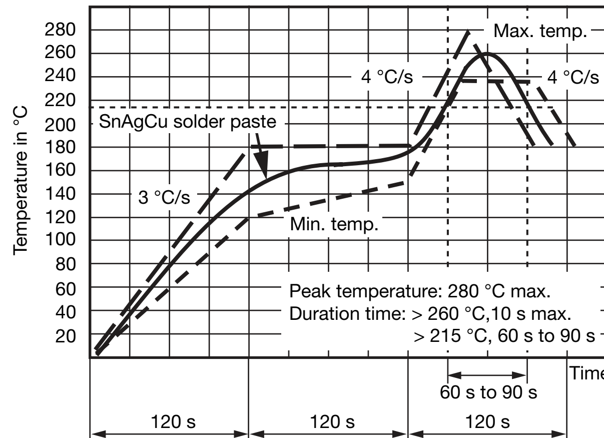
Surface Mount Multilayer Ceramic Chip Capacitors for Commodity Applications

RECOMMENDED SOLDERING CONDITIONS

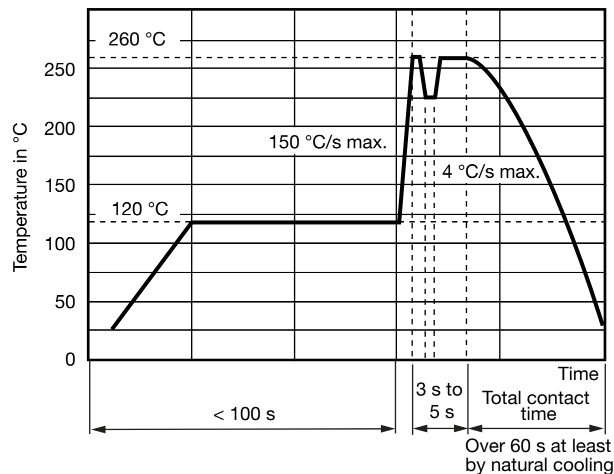
Lead (Pb)-free terminated MLCCs are not only used on SMT with lead (Pb)-free solder paste, but also suitable to be used with lead-containing solder paste. In case the optimized solder joint is requested, increasing soldering time, temperature and concentration of N_2 within the oven are recommended.

SOLDERING PROFILES

Recommended IR reflow soldering profile for SMT process with SnAgCu series solder paste



Recommended wave soldering profile for SMT process with SnAgCu series solder



For technical questions, contact: mlcc@vishay.com

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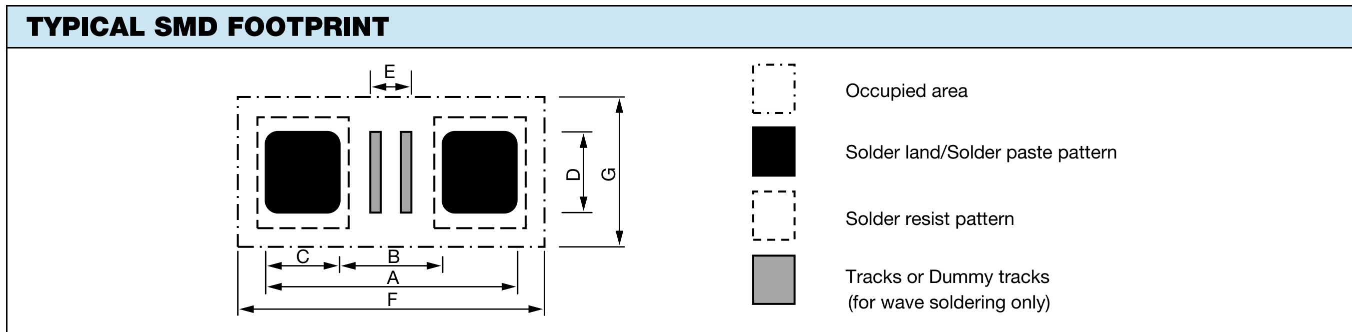
FOOTPRINT DESIGN

Circuit board design first steps are to consider how the surface mount board will be manufactured. The manufacturing process determines the necessary dimensions of the solder land, the minimum spacing between components, the area underneath the SMD where tracks may be laid down and the required component orientation during wave soldering. Therefore a footprint related to the manufacturing process with all this information is an essential tool for SMD circuit board design.

Footprint details depend on following parameters:

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

TYPICAL SMD FOOTPRINT



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	0.40	0.50	0.50	0.10	1.75	0.95		± 0.15
0603	2.30	0.70	0.80	0.80	0.20	2.55	1.40		± 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

WAVE SOLDERING

SIZE	FOOTPRINT DIMENSIONS IN mm							PROPOSED NUMBER AND 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	1 x (0.20 x 0.80)	± 0.10
0805	3.20	1.40	0.90	1.30	0.36	4.10	2.50	1 x (0.30 x 1.30)	± 0.15
1206	4.80	2.30	1.25	1.70	1.25	5.90	3.20	3 x (0.25 x 1.70)	± 0.25
1210	5.30	2.30	1.50	2.60	1.25	6.30	4.20	3 x (0.25 x 2.60)	± 0.25

FOOTPRINT FOR MLCC CHIP ARRAY

SIZE	DIMENSIONS IN mm
A	2.85 + 0.10 / - 0.05
B	0.45 ± 0.05
D	0.80 ± 0.10
P	0.80
F	3.10 ± 0.30

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