Title: Interfacial intermetallic developments of Sn-3.0Ag-0.5Cu-2.0ZnO lead free solder

Abstract: The interfacial intermetallic compound growth behavior of Sn-3.0Ag-0.5Cu lead free solder joints with 2.0wt.% ZnO of micrometer was investigated in this study. Solder joints were fabricated in F4N reflow furnace at 255℃for less than 5min and thereafter aged at 150℃ up to 240h. Results showed that both of Cu6Sn5 and Cu3Sn IMCs layer were almost layer type and grew thicker with extended aging time. The Cu6Sn5 and Cu3Sn IMCs were both diffusion controlled mechanism by diffusion growth kinetics analysis, moreover, the diffusion coefficient were calculated and compared with Sn-3.0Ag-0.5Cu solder, it revealed that ZnO powder can reduced the diffusion coefficient of interfacial intermetallic compound.