

APPLICATION NOTES

STORAGE

To prevent the damage of solderability of terminations, the following storage conditions are recommended:

- Ambient temperature less than 40°C.
- Relative humidity less than 70% RH.
- No harmful gases containing sulfur or chlorine.

In the case of bulk packaging do not unpack the minimum package. In case of unpacking, seal again or store in a desiccator containing drying agent.

HANDLING

Chip Capacitors should be handled with care to avoid contaminatin or damage. The use of vacuum 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 4°C per second and the final preheat temperature should be within 100°C of the soldering temperature for small chips such as 0603, 0805 and 1206, within 50°C of the soldering temperature for bigger chips such as 1210 and 1812, etc.

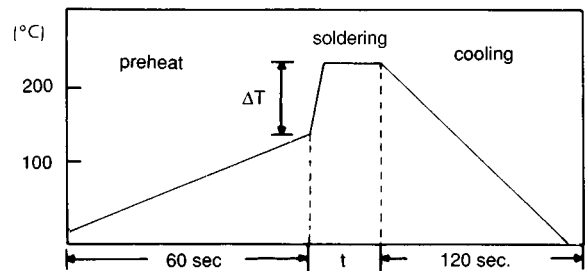
SOLDERING

Use mildly activated rosin RA and RMA fluxes, do not use acivated 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.

Hand soldering with temperature-controlled iron not exceeding 30 watts and diameter of tip less than 1.2 mm is recommended, tip of iron should not contact the ceramic body directly, and the temperature of iron should be set to not more than 260°C.

For bigger chips such as 1210, 1808 and 1812, etc. wave soldering and hand soldering are not recommended.

Recommended soldering profiles as following:



Soldering	Solder Temp. (T)	Soldering Time (t)
Reflow	220-240°C	<15 sec.
Wave	230-250°C	<5 sec.

Chip Size	ΔT
0402, 0603, 0805, 1206	100°C
1210, 1808, 1812	50°C

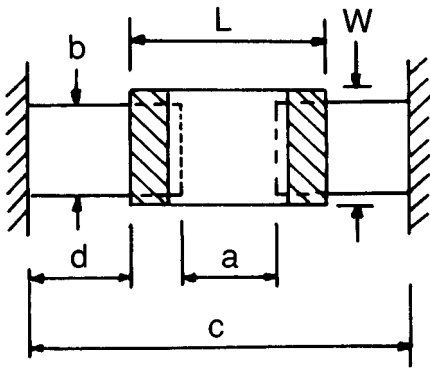
COOLING

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. A cooling rate not exceeding 4°C per second should be used when forced cooling is necessary.

CLEANING

All flux residue must be removed by using suitable electronic-grade vapor-cleaning solvents to eliminate contaminations 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 dependent upon many factors such as component mix, flux, solder paste and assembly method. The ability of the cleaning system to remove flux residues and contamination from under the chips is very important.

RECOMMENDED PAD DIMENSIONS



Unit: mm (inches)

Chip Size	L	W	a	b	c	d
0402	1.0 (.039)	0.5 (.02)	0.6 (.023)	0.6 (.023)	1.7 (.067)	0.35 (.014)
0603	1.6 (.063)	0.8 (.032)	0.7 (.028)	0.7 (.028)	2.1 (.083)	0.7 (.028)
0805	2.0 (.080)	1.2 (.050)	1.0 (.040)	1.0 (.040)	2.6 (.102)	0.8 (.032)
1206	3.2 (.126)	1.6 (.063)	2.2 (.087)	1.4 (.055)	4.4 (.173)	1.1 (.043)
1210	3.2 (.126)	2.5 (.100)	2.2 (.087)	2.2 (.087)	4.4 (.173)	1.1 (.043)
1808	4.5 (.177)	2.0 (.080)	3.5 (.137)	2.8 (.110)	6.7 (.264)	1.1 (.043)
1812	4.5 (.177)	3.2 (.126)	3.5 (.137)	2.8 (.110)	6.7 (.264)	1.1 (.043)