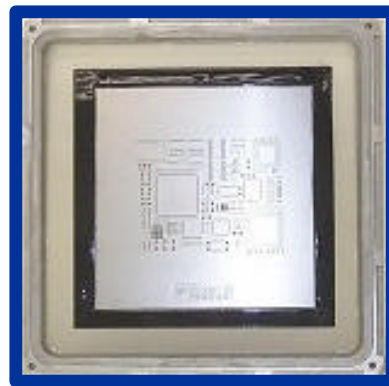
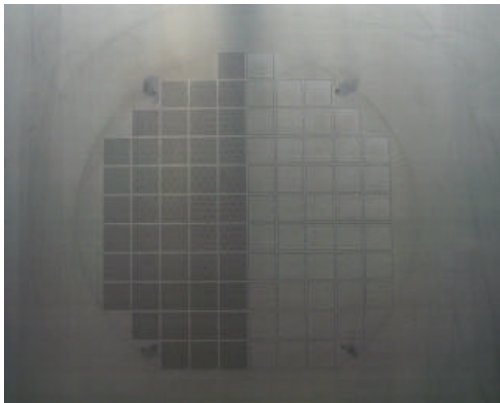


Stencils for Wafer and Board Printing

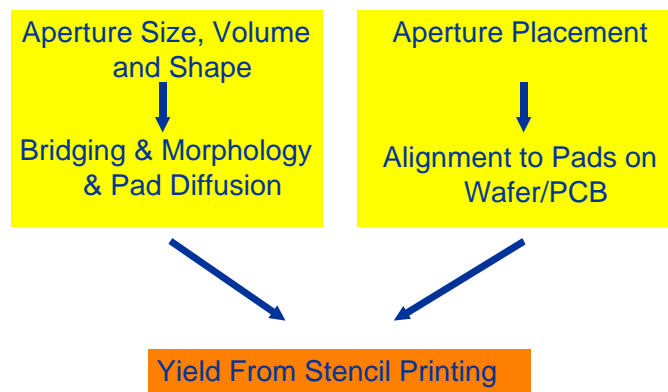


Introduction

There are a number of processes that employ metal stencils to define regions on wafers and surface mount boards where solder is to be applied. The two predominant processes are based around either the sputtering of solder material (PbSn) or the application of solder paste coupled with the use of a squeegee based printer. The former, widely known as C4, utilizes a physical mask mounted directly on the wafer surface during the sputtering process step. The latter, which can be found in both wafer and PC board process lines, is a technique that utilizes a stretched and framed mask containing peripheral or area array patterns of apertures for the solder paste to enter.

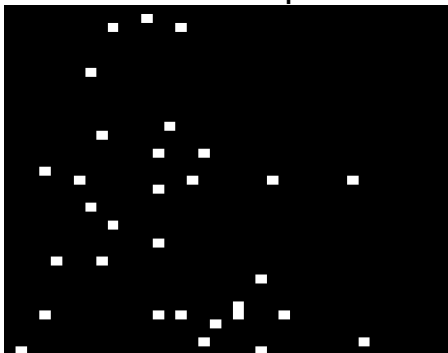
The Measurement Need

The ever shrinking of geometries in the front end of IC manufacturing are accompanied by the same shrinks in the back end. Instead of poly-silicon lines that define gate widths of transistors, it is interconnect pads that define the electrical connection of the devices to the real world. Stencil printing is an alternative technique to making this electrical connection to the chip, the present process of record entails the use of photolithography because of its high yield. Thus the yield from stencil printing must also be comparable and is found to be directly traceable to the quality of the stencil. The measurement of stencil apertures is not only need as a QC check after fabrication but is also needed after the cleaning step at the end user's facility to check for presence of residual solder left in the aperture from an insufficient clean.



JMAR's Lumina line of Video Coordinate Measurement Machines are especially suited to measure the 2D and 3D qualities of these stencils at the highest throughput. Three-dimensional measurements i.e. stencil thickness, of state of the art stencils are critical as the process of making these stencils are new and the impact to yield is great.

Width Map



- Measurements are within 2 sigma of average value
- Measurements are out of 2 sigma and within 3 sigma of average value
- Measurements are out of 3 sigma of average value

Width/Height Scatter Plot

