

APPLICATIONS

- If good electronic design dictates whenever it is possible to use standard components with multiple sources, some special needs can be only addressed with a custom developed product, as to allow gain in performance, compacity, reliability.
- With our highly flexible production, our offer in standard products covers a wide range of products, always without obsolescence.
- In addition to this standard range, designer can work with SRT-Microcéramique engineers to develop any combination of ceramic, voltage, capacity, package, reliability program to fit their exact needs.

OBSOLESCENCE

- The need to produce and maintain some electronic design for tens of years, often collides with the obsolescence policies of the major manufacturers. SRT-Microcéramique can provide strict equivalents to concurrent designs, SMD, Stacks, Dipped, Encapsulated radials, axials... and insure its production overtime with its no obsolescence policy.

FORMAT

- For cross references needs or specific designs we can propose any SMD format between 0402 and 80300.
- Barcap, 4 corners, discs, arrays... can be proposed

CERAMIC

- In addition to its wide range of ceramic, type 1, type 2, N2T for power and pulse application, SRT-Microcéramique can also offer positive temperature coefficients, high temperature type 1 etc...

VOLTAGE

- Any specific voltage that is not in our standard range can be added (1100V, 1200V etc...) in order to optimize the component design.
- Very high voltage design up to 32KV.

CAPACITY

- Specific capacitance values that are not in the standard ISO range can be proposed.
- The codification of the specific P/N is based on the capacitance in picofarad with R as a decimal operation
- ex : 45,3pf = 45R3, 8320pf = 8320R0, 12.2nF = 12200R0

TERMINATION

- Any combination of components and termination, even if not present in our standard catalog can be proposed.
- Change of termination on any component, even if not produced by SRT, especially high value BME products is possible : Gold termination, dipped lead, dipped SAC, Silver-Palladium etc...

PACKAGE

- Any combination of stacks, leaded, dipped, encapsulated in any specific format can be proposed with PME SRT components or qualified BME high capacitance components.

SORTING

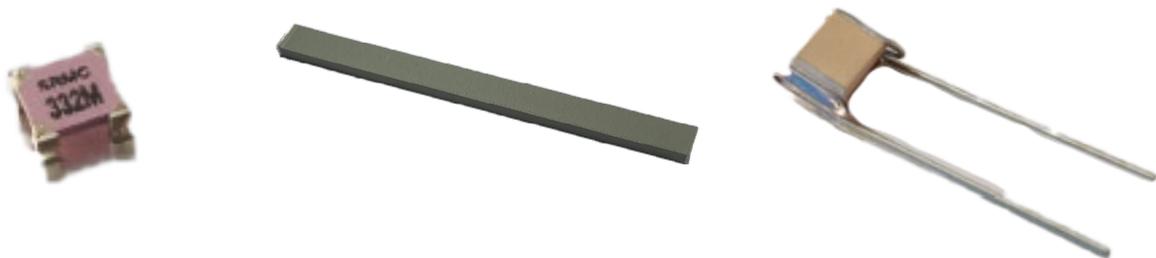
- SRT-Microcéramique, proposes on a regular basis, very high precision sorting for some of its customers.
- Up to 0.05% in Type 1, on specific value or cells.

RELIABILITY

- Depending on the Reliability need of the component, specific qualifications and testing programs can be agreed upon in addition to our standard process.
- Burn-In, LAT, RCS etc...
- SRT-Microcéramique regularly works with space, medical and defense customers.

DESIGN PROCESS

- Working directly with our engineers and depending on the development difficulty, custom design can be proposed in 8 to 10 weeks.
- The first samples could require some tooling and development cost, but every effort will be made to propose consistent and as competitive as possible price for production volume.
- A specific datasheet for the custom product will be provided and the no obsolescence policy will guarantee the production over the years.



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 SAC405 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.

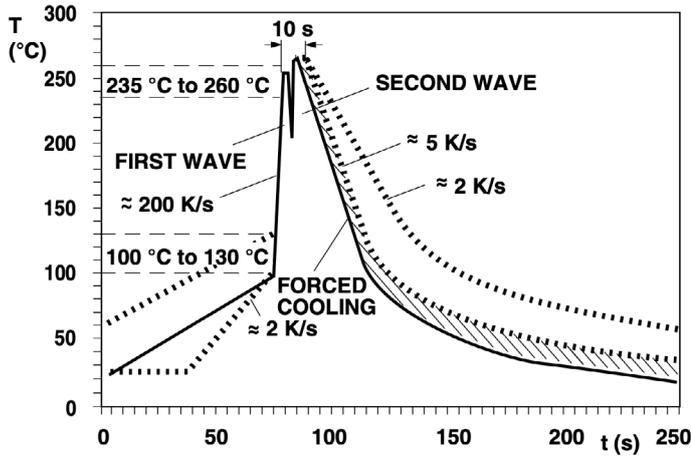
CLEANING

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.

