

# AXIAL CAPACITOR Encapsulated

NPO N2T X7R 25V-5KV



**SRT**  
MICROCÉRAMIQUE  
MLCC CAPACITORS

## APPLICATIONS

- Severe environment
- Historical design



## FEATURES

- Leaded radial MLCC capacitor
- Epoxy molded
- High reliability, 100% burn in
- Available in NPO, N2T, BX, 2X1, X7R
- Equivalent to wide range of competitors design
- Custom voltage, package size, capacitance value on request
- Tested in accordance to CECC 32100 and AEC-Q200
- NPO version CECC 30600 et NFC 83-131 compliant
- X7R version CECC 30700 et NFC 83-132 compliant
- 2C1 version NF 83-132 compliant
- High Reliability option : 168 hours burn in

## ELECTRICAL PARAMETERS

**ELECTRICAL CHARACTERISTICS :**  
at + 25°C unless otherwise specified

**OPERATING TEMPERATURE :**  
X7R, N2T : - 55°C, + 125°C  
NPO : - 55°C, + 125°C

**TEMPERATURE COEFFICIENT :**  
NPO : ± 30ppm  
N2T : -2200 ± 350 ppm/°C  
X7R : ± 15% with 0Vdc applied

**DISSIPATION FACTOR:**  
NPO : ≤ 1.10<sup>-3</sup> at 1Vrms and 1MHz for values ≤ 1000pF  
≤ 1.10<sup>-3</sup> at 1Vrms and 1KHz for values > 1000pF  
N2T : ≤ 1.10<sup>-3</sup> at 1Vrms and 1MHz for values ≤ 1000pF  
≤ 1.10<sup>-3</sup> at 1Vrms and 1KHz for values > 1000pF  
X7R : ≤ 0.025 at 1kHz

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

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

**BURN IN :**  
48 hours 125°C 2U U≤500 | 1.5U 500<U<1000 | 1.2U U≥1000

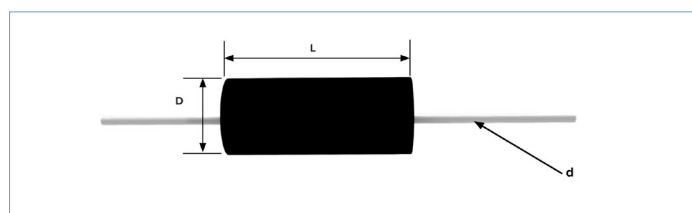
## ORDERING INFORMATION

SA	70	Y	102	J	A	V	-
SERIES	SIZE	DIELECTRIC	CAPACITANCE	TOLERANCE	VOLTAGE	PACKAGING	SPECIAL
SA	40 50 60 70 80	A = NPO P = N2T X = BX Y = X7R BY=2C1	Expressed in picofarads (pF). The first two digits are significant, the third digit give 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 if < 10pF and 0.05% if > 10pF B = ± 0.1pF C = ± 0.25pF D = ± 0.5pF F = ± 1% G = ± 2% J = ± 5% K = ± 10% M = ± 20%	X = 25 V A = 50 V U = 63 V B = 100 V C = 200 V P = 250 V E = 500 V F = 630 V G = 1 KV H = 2 KV I = 3 KV K = 4 KV L = 5 KV	V = Bulk	-  Dxx = Reliability spec Exx = Sorting spec

For other sizes, voltage, tolerance contact us

## DIMENSIONS (in millimeters)

SIZE	SA40	SA50	SA60	SA70	SA75	SA80	SA90
Lenght (L) ± 0.4	4,3	6,4	6,6	10	11	12,7	17,5
Diameter (D) ± 0.4	2,5	2,5	3,9	3,9	5,5	6,4	8,9
Lead diameter (D)	0,5	0,5	0,6	0,6	0,6	0,6	0,6
Lead minimal lenght	38	38	38	38	38	38	38



This document is subject to change without notice.

