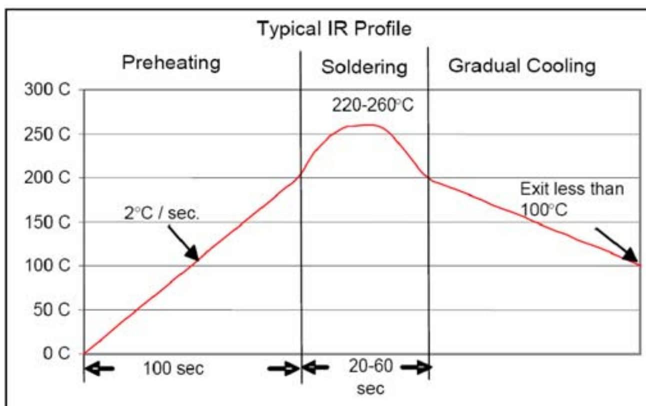
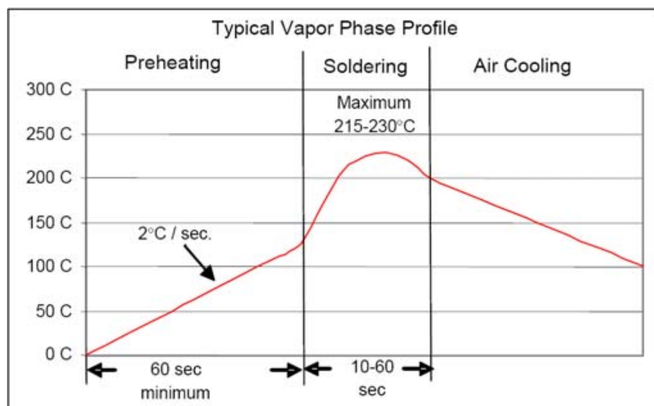
Recommended Solder Attachment Techniques for Multilayer Chip and Pre-Tinned Capacitors

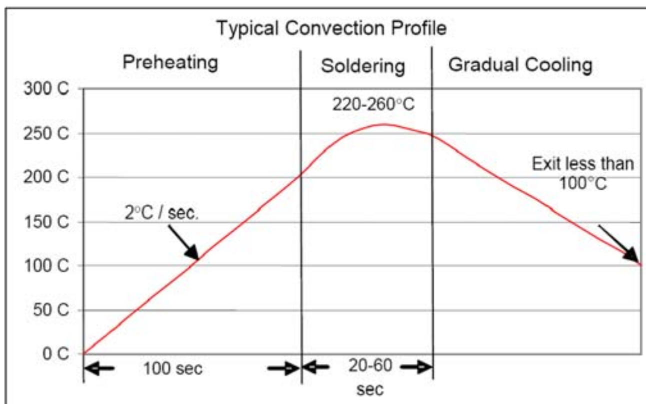
knowles
DLI•Novacap•Syfer•Voltronics

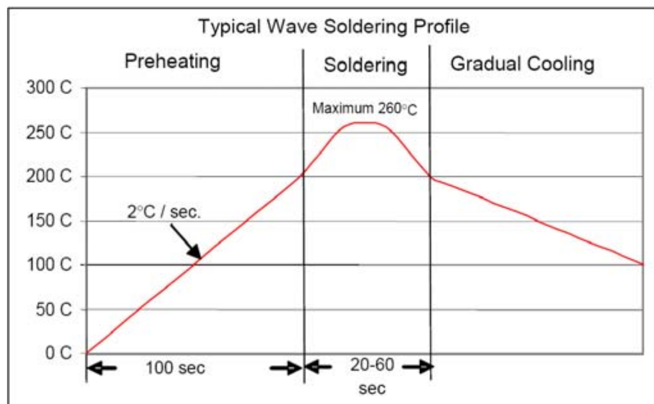
DLI recommends three methods of reflow solder attachment: IR Reflow, Vapor Phase Reflow, and Hot Air Convection Reflow. Ideal profiles for any of the methods should exhibit a ramp up of approximately 2°C/second. It is advised not to exceed 4°C/second. In all applications, DLI recommends that the chip user employ a pre-heat temperature to within 100°C of the working temperature of the user's machine.

TYPICAL REFLOW PROFILES









Hand Soldering

Hand soldering with a soldering iron is an individual process, each solder connection can see different temperatures, stresses, and solder. The following hand soldering technique is recommended for proper installation of a chip capacitor across two lands of a printed circuit board.

