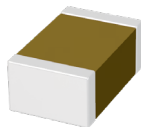




DESCRIPTION

Safety certified capacitors are designed for surge or lightning immunity in modern facsimile and other equipments. The capacitors of FK series are class X1/Y2 compliant, and the capacitors of FH series are class X2 compliant respectively. The green type capacitors in FK/FH series are manufactured by using environmentally friendly materials without lead or cadmium. The terminations are composed of plated nickel and pure tin to feature the superiority of leaching resistance during soldering.



APPLICATIONS

- Modem
- Facsimile
- Telephone
- Other electronic equipment for lighting or surge protection and isolation

FEATURES

- High reliability and stability.
- Small size and high capacitance
- Safety standard approval by :
 - EN 60384-14 : 2013/A1 : 2016
 - IEC60384-14:2013/AMD1:2016
 - UL 60384-14(Ed 2.0)UL 62368-1 (2nd Edition)
- Certificate number :
 - UL R 50041666 & R 50359148 by TUV.
 - E346791(FOWX2/8) by UL, E231248 by UL
 - CQC20001247849 by CQC (FK series)
 - CQC20001247848 by CQC (FH series)
- Licenses :
 - ENEC-03020 (FK series)
 - ENEC-03021 (FH series)
- RoHS and HALOGEN compliant
- Manufactured by PDC

ELECTRICAL PARAMETERS

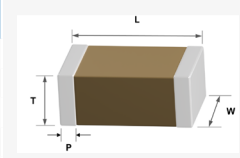
| DIELECTRIC | COG | X7R |
|----------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Size | 1808, 1812 2211 | 1808, 1812, 2211, 2220 |
| Rated Voltage | 250 Vac | |
| Capacitance Range | X1/Y2 Class (Impulse 6KV) : 4pF - 100pF X1/Y2 Class (Impulse 5KV) : 3pF - 720pF X2 Class : 3pF - 1000pF | X1/Y2 Class : 100pF-4700pF X2 Class : 56000pF |
| Capacitance Tolerance | Cap.<10pF : D (±0.5pF) 10pF≤ Cap : F (±1%), G (±2%), J (±5%),K (±10%), M (±20%) | J (±5%) K (±10%) M (±20%) |
| DF | Cap.<30pF : Q≥400+20C Cap.≥30pF : Q≥1000 | ≤2.5% |
| Capacitance & DF- Test Condition | Measured at the condition of 30-70% related humidity. | |
| | For 25°C at ambient temperature | Preconditioning for Class II MLCC : Perform a heat treatment at 150 ±10°C for 1 hour, then leave in ambient condition for 24±2 hours before measurement |
| Insulation Resistance | ≥100GΩ or RxC≥1000Ω-F, whichever is smaller | ≥10GΩ or RxC≥5000Ω-F, whichever is smaller |
| Operating Temperature | -55°C to +125°C | |
| Temperature coefficient | ±30ppm/°C | ±15% |
| Termination | Cu or Ag/Ni/Sn (lead-free termination) | |

ORDERING INFORMATION

| FK | 0805 | Y | 103 | K | 502 | B | G |
|-----------------------------------------------------|--------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SERIES | SIZE | DIELECTRIC | CAPACITANCE | TOLERANCE | VOLTAGE | PACKAGING | SPECIAL |
| FK = Safety X1 & Y2 Series FH = Safety X2 Series | 1206 1808 1812 2211 2220 | A = COG Y = X7R | Expressed in picofarads (pF). The first two digits are significant, the third digit gives the number of noughts. Example : 102 = 1 000pF | D = ± 0.50pF F = ± 1% G = ± 2% J = ± 5% K = ± 10% M = ± 20% | T = 2.5KV L = 5KV 6 = 6KV | B = Reel V = Bulk | G = RoHS Compliant H = High Reliability Q = Anti-Arcing E = Anti Bending Z = Anti-Arcing + Anti-Bending Dxx = Reliability spec Exx = Sorting spec |

