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電解Ni/Auめっきを用いたBGA鉛フリーはんだ接合部の衝撃信頼性におよぼすNiめっき条件の影響

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Effect of Ni Plating Condition on Lead-Free Solder Joints Reliability of BGA Using Electroplated Ni/Au under Impact Load

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Abstract

Tests were performed to evaluate the impact strength and analyze the fracture mechanism of Sn–3mass%Ag–0.5mass%Cu solder joints on electroplated Ni/Au BGAs. The impact strength of solder joints deteriorates with higher concentrations of impurities (Cl, S, C) in the Ni plating film on the BGA substrates. These impurities are mixed into the Ni plating film during the plating process, and the concentration of the impurities is increased by Ni plating bath contamination ascribed to the solder mask of the BGA substrates. To improve the impact strength of the BGA solder joints, we must lower the concentration of these impurities in the Ni plating film. This requires 1) selection of a solder mask material that does not contaminate the Ni plating bath, 2) prevention of contamination from other sources, and 3) sanitization of the plating bath.

Key Words: *Sn–Ag–Cu Solder, BGA, Intermetallic Compound, Impact Load, Electroplated Ni/Au, Solder Mask*