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EFFECTS OF RUBBER-MODIFIED ON THERMAL AND MECHANICAL PROPERTIES OF EPOXY MOLD COMPOUND

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ABSTRACT

In a semiconductor packaging, the thermal stress greatly influenced the package cracking, passivation layer cracking and aluminium pattern deformation. The effects of thermal stress that resulted from the use of plastic encapsulants will contribute to shrinkage of the plastic upon curing and thermal mismatch between the resin and the device. Therefore, an innovative low stress epoxy molding compounds (EMC) were formulated by utilization of rubber modification technology. The characteristics can be achieved a lower Young's modulus and coefficient of thermal expansion (CTE). The EMCs are generally prepared from a blend of an epoxy resin, hardener, fillers, catalyts, low stress agent, and colorants. This article reports the effects of the modified EMC by liquid poly (methyl methacrylate) grafted natural rubber copolymer on the thermal and mechanical properties of EMCs as a function low stress agent. The addition of rubber significantly decreased the flexural strength and elastic modulus the EMCs without lowering the T_g. Therefore, this properties of EMCs found considerably used in semiconductor packaging. Various characterization have been done on the EMC such as thermal expansion using thermo mechanical analyzer (TMA), storage modulus and tan δ using dynamic mechanical analyzer (DMA) and flexural properties using Universal Testing Machine. Morphological observations were done using the scanning electron microscopy (SEM).

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