Tensile Test Behavior of the Eutectic Sn-Ag Solder Joint in Ball Grid Array Assemblies

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Abstract

The mechanical behavior of a Sn-3Ag-0.5Cu ball-grid array assembly was evaluated by tensile testing at a strain rate of 10-3 s-1 at various homologous temperatures in this study. The maximum stress of the Sn-3Ag-0.5Cu ball-grid array assembly decreased as the testing temperatures increased. At a strain rate of 10-3 s-1 and at homologous temperatures higher than 0.65, the crack propagation occurred at the angle 45 with the tensile axis. A transgranular fracture with creep voids was found on the failed surfaces of Sn-3Ag-0.5Cu ball-grid array assemblies.

Keyword：Sn-3Ag-0.5Cu solder, ball-grid array assembly, tensile test behaviors,
homologous temperatures, transgranular fracture