Preparation of Au-less surface finish on PCB for wire bonding with the galvanic displacement reaction of Pd-Cu alloy layer

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Recently, the efforts are required to reduce the gold amount on PCB where the wire bonding has to be processed, due to the increase of gold price. So far, to eliminate gold layer on the PCB surface, the use of pure palladium layer for wire-bonding substrate and the direct wire-bonding on the copper after protection from the oxidation with self-assembled molecules. These approaches, however, were not applicable yet because of poor bonding performance.
In this presentation, the advanced Au-less surface finish will be introduced. As a first step, the Pd-Cu alloy layerwas fabricated by electrodepositionor electrolessdeposition, instead of the palladium layer of ENEPIG process. Subsequently,the copper in Pd-Cu layer has been replaced withgold by galvanic displacement reaction, in which the amount of gold is finely controlled.
The wire bonding performance on various gold thicknesses will also be presented, which has been measured usingKulicke&Sorra 4500 Series Manual Wire Bonders.