Abstract

SCRIBE AND BREAK OF HARD-TO-SCRIBE MATERIALS

A hard-to-scribe substrate is lapped to a thickness suitable for later cleaving. On the surface of the substrate selected for scribing, a non-ductile material such as a dielectric scribe facilitation layer is grown or deposited over the substrate. This layer's hardness and thickness are selected to be softer than the substrate and to accept a clean scribe line . Alternately, or in conjunction, a second non-ductile layer such as a dielectric break facilitation layer is grown or deposited on the side of the hard-to-scribe substrate other than the one selected for scribing. This layer's thickness and hardness are selected to put the scribing surface in an optimal state of tension for clean break propagation. An optional layer of metal is placed over the surface to be scribed. This layer serves to dissipate heat generated from die separation and shield the cutting tool from piezoelectric discharge.

(Figure 1A)