MLCC High Q RF Power

50V-8000V

SRT MICROCÉRAMIQUE
MLCC CAPACITORS

APPLICATIONS

- **Lasers, CATV, RF Power Amplifiers**
- **Mixers, RF Instruments**

RoHS compliant

FEATURE

- **Wide range of termination magnetic and non magnetic**
- **Microstrips and wires, axial, radial**
- **Equivalent to concurrent design**
- **Very low ESL/ESR. High current**

ELECTRICAL PARAMETERS

ELECTRICAL CHARACTERISTICS:
at + 25°C unless otherwise specified

OPERATING TEMPERATURE:
- 55°C, + 125°C

TEMPERATURE COEFFICIENT:
± 30ppm

DISSIPATION FACTOR:
≤ 5.10^{-4} at 1Vrms at 1Vrms 1MHz for values ≤ 1000pF
≤ 5.10^{-4} at 1Vrms at 1Vrms 1KHz for values > 1000pF

INSULATION RESISTANCE (IR):
25°C/Un 10^5 MOhm or 1000 Ohm-Farad whichever is less
125°C/Un 10^4 MOhm or 100 Ohm-Farad whichever is less

DIELECTRIC STRENGTH TEST:
2.5Un U≤200V I U+250V 200<U≤500 I 1.5U 500<U<1000 I 1.2U U≥1000
for 5s with 50mA max charging current

QUICK REFERENCE DATA

	0505	1111	2325	4040	7274
MIN	0.1pF	0.1pF	1pF	1pF	100pF
50V	1.0nF	5.1nF			
150V	620pF	1.0nF			
250V	100pF				
300V			3.3nF		
500V		680pF	3.0nF		
630V			2.4nF		
1000V		200pF	1.2nF	6.8nF	
1500V		47pF	470pF		
2000V				5.1nF	20nF
2500V			220pF	2.2nF	
3600V			51pF	390pF	
5000V				180pF	3nF
7200V					
8000V					220pF

ORDERING INFORMATION

2325	Q	560	F	E	X	B	-
SIZE	DIELECTRIC	CAPACITANCE	TOLERANCE	VOLTAGE	TERMINATION	PACKAGING	SPECIAL
0505 1111 2325 4040 7274	Q = High Q	Expressed in picofarads (pF).The first two digits are significant, the third digit gives the number of noughts. Example : 102 = 1000pF For special values R is used as decimal separator Example 12R7 = 12.7pF 1340R0 = 1340pF	A = ±0.05pF if < 10pF and 0.05% if > 10pF B = ± 0.1pF C = ± 0,25pF D = ± 0,5pF F = ± 1% G = ± 2% J = ± 5%	A = 50V B = 100V C = 200V P = 250V D = 300V E = 500V F = 630V G = 1000V O = 1500V H = 2000V T = 2500V I = 3000V M = 3600V K = 4000V L = 5000V S = 7200V 8 = 8000V	X = Nickel Tin C = Copper Tin (Non magnetic) F = Silver Palladium (Non magnetic) W = Nickel Gold Flash G = Nickel Gold Thick H = Dipped SnPb I = Electrolytic SnPb M = Microstrip A = Axial Ribbon R = Radial Ribbon U = Axial Wire V = Radial Wire CM = Microstrip (Non magnetic) CA = Axial Ribbon (Non magnetic) CR = Axial Ribbon (Non magnetic) CU = Axial Wire (Non magnetic) CV = Radial Wire (Non magnetic)	B = Reel V = Bulk	- Dxx = Reliability spec Exx = Sorting spec

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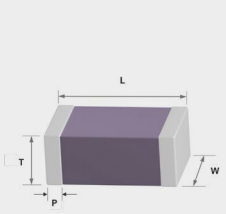
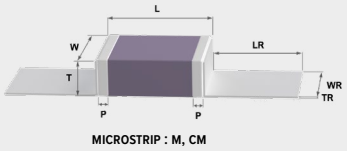
DIMENSIONS IN MILIMETERS

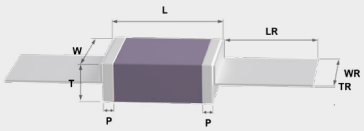
DESIGNATION		TERMINATION	0505	1111	2325	4040	7274
LENGTH (L)		X, C, F, W,G, H, I	1.40 ± 0.6	2.80 ± 0.5	5.85 ± 0.6	9.7 ± 0.8	18.9 ± 1.00
LENGTH (L)		M, CM, A, AR, R, CR		3.20 ± 0.5	6.30 ± 0.6	10.1 ± 0.8	18.9 ± 1.00
LENGTH (L)		U, UC, CU, CV		3.70 ± 0.5	6.30 ± 0.6	10.1 ± 0.8	
WIDTH (W)		ALL	1.40 ± 0.4	2.80 ± 0.4	6.35 ± 0.5	9.7 ± 0.8	19.1 ± 1.00
THICKNESS MAX (T)		ALL - M, CM	1.45	2.60	4.30	4.30	4.30
THICKNESS MAX (T)		M, CM		3.10	4.30	4.30	
TERMINATION (P)	MIN	ALL	0.10	0.20	0.25	0.80	0.80
	MAX	ALL	0.40	0.50	0.80	1.50	1.50
LENGTH RIBBON MIN (LR)		M, CM, A, AR, R, CR		7.00	13.00	20.00	20.00
WIDTH RIBBON (WR)		M, CM, A, AR, R, CR		2.40 ± 0.2	6.10 ± 0.2	8.90 ± 0.2	16.7 ± 0.4
THICKNESS RIBBON (TR)		M, CM, A, AR, R, CR		0.10	0.10	0.25	0.25
LENGTH WIRE MIN (LW)		U, UC, CU, CV		13.00	13.00	25.00	
DIAMETER WIRE (DW)		U, UC, CU, CV		0.41	0.81	0.81	



