

Precautions for Soldering (page-1)

1. Reflow Soldering

Special attentions should be paid to Film Capacitors in soldering as compared with other types of SMD products. Please see the below items to avoid defects of wetting and tombstone.

1-1. Soldering Ability

Soldering problem might happen with ECHU(B) and ECWU(B) due to the shape of the electrode edge. Therefore ECHU(X) and ECWU(X) that have improved soldering performance would be recommended. Please press the button below for the differences in between (B)type and (X)type and comparison data for soldering ability.

Outer electrode constructions of (B) / (X)

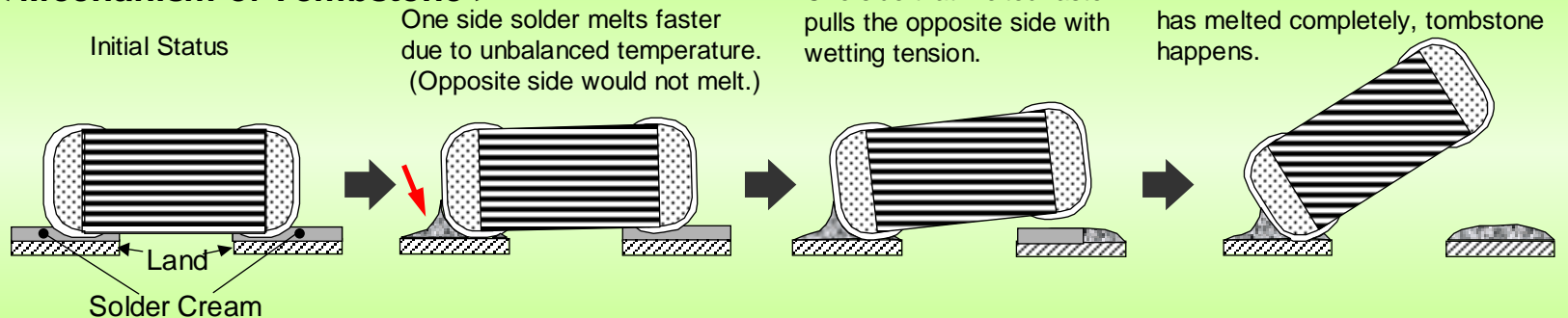
Soldering test result for (X)

1-2. Tombstone

(1) Mechanism of Tombstone

In reflow soldering, soldering timing of the right and left electrode might not go together. When soldering timing of cream solder in right and left electrode would be different, tombstone might happen under the below mechanism.

< Mechanism of Tombstone >



Precautions for Soldering (page-2)

<(X)type shape of electrode >



(2)Cause of tombstone is as follows.

- 1)Weight is lighter than other products.-----1/2 or 1/3 of the same size of MLCC.
- 2)Shape of the electrode is round. -----(X)type has a round shaped electrode shown in the right.
(B)type has unstable soldering ability in the edge of electrode.

