

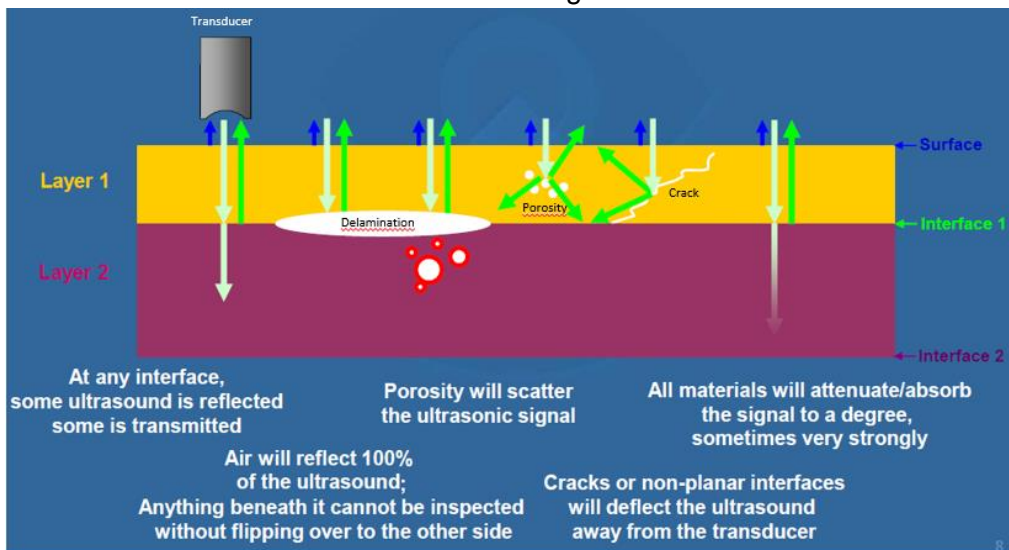
SCANNING ACOUSTIC MICROSCOPY



Analytical Services

Scanning Acoustic Microscopy (SAM) is a non-destructive inspection technique significantly used in the microelectronics industry for decades. This technique developed at Stanford in the early 1970's provides a non-destructive imaging of moisture/thermal-induced damage, such as package cracks and delamination. SAM is a useful technique supporting counterfeit detection, product reliability testing, process validation, quality control and failure analysis.

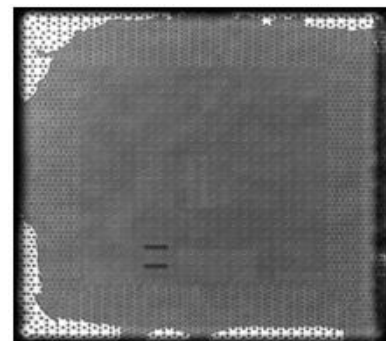
The SAM technique uses high frequency ultrasounds (10 MHz to 250 MHz) generated by a piezoelectric transducer above the sample submerged in water. The reflected ultrasounds generated by the acoustic impedance variation, such as a boundary or object, is collected and electronically converted into an image.



Reference: Drawing from SonoLab

Ultrasounds (over 10 MHz) cannot propagate in air nor in vacuum, thus a very sensitive inspection technique for delamination detection. The spacial resolution in X & Y is depending on the transducer properties (frequency, focal length and lense diameter) and the ultrasounds velocity propagation of the inspected material. Resolution as low as 10µm can be reached under optimized conditions.

Various imaging modes are available accordingly to the inspection needs. The C-mode, allowing the image of an X-Y plane at a specific depth Z, is the most popular mode. But, virtual cross section along an X-Z plane, surface profiling imaging and 3D imaging are also available.



C-Mode
White areas are delamination at chip / underfill interface