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SOME ASPECTS ON FREE AIR BALL (FAB) FORMATION OF COPPER WIRE BONDING

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ABSTRACT

Wire bonding is one of the popular interconnection methods in semiconductor device packaging. The most important technique in wire bonding process is the formation of Free Air Ball (FAB). The FAB form by Electric Flame Off (EFO) with diameter ranging from 1.5 to 2.5 times of the wire diameter. Copper wire ball bonding has been developed as an alternative method for gold wire ball bonding because of economic advantages, strong resistance to sweeping, superior electrical and mechanical performance. Copper wires normally being used in some low end ICs packages. Copper wire oxidizes readily at relatively low temperatures. During the formation of FAB, the copper wire must be enclosed in an inert gas environment in order to prevent oxidization of the FAB. This paper investigates the FAB formation for 50.8 μm (2 mil) copper wires due to various EFO parameters which are EFO current and firing time. It is found that the higher EFO current was needed to form copper FAB. The effect of firing time and FAB formation will briefly discuss in this paper. FAB would get symmetrical shapes and perfect surface in setting of high EFO current with low EFO time and in low EFO current with high EFO time.

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