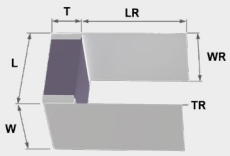
SMD : X, C, F, W, G, H, I



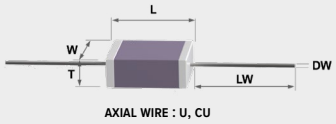
MICROSTRIP : M, CM



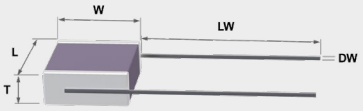
AXIAL MICROSTRIP : A, CA



RADIAL MICROSTRIP : R, CR



AXIAL WIRE : U, CU



RADIAL WIRE : V, CV

TYPICAL VALUES : 0505 TO 4040

SIZE		0505			1111							2325							4040				
CODE	CAP	50	150	250	50	150	200	300	500	1000	1500	300	500	630	1000	1500	2500	3600	1000	2000	2500	3600	5000
0R1	0.1pF		■	■					■	■	■												
0R2	0.2pF		■	■					■	■	■												
0R3	0.3pF		■	■					■	■	■												
0R4	0.4pF		■	■					■	■	■												
0R5	0.5pF		■	■					■	■	■												
0R6	0.6pF		■	■					■	■	■												
0R7	0.7pF		■	■					■	■	■												
0R8	0.8pF		■	■					■	■	■												
0R9	0.9pF		■	■					■	■	■												
1R0	1.0pF		■	■					■	■	■						■	■				■	■
1R1	1.1pF		■	■					■	■	■						■	■				■	■
1R2	1.2pF		■	■					■	■	■						■	■				■	■
1R3	1.3pF		■	■					■	■	■						■	■				■	■
1R4	1.4pF		■	■					■	■	■						■	■				■	■
1R5	1.5pF		■	■					■	■	■						■	■				■	■
1R6	1.6pF		■	■					■	■	■						■	■				■	■
1R7	1.7pF		■	■					■	■	■						■	■				■	■
1R8	1.8pF		■	■					■	■	■						■	■				■	■
1R9	1.9pF		■	■					■	■	■						■	■				■	■
2R1	2.1pF		■	■					■	■	■						■	■				■	■
2R2	2.2pF		■	■					■	■	■						■	■				■	■
2R2	2.2pF		■	■					■	■	■						■	■				■	■
2R4	2.4pF		■	■					■	■	■						■	■				■	■
2R7	2.7pF		■	■					■	■	■						■	■				■	■
3R0	3.0pF		■	■					■	■	■						■	■				■	■
3R3	3.3pF		■	■					■	■	■						■	■				■	■
3R6	3.6pF		■	■					■	■	■						■	■				■	■
3R9	3.9pF		■	■					■	■	■						■	■				■	■
4R3	4.3pF		■	■					■	■	■						■	■				■	■
4R7	4.7pF		■	■					■	■	■						■	■				■	■
5R6	5.6pF		■	■					■	■	■						■	■				■	■
6R2	6.2pF		■	■					■	■	■						■	■				■	■
6R8	6.8pF		■	■					■	■	■						■	■				■	■
7R5	7.5pF		■	■					■	■	■						■	■				■	■
8R2	8.2pF		■	■					■	■	■						■	■				■	■
9R1	9.1pF		■	■					■	■	■						■	■				■	■
100	10pF		■	■					■	■	■						■	■				■	■
110	11pF		■	■					■	■	■						■	■				■	■
120	12pF		■	■					■	■	■						■	■				■	■
130	13pF		■	■					■	■	■						■	■				■	■
150	15pF		■	■					■	■	■						■	■				■	■
160	16pF		■	■					■	■	■						■	■				■	■
180	18pF		■	■					■	■	■						■	■				■	■
200	20pF		■	■					■	■	■						■	■				■	■
220	22pF		■	■					■	■	■						■	■				■	■
240	24pF		■	■					■	■	■						■	■				■	■
270	27pF		■	■					■	■	■						■	■				■	■
300	30pF		■	■					■	■	■						■	■				■	■
330	33pF		■	■					■	■	■						■	■				■	■
360	36pF		■	■					■	■	■						■	■				■	■
390	39pF		■	■					■	■	■						■	■				■	■
430	43pF		■	■					■	■	■						■	■				■	■
470	47pF		■	■					■	■	■						■	■				■	■
510	51pF		■	■					■	■							■	■				■	■
560	56pF		■	■					■	■							■					■	■
620	62pF		■	■					■	■							■					■	■
680	68pF		■	■					■	■							■					■	■
750	75pF		■	■					■	■							■					■	■
820	82pF		■	■					■	■							■					■	■
910	91pF		■	■					■	■							■					■	■
101	100pF		■	■					■	■						■	■					■	■
111	110pF		■					■	■	■						■	■					■	■
121	120pF		■					■	■	■						■	■					■	■
131	130pF		■					■	■	■						■	■					■	■
151	150pF		■					■	■	■						■	■					■	■
161	160pF		■					■	■	■						■	■					■	■
181	180pF		■					■	■	■						■	■					■	■
201	200pF		■					■	■	■						■	■					■	■
221	220pF		■				■	■	■							■	■					■	
241	240pF		■				■	■	■							■	■					■	
271	270pF		■				■	■	■							■	■				■	■	
301	300pF		■				■	■	■							■	■				■	■	
331	330pF		■				■	■	■							■	■				■	■	
361	360pF		■				■	■	■							■	■				■	■	
391	390pF		■				■	■	■							■	■				■	■	
431	430pF		■				■	■	■							■	■				■	■	
471	470pF		■				■	■	■							■	■				■	■	
511	510pF		■			■	■									■	■				■	■	
561	560pF		■			■	■									■	■				■	■	
621	620pF		■			■	■									■	■				■	■	
681	680pF	■			■	■										■	■				■	■	
751	750pF	■			■	■										■	■				■	■	
821	820pF	■			■	■										■	■				■	■	
9111	910pF	■			■	■										■	■				■	■	
102	1.0nF	■			■	■										■	■			■	■	■	
112	1.1nF				■											■	■			■	■	■	
122	1.2nF				■											■	■			■	■	■	
152	1.5nF				■									■	■	■	■			■	■	■	
182	1.8nF				■									■	■	■	■			■	■	■	
222	2.2nF				■									■	■	■	■			■	■	■	
272	2.7nF				■									■	■	■	■			■	■	■	
242	2.4nF				■									■	■	■	■			■	■	■	
272	2.7nF				■								■	■	■					■	■	■	
302	3.0nF				■								■	■	■					■	■	■	
332	3.3nF				■								■	■	■					■	■	■	
392	3.9nF				■															■	■	■	
472	4.7nF				■															■	■	■	
512	5.1nF				■															■	■	■	
562	5.6nF																			■			
682	6.8nF																			■			

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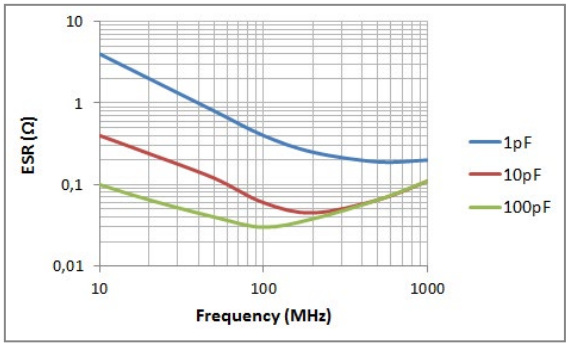
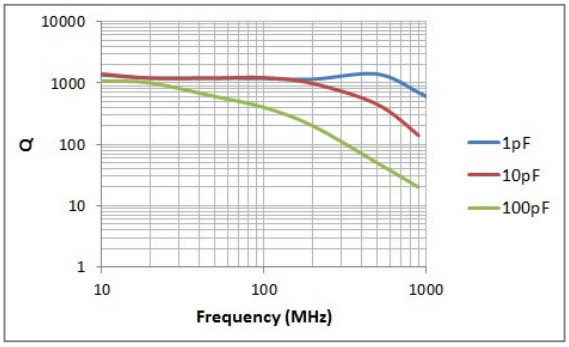
TYPICAL CHARACTERISTICS : 0505 TO 1111

0505

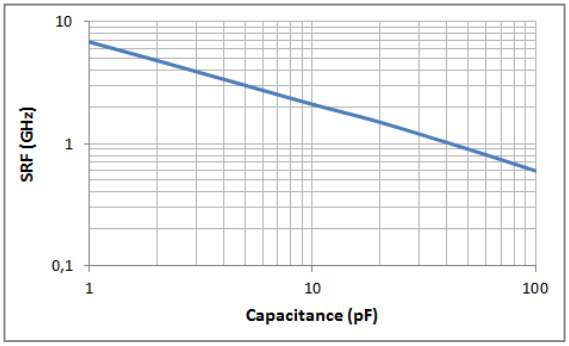
ESR = f(F_{MHz})



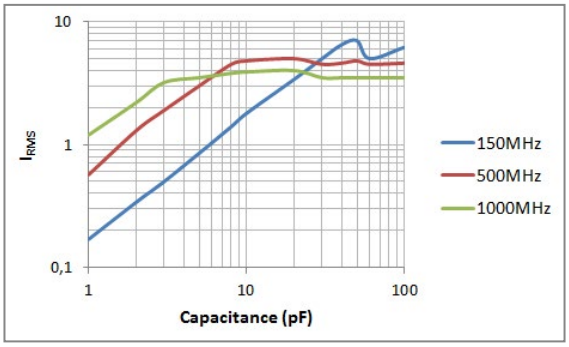
Q Value = f(F_{MHz})



Resonant Frequency = f(CAP_{pF})

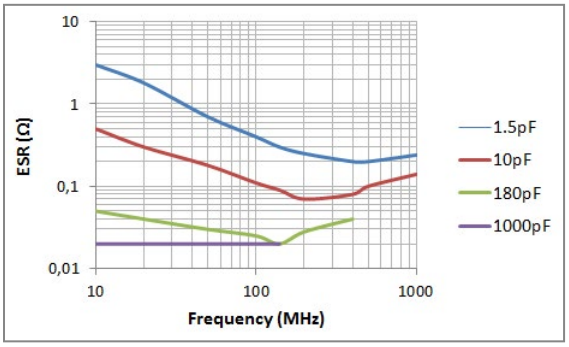


I_{RMS} = f(CAP_{pF})

