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MLCC Application Guide

1 Storage condition

1.1 The capacitors must be stored in an ambient temperature between 5 to 40℃ with a relative humidity of 20 to 70%. The products should be used within 12 months upon receipt.

1.2 The capacitors must be operated and stored in an environment free of dew condensation and these gases such as Hydrogen Sulphide, Hydrogen Sulfate, Chlorine and Ammonia and sulfur.

1.3 Avoid storing in direct sunlight, excessive shock, vibration and falling of dew.

1.4 Do not use capacitors under high humidity and high and low atmospheric pressure which may affect capacitors reliability.

2 Footprint design

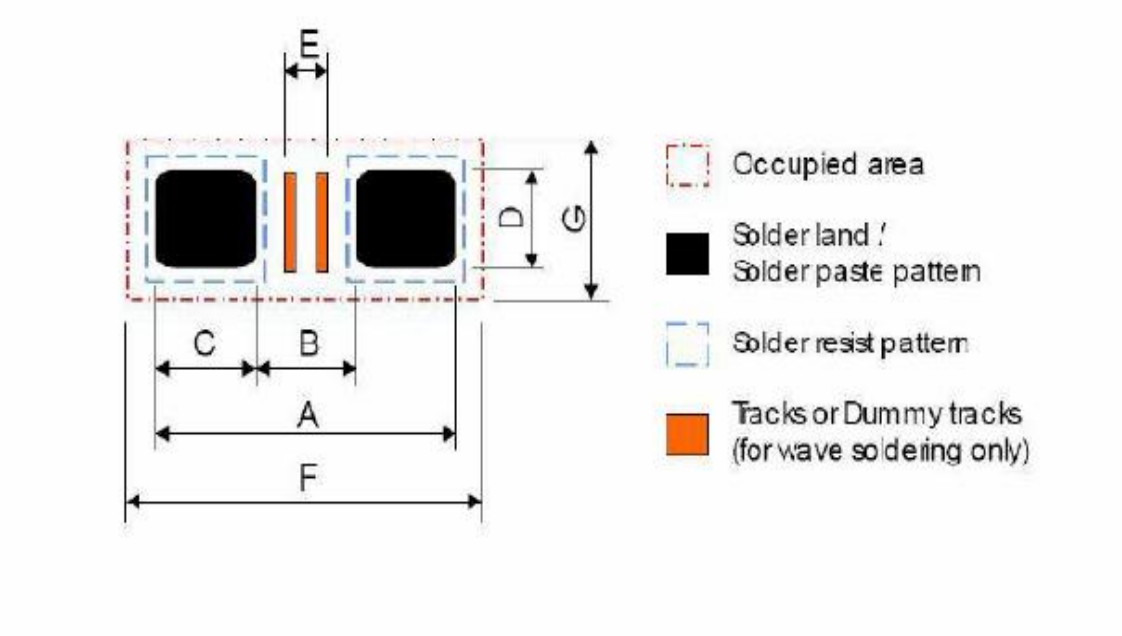
2.1 The amount of solder at the terminations has a direct effect on the reliability of the capacitors.

2.2 The greater the amount of solder, the higher the stress on the chip capacitor, and the more likely that it will break. When designing a PCB, determine the shape and size of the solder pads to have proper amount of solder on the termination.

2.3 Avoid using common solder pads for multiple terminations and provide individual solder pads for each terminations.

2.4 A typical SMD footprint, as shown in following figure is composed of. These footprint details depends on the following parameters:

- Components dimensions and tolerances as given in the components data
- Board dimensional accuracy
- Placement accuracy of the components with respect to the solder lands on the board
- Solder paste position tolerance with respect to the solder lands (for reflow soldering only)
- The soldering process parameters
- Solder resist position tolerances with respect to the solder lands
- Solder joint parameters for reliable joints



