

# Chip Scale Packages (CSP)

## Application Overview:

As the push for smaller and smaller packages has gotten stronger, chip scale packages have proven to be a valuable resource. Acoustic inspection of CSPs has become a dominate tool for failure analysis and process control. SAMs ability to find very thin (< 0.1 micron), planar defects makes it a superior tool for imaging device integrity.

## Package Types:

MicroBGA™, *see also flip chip applications*

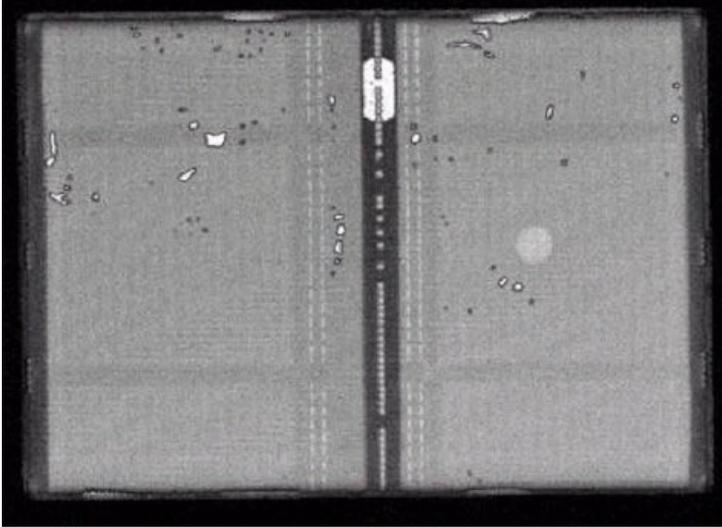
## Inspection Standards:

- none -

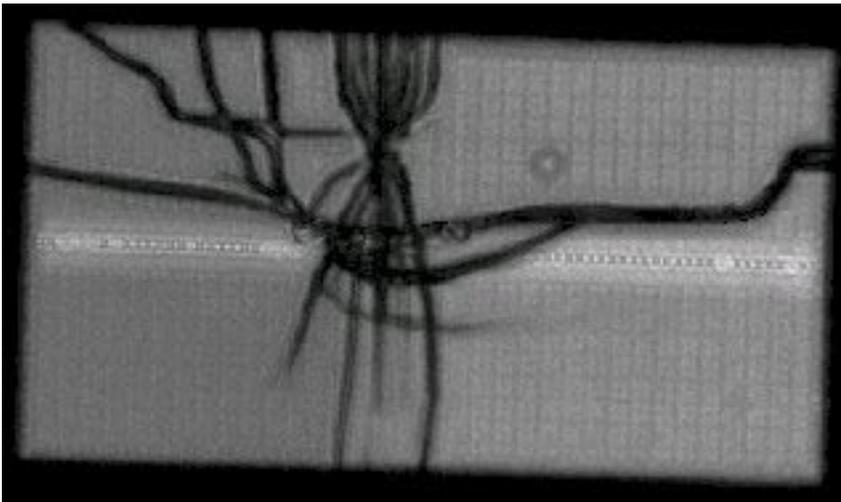
## Failure Types Commonly Detected:

- Non-bonded interfaces
- Die tilt or cupping
- Interlaminar disbonding
- Porous die attach
- Die cracks
- Lack or insufficient die attach
- Molding compound voids
- Package cracks
- Delamination within the substrate
- Encapsulant material characterization

## Images:



This is a pulse-echo mode image of the top side of a Chip Scale Package (CSP). A 110MHz 8mm focal length transducer was used to create this interface image. Information regarding the bond quality of the encapsulant to the die and the elastomer layer can be seen in this peak amplitude image. White areas are where the plastic encapsulant did not adequately adhere to the silicon die. Voids can also be seen in the interface between the elastomer and the polyimide substrate.



This is a pulse-echo mode image of the top side of a CSP. A UHF 5.9mm focal length transducer was used to create this interface image. Black lines can be seen in the images as the result of cracks in the die. This was due to mechanical stress induced by a mismatch of the coefficient of thermal expansion between the encapsulant material and the die.