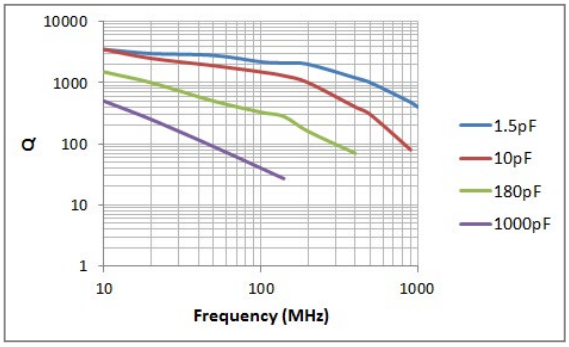


1111

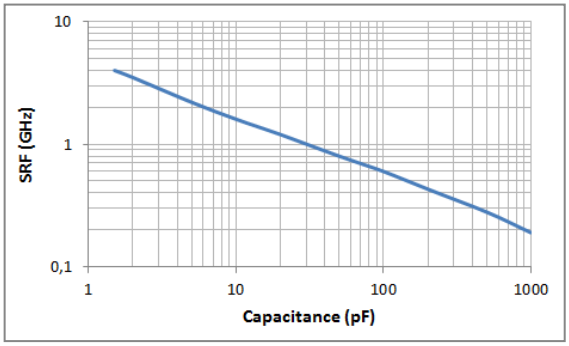
ESR = f(F_{MHz})



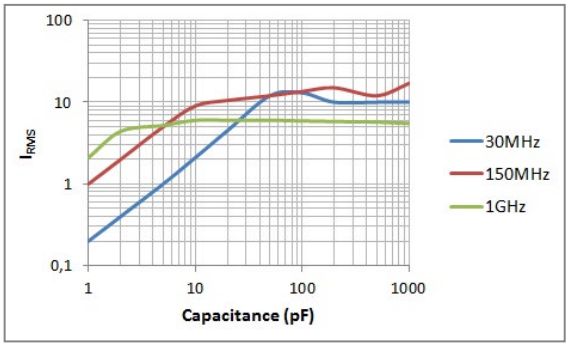
Q Value = f(F_{MHz})



Resonant Frequency = f(CAP_{pF})



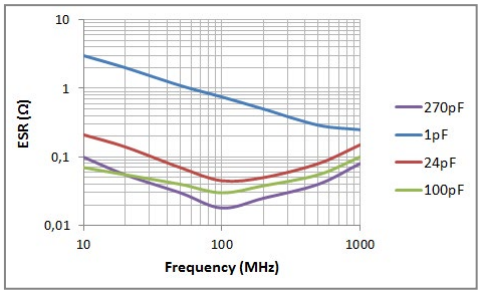
I_{RMS} = f(CAP_{pF})



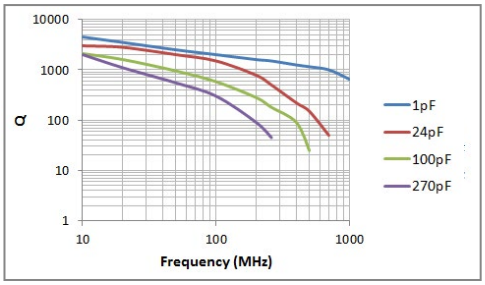
TYPICAL CHARACTERISTICS : 2325 TO 4040

2325

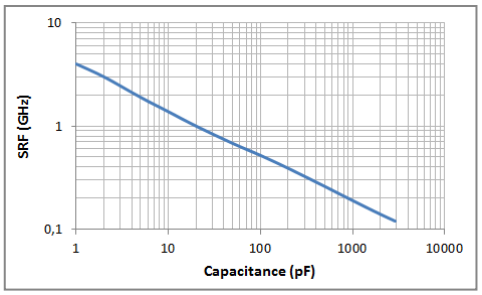
ESR = f(F_{MHz})



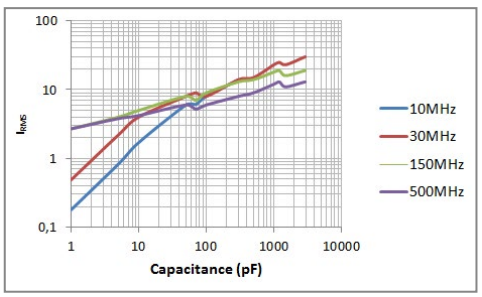
Q Value = f(F_{MHz})



Resonant Frequency = f(CAP_{pF})

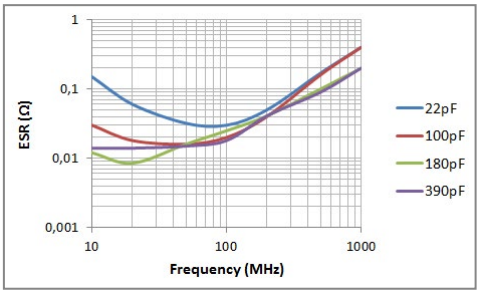


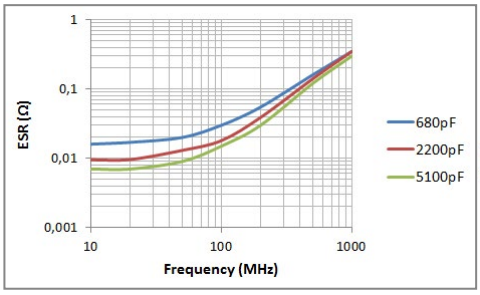
I_{RMS} = f(CAP_{pF})



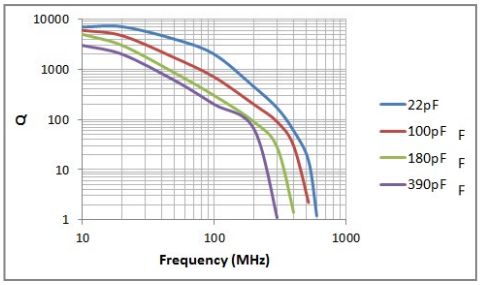
4040

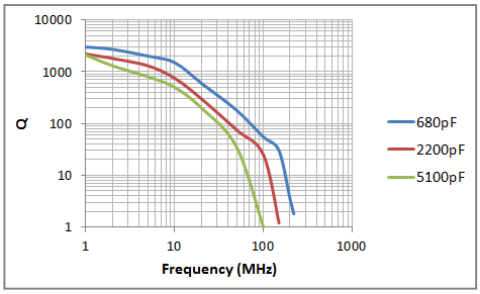
ESR = f(F_{MHz})



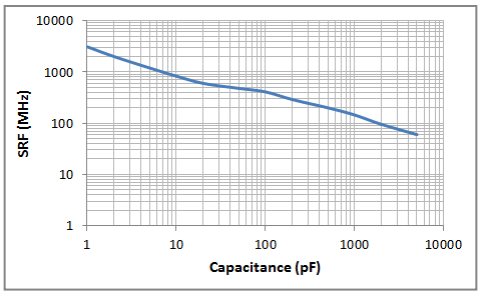


Q Value = f(F_{MHz})

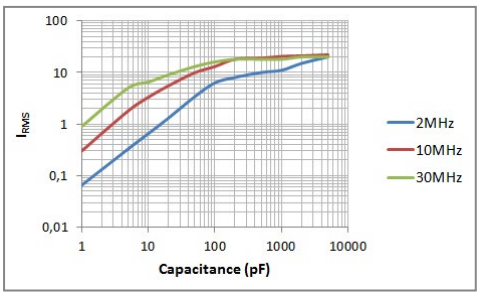




Resonant Frequency = f(CAP_{pF})



I_{RMS} = f(CAP_{pF})