DIMENSIONS IN MILLIMETERS

| | 1206 | 1808 | 1812 | 2211 | 2220 |
|-------------------|------------|----------------|----------------|------------|------------|
| Length (L) | 3.30 ±0.40 | 4.50 +0.6/-0.3 | 4.50 +0.6/-0.3 | 5.70 ±0.50 | 5.70 ±0.50 |
| Width (W) | 1.60 ±0.20 | 2.00 ±0.30 | 3.20 ±0.40 | 2.80 ±0.40 | 5.00 ±0.50 |
| Thickness max (T) | 1.35 | 2.20 | 2.80 | 3.10 | 3.10 |
| Termination (P) | Min | 0.25 | 0.25 | 0.30 | 0.30 |
| | Max | 0.75 | 0.75 | 0.75 | 0.90 |





CAPACITANCE RANGE

| Class | | X1/Y2 (FK series) | | | | | | | | | | | | X2 (FH series) | | | | |
|---------------|--------|-------------------------------|------|------|------|------|------|------|------|-------|------|------|------|----------------|-------|--|--|--|
| Rated Voltage | | 250Vac | | | | | | | | | | | | | | | | |
| Certificated | | TUV / UL / CQC (IEC 60384-14) | | | | | | | | | | | | | | | | |
| Dielectric | | COG | | | | X7R | | | | COG | | X7R | | | X7R | | | |
| Size | | 1808 | 1812 | 2211 | 2211 | 1808 | 1812 | 2211 | 2220 | 1808 | 1812 | 1808 | 1812 | 2220 | 1206 | | | |
| Impulse | | 5KV | | | 6KV | 5KV | | | | 2.5KV | | | | | 2.5KV | | | |
| Code | Cap | | | | | | | | | | | | | | | | | |
| 3R0 | 3.0 pF | R | | | | | | | | | R | | | | | | | |
| 3R3 | 3.3 pF | R | | | | | | | | | | | | | | | | |
| 4R0 | 4.0 pF | R | | W | W | | | | | R | | | | | | | | |
| 4R7 | 4.7 pF | R | | W | W | | | | | | | | | | | | | |
| 5R0 | 5.0 pF | R | | W | W | | | | | R | | | | | | | | |
| 5R6 | 5.6 pF | R | | W | W | | | | | | | | | | | | | |
| 6R0 | 6.0 pF | R | | W | W | | | | | R | | | | | | | | |
| 6R8 | 6.8 pF | R | | W | W | | | | | | | | | | | | | |
| 7R0 | 7.0 pF | R | | W | W | | | | | R | | | | | | | | |
| 8R0 | 8.0 pF | R | | W | W | | | | | R | | | | | | | | |
| 8R2 | 8.2 pF | R | | W | W | | | | | | | | | | | | | |
| 9R0 | 9.0 pF | R | | | | | | | | R | | | | | | | | |
| 100 | 10 pF | R | P | W | W | | | | | R | P | | | | | | | |
| 120 | 12 pF | R | P | W | W | | | | | R | P | | | | | | | |
| 150 | 15 pF | R | P | W | W | | | | | R | P | | | | | | | |
| 180 | 18 pF | R | P | W | W | | | | | R | | | | | | | | |
| 220 | 22 pF | R | P | W | W | | | | | R | P | | | | | | | |
| 270 | 27 pF | R | P | W | W | | | | | R | P | | | | | | | |
| 330 | 33 pF | R | P | W | W | | | | | R | P | | | | | | | |
| 390 | 39 pF | T | P | W | W | | | | | T | P | | | | | | | |
| 470 | 47 pF | T | P | W | W | | | | | T | P | | | | | | | |
| 560 | 56 pF | T | P | W | W | | | | | T | P | | | | | | | |
| 680 | 68 pF | T | P | W | Y | | | | | T | P | | | | | | | |
| 820 | 82 pF | T | P | W | Y | | | | | T | P | | | | | | | |
