

RADIAL CAPACITOR Dipped High Voltage

NPO N2T X7R 1KV-15KV



SRT
MICROCÉRAMIQUE
MLCC CAPACITORS

APPLICATIONS

- Severe environment
- Historical design



FEATURES

- Highly reliable design
- Epoxy coating option
- Available in NPO, N2T, BX, 2X1, X7R
- Non magnetic option
- Equivalence to most concurrent design (cf file)

ELECTRICAL PARAMETERS

ELECTRICAL CHARACTERISTICS :
at + 25°C unless otherwise specified

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

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

DISSIPATION FACTOR:
NPO : ≤ 1.10⁻³ at 1Vrms and 1MHz for values ≤ 1000pF
 ≤ 1.10⁻³ at 1Vrms and 1KHz for values > 1000pF
N2T : ≤ 1.10⁻³ at 1Vrms and 1MHz for values ≤ 1000pF
 ≤ 1.10⁻³ at 1Vrms and 1KHz for values > 1000pF
X7R : ≤ 0.025 at 1kHz

INSULATION RESISTANCE (IR) :
25°C/Un 10⁵ MOhm or 1000 Ohm-Farad whichever is less
125°C/Un 10⁴ MOhm or 100 Ohm-Farad whichever is less

DIELECTRIC STRENGTH TEST :
1.2Un for 5s with 50mA max charging current

BURN IN :
48 hours 125°C 2Un if Un<500V and 1.5 Un if Un >500V

ORDERING INFORMATION

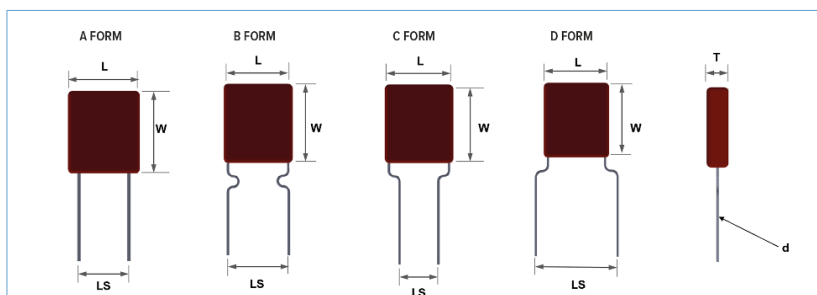
SRMC	41	Y	102	J	A	-	-	E	B	-
SERIES	SIZE	DIELECTRIC	CAPACITANCE	TOLERANCE	VOLTAGE	TERMINATION	LEAD	COATING	PACKAGING	SPECIAL
SRMC	31 to 96	A = NPO P = N2T X = BX Y = X7R BY = 2C1	Expressed in picofarads (pF). The first two digits are significant, the third digit give the number of noughts. Example : 102 = 1 000pF	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 = 25V A = 50V B = 100V C = 200V E = 500V G = 1000V	- = Sn C = Non magnetic	- = Default A,C,D Form B = B Form	- = Conformal Coating H = Epoxy Coating	B = Reel V = Bulk	- BM = BME Dxx = Reliability spec Exx = Sorting spec

For other sizes, voltage, tolerance contact us

DIMENSIONS (in millimeters)

SIZE	31	32	38	40	41	43	44	45	47	48	49	52	54	58
Lenght (L) max	3.8	5.0	6.4	3.8	5.1	6.5	7.6	10.1	8.1	5.1	9.4	6.6	9.0	11.9
Width (W) max	3.8	5.0	5.6	3.8	5.1	5.8	7.0	10.2	7.1	3.8	7.6	5.6	7.5	10.2
Thickness (T) max	2.5	3.2	5.0	2.5	3.2	3.8	4.5	4.5	5.0	4.0	5.0	4.0	4.0	5.0
Lead spacing (LS) ± 0,5	2.54	2.54	4.30	5.08	5.08	5.08	5.08	5.08	5.60	6.40	7.00	7.62	7.62	9.50
Lead diameter (d)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Lead form	C	C	C	D	A/B	C	C	C	C	D	C	D	C	C

