Abstract

Pd-Coated Copper Ball Bonding Wire

[Object] To improve the reliability of the bonding strength of a palladium-coated copper wire for ball bonding when stitched on an aluminum electrode.

[Means to achieve the object]
Form a ultra thin gold (Au) layer having a thickness of 5 nm or smaller on the surface of a palladium (Pd) intermediate layer, and conduct a heat treatment in a hydrogen-containing inert atmosphere whereby the palladium of the intermediate layer invades the ultra thin gold layer to trigger the Stranski-Krastanov growth in which the infinitesimal gold phase and the palladium phase grow spatially with a result that a gold-palladium mixture layer is created. The palladium imbibes hydrogen during the heat treatment, and as it is rapidly cooled after the heat treatment, the palladium in the mixture layer is stabilized, and the palladium which melts quickly at the time of the formation of the molten ball and reaches an end face of the wire accompanying the gold that coats the wire end face melts and diffuses uniformly and densely through the surface layer of the molten ball, and restricts the oxidation of aluminum at the interface between the wire and the aluminum.