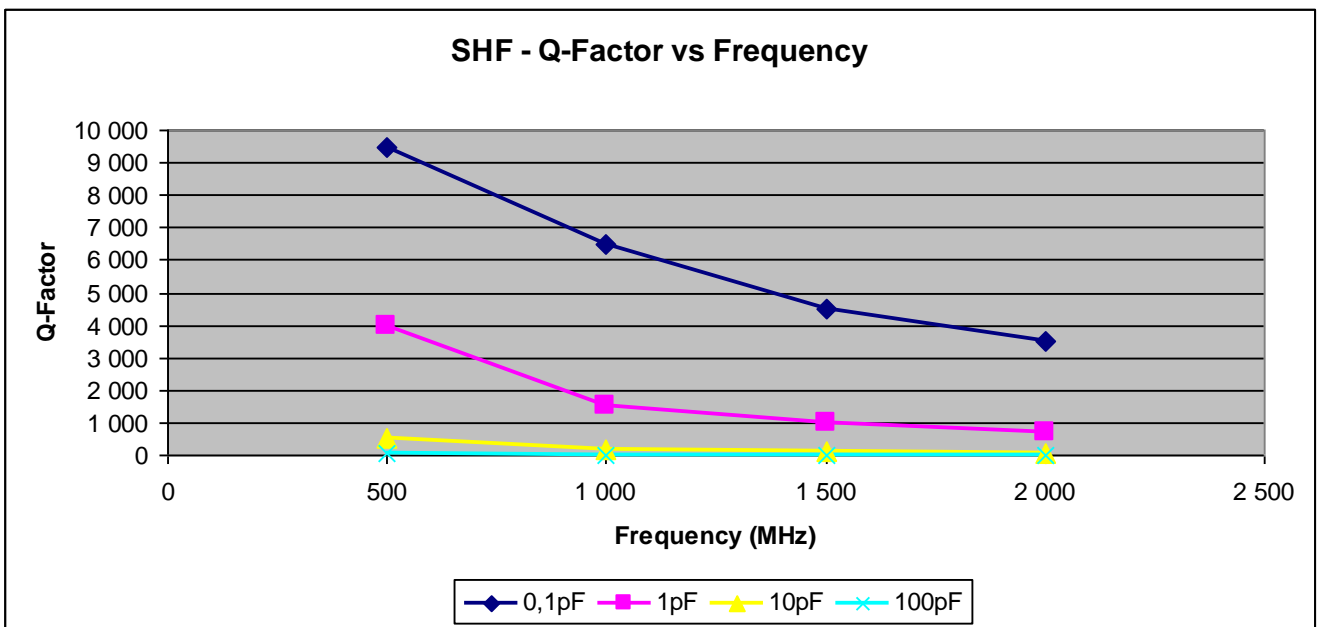
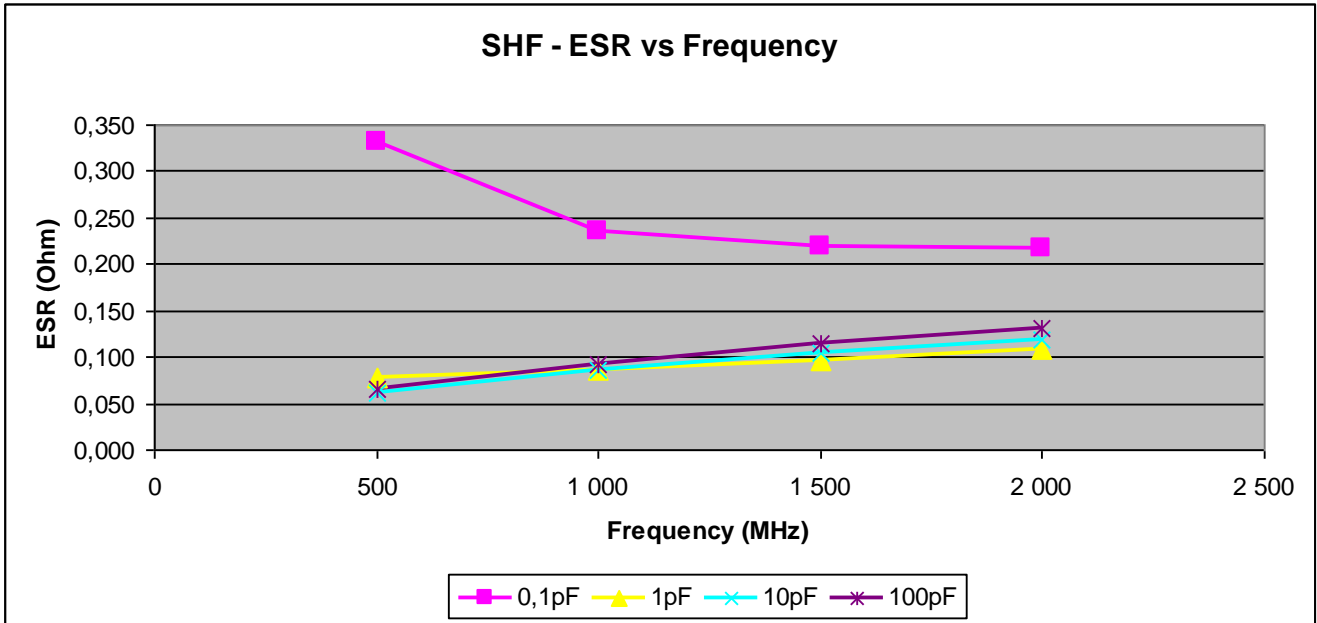