SIZE	60	63	68	72	74	76	80	82	84	88	90	91	92	96
Lenght (L) max	10.0	12.7	14.5	12.0	17.0	16.0	18.7	19.6	18.5	22.1	25.0	26.7	30.0	42.5
Width (W) max	10.0	12.3	12.7	12.5	14.0	12.5	22.5	18.3	17.5	16.8	19.0	12.7	22.5	20.0
Thickness (T) max	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead spacing (LS) ± 0,5	10.16	10.16	12.00	12.70	14.60	15.24	15.24	17.10	17.80	20.30	21.00	22.90	27.94	40.64
Lead diameter (d)	0.6	0.6	0.6	0.6	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.0
Lead form	A/B	C	C	A/B	C	A/B	C	C	A/B	A/B	C	C	A/B	A/B



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QUICK REFERENCE DATA (Max capacitance)

	SRMC31			SRMC32			SRMC38			SRMC40			SRMC41			SRMC43			SRMC44			
	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	
min	0.1 pF	1.0 pF	6.8 pF	0.4 pF	4.7 pF	10 pF	0.4 pF	4.7 pF	10 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	1.0 pF	10 pF	10 pF	33 pF
1KV	600 pF	1.8 nF	3.7 nF	5.0 nF	14 nF	32 nF	5.0 nF	14 nF	32 nF	600 pF	1.8 nF	3.7 nF	5.0 nF	14 nF	32 nF	13 nF	42 nF	93 nF	30 nF	99 nF	270 nF	
1,5KV	250 pF	520 pF	1.3 nF	2.1 nF	4.2 nF	11 nF	2.1 nF	4.2 nF	11 nF	250 pF	520 pF	1.3 nF	2.1 nF	4.2 nF	11 nF	6.5 nF	12 nF	33 nF	18 nF	36 nF	88 nF	
2KV	97 pF	280 pF	590 pF	850 pF	2.5 nF	6.0 nF	850 pF	2.5 nF	6.0 nF	97 pF	280 pF	590 pF	850 pF	2.5 nF	6.0 nF	1.9 nF	6.1 nF	16 nF	4.8 nF	15 nF	51 nF	
2,5KV				540 pF	1.2 nF	3.4 nF	540 pF	1.2 nF	3.4 nF				540 pF	1.2 nF	3.4 nF	1.3 nF	3.8 nF	10 nF	3.5 nF	10 nF	29 nF	
3KV				360 pF	900 pF	2.1 nF	360 pF	900 pF	2.1 nF				360 pF	900 pF	2.1 nF	1.0 nF	2.0 nF	6.7 nF	2.5 nF	6.4 nF	20 nF	
4KV				180 pF	400 pF		180 pF	400 pF					180 pF	400 pF				420 pF	1.1 nF	3.6 nF	1.0 nF	2.9 nF
5KV																		230 pF	630 pF	2.1 nF	580 pF	1.6 nF
6KV																		190 pF	420 pF	1.3 nF	480 pF	1.1 nF
8KV																		90 pF	230 pF		230 pF	640 pF
10KV																		31 pF	100 pF		150 pF	330 pF