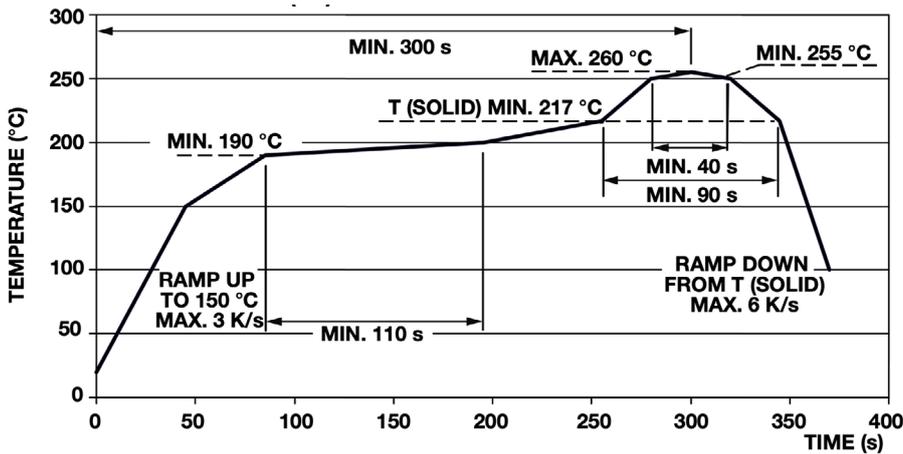
SOLDERING CONDITIONS

SIZE	THICKNESS	WAVE	REFLOW
0402	All	0	0
0505	All	0	0
0603	All	0	0
0805	< 1.25mm	0	0
0805	≥ 1.25mm	0	0
1111	< 1.25mm	0	0
1111	≥ 1.25mm	0	0
1206	< 1.25mm	0	0
1206	≥ 1.25mm	0	0
1210	< 1.25mm	0	0
1210	≥ 1.25mm	0	0
larger than 1210	All	0	0