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IX.5. CAPACITANCE IN F SIZE (0805): SUPER-HIQ SERIES



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REVERSE-GEOMETRY, ULTRA LOW ESL, NPO

RF & MICROWAVE CAPACITORS, RoHS COMPLIANT

Description

Reverse-Geometry MLCC
Lowest ESR in class
Highest working voltage in class - 500V
Laser Marked (optional)
Very High Self Resonance Frequencies



Applications

- Cellular Base Station Equipment
- Broadband Wireless Service
- Point to Point/Multipoint Radios
- Broadcasting Equipment

Circuit applications

- Impedance Matching
- Bypass, Feedback
- Tuning, Coupling and DC Blocking

I. Electrical specifications

Parameter	Value
Capacitance	0.5 to 100 pF
Tolerances	B, C, D below 10 pF (A up to 3.3pF) G, J, K, M above 10 pF
Working Voltage (WVDC)	see Capacitance Value chart
Temperature Coefficient	0 +/-30ppm/°C, -55°C to +175°C
Insulation Resistance	10 ⁵ MΩ min
Dielectric Withstanding (test voltage applied for 5 seconds)	2.5 x WVDC for WVDC ≤ 500V
Aging	none
Piezo Effects	none

II. Mechanical specifications

Parameter	Value	Comment
Case Size	R	0709

NB: all the terminations are backward compatible and lead-free.

Termination Type	Code	SHR
Standard (tin-plated nickel)	S	AVAILABLE

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REVERSE-GEOMETRY, ULTRA LOW ESL, NPO

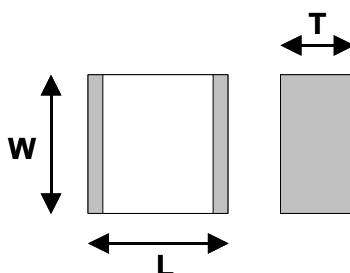
RF & MICROWAVE CAPACITORS, RoHS COMPLIANT

III. Environmental specifications

Parameter	Value
Life Test	1'000 hours, +175°C at 500V 2'000 hours, +125°C at 1000V
Moisture Resistance Test 1	240 hours, 85% relative humidity at +85°C (ESA/SCC n°3009)
Moisture Resistance Test 2	56 days, 93% relative humidity at +40°C 0V, 5V, WVDC

IV. Outline dimensions

Parameter	R (0709)
Length (L)	1.78 ±0.38mm
Width (W)	2.29 ±0.25mm
Thickness (T)	2.67 mm (max.)
End-Band (e)	0.25 + 0.2 mm / - 0.15 mm



REVERSE-GEOMETRY, ULTRA LOW ESL, NPO

RF & MICROWAVE CAPACITORS, RoHS COMPLIANT

V. How to order

501	SH	R	100	J	S	L	E	ROHS
voltage	dielectric	case size	capacitance	tolerance code	termination code	marking code	tape and reel	
501=500V			please refer to Cap. Code given in Capacitance Values chart	B=±0.10pF C=±0.25pF D=±0.5pF G=±2% J=±5% K=±10% M=±20%		"L" means laser marking required leave blank if no marking requested	"E" means tape and reel required leave blank if no tape and reel requested	the RoHS tag is not part of the reference tag added at the end of P/N for information

NB: for capacitance values lower than 10pF, tolerances B, C and D apply. For capacitance values lower or equal to 3,3pF, tolerance A also applies. For capacitance values equal to or higher than 10pF, tolerances F, G, J, K and M apply.