n Reflow Soldering

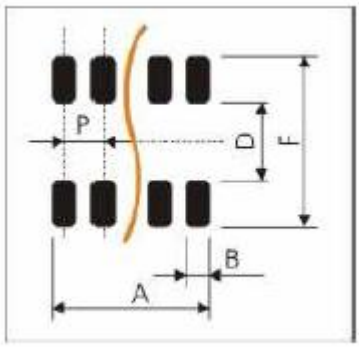
SIZE	Footprint dimensions in mm							Processing remarks	Placement accuracy
	A	B	C	D	E	F	G		
0201	0.65	0.23	0.21	0.30	N/A	0.90	0.60	Reflow or hot plate soldering	±0.05
0402	1.50	0.50	0.50	0.50	0.10	1.75	0.95		±0.15
0508	2.50	0.50	1.00	2.00	0.15	2.90	2.40		±0.20
0603	2.30	0.70	0.80	0.80	0.20	2.55	1.40		±0.25
0612	2.80	0.80	1.00	3.20	0.20	3.08	3.85		±0.25
0805	2.80	1.00	0.90	1.30	0.40	3.05	1.85		±0.25
1206	4.00	2.20	0.90	1.60	1.60	4.25	2.25		±0.25
1210	4.00	2.20	0.90	2.50	1.60	4.25	3.15		±0.25
1808	5.40	3.30	1.05	2.30	2.70	5.80	2.90		±0.25
1812	5.40	3.30	1.05	3.80	3.00	5.65	4.05		±0.25
1825	5.40	3.30	1.05	6.73	3.00	5.65	7.00		±0.25
2211	7.00	4.30	2.00	3.70	N/A	7.60	4.10		±0.30
2220	7.00	4.30	2.00	5.00	N/A	7.60	5.50		±0.30
2225	7.00	4.30	2.00	6.73	N/A	7.60	7.00		±0.30

n Wave Soldering

SIZE	Footprint dimensions in mm							Proposed No. & dimensions of dummy tracks	Placement accuracy
	A	B	C	D	E	F	G		
0603	2.40	1.00	0.70	0.80	0.20	3.10	1.90	1x(0.20x0.80)	±0.25
0805	3.20	1.40	0.90	1.30	0.36	4.10	2.50	1x(0.30x1.30)	±0.25
1206	4.80	2.30	1.25	1.70	1.25	5.90	3.20	3x(0.25x1.70)	±0.25
1210	5.30	2.30	1.50	2.60	1.25	6.30	4.20	3x(0.25x2.60)	±0.25

n Footprint for Capacitor Array

Type	0603*4	0402*4
A	2.85+0.1/-0.05	1.80±0.10
B	0.45±0.05	0.25±0.05
D	0.80±0.10	0.65±0.05
P	0.80	0.50
F	3.10±0.30	1.85±0.25



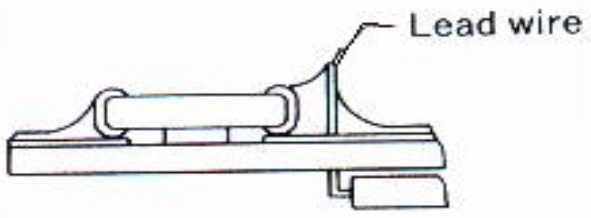
n PCB Design

Chip components are susceptible to board stress since the component itself is mounted directly on the board. They are also sensitive to mechanical and thermal stress when solder, which may cause chip cracked. Please take solder form and component layout into consideration to eliminate stress.

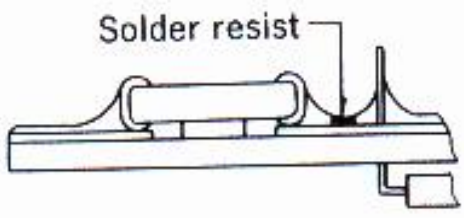
u Pattern form

(1) Placing of chip components and component.

