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Reduction of delamination for MSOP Package in die attach process for integrated circuit package

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Delamination is a mode of failure for composite different materials and can cause layer to separate between silicon die and die attach material. Because there is a mismatch in the thermal of materials, lead to cracking and damaging on integrated circuit (IC) packages. In this study, we attempted to reduce the delamination of mini small outline package (MSOP) in die attach process. The roughened leadframe was treated by micro-etching method (ME version2), and then was plated with Ni/Pd/Au on copper base materials (known as PPF+ME2). The bond line thickness was controlled in the range 0.5-1.0 mil and also designed the experiment of cure profiles. The curing time was rapidly ramped up from existing temperature to 175 Celsius by 10 min and comparing with ramp up time by 30 min. The delamination inside the IC package was investigated by scanning acoustic microscope (SAM) after reliability test. The results shown that total curing time at 90 min (ramp up time to 175 Celsius by 30 min) and bond line thickness setting greater than 0.5 mil didn't show delamination. Finally, we can confirm that the delamination risk was reduced and IC package can be used in the temperature range of -65 Celsius to 150 Celsius.

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