VI. Tape and Reel

The following chart gives the number of components per reel.

	SHR
Parts per Reel	1'000

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REVERSE-GEOMETRY, ULTRA LOW ESL, NPO

RF & MICROWAVE CAPACITORS, RoHS COMPLIANT

VII. Capacitance values

Value (pF)	Cap. Code	R (0709)
0.5	0R5	500V
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	
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	
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	

NB: special values, tolerances, higher WVDC and matching available, please consult factory.

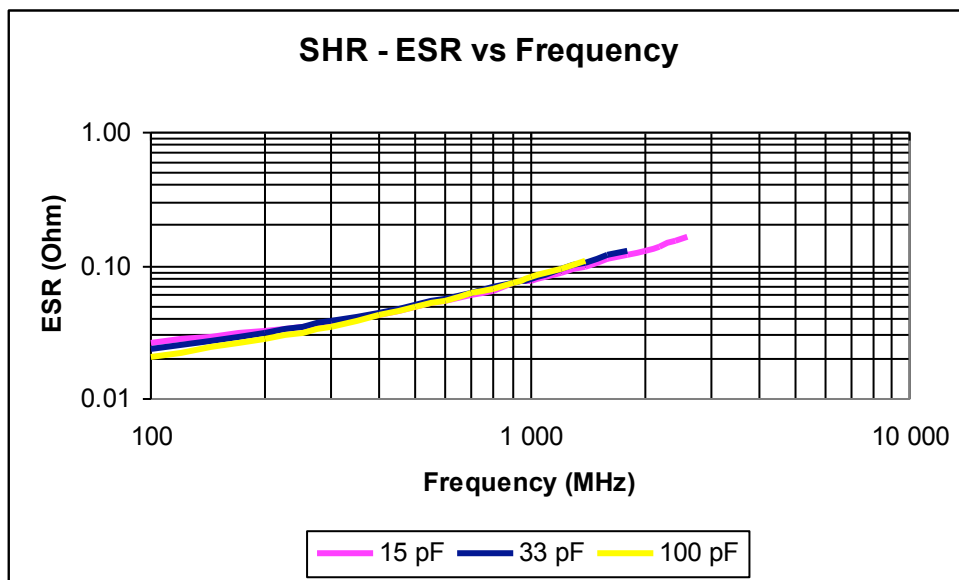
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REVERSE-GEOMETRY, ULTRA LOW ESL, NPO

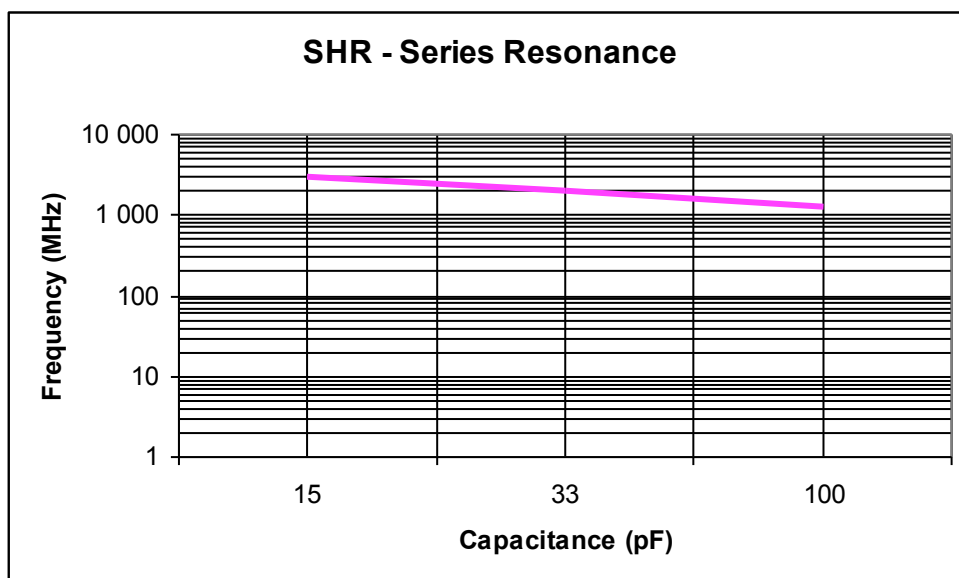
RF & MICROWAVE CAPACITORS, RoHS COMPLIANT