# AXIAL CAPACITOR Encapsulated

NPO N2T X7R 25V-5KV



**SRT**  
MICROCÉRAMIQUE  
MLCC CAPACITORS

## QUICK REFERENCE DATA (Max capacitance)

	SA40			SA50			SA60			SA70		
	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R
Min	0.1 pF	0.3 pF	2.2 pF	0.1 pF	1.0 pF	6.8 pF	0.4 pF	4.7 pF	10 pF	1.0 pF	4.7 pF	10 pF
25V	<i>15 nF</i>	5.8 nF	<i>1.0 μF</i>	47 nF	15 nF	<i>4.7 μF</i>	<i>220 nF</i>	65 nF	<i>22 μF</i>	<i>220 nF</i>	140 nF	<i>22 μF</i>
50V	<i>10 nF</i>	5.7 nF	<i>470 nF</i>	33 nF	15 nF	<i>4.7 μF</i>	<i>150 nF</i>	65 nF	<i>10 μF</i>	<i>220 nF</i>	140 nF	<i>6.8 μF</i>
100V	<i>10 nF</i>	5.6 nF	<i>100 nF</i>	33 nF	15 nF	<i>1.0 μF</i>	<i>100 nF</i>	65 nF	<i>4.7 μF</i>	<i>150 nF</i>	140 nF	<i>4.7 μF</i>
200V	<i>2.2 nF</i>	5.5 nF	38 nF	10 nF	15 nF	100 nF	<i>47 nF</i>	65 nF	450 nF	<i>100 nF</i>	140 nF	970 nF
250V	<i>2.2 nF</i>	5.3 nF	29 nF	10 nF	15 nF	96 nF	<i>22 nF</i>	65 nF	400 nF	36 nF	140 nF	860 nF
500V	630 pF	1.8 nF	5.5 nF	2.5 nF	7.6 nF	22 nF	12 nF	39 nF	160 nF	26 nF	85 nF	350 nF
630V	380 pF	1.1 nF	2.9 nF	1.5 nF	4.6 nF	12 nF	9.6 nF	31 nF	100 nF	20 nF	67 nF	260 nF
1000V	140 pF	420 pF	850 pF	600 pF	1.8 nF	3.7 nF	5.0 nF	14 nF	32 nF	13 nF	42 nF	93 nF
1500V	58 pF	110 pF	270 pF	250 pF	520 pF	1.3 nF	2.1 nF	4.2 nF	11 nF	6.5 nF	12 nF	33 nF
2000V				97 pF	280 pF	590 pF	850 pF	2.5 nF	6.0 nF	1.9 nF	6.1 nF	16 nF

	SA75			SA80			SA90		
	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R
Min	1.0 pF	4.7 pF	10 pF	1.0 pF	10 pF	33 pF	1.0 pF	10 pF	33 pF
25V	<i>220 nF</i>	140 nF	<i>22 μF</i>	<i>470 nF</i>	320 nF	22 μF	97 nF	370 nF	2.6 μF
50V	<i>220 nF</i>	140 nF	<i>6.8 μF</i>	<i>470 nF</i>	320 nF	10 μF	97 nF	370 nF	2.6 μF
100V	<i>150 nF</i>	140 nF	<i>4.7 μF</i>	<i>330 nF</i>	320 nF	10 μF	97 nF	370 nF	2.6 μF
200V	<i>100 nF</i>	140 nF	970 nF	<i>220 nF</i>	320 nF	2.2 μF	97 nF	370 nF	2.6 μF
250V	36 nF	140 nF	860 nF	84 nF	320 nF	2.0 μF	97 nF	370 nF	2.3 μF
500V	26 nF	85 nF	350 nF	60 nF	190 nF	830 nF	70 nF	220 nF	950 nF
630V	20 nF	67 nF	260 nF	48 nF	150 nF	600 nF	55 nF	180 nF	690 nF
1000V	13 nF	42 nF	93 nF	30 nF	99 nF	270 nF	35 nF	110 nF	310 nF
1500V	6.5 nF	12 nF	33 nF	18 nF	36 nF	88 nF	21 nF	42 nF	100 nF
2000V	1.9 nF	6.1 nF	16 nF	4.8 nF	15 nF	51 nF	5.7 nF	18 nF	61 nF

1) Max Values in italic obtained with BME part

This document is subject to change without notice.

## 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.

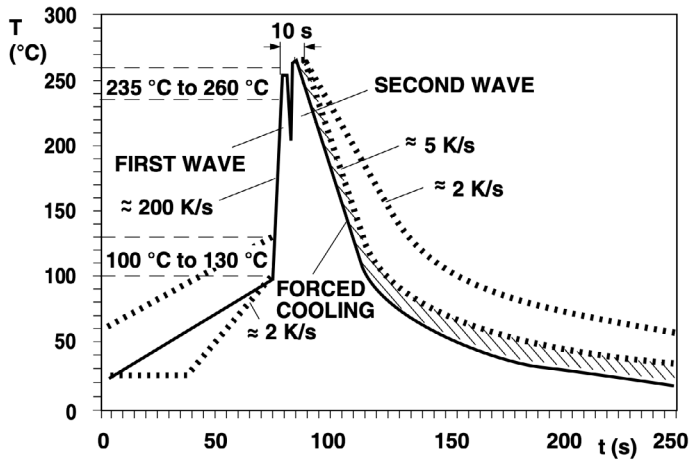
## CLEANING

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.

