

PRACTICAL EVALUATION FOR LONG-TERM STABILITY OF THERMAL INTERFACE MATERIAL

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Abstract

This research proposes a practical evaluation methodology for long-term stability of thermal interface material (TIM). Instead of the ASTM D5470 testing standard, a thermal test vehicle with a sensors and heaters embedded thermal test chip was designed to conduct θ_{jc} measurement. Pre-condition, uHAST, TC and HTS are reliability test items to evaluate degradation of TIM performance using mechanical deformation, heat and moisture. An example study was performed to compare the θ_{jc} data between pre-stress and post-stress conditions. The comparison results show that uHAST and HTS tests have server degradations than other two reliability tests. For siloxane-based TIM, Heat and moisture are two major root causes to degrade TIM performance because of harden and de-adhesion. Good correlations were established between known chemical reactions and experimental data with measurable θ_{jc} quantities.

Keyword : TIM, long-term stability, degradation