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Investigation of Thermal Reflow Profile for Copper Pillar Technology

Abstract

The reflow soldering process is crucial in flip chip applications for forming a high-quality interconnection joint. This paper aims to investigate the effect of bump diameters of solder bump and copper pillar bump on the reflow temperature distribution during the reflow soldering process. A simplified reflow oven is developed and the virtual reflow process is established using computational fluid dynamics (CFD) software. The simulation study is validated with the experiment result. The numerical findings show that the temperature distribution is uniform in the copper pillar bumps with different diameters but uneven for the solder bumps. This study provides a foundation and insights into the effects of copper pillar bump structure on the reflow temperature profile during the reflow soldering process.

Keywords

Computational Fluid Dynamics; Copper Pillar Technology; Infrared-Convection Reflow Oven; Surface Mount Technology