Materials Science & Engineering Master's Defense

Effect of Grain Orientation on Electromigration in Sn-0.7Cu Solder Joints

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abstract

Microelectronic industry is continuously moving in a trend requiring smaller and smaller devices and reduced form factors with time, resulting in new challenges. Reduction in device and interconnect solder bump sizes has led to increased current density in these small solders. Higher level of electromigration occurring due to increased current density is of great concern affecting the reliability of the entire microelectronics systems. This presentation reviews electromigration in Pb- free solders, focusing specifically on Sn0.7wt.% Cu solder joints. Effect of texture, grain orientation, and grain-boundary misorientation angle on electromigration and intermetallic compound (IMC) formation is studied through EBSD analysis performed on actual C4 bumps.

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