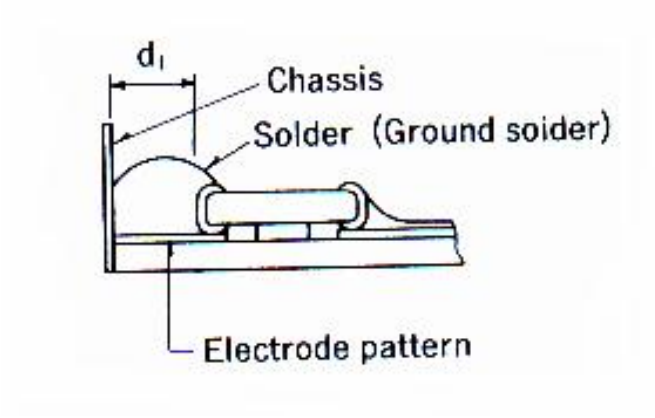
incorrect

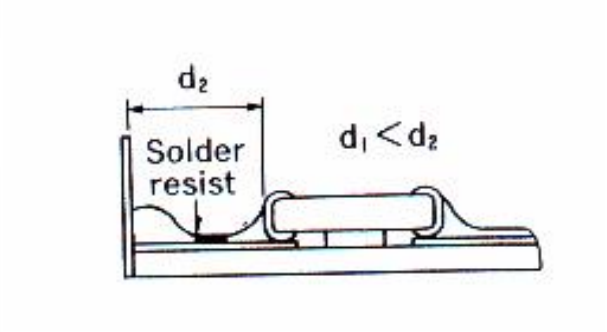


correct

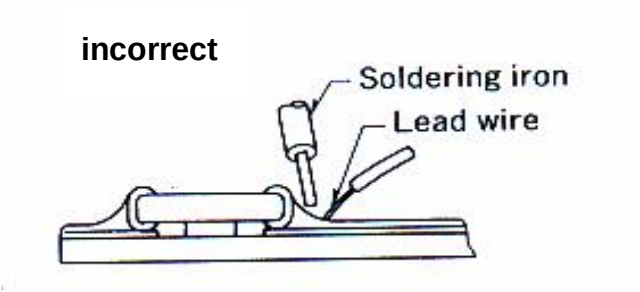


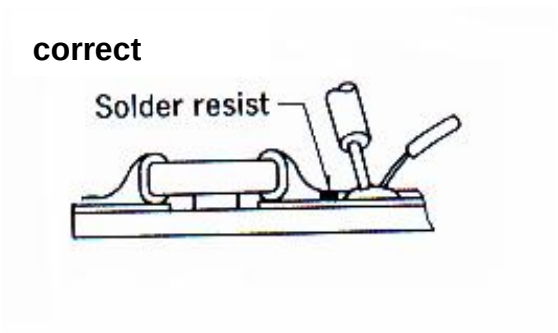
(2) Placing close to chassis.



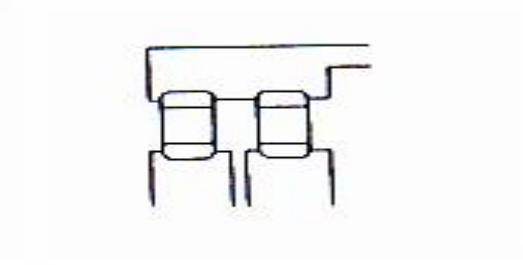


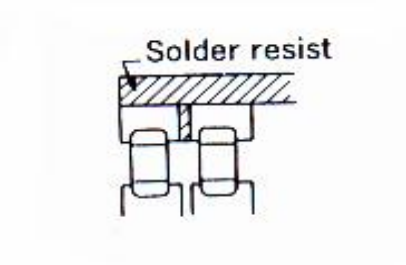
(3) Placing leaded components after chip component.





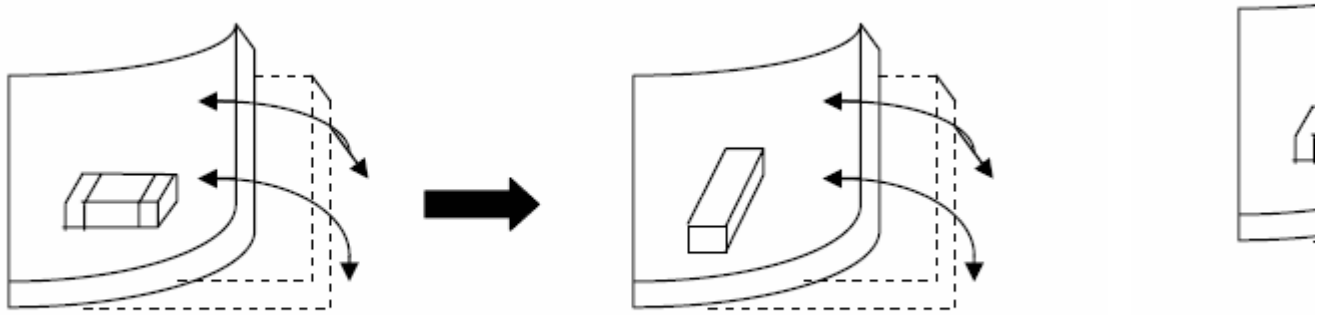
(4) Lateral mounting





u Component Direction

(1) put the component lateral to the direction in which stress acts.



(2) Component layout close to board separation point.
Susceptibility to stress in the order: A＞C＞B＝D