| 101 | 100 pF | W | P | W | Z | T* | | T* | | W | P | | | | P | | | |
| 121 | 120 pF | W | P | Y | | T* | | T* | | W | P | | | | P | | | |
| 131 | 130 pF | W | P | | | | | T* | | | | | | | P | | | |
| 151 | 150 pF | W | P | Y | | T* | T* | T* | | W | P | T | | | P | | | |
| 161 | 160 pF | W | P | Y | | T* | | | W* | | | T | | | P | | | |
| 181 | 180 pF | W | P | Y | | T* | T* | T* | W* | W | P | T | | | P | | | |
| 221 | 220 pF | W | W | Y | | T* | T* | T* | W* | W | P | T | | | P | | | |
| 271 | 270 pF | W | W | Y | | W* | T* | | W* | W | R | T | T | | P | | | |
| 301 | 300 pF | | W | | | | | | | | | T | T | | P | | | |
| 331 | 330 pF | | W | Y | | W* | T* | T* | W* | W | R | T | T | | P | | | |
| 391 | 390 pF | | W | Y | | W* | T* | T* | W* | W | R | T | T | | P | | | |
| 471 | 470 pF | | W | Y | | W* | T* | W* | W* | W | T | T | T | | P | | | |
| 561 | 560 pF | | | Y | | W* | T* | W* | W* | W | W | T | T | | P | | | |
| 681 | 680 pF | | | Y | | W* | W* | W* | W* | W | W | T | T | | P | | | |
| 721 | 720 pF | | | | | | | | W* | W | | | T | | P | | | |
| 821 | 820 pF | | | | | W* | W* | W* | W* | W | Y | T | T | | P | | | |
| 102 | 1.0 nF | | | | | W* | Y* | Y* | W* | W | Y | W | T | | P | | | |
| 122 | 1.2 nF | | | | | | | Y* | Y* | | | W | T | | | | | |
| 152 | 1.5 nF | | | | | | | Y* | Y* | | | W | W | | | | | |
| 182 | 1.8 nF | | | | | | | Y* | Y* | | | W | W | | | | | |
| 222 | 2.2 nF | | | | | | | Y* | Y* | | | W | Y | | | | | |
| 272 | 2.7 nF | | | | | | | Z* | Y* | | | | Y | | | | | |
| 332 | 3.3 nF | | | | | | | | Y* | | | | Y | | | | | |
| 392 | 3.9 nF | | | | | | | | Y* | | | | Y | | | | | |
| 472 | 4.7 nF | | | | | | | | Y* | | | | Y | | | | | |
| 562 | 5.6 nF | | | | | | | | | | | | Y | | | | | |
| 682 | 6.8 nF | | | | | | | | | | | | | | | | | |
| 822 | 8.2 nF | | | | | | | | | | | | | | | | | |
| 103 | 10 nF | | | | | | | | | | | | | Y | | | | |
| 123 | 12 nF | | | | | | | | | | | | | Y | | | | |
| 153 | 15 nF | | | | | | | | | | | | | Y | | | | |
| 183 | 18 nF | | | | | | | | | | | | | Y | | | | |
| 223 | 22 nF | | | | | | | | | | | | | Z | | | | |
| 273 | 27 nF | | | | | | | | | | | | | Z* | | | | |
| 333 | 33 nF | | | | | | | | | | | | | Z* | | | | |
| 393 | 39 nF | | | | | | | | | | | | | Z* | | | | |
| 473 | 47 nF | | | | | | | | | | | | | Z* | | | | |
| 563 | 56 nF | | | | | | | | | | | | | Z* | | | | |

| Code | Thickness (mm) |
|------|----------------|
| P | 1.25±0.10 |
| R | 1.40±0.15 |
| T | 1.60±0.20 |
| W | 2.00±0.20 |
| Y | 2.50±0.30 |
| Z | 2.80±0.30 |

* : Surface coating only

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 requires a solderability check before use.