	SRMC45			SRMC47			SRMC48			SRMC49			SRMC52			SRMC54			SRMC58		
	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R
min	10 pF	47 pF	100 pF	1.0 pF	10 pF	33 pF	0.4 pF	4.7 pF	10 pF	1.0 pF	10 pF	33 pF	1.0 pF	4.7 pF	10 pF	1.0 pF	10 pF	33 pF	10 pF	47 pF	100 pF
1KV	68 nF	220 nF	620 nF	30 nF	99 nF	270 nF	1.8 nF	5.4 nF	11 nF	1.0 nF	10 nF	310 nF	13 nF	42 nF	93 nF	35 nF	110 nF	310 nF	68 nF	220 nF	620 nF
1,5KV	41 nF	80 nF	220 nF	18 nF	36 nF	88 nF	810 pF	1.6 nF	4.5 nF	21 nF	42 nF	100 nF	6.5 nF	12 nF	33 nF	21 nF	42 nF	100 nF	41 nF	80 nF	220 nF
2KV	12 nF	39 nF	130 nF	4.8 nF	15 nF	51 nF	300 pF	910 pF	2.1 nF	5.7 nF	18 nF	61 nF	1.9 nF	6.1 nF	16 nF	5.7 nF	18 nF	61 nF	12 nF	39 nF	130 nF
2,5KV	8.8 nF	25 nF	73 nF	3.5 nF	10 nF	29 nF	180 pF	510 pF	1.1 nF	4.1 nF	11 nF	34 nF	1.3 nF	3.8 nF	10 nF	4.1 nF	11 nF	34 nF	8.8 nF	25 nF	73 nF
3KV	6.5 nF	16 nF	50 nF	2.5 nF	6.4 nF	20 nF	120 pF	350 pF	710 pF	3.0 nF	7.6 nF	23 nF	1.0 nF	2.0 nF	6.7 nF	3.0 nF	7.6 nF	23 nF	6.5 nF	16 nF	50 nF
4KV	2.7 nF	7.2 nF	26 nF	1.0 nF	2.9 nF	10 nF	65 pF	140 pF		1.2 nF	3.4 nF	12 nF	420 pF	1.1 nF	3.6 nF	1.2 nF	3.4 nF	12 nF	2.7 nF	7.2 nF	26 nF
5KV	1.4 nF	4.0 nF	16 nF	580 pF	1.6 nF	6.6 nF				680 pF	1.9 nF	7.7 nF	230 pF	630 pF	2.1 nF	680 pF	1.9 nF	7.7 nF	1.4 nF	4.0 nF	16 nF
6KV	1.2 nF	2.9 nF	11 nF	480 pF	1.1 nF	4.5 nF				570 pF	1.4 nF	5.3 nF	190 pF	420 pF	1.3 nF	570 pF	1.4 nF	5.3 nF	1.2 nF	2.9 nF	11 nF
8KV	590 pF	1.5 nF	5.6 nF	230 pF	640 pF	2.1 nF				270 pF	750 pF	2.5 nF	90 pF	230 pF		270 pF	750 pF	2.5 nF	590 pF	1.5 nF	5.6 nF
10KV	400 pF	850 pF	2.9 nF	150 pF	330 pF	1.1 nF				180 pF	390 pF	1.3 nF	31 pF	100 pF		180 pF	390 pF	1.3 nF	400 pF	850 pF	2.9 nF
	280 pF	560 pF	1.8 nF																280 pF	560 pF	1.8 nF

