

A Study of Au-Si Eutectic Bonding with Embedded Barrier Layers

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Abstract

To prevent the inter-diffusion of Au and Si using gold-silicon eutectic bonding technology for VLSI applications, a study of the properties of the embedded barrier layers between the gold and silicon surface has been carried out in this paper. The optimum embedded barrier layer has been successfully developed. Using PECVD nitride forms the best performance of the embedded barrier layer. After leakage current measurement, the embedded barrier layer own larger resistance after high temperature treatment. In addition, the embedded barrier layer has larger resistance to prevent the inter-diffusion of gold and silicon during the eutectic bonding process. Furthermore, the surface roughness of gold is increased with the increasing temperature from the SEM characterization. The surface roughness also affects the bonding quality and the bonding strength during the bonding process.

Keyword : Keywords: eutectic bonding technology and embedded barrier layer