VIII. Typical performance data

VIII.1. Capacitance in R size (0709): Equivalent Series Resistance



VIII.2. Capacitance in R size (0709): Series Resonance Frequency



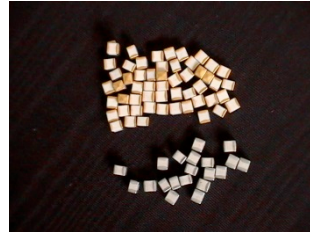
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RF & MICROWAVE CAPACITORS, RoHS COMPLIANT

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 Lowest ESR in class
 Highest working voltage in class - 500V
 Laser Marked (optional)
 Very High Self Resonance Frequencies



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Circuit applications

- Impedance Matching
- Bypass, Feedback
- Tuning, Coupling and DC Blocking

I. Electrical specifications

Parameter	Value
Capacitance	0.5 to 100 pF
Tolerances	B, C, D below 10 pF (A up to 3.3pF) G, J, K, M above 10 pF
Working Voltage (WVDC)	see Capacitance Value chart
Temperature Coefficient	0 +/-30ppm/°C, -55°C to +175°C
Insulation Resistance	10 ⁵ MΩ min
Dielectric Withstanding (test voltage applied for 5 seconds)	2.5 x WVDC for WVDC ≤ 500V
Aging	none
Piezo Effects	none

II. Mechanical specifications

Parameter	Value	Comment
Case Size	D	0711

NB: all the terminations are backward compatible and lead-free.

Termination Type	Code	SHD
Standard (tin-plated nickel)	S	AVAILABLE

III. Environmental specifications

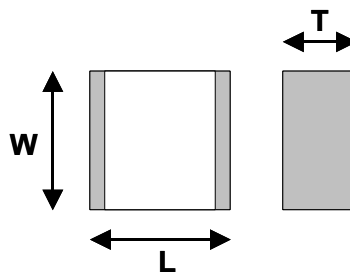
Parameter	Value
Life Test	1'000 hours, +175°C at 500V 2'000 hours, +125°C at 1000V
Moisture Resistance Test 1	240 hours, 85% relative humidity at +85°C (ESA/SCC n°3009)
Moisture Resistance Test 2	56 days, 93% relative humidity at +40°C 0V, 5V, WVDC

REVERSE-GEOMETRY, ULTRA LOW ESL, NPO

RF & MICROWAVE CAPACITORS, RoHS COMPLIANT

IV. Outline dimensions

Parameter	D (0711)
Length (L)	1.78 ±0.38mm
Width (W)	2.67 ±0.25mm
Thickness (T)	2.29 mm (max.)
End-Band (e)	0.25 + 0.2 mm / - 0.15 mm



V. How to order

501	SH	D	100	J	S	L	E	ROHS
voltage	dielectric	case size	capacitance	tolerance code	termination code	marking code	tape and reel	
501=500V			please refer to Cap. Code given in Capacitance Values chart	B=±0.10pF C=±0.25pF D=±0.5pF G=±2% J=±5% K=±10% M=±20%		"L" means laser marking required leave blank if no marking requested	"E" means tape and reel required leave blank if no tape and reel requested	the RoHS tag is not part of the reference tag added at the end of P/N for information

NB: for capacitance values lower than 10pF, tolerances B, C and D apply. For capacitance values equal to or higher than 10pF, tolerances F, G, J, K and M apply.

VI. Tape and Reel

The following chart gives the number of components per reel.

	SHD
Parts per Reel	1'000

REVERSE-GEOMETRY, ULTRA LOW ESL, NPO

RF & MICROWAVE CAPACITORS, RoHS COMPLIANT

VII. Capacitance values

Value (pF)	Cap. Code	D (0711)
0.5	0R5	500V
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	
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	
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	

NB: special values, tolerances, higher WVDC and matching available, please consult factory.

