THERMAL CHARACTERIZATION OF THERMAL INTERFACE MATERIALS

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Abstract

Thermal management has become an increasingly important issue in the semiconductor industry. One aspect of the thermal management system is the efficient transfer of heat from flip-chip packages. And effective thermal interface material (TIM) is crucial when physically connecting different elements of the thermal management system together. This research focuses on the testing methodology and infrastructure to characterize the thermal properties of the TIM. A test system was developed following ASTM D5470 standard. The system maximum power is 150W and the optimized heating plate can reduce the in-plane temperature difference of all cross-sectional planes of the meter bar to less than 0.1℃. A 12.7×12.7 mm specimen size was selected to ensure that surface warpage was less than 2 um. A grease TIM was adopted to conduct an example characterization. The measurements of the thermal conductivity and contact impedance, and the relationship between the thermal impedance and compression force were established for material selection consideration.

Keyword：TIM,flip-chip