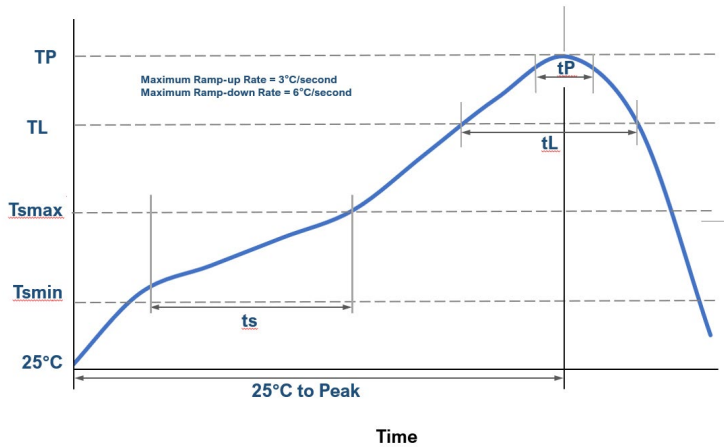
## SOLDERING CONDITIONS

SIZE	THICKNESS	WAVE	REFLOW
0402	All	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
High compact	All	0	0

## WAVE SOLDERING PROFILE

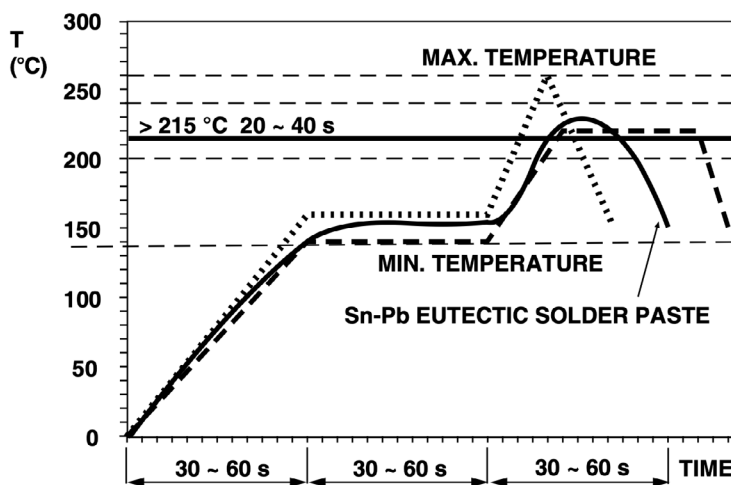


## LEADFREE REFLOW SOLDERING PROFILE



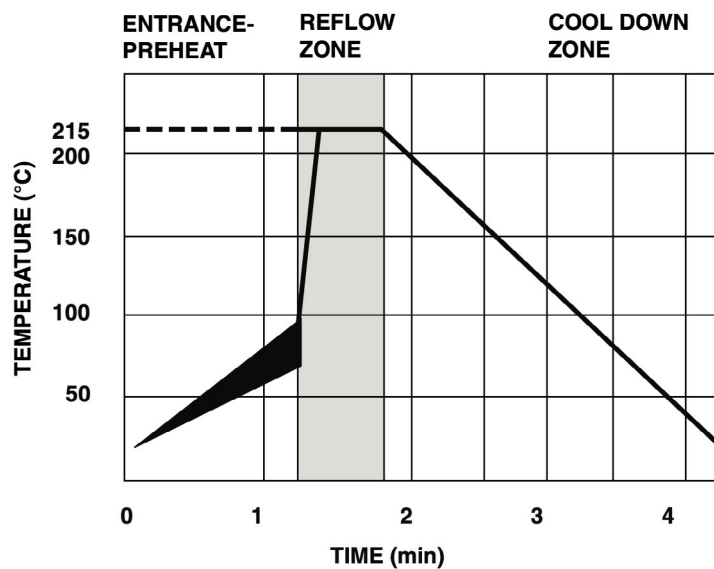
PROFILE FEATURE	LEAD FREE (SAC 305)
Tsmin	150°C
Tsmax	190°C
Time from Tsmin to Tsmax	60 - 120 seconds
Ramp-up Rate	3°C/second max
Liquidous Temperature	217°C
Time above Liquidous	60 - 120 seconds
Peak Temperature	250°C
Time within 5°C of maximum	10 seconds max
Peak Temperature	250°C
Ramp-down Rate	6°C/second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

## SNPB REFLOW SOLDERING PROFILE



## VAPOUR PHASE REFLOW PROFILE

This document is subject to change without notice.



