

ABSTRACT OF THE DISCLOSURE

ADHESION LAYER FOR THROUGH SILICON VIA METALLIZATION

5 To achieve the foregoing and in accordance with the purpose of the present invention, a method for forming copper filled through silicon via features in a silicon wafer is provided. Through silicon vias are etched in the wafer. An insulation layer is formed within the through silicon vias. A barrier layer is formed within the through silicon vias. An oxide free silicon, germanium, or SiGe adhesion layer is deposited over
10 the barrier layer. A seed layer is deposited over the adhesion layer then the wafers is annealed. The features are filled with copper or copper alloy. The stack is annealed.

FIG. 1