DESIGN KITS

SRT-Microcérmique is widening its High Q offer and propose design Kits with

KITS

P/N	DES	RANGE	VALUES	TOL
0603QXK-0R1-020	0603 High Q 250V Nisn Termination (15pcs per value)	1.0pF -> 2.0pF	0.1pF 0.2pF 0.3pF 0.4pF 0.5pF 0.6pF 0.7pF 0.8pF 0.9pF 1.0pF 1.1pF 1.2pF 1.5pF 1.6pF, 1.8pF, 2.0pF	±0.1pF (B) ±0.25pF (C)
0603QXK-010-100		1.0pF -> 10pF	1.0pF 1.2pF 1.5pF 1.8PF 2.0pF 2.2pF 2.4pF 2.7pF 3.0pF 3.3pF 3.9pF 4.7pF 5.6pF 6.8pF 8.2pF 10pF	±0.25pF (C) ±0.50pF (D) ±5% (K)
0603QXK-100-101		10pF -> 100pF	10pF 12pF 15pF 18pF 20pF 22pF 24pF 27pF 30pF 33pF 39pF 47pF 56pF 68pF 82pF 100pF	±5% (K)
0709QXK-010-100	0709 High Q 500V Nisn Termination (15pcs per value)	1.0pF -> 10pF	1.0pF 1.2pF 1.5pF 1.8PF 2.0pF 2.2pF 2.4pF 2.7pF 3.0pF 3.3pF 3.9pF 4.7pF 5.6pF 6.8pF 8.2pF 10pF	±0.25pF (C) ±0.50pF (D) ±5% (K)
0703QXK-100-101		10pF -> 100pF	10pF 12pF 15pF 18pF 20pF 22pF 24pF 27pF 30pF 33pF 39pF 47pF 56pF 68pF 82pF 100pF	±5% (K)

Dielectric Types

Different types of dielectrics display very different behaviours when it comes to withstanding power and heat, and don't demonstrate the same capacitance potential. SRT-Microcéramique proposes a wide range of ceramics. You'll find in the page below more information about what type of ceramic is better suited to your needs.

Class I Dielectrics

Class I Dielectrics are the most stable type and are used when the application demands highly stable performance and cannot allow electrical noise or dielectric loss. Variations of voltage and temperature have minimum consequences on this class of dielectrics, consequently, they are most used for DC blocking, decoupling applications as well as filtering with low capacitance.

Q (Code Q)

- Most stable type
- Low capacitance
- Good for avoiding electrical noise

NP0 (Code A)

- Most stable type
- Lower capacitance
- Good for avoiding electrical noise

Class 1.5 Dielectrics

Close to Class II capacitance and as stable than Class I

N2T (Code P)

- Ultra stable
- No piezo electric effect
- High current pulse discharge

Class II Dielectrics

Class II Dielectrics display stable performance and possess a better volumetric efficiency than class I. Thus, they are used in bypassing, filtering, coupling and decoupling applications.

X7R (Code Y)

- Good volumetric efficiency
- High capacitance
- stable

BX/BY (Code X/2C1)

- Improved ESR
- Better voltage coefficient
- MIL specifications

X5R/X7S/X6S/Y5V (Code R/T/S/V)

- Highest capacitance per volume
- Less stable
- Low voltage

	Class I		Class 1.5	Class II						
Dielectric	High Q	NP0/COG	N2T	X7R	BX	2C1	X5R	X7S	X6S	Y5V
SRT Code	Q	A	P	Y	X	2C1	R	T	S	V
Type	Ultra Stable			Stable						
Temperature Range	-55°C +125°C (250°C)		-55°C +125°C				-55°C +85°C	-55°C +125°C	--55°C +105°C	-25°C +85°C
T° Coefficient no DC applied	± 30ppm		2200ppm ± 350	± 15%		± 20%	± 15%	± 22%		+30% -80%
T° Coefficient rated DC applied	-		-	-	+15 -25%	+20 -30%	-	-	-	
Dielectric constant	10-100		450	2000-3000			3000-20000			
Dissipation Factor	0.01% 0.05%	0.05% 0.1%		1% 3.5%			2.5% 15%			5% 20%
IR 25°C/Un	100 GΩ or 1000 Ω-F whichever is less						10 GΩ or 100 Ω-F whichever is less			
Dielectric strenght ≤200V	2.5 Ur 5 seconds 50mA max									
Dielectric strenght <500V	Ur + 250V 5 seconds 50mA max									
Dielectric strenght <1000V	1.5 Ur 5 seconds 50mA max									
Dielectric strenght ≥1000V	1.2 Ur 5 seconds 50mA max									
Piezo effect	No piezo			piezo effect						
Ageing	None			2% per decade	1% per decade		4% per decade	5% per decade		7% per decade
Tolerance	± 0.25pF ± 0.5pF ± 1% ± 2% ± 5% ± 10%			± 5% ± 10% ± 20%			± 10% ± 20%			-20% +80%
Termination	X,C,H	X,F,P,C,W,H,I		X,P			X			

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Terminations details

All our capacitors are available with a wide range of termination to fit your specific needs :

Tin (Code X)

- Standard termination
- ROHS
- Dipped Silver, Nickel barrier, Sn plated

Polymer (Code P)

- Flexible termination
- Improve bending tolerance
- ROHS
- Avaible on all components
- Designed for gluing

Silver-Palladium (Code F)

- Excellent contact properties
- Resist to leaching during hand soldering
- Dipped Silver-Palladium
- ROHS

Gold Flash (Code W)

- Glueing
- ROHS
- Max 0.2µm Gold Flash

Gold Thick (Code W)

- Microelectronic applications
- Wire Bonding/glueing
- ROHS
- Min 2.5µm Gold

Non Magnetic (Code C/CP)

- High Tesla Applications
- IRM, particule accelerators
- Dipped Silver, Copper barrier, Sn plated
- ROHS

Solderable Silver (Code Q)

- Medical or space application
- Whiskers free
- High temperature
- ROHS

Dipped SAC 305 (Code S/SP)

- Sn96.5 Ag3 Cu0.5
- Medical, space and oil application
- Whiskers free
- High reliability
- ROHS

Dipped Tin-Lead (Code H/HP)

- Sn62 Pb36 Ag2
- Medical or Oil application
- Whiskers free
- High reliability

Electrolytical Tin-Lead (Code I/IP)

- Minimum Pb 10%
- Medical or space application
- Whiskers free
- High reliability

TERMINATION	CODE	ROHS	NON MAGNETIC	IMPROVED BOARD FLEX	SOLDERING	GLUING	WIRE BONDING
Sn	X	O			O		
Polymer	P	O		O	O		
AgPd	F	O			O	O	
Gold Flash	W	O			O	O	
Gold Thick	G	O			O	O	O
Non Magnetic	C	O	O		O		
Solderable Silver	Q	O			O		
Dipped SnPb	H				O		
Dipped SAC	S	O			O		
Electrolytical SnPb	I				O		
Lead	-	O		O	O		
Non Magn Lead	C	O	O	O	O		
Lead Frame	-	O		O	O		
Non Magn Lead Frame	C	O	O	O	O		

O = COMPLIANT

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STORAGE

To prevent the damage of solderability of terminations, the following storage conditions are recommended :
Indoors under 5 ~ 40°C and 20% ~ 70% RH.
No harmful gases containing sulfuric acid, ammonia, hydrogen sulfide or chlorine.
Packaging should not be opened until the capacitors are required for use. If opened, the pack should be re-sealed as soon as possible. Taped products should be stored out of direct sunlight, which might promote deterioration in tape or adhesion performance. The product is recommended to be used within 24 months after shipment. Extended shelf life over this period require a solderability check before use.

HANDLING

Chip capacitors are dense, hard, brittle, and abrasive materials. They are liable to suffer mechanical damage, in the form of cracks or chips. Chip Capacitors should be handled with care to avoid contamination or damage. To use vacuum or plastic tweezers to pick up or plastic tweezers is recommended for manual placement. Tape and reeled packages are suitable for automatic pick and placement machine.

PREHEAT

In order to minimize the risk of thermal shock during soldering, a carefully controlled preheat is required.
The rate of preheat should not exceed 3°C per second.

SOLDERING FLUX

Use mildly activated rosin RA and RMA fluxes, but do not use activated flux. The amount of solder in each solder joint should be controlled to prevent the damage of chip capacitors caused by the stress between solder, chips, and substrate.

SOLDERING TYPE

Lead containing solders, such as Sn60, Sn62 or Sn63 and lead free solders, such as SnAgCu, can all be used with our MLCCs.
In case of non-magnetic termination code C, use lead containing or lead (Pb)-free SAC305 solders.