HANDLING

Chip capacitors are made of dense, hard, brittle, and abrasive materials. They are liable to suffer mechanical damage, in the form of cracks or chips. Chips Capacitors should be handled with care to avoid contamination or damage. The use of 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 process 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

Leads 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 leads 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.

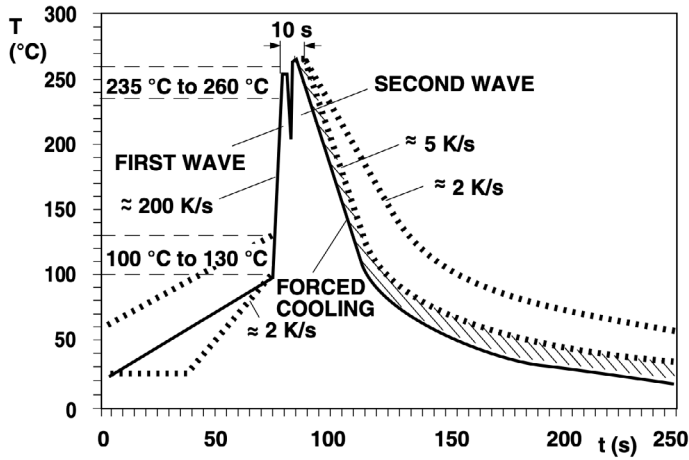
CLEANING

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 solvents. The choice of the proper system depends upon many factors such as component mix, flux, and solder paste and assembly method. The ability for the cleaning system to remove flux residues and contamination from under the chips is of paramount importance.

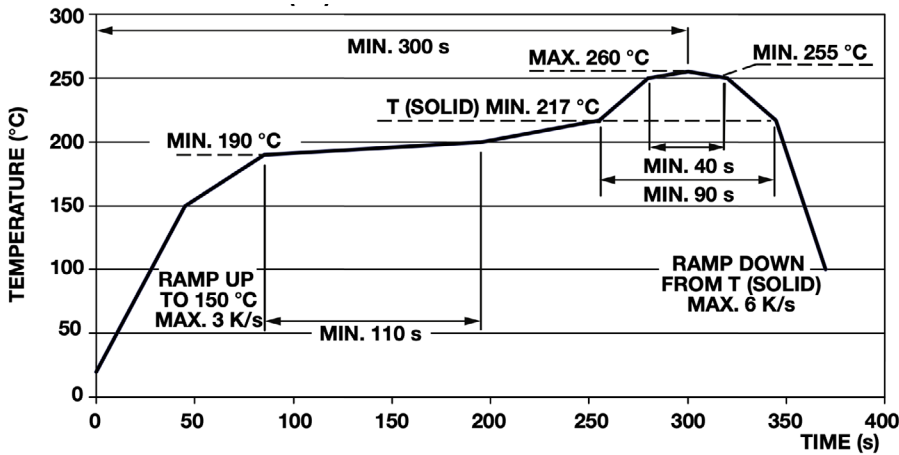
SOLDERING CONDITIONS

| 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 |
| 1111 | < 1.25mm | 0 | 0 |
| 1111 | ≥ 1.25mm | | 0 |
| 1206 | < 1.25mm | 0 | 0 |
| 1206 | ≥ 1.25mm | | 0 |
| 1210 | < 1.25mm | 0 | 0 |
| 1210 | ≥ 1.25mm | | 0 |
| larger than 1210 | All | | 0 |

