

Electromigration effect on the microstructure of Tin foil

Abstract

Electromigration is a generic reliability issue in very large scale integrated device. Often, it will cause the failure of interconnect line. As the trend of miniaturization in flip chip package continues, electromigration in solder joints becomes a serious reliability issue. Tin is the most common element in solder alloys. The focus of this research work was to study the electromigration effect on the microstructure of tin foil. The experimental content was divided into two parts. The first part is the tin stripe stressed by current density of 2×10^4 A/cm² at room temperature and 100 °C, respectively. The second part the thermal annealing process for 200 °C. The purpose of the second part is to compare the current effect with sample in the first.

After current stressing, hillocks were observed in the anode region and voids were observed in the cathode region. Interestingly, we found that the hillocks were tilted. Besides, we also found that the electromigration effect will become serious on the tin microstructure.