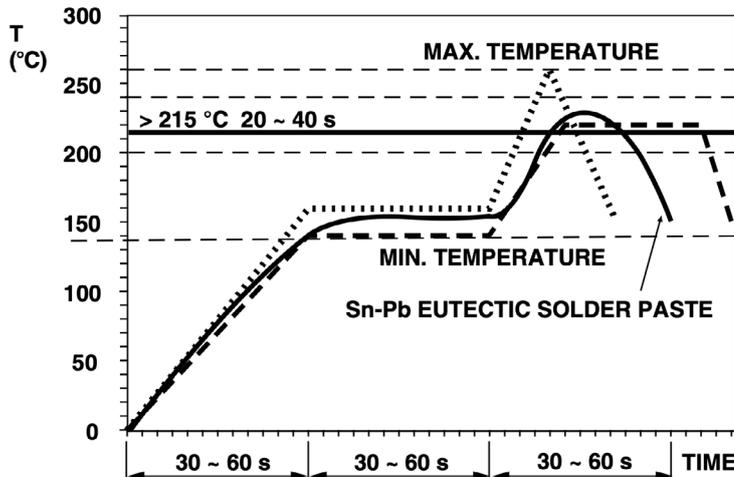
WAVE SOLDERING PROFILE



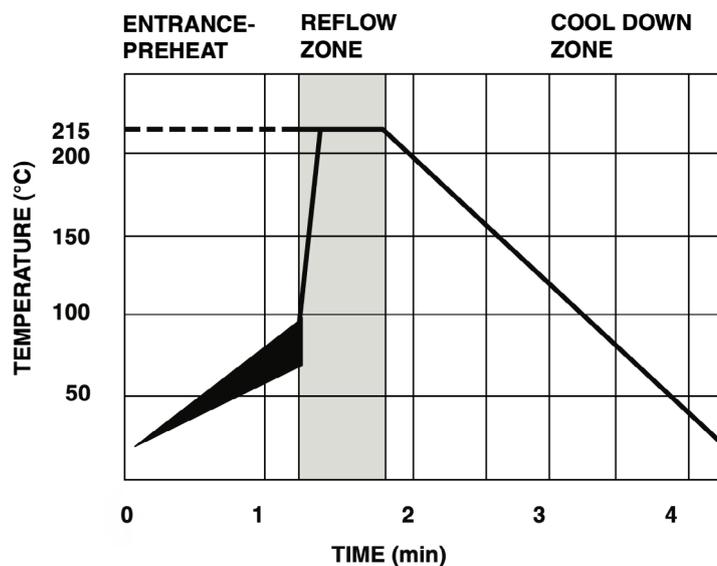
LEADFREE REFLOW SOLDERING PROFILE



SNI



VAPOUR PHASE REFLOW PROFILE



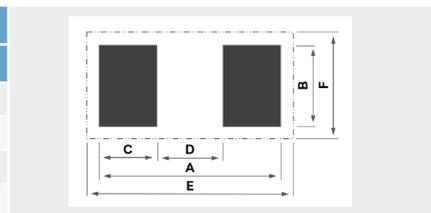
HAND SOLDERING

Hand soldering is not recommended 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.