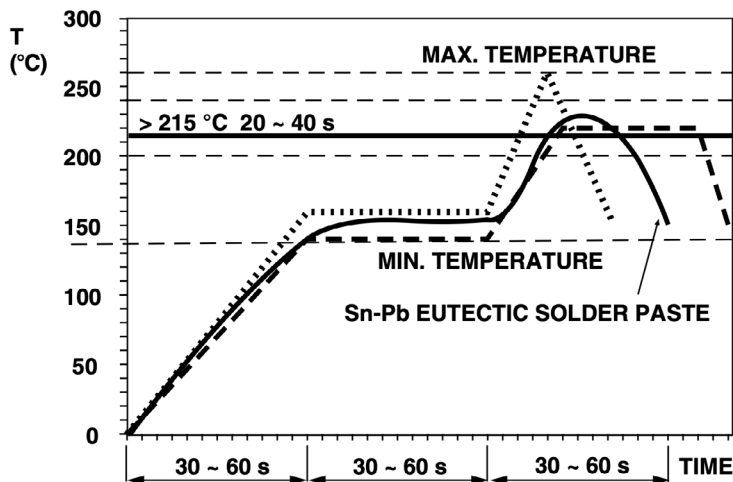
WAVE SOLDERING PROFILE



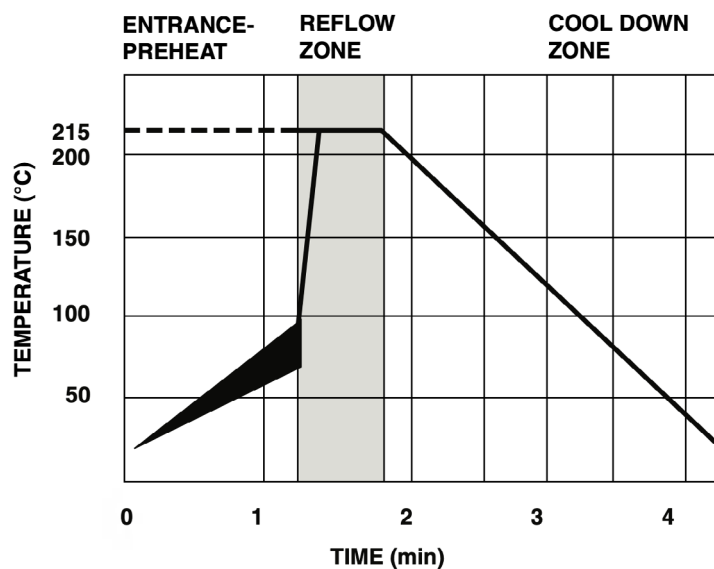
LEADFREE REFLOW SOLDERING PROFILE



SNPB REFLOW SOLDERING PROFILE



VAPOUR PHASE REFLOW PROFILE



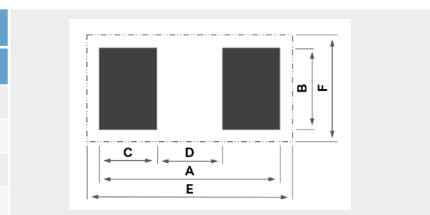
HAND SOLDERING

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 the temperature gradient between the devices and the tip of the soldering iron.
- Tip temperature should be ≤ 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.