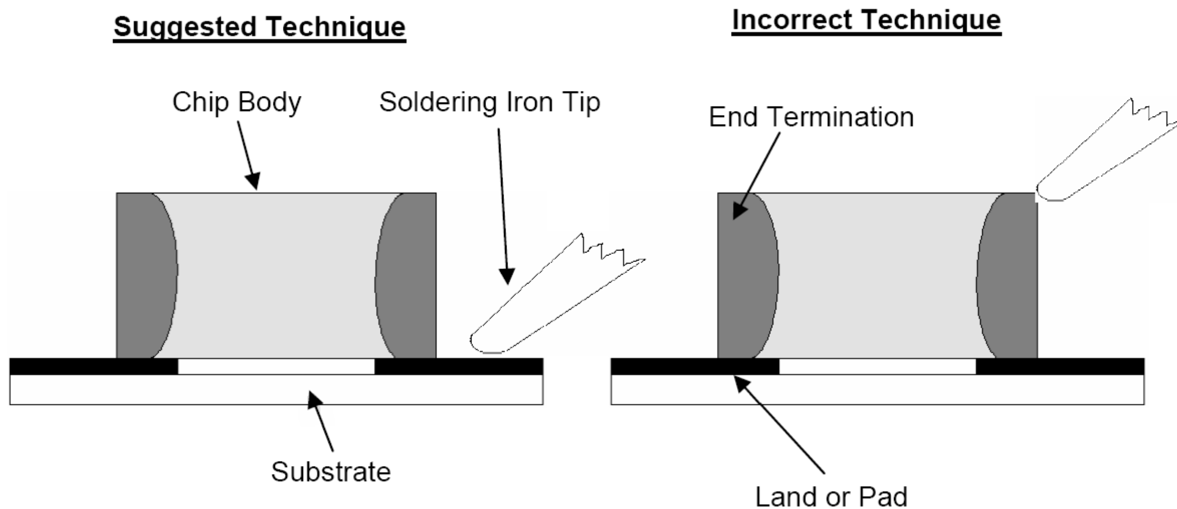
a. Carefully pick up the capacitor to be soldered with stainless steel tweezers, damage will not occur to the ceramic if handled carefully, and will act as a heat sink when soldering.

b. Place a drop of flux on each termination of the capacitor. Alpha 611 type RMA equivalent is recommended.

c. Place the capacitor on the circuit board across the two land areas. To prevent thermal shock, it is recommended to preheat the chip and the board or substrate to 50-70°C below the reflow temperature of the solder used. DLI recommends the use of SN60/SN62/SN63 type solders.

d. Determine which land is larger on the circuit board. The smaller land should be soldered first while holding the chip in place with tweezers. If necessary, apply solder past to the chip and land area.

e. Making sure that the capacitor is held flat on the board, place the soldering iron tip on the land at the chip termination-land interface. The soldering iron should have a temperature controlled tip not to exceed 310°C ±10°C. When the solder begins to flow, slowly move the tip of the soldering iron towards the chip, and then quickly remove the iron.



f. After examination of the chip to assure that it is flat on the board, repeat the previous step.

g. The solder fillet should be evenly flowed and free of solder peaks and voids.

h. The assembly is complete; flux residue should now be removed by using 2-propanol or other flux removal solvents. If possible, use ultrasonic cleaning during this process.

Dielectric Laboratories Inc.
2777 Route 20 East, Cazenovia, NY 13015
QUALITY SYSTEMS ISO 9001 AND AS9100 CERTIFIED

Phone: (315) 655-8710 Fax: (315) 655-8179
Email: sales@dilabs.com Web: www.dilabs.com
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Termination Systems

Part Number Code	Termination System	Applications
T	• Ag Termination • Ni Barrier Layer • Heavy SnPb Plated Solder	• High Reliability Applications • Hand Soldering
U	• Ag Termination • Ni Barrier Layer • SnPb Plated Solder	• High Reliability Applications • High Volume and Hand Solder Assembly
S RoHS	• Ag Termination • Ni Barrier Layer • Au Flash	• Specialty Solder and Epoxy Applications • Standard for 0402 Case Size
Z RoHS	• Ag Termination • Ni Barrier Layer • Sn Plated Solder	• High Volume and Hand Solder Assembly
E RoHS	• Ag Termination • Enhanced Ni Barrier Layer • Sn Plated Solder	• High Volume and Hand Solder Assembly • Ultra Leach Resistant
P RoHS	• AgPd Termination	• Non-Magnetic Applications
Q RoHs	• Polymer Termination • Ni Barrier Layer • Sn Plated Solder	• Resistant to Cracking • High Volume and Hand Solder Assembly
Y	• Polymer Termination • Ni Barrier Layer • SnPb Plated Solder	• Resistant to Cracking • High Reliability Applications • High Volume and Hand Solder Assembly
M RoHS	• Polymer Termination • Cu Barrier Layer • Sn Plated Solder	• Resistant to Cracking • Non-Magnetic Applications • High Volume and Hand Solder Assembly
W RoHS	• Ag Termination • Cu Barrier Layer • Sn Plated Solder	• Non-Magnetic Applications • High Volume
H RoHS	• Ag Termination • Enhanced Cu Barrier Layer • Sn Plated Solder	• Non-Magnetic Applications • High Volume and Hand Solder Assembly • Ultra Leach Resistant
V	• Ag Termination • Cu Barrier Layer • SnPb Plated Solder	• Non-Magnetic Applications • High Reliability Applications • High Volume and Hand Solder Assembly
R	• Ag Termination • Cu Barrier Layer • Heavy SnPb Plated Solder	• Non-Magnetic Applications • High Reliability Applications • Hand Soldering

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Phone: (315) 655-8710 **Fax:** (315) 655-8179
Email: DLISales@knowles.com
Web: www.knowlescapacitors.com
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