	SRMC60			SRMC63			SRMC68			SRMC72			SRMC74			SRMC76			SRMC80		
	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R
min	10 pF	47 pF	100 pF	10 pF	47 pF	100 pF	10 pF	33 pF	100 pF	10 pF	47 pF	100 pF	10 pF	47 pF	100 pF	10 pF	47 pF	100 pF	10 pF	33 pF	100 pF
1KV	68 nF	220 nF	620 nF	110 nF	360 nF	990 nF	120 nF	400 nF	1.1 μF	100 nF	320 nF	880 nF	190 nF	620 nF	1.6 μF	140 nF	480 nF	1.3 μF	330 nF	1.0 μF	2.9 μF
1,5KV	41 nF	80 nF	220 nF	68 nF	130 nF	360 nF	76 nF	140 nF	400 nF	61 nF	110 nF	320 nF	110 nF	220 nF	610 nF	91 nF	170 nF	480 nF	200 nF	380 nF	1.0 μF
2KV	12 nF	39 nF	130 nF	19 nF	64 nF	200 nF	22 nF	71 nF	230 nF	17 nF	57 nF	180 nF	34 nF	100 nF	350 nF	26 nF	86 nF	270 nF	59 nF	190 nF	610 nF
2,5KV	8.8 nF	25 nF	73 nF	14 nF	41 nF	110 nF	16 nF	45 nF	130 nF	12 nF	36 nF	100 nF	24 nF	70 nF	200 nF	19 nF	55 nF	160 nF	42 nF	120 nF	350 nF
3KV	6.5 nF	16 nF	50 nF	10 nF	26 nF	82 nF	11 nF	29 nF	92 nF	9.5 nF	23 nF	74 nF	18 nF	45 nF	140 nF	14 nF	35 nF	110 nF	31 nF	78 nF	240 nF
4KV	2.7 nF	7.2 nF	26 nF	4.4 nF	11 nF	43 nF	4.9 nF	13 nF	48 nF	3.9 nF	10 nF	38 nF	7.5 nF	20 nF	73 nF	5.9 nF	15 nF	57 nF	13 nF	35 nF	120 nF
5KV	1.4 nF	4.0 nF	16 nF	2.3 nF	6.5 nF	26 nF	2.6 nF	7.3 nF	29 nF	2.1 nF	5.8 nF	24 nF	4.0 nF	11 nF	45 nF	3.1 nF	8.7 nF	35 nF	7.0 nF	19 nF	79 nF
8KV	590 pF	1.5 nF	5.6 nF	960 pF	2.5 nF	9.1 nF	1.0 nF	2.8 nF	10 nF	860 pF	2.2 nF	8.2 nF	1.6 nF	4.3 nF	15 nF	1.2 nF	3.4 nF	12 nF	2.8 nF	7.5 nF	27 nF
10KV	400 pF	850 pF	2.9 nF	660 pF	1.3 nF	4.7 nF	730 pF	1.5 nF	5.3 nF	590 pF	1.2 nF	4.2 nF	1.1 nF	2.3 nF	8.1 nF	880 pF	1.8 nF	6.4 nF	1.9 nF	4.1 nF	14 nF
12KV	280 pF	560 pF	1.8 nF	460 pF	920 pF	3.0 nF	510 pF	1.0 nF	3.4 nF	410 pF	830 pF	2.7 nF	780 pF	1.5 nF	5.2 nF	610 pF	1.2 nF	4.1 nF	1.3 nF	2.7 nF	9.1 nF
15KV				280 pF	560 pF		310 pF	620 pF		250 pF	500 pF		480 pF	950 pF		370 pF	750 pF		830 pF	1.6 nF	