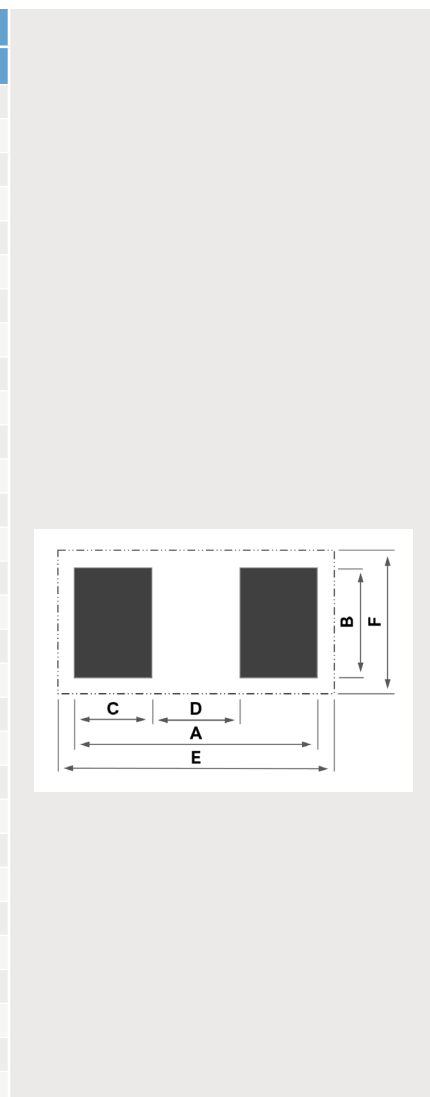
TYPICAL SMD FOOTPRINT WAVE SOLDERING

| 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 |



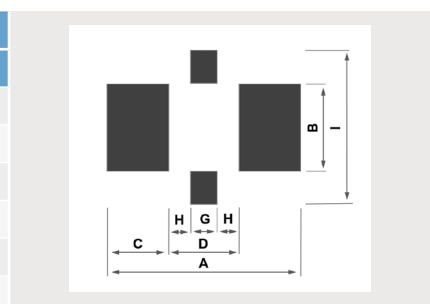
TYPICAL SMD FOOTPRINT REFLOW SOLDERING

| 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

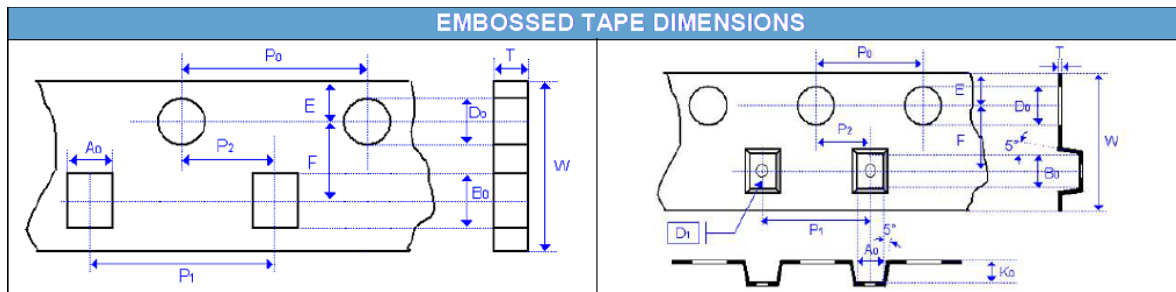
| SIZE | FOOTPRINT DIMENSIONS IN mm | | | | | | |
|------|----------------------------|------|------|------|------|------|------|
| | A | B | C | D | G | H | I |
| 0603 | 2.30 | 0.80 | 0.45 | 1.40 | 0.60 | 0.40 | 1.50 |
| 0805 | 2.90 | 1.25 | 0.90 | 1.80 | 0.80 | 0.50 | 2.00 |
| 1206 | 4.10 | 1.60 | 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 |



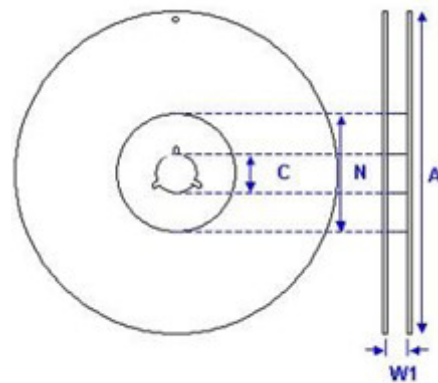
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PACKAGE DIMENSION AND QUANTITY

| 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, in which the 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 deepen 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/batch | DPA | | AEC-Q200-5 | internal component integrity |
| 5/batch | Dimension | CECC-32100-4.5 | AEC-Q200-5 | according to datasheet |
| 5/batch | Resistance to soldering heat | CECC-32100-4.10 | AEC-Q200-15 | |
| 5/batch | Solderability | CECC-32100-4.11 | AEC-Q200-18 | |
| 10/batch | Voltage proof | CECC-32100-4.6.4 | | |
| 1/ceramic batch | 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

- 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 appendit 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 **Sn 96.5 Ag 3 Cu 0.5**

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.