SOLDERING HEIGHT

The solder climbing minimum height is suggesting to 25% of chip thickness or 500um whichever is less.
(Reference from IPC-610E)

COOLING

After soldering, cool the chips and the substrate gradually to room temperature. Natural cooling in air is recommended to minimize stress in the solder joint.

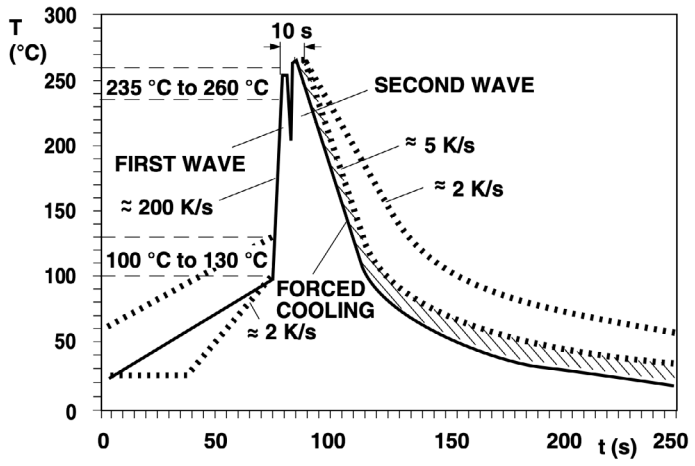
CLEANING

All flux residues must be removed by using suitable electronic-grade vapor-cleaning solvents to eliminate contamination that could cause electrolytic surface corrosion. Good results can be obtained by using ultrasonic cleaning of the solvent. The choice of the proper system is depends upon many factors such as component mix, flux, and solder paste and assembly method. The ability of the cleaning system to remove flux residues and contamination from under the chips is very important.

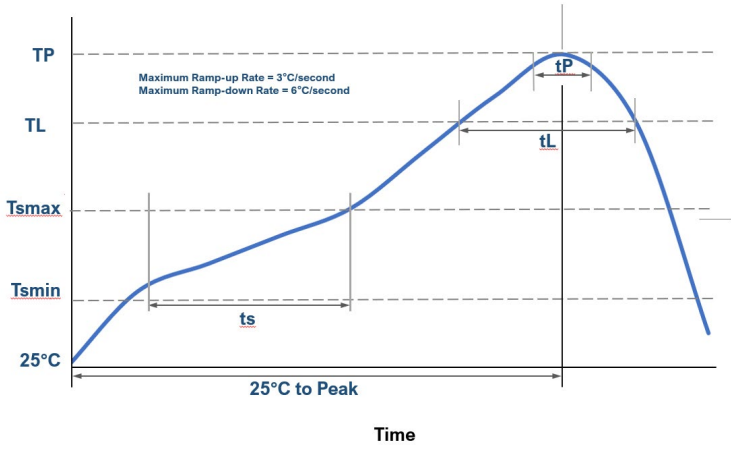
SOLDERING CONDITIONS

SIZE	THICKNESS	WAVE	REFLOW
0402	All	O	O
0505	All	O	O
0603	All	O	O
0805	< 1.25mm	O	O
0805	≥ 1.25mm		O
1111	< 1.25mm	O	O
1111	≥ 1.25mm		O
1206	< 1.25mm	O	O
1206	≥ 1.25mm		O
1210	< 1.25mm	O	O
1210	≥ 1.25mm		O
larger than 1210	All		O
High compact	All		O

WAVE SOLDERING PROFILE

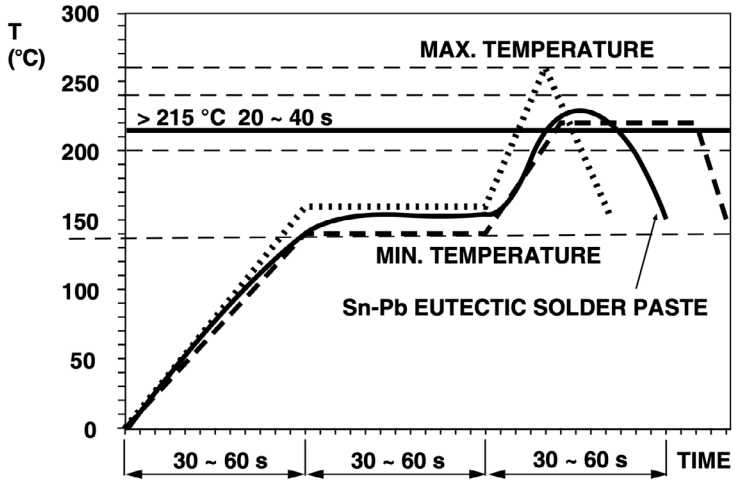


LEADFREE REFLOW SOLDERING PROFILE



PROFILE FEATURE	LEAD FREE (SAC 305)
Tsmin	150°C
Tsmax	190°C
Time from Tsmin to Tsmax	60 - 120 seconds
Ramp-up Rate	3°C/second max
Liquidous Temperature	217°C
Time above Liquidous	60 - 120 seconds
Peak Temperature	250°C
Time within 5°C of maximum Peak Temperature	10 seconds max
Ramp-down Rate	6°C/second max
Time 25°C to Peak	8min max

SNPB REFLOW SOLDERING PROFILE



VAPOUR PHASE REFLOW PROFILE

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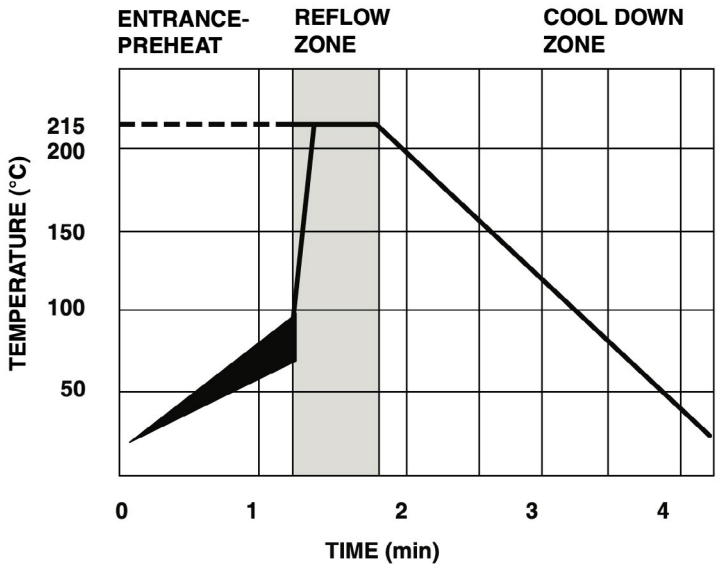


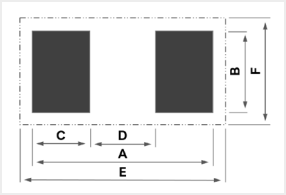
HAND SOLDERING

Hand soldering is not recommanded as the thermal shock may cause a crack, however if used the following recommendations should be taken :

- Soldering iron tip diameter ≤3.0 mm and wattage max. 20W.
- The Capacitors shall be pre-heated to 150°C and that the temperature gradient between the devices and the tip of the soldering iron.
- Tip temperature ≤280°C and should't be applied for more than 5 seconds.
- The required amount of solder shall be melted on the soldering tip.
- The tip of iron should not contact the ceramic body directly.
- The Capacitors shall be cooled gradually at room temperature after soldering.
- Forced air cooling is not allowed.