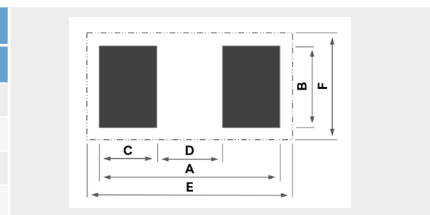
## HAND SOLDERING

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  $\leq 3.0$  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  $\leq 280$ °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.

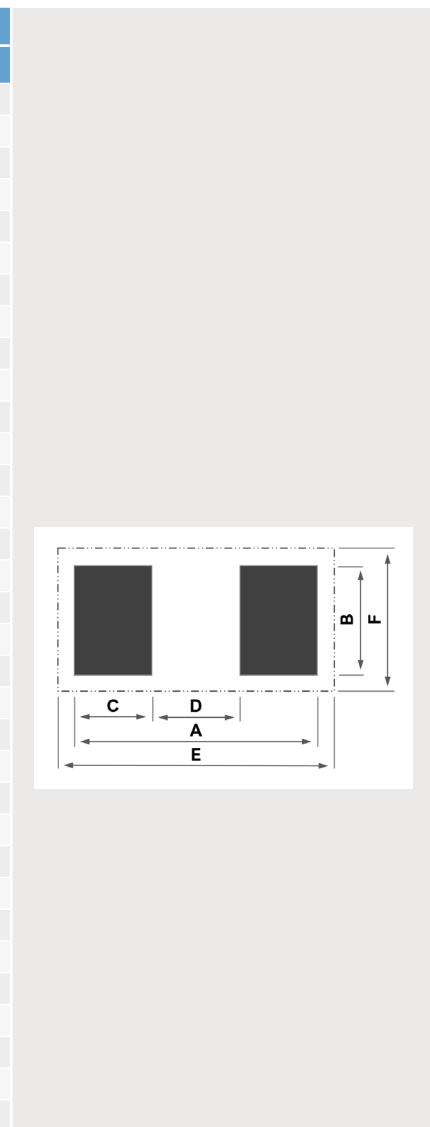
## TYPICAL SMD FOOTPRINT WAVE SOLDERING

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



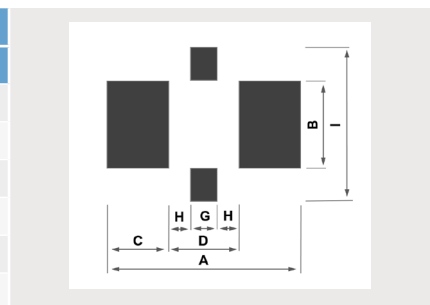
## TYPICAL SMD FOOTPRINT REFLOW SOLDERING

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



This document is subject to change without notice.



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

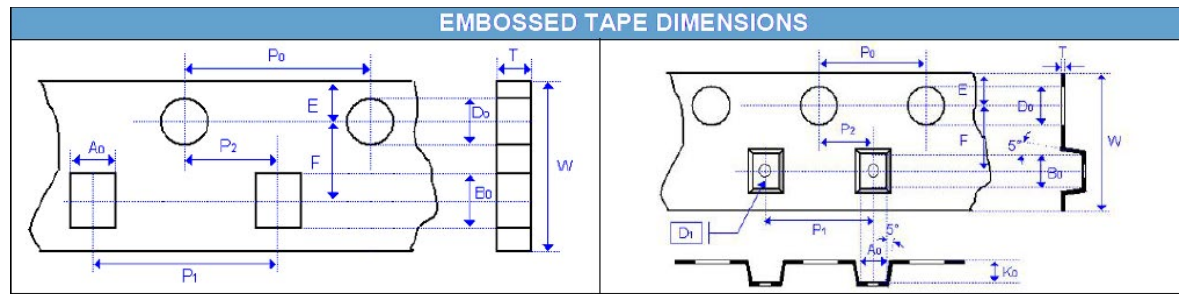
## SORTING

OPTIONAL CODE	SORTING DETAIL
E01	2 cells sorting 0 to +2,5 & +2,5 to +5 (% or pF 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

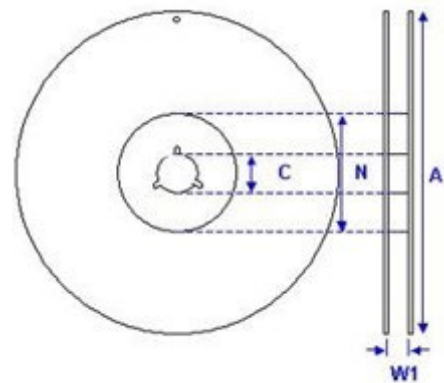


## PACKAGE DIMENSION AND QUANTITY

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
HIGH COMPACT 1210				1K	6K
HIGH COMPACT 1812				1K	6K
HIGH COMPACT 2220				0.5K	2K



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



This document is subject to change without notice.



