액상 80Au-20Sn 솔더와 UBM(Au/Ni(V)/Al)의 계면현상에 대한 고찰

(Microstructural Evolution of the Joint Interface between Eutectic 80Au-20Sn Solder and Under Bump Metallurgy)

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Abstract

The interfacial reaction of the eutectic Au-Sn solder with the sputtered UBM (Au/Ni(V)/Al) was studied at 300°C. By 20 sec soldering, the protective Au layer was dissolved away and the Ni(V) layer partially started to be dissolved into the solder and thus some of the Au reacted with the Al underlayer to form the Au_8Al_3 phase, which accompanied volume expansion at the joint. Thereby, the $(Au,Ni)_3Sn_2$ layer was lifted up and several interlocked $(Au,Ni)_3Sn_2$ grains were broken and separated at weak points along the joint interface. In this way, the joint interface was separated from the Si chip and a resultant failure occurred in the device.