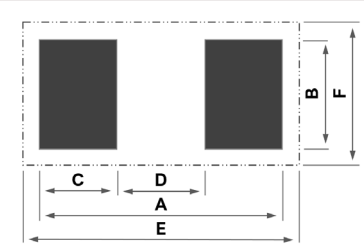
TYPICAL SMD FOOTPRINT WAVE SOLDERING

SIZE	FOOTPRINT DIMENSIONS IN MM					
	A	B	C	D	E	F
0603	2.40	0.80	0.70	1.00	3.10	1.40
0805	3.20	1.30	0.90	1.40	4.10	1.85
1206	4.80	1.70	1.25	2.30	5.90	2.25
1210	4.80	2.60	1.25	2.30	5.90	3.15



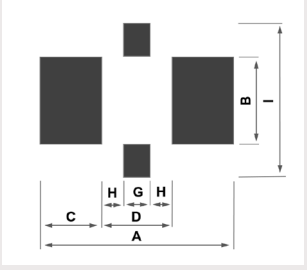
TYPICAL SMD FOOTPRINT REFLOW SOLDERING

SIZE	FOOTPRINT DIMENSIONS IN mm					
	A	B	C	D	E	F
0201	0.65	0.30	0.21	0.23	0.90	0.60
0204	1.00	1.00	0.30	0.40	1.25	1.45
0402	1.50	0.50	0.40	0.70	1.75	0.95
0306	1.30	1.60	0.40	0.50	1.55	2.05
0404	1.50	1.00	0.40	0.70	1.75	1.45
0504	1.90	1.00	0.40	1.10	2.15	1.45
0505	1.90	1.30	0.50	0.80	2.15	1.75
0508	1.90	2.00	0.50	0.90	2.15	2.55
0603	2.30	0.80	0.60	1.10	2.55	1.35
0612	2.30	3.20	0.60	1.10	2.55	3.75
0805	2.90	1.25	0.90	1.10	3.15	1.80
1206	4.10	1.60	0.90	2.30	4.35	2.25
1210	4.10	2.50	1.00	2.10	4.35	3.15
1808	5.50	2.10	1.20	3.10	5.75	2.75
1812	5.50	3.30	1.20	3.10	5.75	3.95
1825	5.50	6.55	1.20	3.10	5.75	7.20
2211	6.80	3.00	1.40	4.00	7.05	3.65
2220	6.80	5.40	1.40	4.00	7.05	6.05
2225	6.80	6.70	1.65	3.50	7.05	7.50
2525	7.70	6.75	1.65	4.40	7.95	7.55
2825	8.40	6.70	1.65	5.10	8.65	7.50
3033	9.00	8.80	1.95	5.10	9.25	9.60
3640	10.55	10.70	2.35	5.85	10.80	11.50
4040	11.60	10.70	2.35	6.90	11.85	11.50
40100	11.60	26.20	2.35	6.90	11.85	27.00
5550	15.50	13.20	2.35	10.80	15.75	14.00
6080	16.70	20.80	2.35	12.00	16.95	21.60
6660	18.30	15.70	2.35	13.60	18.55	16.50
8060	21.90	15.70	2.35	17.20	22.15	16.50
80150	21.90	38.90	2.35	17.20	22.15	39.70
HIGH COMPACT 1210	4.15	2.60	1.15	1.85	5.05	3.30
HIGH COMPACT 1812	5.75	3.40	1.35	3.05	6.70	4.20
HIGH COMPACT 2220	6.80	5.50	1.70	3.40	7.70	6.30



TYPICAL FILTER FOOTPRINT REFLOW SOLDERING

SIZE	FOOTPRINT DIMENSIONS IN mm						
	A	B	C	D	G	H	I
0603	2.30	0.80	0.45	1.40	0.60	0.40	1.50
0805	2.90	1.25	0.90	1.80	0.80	0.50	2.00
1206	4.10	1.60	0.90	2.40	1.00	0.70	3.00
1806	5.50	1.60	1.20	3.20	1.00	1.10	3.00
1812	5.50	3.30	1.20	3.90	1.50	1.20	4.80
2220	6.80	5.40	1.40	4.50	1.50	1.50	7.00



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ORDERING INFORMATION

SRMC	0603	Y	102	J	A	-	L	040	-	-	-	B	-
SERIE	SIZE	DIELECTRIC	CAPACITANCE	TOLERANCE	VOLTAGE	TERMINAISON	FORM	HEIGHT	LEADS	COATING	CURRENT	PACKAGING	SPECIAL
- FK FH SREV MCF M2F MPF SRMC SRTV SR SA H	0201 0204 0402 0303 0306 0404 0505 0508 0603 0612 0805 1206 1210 1808 1812 1825 2211 2220 2225 2325 2525 2825 3033 3640 4040 40100 5550 6080 6660 7274 8060 80150 15080 40 to 94	Q = High Q A = NP0 P = N2T X = BX Y=X7R BY=2C1 T = X7S S = X5R R = X6S V = Y5V U = X8R	Expressed in picofarads (pF) The first two digits are significant, the third digit gives the number of noughts Example : 102 = 1 000pF For special values R is used as decimal separator Example 12R7 = 12.7pF 1340R0 = 1340pF	A = ± 0.05pF/0.1% B = ± 0.1pF C = ± 0,25pF D = ± 0,5pF E = ± 0.5% F = ± 1% G = ± 2% J = ± 5% K = ± 10% M = ± 20% Z = -20% +80%	Y = 4V R = 6.3V Q = 10V J = 16V X = 25V Z = 35V A = 50V U = 63V B = 100V C = 200V P = 250V D = 300V E = 500V F = 630V G = 1000V O = 1500V H = 2000V T = 2500V I = 3000V K = 4000V L= 5000V 6 = 6000V S = 7200V 8 = 8000V 10 = 10000V 12 =12000V 15 = 15000V	- = Sn lead/lead frame X = Nickel Tin F = Palladium-Silver P = Polymer Tin (Flex) C = Copper Tin (Non magnetic) CP = Copper Polymer Tin (Non magnetic) W = Nickel Gold Flash G = Nickel Gold Thick HP = Dipped SnPb Polymer H = Dipped SnPb S = Dipped SAC SP = Polymer Dipped SAC I = Electrolytic SnPb IP = Polymer Eletrolytical SnPb Q = Solderable Silver M = Microstrip A = Axial Ribbon R = Radial Ribbon U = Axial Wire V = Radial Wire CM = Microstrip (Non magnetic) CA = Axial Ribbon (Non magnetic) CR = Radia Ribbon (Non magnetic) CU = Axial Wire (Non magnetic) CV = Radial Wire (Non magnetic)	- J L D M T = 2 leads U = 4 leads	020 030 040 050 060 070 080 090 100 110 120 130 140 160 180	- 2 to 10 B	- I = Conformal-Coating H = EpoxyCoating	- 1 2	B = Reel V = Bulk T = Tray Package W = Waffle Pack	- BM = BME Dxx = Reliability spec Exx = Sorting spec H = High Reliability Q = Anti-Arcing E = Anti Bending Z = Anti-Arcing + Anti-Bending

RELIABILITY

OPTIONAL CODE	TESTING DETAIL
D03	Burn-In 100% 125° 168H, no default allowed
D05	Burn-In 100% 125° 168H, less than 5% default allowed VRT CEI 68-2-14 10 cycles 0V -55°C/+125°C, less than 5% default allowed 20 pieces life test 125°C, 1.5Un, 1 default allowed
D20	AECQ-200
D30	Screened and LAT according to ECSS-3009 for space application
D32	Evaluation version for space development according to ECSS-2310
COTS1	Class 1 COTS+ according to ECSS-Q-ST-60-13C-Rev1
COTS2	Class 2 COTS+ according to ECSS-Q-ST-60-13C-Rev1
COTS3	Class 3 COTS+ according to ECSS-Q-ST-60-13C-Rev1

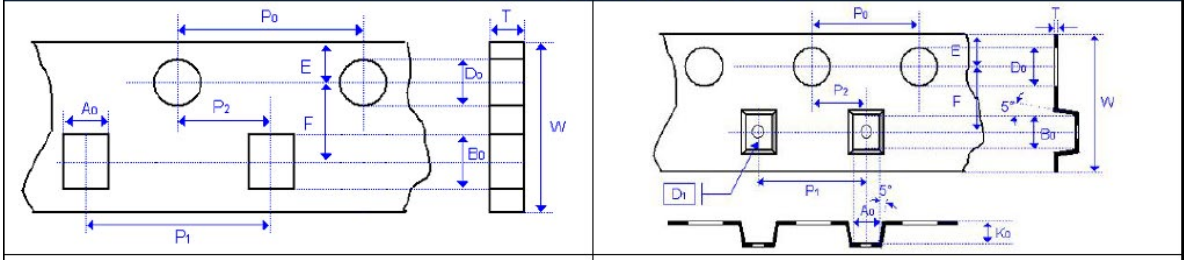
SORTING

OPTIONAL CODE	SORTING DETAIL
E01	2 cells sorting 0 to +2,5 & +2,5 to +5 (% or pF accoding to value)
E02	4 cells sorting -5 to –2,5 ; -2,5 to 0 ; 0 to +2,5 & +2,5 to 5 (% or pF accoding to value)
E21	2% cells

