

**EFFECT OF MOLDING COMPOUND AND DIE ATTACH ADHESIVE MATERIAL
ON QFN PACKAGE DELAMINATION AND
WARPAGE ISSUES**

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ABSTRACT

The presence of thermal mismatch between different materials of plastic IC packages was found to cause reliability and moldability issues such as delamination and warpage phenomenon. Delamination and warpage between the mold compound and die attach adhesive material were evaluated for Quad Flat No-lead (QFN) package. Evaluation was conducted on two set of different materials combination of epoxy mold compounds (EMC A & EMC B) and epoxies (Epoxy A and Epoxy B). The objective of this evaluation is to qualify QFN green compound with die attach adhesive material and pass MSL-1 with 3xIR reflow @ 260 °C. The effect of material properties performance of both materials were also studied. The delamination was observed between the mold compound and epoxy by using C-SAM technique. From the C-SAM image, delamination almost occur at bottom of the die to epoxy die attach, epoxy die attach to top surface of the leadframe, leadframe to mold compound and top of die to mold compound. While the warpage of QFN stacked die were measured using Smartscope Gaging 250 optical testing. The warpage are warp into crossbow warpage type according to the combined expansion characteristics of the different materials. It is found that not only the EMC properties, but also the epoxy die attach properties will also affect the warpage and delamination phenomenon.

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