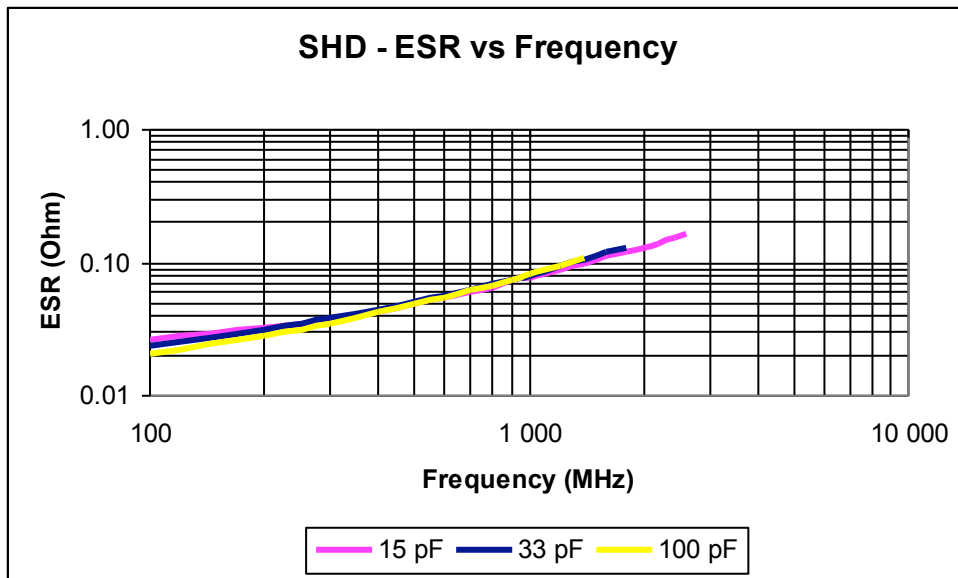
EXXELIA TEMEX reserves the right to modify herein specifications and information at any time when necessary to provide optimum performance and cost.

REVERSE-GEOMETRY, ULTRA LOW ESL, NPO

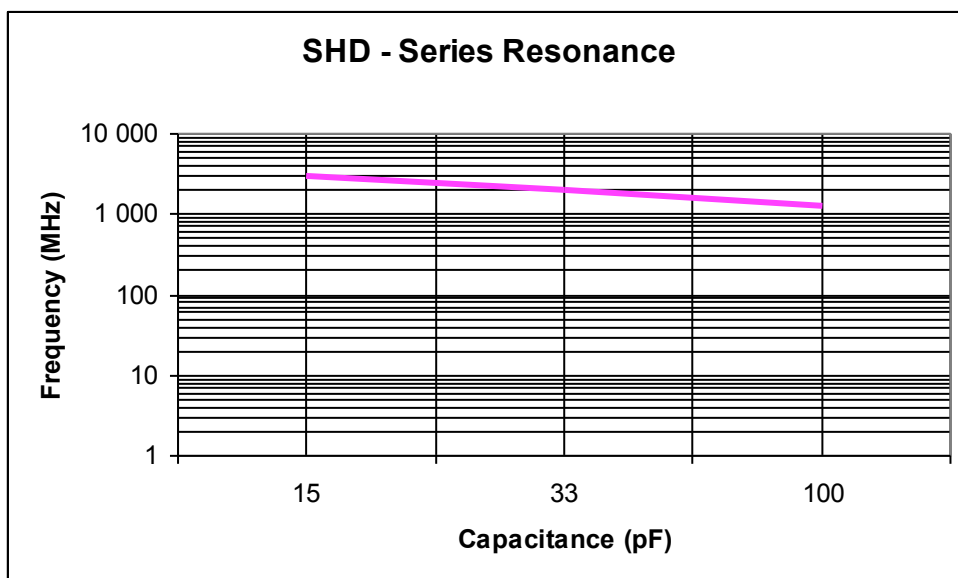
RF & MICROWAVE CAPACITORS, RoHS COMPLIANT

VIII. Typical performance data

VIII.1. Capacitance in D size (0711): Equivalent Series Resistance



VIII.2. Capacitance in D size (0711): Series Resonance Frequency



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