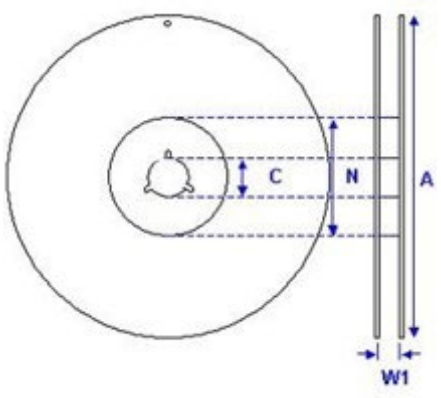
PACKAGE DIMENSION AND QUANTITY

SIZE	THICKNESS	PAPER TAPE		PLASTIC TAPE	
		7 REEL	13 REEL	7' REEL	13 REEL
0402	0.5 ± 0.05	10 K	50 K		
0504	0.6 ± 0.05			4K	15K
	0.9 ± 0.05			4K	15K
0603	0.7 ± 0.07	4K		4K	15K
	0.9 ± 0.07	4K	15K	4K	15K
	0.9 ± 0.07			4K	15K
	1.1 ± 0.07			4K	15K
0805	0.8 ± 0.07	4K	15K	4K	15K
	0.9 ± 0.07			4K	10K
	1.1 ± 0.07			3K	10K
	1.3 ± 0.07			3K	10K
1206	1.1 ± 0.1			3K	10K
	1.4 ± 0.1			3K	8K
	1.8 ± 0.1			2K	8K
1210	1.4 ± 0.1			3K	8K
	1.8 ± 0.1			1K	6K
1808	1.4 ± 0.1			3K	8K
1812	1.6 ± 0.1			2K	8K
	2.1 ± 0.1			1K	6K
	2.8 ± 0.1			1K	6K
2220	1.8 ± 0.1			1K	6K
	3.0 ± 0.1			0.5K	2K
2225	3.0 ± 0.1			0.5K	2K
3033	3.0 ± 0.1			0.5K	2K
3640	3.0 ± 0.1			0.5K	2K
5440	3.9 ± 0.1				0.5K - 1K
HIGH COMPACT 1210				1K	6K
HIGH COMPACT 1812				1K	6K
HIGH COMPACT 2220				0.5K	2K

EMBOSSED TAPE DIMENSIONS



REEL SIZE	7	7	13
C	13.0 +0.5/-0.2	13.0 +0.5/-0.2	13.0 +0.7/-0.3
W1	8.4 +1.5/-0	12.4 +2.0/-0	8.4 +2.0/-0
A	178.0 ±0.10	178.0 ±0.10	330.0 ±1.0
N	60.0 ±1.0	80.0 ±1.0	100 ±1.0



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RELIABILITY PRINCIPLES OVERVIEW GENERAL PRODUCTION

In order to guarantee highly reliable products to their customers, SRT-Microcéramique follows a strict quality policy which is explained below :

- According to AECQ philosophy, each component belongs to a family, which most restrictives members (four corners) have been fully qualified.
- PME components are produced in our Vendôme facility, with very stable process and equipments, in order to ensure Reliability and reproductibility.
- Reliability is based on batch tests, new product or equipment-specific qualifications and periodic requalifications.
- In addition to those regular tests, our quality departement launches regular accelerated tests to further deepens our reliability datas.
- Tests and qualifications of our standard products are based on AECQ methodology and are qualified according to the following limits.
- In accordance to AECQ methodology, specifics tests and limits can be adapted to fit our clients' needs.
- A whole range of stricter reliability tests can be offered for high Reliability products (burn-in, shocks, pulses...) for medical, space and defense applications.
- Based on our reliability database, FIT datas can be provided if necessary.

PRODUCTION CONTROL

Test conducted on each lot according to AECQ-200 framework

FREQUENCY	TEST/STRESS	REFERENCE	AEC-Q	DETAIL
100%	Capa, DF, IR	CECC-32100-4.6		according to datasheet
100%	Visual	CECC-32100-4.5	AEC-Q200-9	no visual defects
50/lot	DPA		AEC-Q200-5	internal component integrity
5/lot	Dimension	CECC-32100-4.5	AEC-Q200-5	according to datasheet
5/lot	Resistance to soldering heat	CECC-32100-4.10	AEC-Q200-15	
5/lot	Solderability	CECC-32100-4.11	AEC-Q200-18	
10/lot	Voltage proof	CECC-32100-4.6.4		
1/ceramic lot	Temperature coefficient	CECC 32100-Prgph4,7		according to datasheet

QUALIFICATIONS

Each component family has been qualified according to CECC and AECQ tests methodology, which are renewed on a periodic basis.

FREQUENCY	TEST/STRESS	REFERENCE	AEC-Q	DETAIL
Qualif	Electrical Characterization	CECC-32100-4.6 4.7	AEC-Q200-19	measure before test according to datasheet and after test according to post environmental limits
Qualif	Temperature Cycling	JESD22 Method-JA method 104	AEC-Q200-4	1,000 cycles -55°C to +125°C Measurement at 24 ± 2 hours after test conclusion
Qualif	Biased Humidity	MIL-STD-202 Method 103	AEC-Q200-7	1,000 hours 85°C/85%RH. Rated voltage. Measurement at 24 ± 2 hours after test conclusion
Qualif	Operational Life	MIL-STD-202 Method 108 condition D	AEC-Q200-8	1,000 hours at 125°C with apllied Voltage : 2xRV RV≤500V, 1.2xRV 500V<RV≤1250V, RV RV>1250V
Qualif	High Temperature Exposure (Storage)	MIL-STD-202 Method 108	AEC-Q200-3	1,000 hours at 150°C with 0V. Measurement at 24 ± 2 hours after test conclusion
Qualif	Terminal Strength	CECC-32100-4.8	AEC-Q200-6	1.8kg 60 seconds
Qualif	Vibration	MIL-STD-202 Method 204	AEC-Q200-14	5g 20min 12cycles 3 orientations 10-2000Hz
Qualif	Board Flex	CEC 32100-4.9	AEC-Q200-21	3mm Type 1, 2mm Type 2, Measurement at 24 ± 2 hours after test conclusion

POST ENVIRONMENTAL STRESS LIMIT

DIELECTRIC	DISSIPATION FACTOR (MAXIMUM)	CAPACITANCE SHIFT	INSULATION RESISTANCE
NPO	≤ 4 10-3	±2%	10% initial limit
N2T	≤ 6 10-3	±4%	10% initial limit
X7R	≤ 0.035	±15%	10% initial limit

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SPACE LEVEL COMPONENT SCREENED AND QUALIFIED ACCORDING TO ESCC-3009

SRT-Microcéramique can propose a wide range of BME and PME component qualified and tested according to ESCC-3009 standard for space projects.
Both for development en evaluation (D32) and flight ready with full lot validation and ESCC standard documentation.
Specific qualification programms can be included to meet final customer requirement.