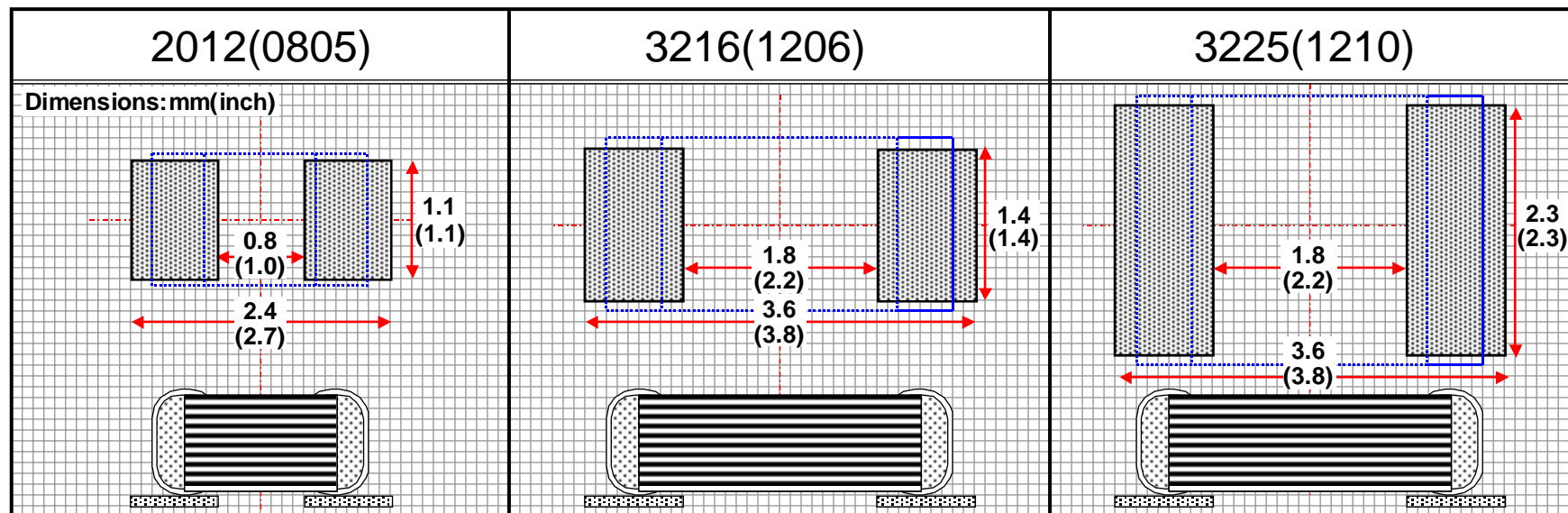
(3)Countermeasures

Please use (X)type for reflow soldering. (B)type is for flow soldering only.

Tombstone is controlled by soldering conditions. The items below are major factors to be specified.

1)Land Pattern

1.Please use the recommended size of land pattern shown below.



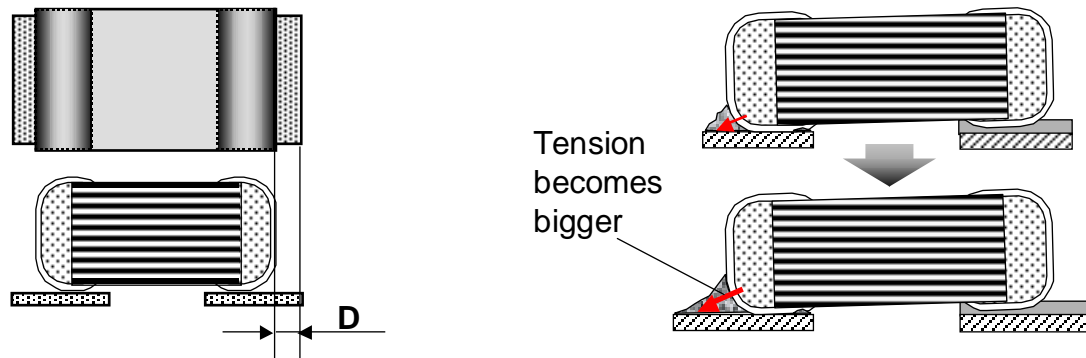
Please click the button, when you refer to precaution of soldering.

Basic precaution of soldering

Precautions for Soldering (page-3)

2. Tombstone is controlled by the size of land pattern. When dimension (D) shown in the below chart is bigger, wetting tension becomes larger due to much amount of solder and the possibility of tombstone becomes bigger.

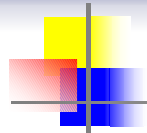
Therefore, special attention should be paid to dimension (D). The recommended land pattern includes its special notice.



3. When land pattern could not be changed to the recommended one shortly, Even a metal mask that is adjusted its dimension to the recommended land pattern could improve tombstone defect sharply.

2) Unbalanced Temperature in between right and left electrode

The major cause of tombstone is a different melting timing of right and left cream solder. "When a large component is placed near one side electrode" or "When land is patterned to concentrate heat easily or parts are connected by pattern", speed of temperature rise of each side electrode would be different and unbalanced temperature would make tombstone.



Precautions for Soldering (page-4)

1) Solder Cream

1. Thickness

0.1...0.15mm is a general thickness for current reflow soldering. (Panasonic recommended is 0.1...0.15mm).

The thicker solder would make the possibility of tombstone bigger because of larger wetting tension caused by much cream solder.

2. Types of Cream Solder

Types of cream solder have a tendency shown below.

Sn=6:Pb=4 solder would melt suddenly when it reaches around the melting point of 183 degree C.

Such a sudden melting solder (Narrow melting range) would have tombstone happen more easily.

Wide melting solder that contains Ag would prevent tombstone because of little temperature gap in between each side electrode.

4) Temperature Profile

It has not been confirmed how temperature profile affects tombstone. However, insufficient preheating or low temperature profile (around melting point) could be a cause of tombstone.

Please use components according to the specifications.

Specification

2. When use ECHU(B) or ECWU(B)

ECHU(X) and ECWU(X) that have improved wetting ability, tombstone and shape of electrode are available. (Please contact when ECHU(X) or ECWU(X) would have soldering problems.)

ECHU(X) and ECWU(X) are for reflow soldering only. And ECHU(A) has a same electrode constructions as ECHU(X) and ECWU(X) have.

Please contact if you have any queries or problems after checking the items above.