## 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 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.

## PRODUCTION CONTROL

Test conducted on each lot according to ESCC-3009 for

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 <sup>-3</sup>	±2%	10% initial limit
N2T	≤ 6 10 <sup>-3</sup>	±4%	10% initial limit
X7R	≤ 0.035	±15%	10% initial limit

## 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 programmes 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)

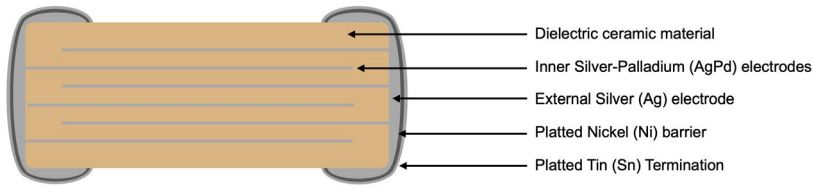
AECQ-200	CLASS 1	CLASS 2	CLASS 3	CATEGORY	TEST TYPE	SAMPLE	PROCEDURE
Yes	X	X	X	Evaluation	Construction Analysis	5	ESCC21001
Yes	X	X	X	Evaluation	Temperature characterization	5	ESCC3009 8.10
Yes	X			Evaluation	Life Test 2000h	40	ESCC3009 8.6 + 8.9
Yes	X			Screening	Complete screening	100%	ESCC3009 chart 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

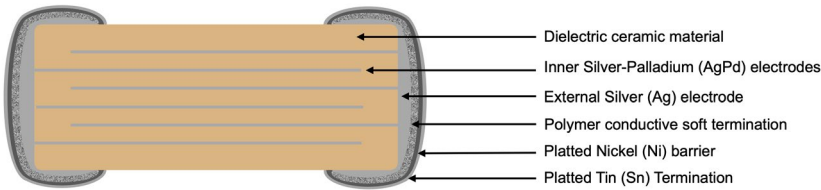
All component for space application can be proposed with dipped SnPb termination (Sn62 Pb36 Ag2) or SAC 305 (Sn96.5 Ag3 Cu0.5) for maximum reliability and whiskers avoidance.

*This document is subject to change without notice.*

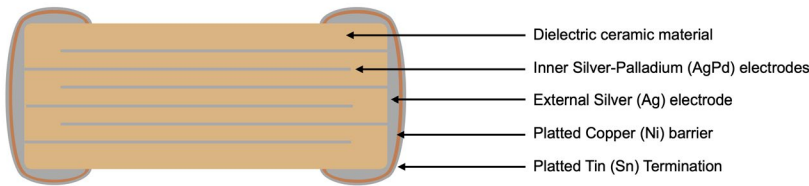
### PME (Precious Metal Electrodes)



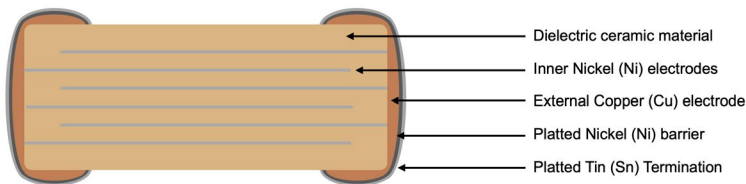
### PME (Precious Metal Electrodes) Polymer Soft Termination



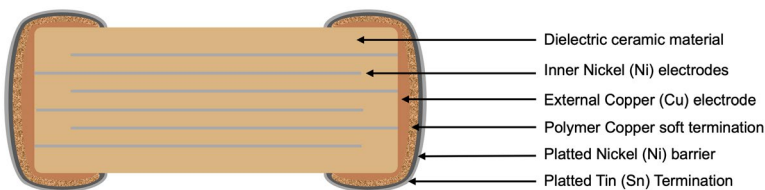
### PME (Precious Metal Electrodes) Non Magnetic



### 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 intended to be released under normal or reasonably foreseeable conditions of use according to 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) phthalate (DEHP) Benzyl butyl phthalate (BBP)
- Dibutyl phthalate (DBP) Diisobutyl phthalate (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.