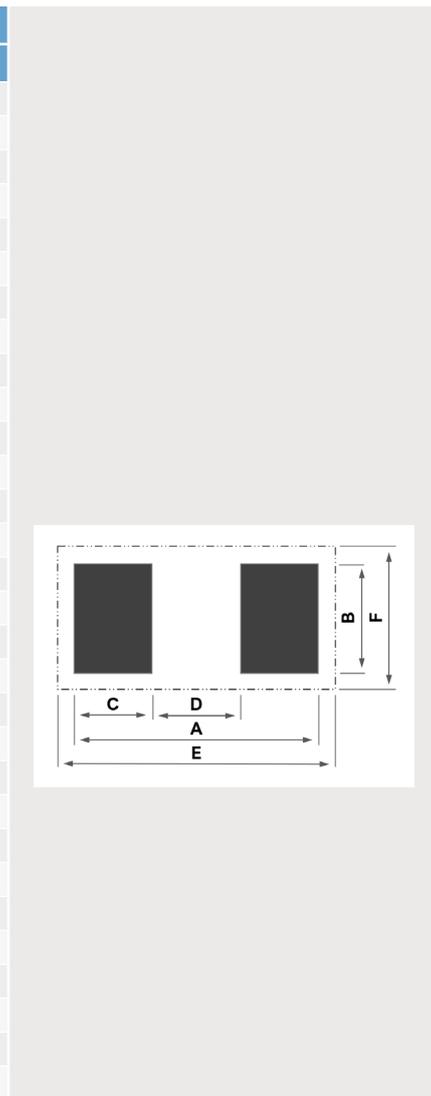
TYPICAL SMD FOOTPRINT WAVE SOLDERING

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



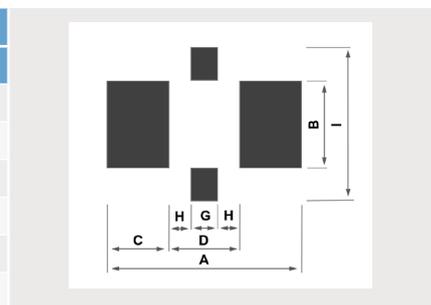
TYPICAL SMD FOOTPRINT REFLOW SOLDERING

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



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	CUR-RENT	PACKAGING	SPECIAL
-	0201	Q = High Q	Expressed in picofarads (pF)	A = ± 0.05pF/0.1%	Y = 4V	- = Sn lead/lead frame	-	020	-	-	-	B = Reel	-
FS	0204	A = NPO	The first two digits are significant, the third digit gives the number of noughts	B = ± 0.1pF	R = 6.3V	X = Nickel Tin	J	030	2 to 10	I = Conformal-Coating	1	V = Bulk	BM = BME
FK	0402	P = N2T	Example : 102 = 1 000pF	C = ± 0.25pF	Q = 10V	F = Palladium-Silver	L	040	B	H = EpoxyCoating	2	T = Tray Package	Dxx = Reliability spec
FH	0303	X = BX		D = ± 0.5pF	J = 16V	P = Polymer Tin (Flex)	D	050				W = Waffle Pack	Exx = Sorting spec
SREV	0306	Y=X7R		E = ± 0.5%	X = 25V	C = Copper Tin (Non magnetic)	M	060					H = High Reliability
MCF	0404	BY=2C1		F = ± 1%	Z = 35V	W = Nickel Gold	T = 2	070					Q = Anti-Arcing
M2F	0505	T = X7S		G = ± 2%	A = 50V	H = Dipped SnPb	leads	080					E = Anti Bending
MPF	0508	S = X5R		J = ± 5%	U = 63V	S = Dipped SAC	U = 4	090					Z = Anti-Arcing + Anti-Bending
SRMC	0603	R = X6S		K = ± 10%	B = 100V	I = Electrolytic SnPb	leads	100					
SRTV	0612	V = Y5V		M = ± 20%	C = 200V	Q = Solderable Silver		110					
SR	0805			Z = -20% +80%	P = 250V			120					
SA	1206				D = 300V			130					
	1210				E = 500V			140					
	1808				F = 630V			160					
	1812				G = 1000V			180					
	1825				O = 1500V								
	2211				H = 2000V								
	2220				T = 2500V								
	2225				I = 3000V								
	2525				K = 4000V								
	2825				L = 5000V								
	3033				6 = 6000V								
	3640				S = 7200V								
	4040				8 = 8000V								
	40100				10 = 10000V								
	5550				12 = 12000V								
	6080				15 = 15000V								
	6660												
	8060												
	80150												
	40 to 94												

RELIABILITY

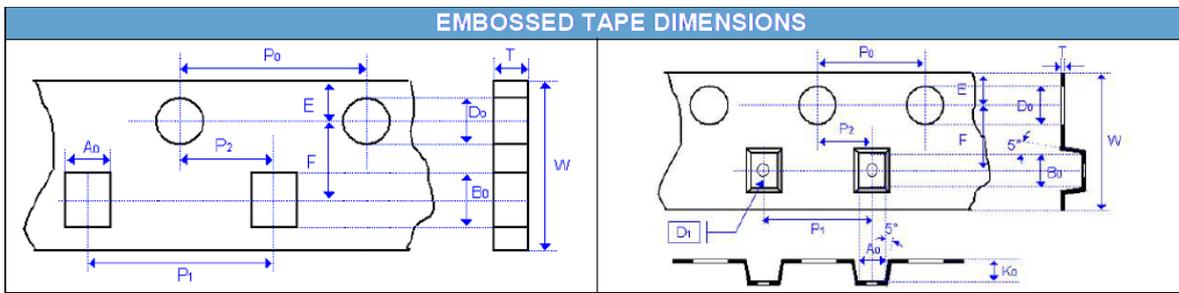
OPTIONAL CODE	TESTING DETAIL
D03	Burn-In 100% 125° 168H, no default allowed
D05	Burn-In 100% 125° 168H, less than 5% default allowed VRT CEI 68-2-14 10 cycles 0V -55°C/+125°C, less than 5% default allowed 20 pieces life test 125°C, 1.5Un, 1 default allowed
D20	AECQ-200

SORTING

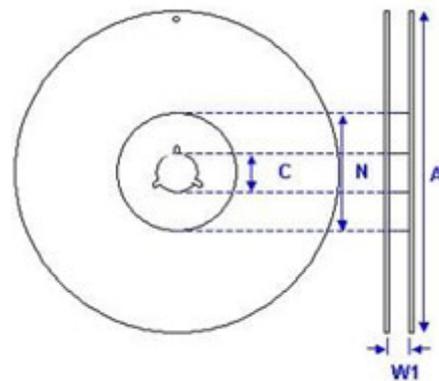
OPTIONAL CODE	SORTING DETAIL
E01	2 cells sorting 0 to +2,5 & +2,5 to +5 (% or pF according to value)
E02	4 cells sorting -5 to -2,5 ; -2,5 to 0 ; 0 to +2,5 & +2,5 to 5 (% or pF according to value)
E21	2% cells

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



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

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 restrictive 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.

TESTING

Tests conducted during each batch

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 applied 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

REACH Compliance

Reach Declaration, According to Regulation (EC) N°. 1907/2006 (REACH) ; Article 33 :

- SRT-Microcéramique delivers non-chemical articles only.
- These contain no substances which are intended 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) Published January 19th, 2021 (211 Substances) :

<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 to the 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.