	SRMC82			SRMC84			SRMC88			SRMC90			SRMC91			SRMC92			SRMC96		
	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R	NPO	N2T	X7R
min	10 pF	33 pF	100 pF	10 pF	33 pF	100 pF	10 pF	33 pF	100 pF	10 pF	47 pF	100 pF	10 pF	33 pF	100 pF	22 pF	68 pF	180 pF	22 pF	68 pF	180 pF
1KV	260 nF	870 nF	2.3 μF	260 nF	870 nF	2.3 μF	310 nF	1.0 μF	2.7 μF	330 nF	1.0 μF	2.9 μF	250 nF	810 nF	2.2 μF	430 nF	1.4 μF	3.8 μF	640 nF	2.0 μF	5.7 μF
1,5KV	160 nF	310 nF	870 nF	160 nF	310 nF	870 nF	190 nF	360 nF	1.0 μF	200 nF	380 nF	1.0 μF	150 nF	290 nF	810 nF	260 nF	510 nF	1.4 μF	390 nF	750 nF	2.0 μF
2KV	48 nF	150 nF	500 nF	48 nF	150 nF	500 nF	55 nF	170 nF	580 nF	59 nF	190 nF	610 nF	44 nF	140 nF	460 nF	77 nF	250 nF	810 nF	110 nF	360 nF	1.1 μF
2,5KV	34 nF	99 nF	280 nF	34 nF	99 nF	280 nF	40 nF	110 nF	330 nF	42 nF	120 nF	350 nF	32 nF	92 nF	260 nF	56 nF	160 nF	460 nF	82 nF	230 nF	680 nF
3KV	25 nF	64 nF	190 nF	25 nF	64 nF	190 nF	29 nF	74 nF	230 nF	31 nF	78 nF	240 nF	23 nF	59 nF	180 nF	41 nF	100 nF	320 nF	61 nF	150 nF	470 nF
4KV	10 nF	28 nF	100 nF	10 nF	28 nF	100 nF	12 nF	32 nF	120 nF	13 nF	35 nF	120 nF	9.9 nF	26 nF	96 nF	17 nF	46 nF	160 nF	25 nF	67 nF	240 nF
5KV	5.7 nF	15 nF	64 nF	5.7 nF	15 nF	64 nF	6.6 nF	18 nF	74 nF	7.0 nF	19 nF	79 nF	5.3 nF	14 nF	60 nF	9.2 nF	25 nF	100 nF	13 nF	37 nF	150 nF
8KV	2.3 nF	6.1 nF	22 nF	2.3 nF	6.1 nF	22 nF	2.6 nF	7.1 nF	25 nF	2.8 nF	7.5 nF	27 nF	2.1 nF	5.7 nF	20 nF	3.7 nF	9.9 nF	35 nF	5.5 nF	14 nF	52 nF
10KV	1.5 nF	3.3 nF	11 nF	1.5 nF	3.3 nF	11 nF	1.8 nF	3.8 nF	13 nF	1.9 nF	4.1 nF	14 nF	1.4 nF	3.1 nF	10 nF	2.5 nF	5.4 nF	18 nF	3.8 nF	8.0 nF	27 nF
12KV	1.1 nF	2.2 nF	7.3 nF	1.1 nF	2.2 nF	7.3 nF	1.2 nF	2.5 nF	8.5 nF	1.3 nF	2.7 nF	9.1 nF	1.0 nF	2.0 nF	6.8 nF	1.7 nF	3.6 nF	11 nF	2.6 nF	5.3 nF	17 nF
15KV	680 pF	1.3 nF		680 pF	1.3 nF		780 pF	1.5 nF		830 pF	1.6 nF		630 pF	1.2 nF		1.1 nF	2.1 nF		1.6 nF	3.2 nF	

