

SOLDERING RECOMMENDATIONS

Ceramic Capacitors Monolithic Chips

SOLDERING RECOMMENDATIONS

1. Termination Selection:

- A. Our tin plate nickel barrier termination (Termination Code "B") is recommended for all attachment methods which use solder. skywell termination code B has a nickel barrier to prevent leaching of silver during the solder process.
- B. Use palladium silver (Termination Code "A") for all installation methods other than solder or solder paste. skywell palladium silver termination is an ideal termination for conductive epoxy installation used for hybrid applications.

2. Chip Size vs. Solder Profile:

- A. 0201 0402,0603,0805,1206,1210 and 1812 may be used in all three solder systems shown on the next page.
- B. Sizes 1825 and larger should be reflow or vapor phase soldered. wave solder is not recommended for these larger chip capacitor body size.
- C. Solder profiles should be properly controlled to minimize any thermal shock to the capacitor(s). (See Soldering Techniques.)

3. Soldering Flux:

Use mildly activated rosin flux RMA or RA types or low residue liquid fluxes (no-clean flux). Flux residues from no-clean flux can be removed with aqueous cleaners. During wave soldering ensure that the majority of solvents are removed at preheat.

4. Solder Type:

Follow the soldering curves shown on next page.

6. Soldering With a Solder Iron:

Preheat part before soldering to a temperature of +100°C to +120°C (hotplate, blow drier). The soldering iron must be temperature controlled, not to exceed +280°C with a maximum soldering time of 5 seconds. Use a 30W (max.) soldering iron with a tip diameter of 3mm (max.) it is advisable to effect the transmission of heat through the soldering material. Reflow, wave or vapor phase systems are recommended. Attachment by soldering iron is not recommended, however, if used, the following precautions should be followed:

- A. Use a low wattage iron (30 watts maximum).
- B. Use the lowest tip temperature setting possible (+280°C maximum).
- C. Use a soldering tip no greater than 0.120" [3.0mm] in diameter.
- D. Preheat the chip capacitor to +150°C minimum. Use hot air flow for preheat.
- E. When removal of chip capacitor is necessary, do not touch the bare ceramic chip capacitor body with the soldering iron. Apply the heat through the solder (iron top to mounting pad) or, if absolutely necessary, apply the iron tip to the solder fillet.

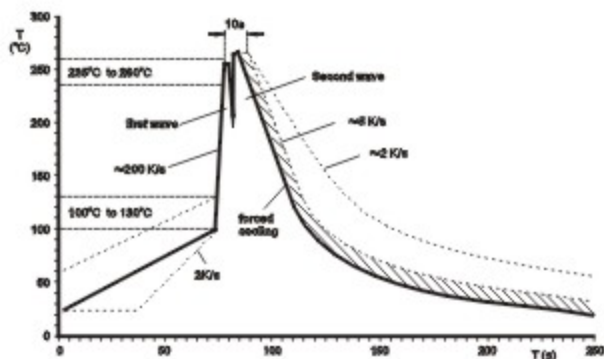
7. Cool Down:

After soldering, allow the chip to cool at room ambient conditions, as an expedited cool down (fans, cold cleaning solutions, etc.) could result in thermal shock cracking.

8. Cleaning:

Selection of an appropriate cleaning solvent is dependent upon the type of flux used. Cleaning in alcohol, water, hydrocarbons or any of the common, halogenated degreaser solvents is not detrimental to skywell chip capacitors.

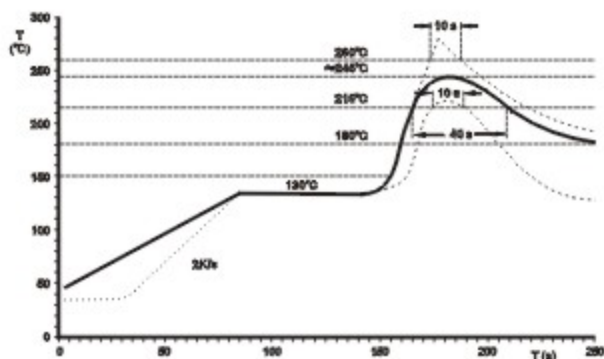
WAVE SOLDERING



Skywell offers the following recommendations:

1. Set dwell time in the solder wave 2 to 3 seconds. Solder pot set at +240°C to +260°C. Belt speed at 3 to 5 feet/minute
2. Adjust Flux station (foam, spray or wave) topside preheat at +80°C to +105°C.
3. Set preheat \approx +100°C below the solder wave temperature. Usually maximum underside PC board temperature at last preheat zone is +150°C. Preheat rate should be 1.5 to 2.5°C/second.
4. Do not force cool the PC board. Maintain a uniform profile.
5. Finally check that the delta difference between the solder temperature and the temperature as the PC board leaves the last preheat zone is +100°C or less. Chip size and mass make some type more prone to thermal shocking during the soldering operation, leading to insulation resistance (IR) failures in use. Skywell does not recommend wave soldering chips \geq 1825 size.

REFLOW SOLDERING

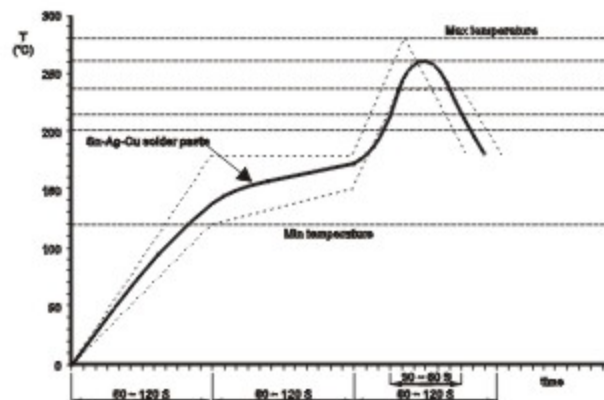


The reflow soldering using no-clean lead free solder paste for mounting ceramic chip capacitors has grown wide acceptance. Chip capacitors may develop thermally induced cracks if the temperature changes in reflow process are not controlled. Skywell offers the following recommendations:

1. Set peak reflow temperature at +215 to +260°C based on paste melting point. Typical paste melting point = +183°C. dwell at peak temperature should be 10 seconds.
2. First preheat zone temperature elevation at +150°C \pm 10°C, ramp rate 3°C/second.
3. Second preheat zone temperature +150°C \pm 10°C, ramp rate of 0.1°C/second. Set preheat for \leq 60 seconds. Long preheat times could cause solder balls near the capacitor/ other components.
4. Adjust reflow zone temperature to +150°C \pm 10°C, to +225°C \pm 5°C at ramp of 4 to 5°C/second. Total time at reflow over +200°C should not exceed 15 to 20 seconds.
5. Use natural cooling at the final cooling zone. Maintain a uniform profile no more than -3°C/second.

IR REFLOW SOLDERING

IR REFLOW WITH SnAgCu SOLDER



IR REFLOW WITH SnPb SOLDER