PRODUCTION CONTROL/SCREENING

Tests conducted on each lot and screening for evaluation components D32 and flying components D30

FREQUENCY	TEST/STRESS	REFERENCE	DETAIL
Lot	DPA	ESCC-23400	Construction analysis
3/Lot	Dimension/weight	ESCC-20400/20500	Dimension in spec/max weight in spec
100%	Burn-In	ESCC-3009	168H, max T°, 2Ur Ur<500V, 1.5Ur Ur=500V, 1.3Ur 500V<Ur≤1250V, 1Ur Ur>1250V (fail<5%)
100%	Room Temperature Electrical Measurements	ESCC-3009	Cp, DF, IR, VP according to datasheet
5/lot	High and Low Temperatures Electrical Measurements	ESCC-3009	0 fail
100%	Visual Inspection	ESCC-20400/20500	

LOT VALIDATION

Lot validation for flying components D30

FREQUENCY	TEST/STRESS	REFERENCE	DETAIL
20/Lot	PCB Mounting, Rapid Change of Temperature, Steady State Humidity, external visual inspection	ESCC-3009/ IEC 60384-1/IEC 60068-2-14	
20/Lot	PCB Mounting, Life test	ECSS-3009/IEC 60384-1	1000H, max T°, 2Ur Ur<500V, 1.5Ur Ur=500V, 1.3Ur 500V<Ur≤1250V, 1Ur Ur>1250V
6/Lot	PCB Mounting, Temperature Characterisation, Robustness of Terminations	ESCC-3009/ IEC 60068-2-14/IEC 60384-1	
6/Lot	Solderability, Permanence of Marking	ECSS-3009/ IEC 60068-2-58/ ECSS-24800	

SPACE LEVEL COMPONENT SCREENED ACCORDING TO COTS+ ECSS-Q-ST-60-13C-REV1

SRT-Microcéramique can apply the COTS+ qualification framework to any suitable component AEQ-200 or not, to make them fly ready, offering a wide range of possibilities at competitive cost, either in Class 1 (COTS1), Class 2 (COTS2) or Class 3 (COTS3).

EVALUATION/SCREENING/LAT

Class 1 (COTS1), Class 2 (COTS2), Class 3 (COTS3)

AECQ-200	CLASS 1	CLASS 2	CLASS 3	CATEGORY	TEST TYPE	SAMPLE	PROCEDURE
Yes	X	X	X	Evaluation	Construction Analysis	5	ESCC21001
Yes	X	X	X	Evaluation	Temperature characterization	5	ESCC3009 8.10
Yes	X			Evaluation	Life Test 2000h	40	ESCC3009 8.6 + 8.9
Yes	X			Screening	Complete screening	100%	ESCC3009 chart F3
Yes	X	X	X	LAT	DPA	3	ESCC21001
Yes	X	X		LAT	Life Test 1000h	20	ESCC3009 8.6 + 8.9
No	X	X	X	Evaluation	Construction Analysis	5	ESCC21001
No	X	X	X	Evaluation	Temperature characterization	5	ESCC 3009 8.10
No	X	X		Evaluation	Complete evaluation	72	ESCC 3009 chart F4
No			X	Evaluation	Life Test 1000h	40	ESCC3009 8.6 + 8.9
No	X	X	X	Screening	Complete screening	100%	ESCC3009 chart F3
No	X	X	X	LAT	DPA	3	ESCC21001
No	X			LAT	Complete LAT	52	ESCC 3009 chart F4
No		X	X	LAT	Life Test 1000h	20	ESCC3009 8.6 + 8.9

TINNING

All component for space application can be proposed with dipped SnPb termination (Sn62 Pb36 Ag2) or SAC 305 (Sn96.5 Ag3 Cu0.5) for maximum reliability and whiskers avoidance.

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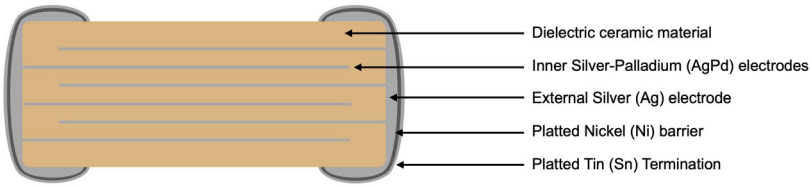
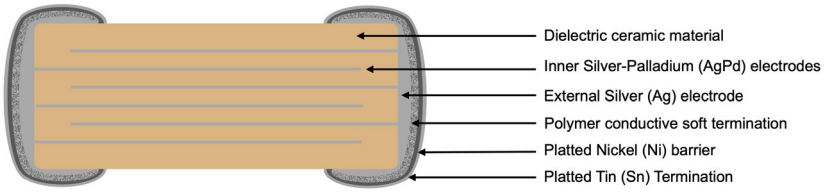
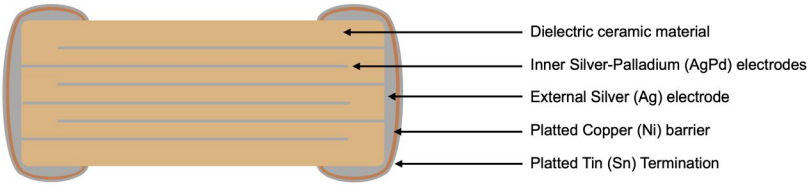
PME (Precious Metal Electrodes)



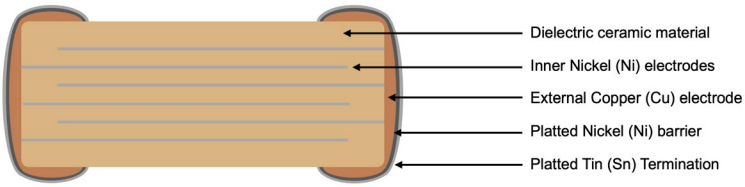
PME (Precious Metal Electrodes) Polymer Soft Termination



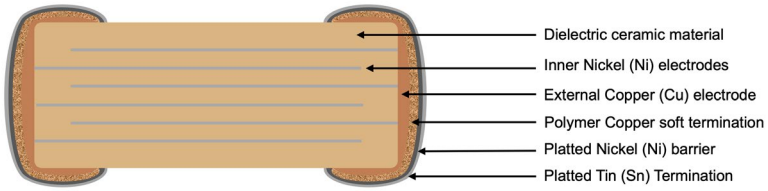
PME (Precious Metal Electrodes) Non Magnetic



BME (Basis Metal Electrodes) code BM



BME (Basis Metal Electrodes) code BM Polymer Soft Termination



REACH Compliance

- SRT-Microcéramique delivers non-chemical articles only.
- These contain no substances which are intented to be released under normal or reasonably foreseeable conditions of use according Reach article 7(1).

SRT-Microcéramique confirms hereby that our products contain none of the substances which are listed in the present candidate list of the European Chemicals Agency (ECHA), above a concentration of 0.1% by weight of the whole component.

Candidate list of substances (European Chemicals Agency ECHA) :
http://echa.europa.eu/fr/candidate-list-table

ROHS COMPLIANCE

SRT-Microcéramique herewith confirms that RoHS-compliant SRT-microcéramique products are conforming to the following EU directives:
EU directive 2015/863/EU EU directive 2011/65/EU EU directive 2003/11/EC

Following restricted materials are not used and do not exceed the legal limits: Lead (Pb, see exemptions),
- Mercury (Hg)
- Cadmium (Cd)
- Chromium (Cr VI)
- Polybrominated biphenyls (PBB) Polybrominated diphenyl ethers (PBDE) Bis(2-Ethylhexyl) phtalate (DEHP) Benzyl butyl phtalate (BBP)
- Dibutyl phtalate (DBP) Diisobutyl phtalate (DIBP)

Exemptions: The following exemptions according tot he RoHS annexe are applicable:
Identity 7(a) :
- Lead in high melting temperature type solders (i.e lead-based alloys containing 85% by weight or more lead).

Identity 7(c)-I :
- Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound.

The components are suitable for a lead-free process according to EN 60068-2-58 and in accordance with the IPC/JEDEC standard J-Std-020D.
The lead free process has been tested using solder alloy sn96.5Ag3Cu0.5

Export controls and dual-use regulations

Some SRT-Microcéramique components fall under ‘dual-use’ items under international export controls definition - those that can be used for civil or military purposes which meet certain specified technical standards.

The defining criteria for a dual use component is one with a voltage rating of >750Vdc and a capacitance value of >250nF when measured at 750Vdc and a series inductance <10nH. Components defined as dual-use under the above criteria may require a licence for export across international borders. Please contact us for further information on specific part numbers.

ISO9001:2015

In their design, research and development as well as the manufacturing of MLCC capacitors, customer service and distribution SRT-Microcéramique uses and maintains a Management System audited and certified in accordance to : **ISO9001:2015**

You may contact us for any inquiry regarding the regulations and compliance listed above.

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