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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 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.

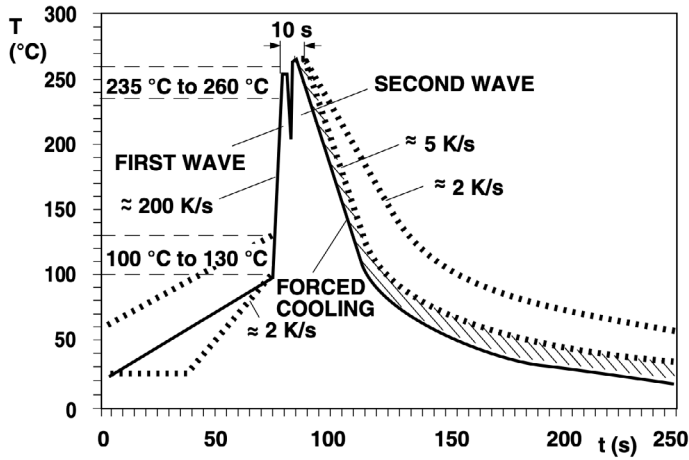
CLEANING

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.

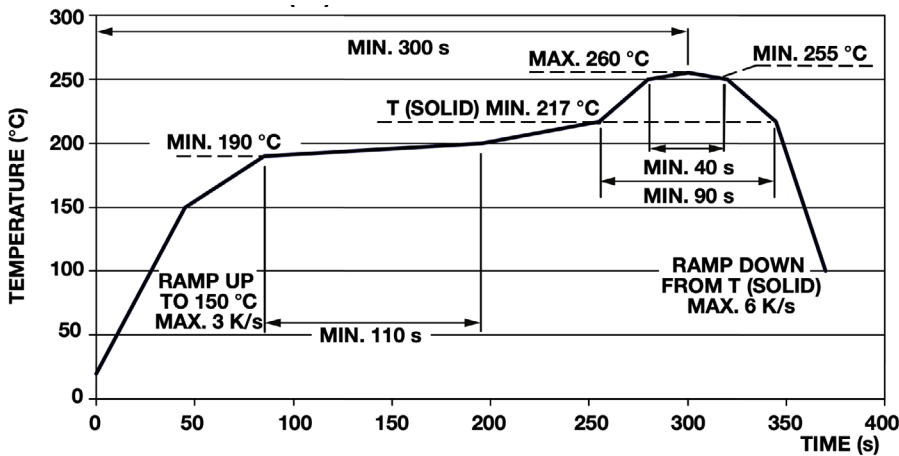
SOLDERING CONDITIONS

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

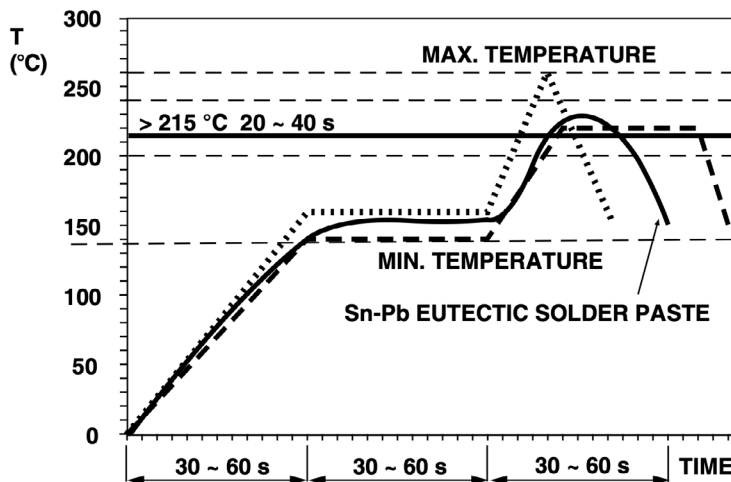
WAVE SOLDERING PROFILE



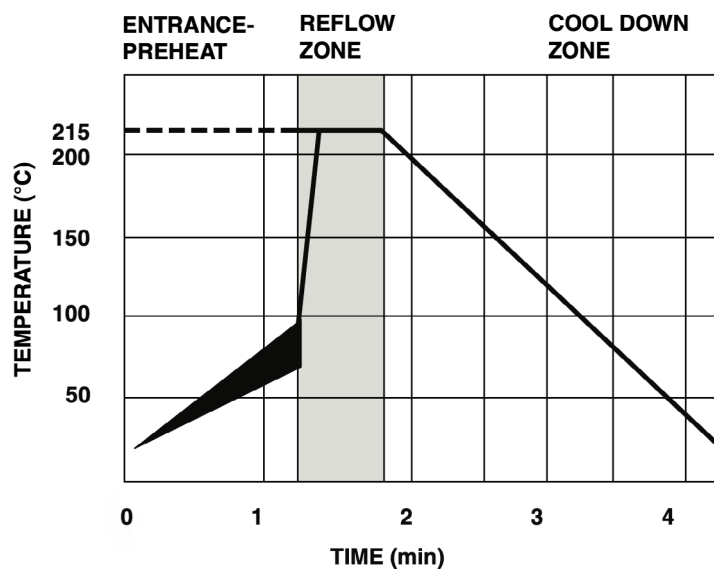
LEADFREE REFLOW SOLDERING PROFILE



SNI



VAPOUR PHASE REFLOW PROFILE



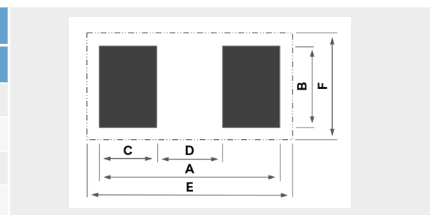
HAND SOLDERING

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.

