ACOUSTIC MICROSCOPE ANALYZES A DIVERSE VARIETY OF WAFERS

Sonoscan's Dual Scanning™, high-speed and highly automated acoustic system for inspecting 300mm wafers for internal defects can handle any wafer type. But the features and defects that it sees vary from one type to another.

• Individual 300mm wafers. These are imaged before bonding to eliminate those having cracks in the silicon. As each of the two transducers raster-scans, the pulsed ultrasound is reflected from the gap in any cracks in the wafer.

• Direct-bonded SOI wafers. Where the two silicon wafers are well bonded, there is no echo because there is no material interface – it's all silicon. But a non-bond or a void (perhaps caused by a particle) or a crack sends back a strong echo.

• Intermediate bond wafers. The glass frit, metal film or other "glue" bonding these wafers ensures there is a material interface – or perhaps two

distinguishable interfaces if the adhesive is thick enough. Voids and non-bonds may be at or in the adhesive layer; there may also be cracks in the wafers themselves. In MEMS wafers, the bonding layer forms the critical seal around the MEMS cavity. The width of the seal and defects in the seal can be observed to determine the reliability of the hermetic seal.

- Anodic bond wafers. Where the glass wafer is bonded to the silicon wafer, there is a material interface and hence an echo. Much stronger echoes will come from non-bonds, voids and cracks.

- 3D IC, Chip on wafer, or chip stack on wafer. These configurations are especially vulnerable to non-bonds, voids and the like. The AW300 can encompass the entire thickness of the structure to find defects at any level.

The purpose of the AW300 is to permit the swift and automated identification and removal of unreliable devices as early as possible in the production cycle.

Source: http://electroiq.com/mysemicondaily/2012/07/11/sonoscans-aw300-production-acoustic-microscope-analyzes-a-diverse-variety-of-wafers/