

Title : A study of Advance Acid Decapsulation of Copper Wire-bonded Package

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## ABSTRACT

This project, we investigated chemical decapsulation methods of copper wire-bonded packages to prevent or minimize corrosion of the copper wire and internal components of an integrated circuit (IC). The decapsulation process uses a mixed acid solution of nitric and sulfuric acids to dissolve the package's mold compound, exposing the semiconductor chip, copper wire, and bonding materials for the failure analysis (FA). We systematically varied the ratios of the acid mixture to reduce surface damage caused by corrosion, particularly from nitric acid. After decapsulation, a scanning electron microscope (SEM) was used to observe and evaluate the surfaces of the copper wire and bonding area. The optimal acid ratio resulted in significantly better surface quality, as evidenced by SEM images, compared to conventional methods. Additionally, we explored an integrated decapsulation method that incorporated cathodic protection to further mitigate nitric acid corrosion.

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