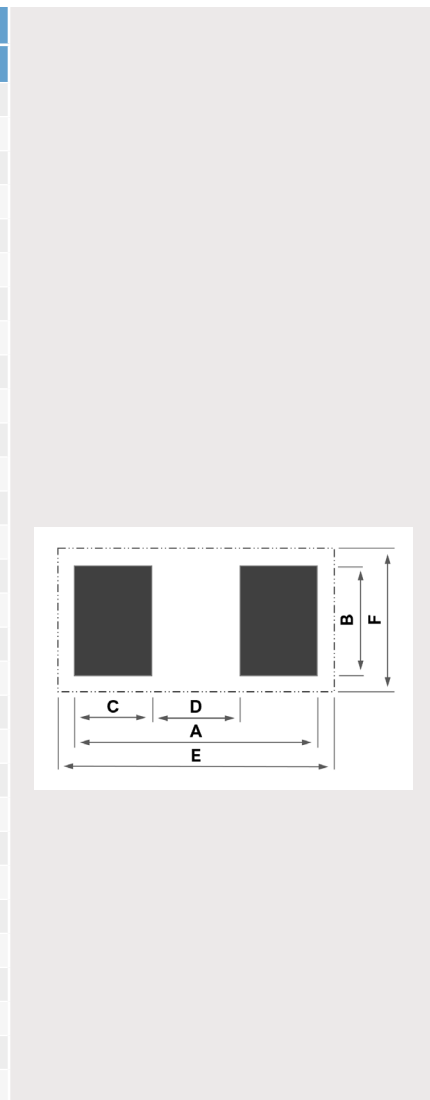
TYPICAL SMD FOOTPRINT WAVE SOLDERING

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



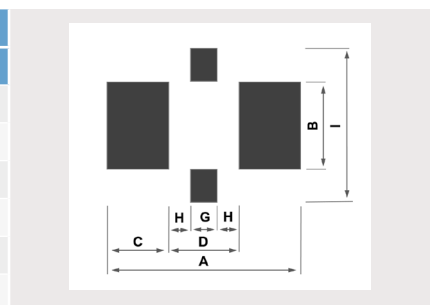
TYPICAL SMD FOOTPRINT REFLOW SOLDERING

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



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	TERMINATION	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	S = Dipped SAC	leads	080					E = Anti Bending
MPF	0508	S = X5R		J = ± 5%	U = 63V	H = Dipped SnPb	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

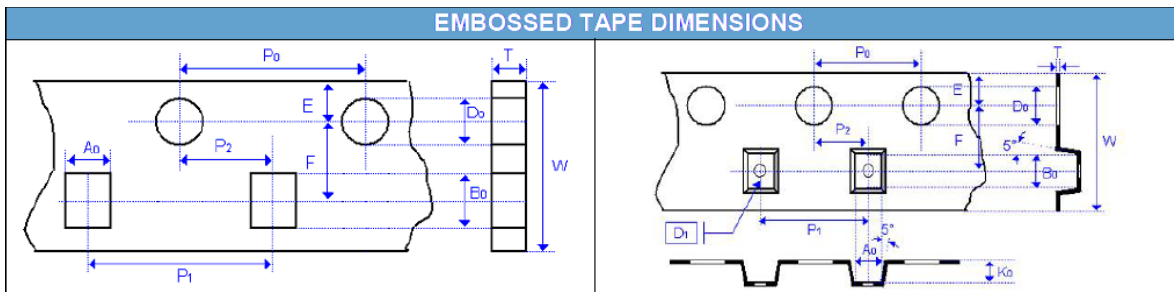
OPTIONAL CODE	TESTING DETAIL
D03	Burn-In 100% 125° 168H, no default allowed
D05	Burn-In 100% 125° 168H, less than 5% default allowed VRT CEI 68-2-14 10 cycles 0V -55°C/+125°C, less than 5% default allowed 20 pieces life test 125°C, 1.5Un, 1 default allowed
D20	AECQ-200

SORTING

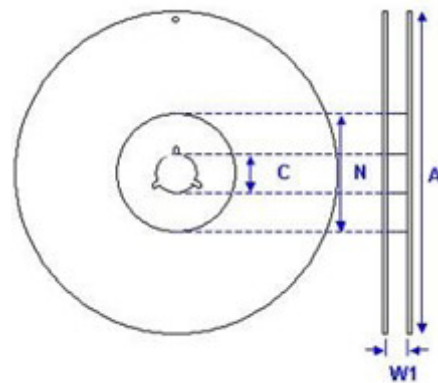
OPTIONAL CODE	SORTING DETAIL
E01	2 cells sorting 0 to +2,5 & +2,5 to +5 (% or pF according to value)
E02	4 cells sorting -5 to -2,5 ; -2,5 to 0 ; 0 to +2,5 & +2,5 to 5 (% or pF according to value)
E21	2% cells

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



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.