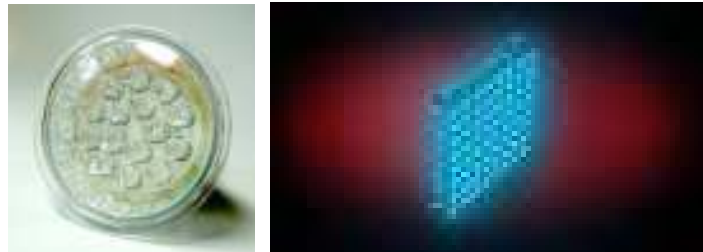


VFM Curing of LED Encapsulants

Light-emitting diodes (LED) are semiconductor diodes that emit light when an electrical current is applied in the forward direction of the device. LED packaging materials applied over the device must be cured to enhance the light transmission, reliability and longevity of a device.



Single LED to
be encapsulated



Encapsulated LEDs

Variable Frequency Microwave processing leads to rapid curing of encapsulant materials. The enhancement in the cure times is due to the ability of the microwave field to cause a rotational movement of the polar molecules of the material in addition to the normal thermal agitations.

VFM has been successfully employed to cure encapsulants from major manufacturers and demonstrated to reduce the process time and hence reduce the potential of yellowing of the transparent materials with extended convection cure times. The rapid, selective and volumetric heating also reduces the cure related stress in the material. The materials should have good thermal, mechanical and optical properties and the volumetric VFM heating has been able to achieve it. All thermal processes, including activation, annealing, passivation and wafer level packaging can be accomplished using VFM.

Like all other semiconductor application there was no damage to the silicon die and wire bonds on the devices.