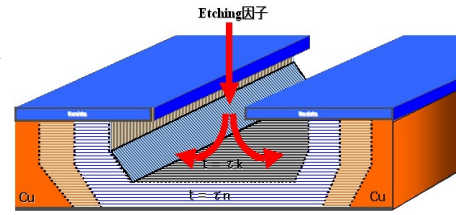


# Our Revolutionary Technology to Improve PCB and LSI Yields *Oscillated Recall Technology*

In recent years, the rapid spread of mobile information devices, such as smart phones and tablet devices, have caused a significant decline in yield of PCB or LSI-Package etched micro wirings. To solve this issue, we provide the optimization tool in cooperation with other circuit board detection device manufacturers, microscope manufacturers, and national research institutes. Our tool enables mask data generation applicable to designed data, finished shape check, automatic modification of mask data based on the latest state of concentration and surface irregularities of etchant and automatic measurement of results.



## 1. Our Technology Overview: WELCOM

- 1) Our company developed innovative bi-directional simulator that can calculate local etching force from distribution of resist patterns and perform automatic correction and etching analysis.
- 2) We have developed the world's fastest simulator that can extract etching properties with a simple test pattern and automatically generate optimum mask data applicable to the process. (generating mask data for 14mm x 14mm circuit board in 10 seconds)
- 3) Our simulator achieves precise accuracy and outstanding results. We maintain the development of completely unique software that our competitors cannot follow.

*Our Result*



*Our Result using WELCOM*



Comparison of Calculation Results

*Mask Data Result using WELCOM*

*Other company's mask data result*

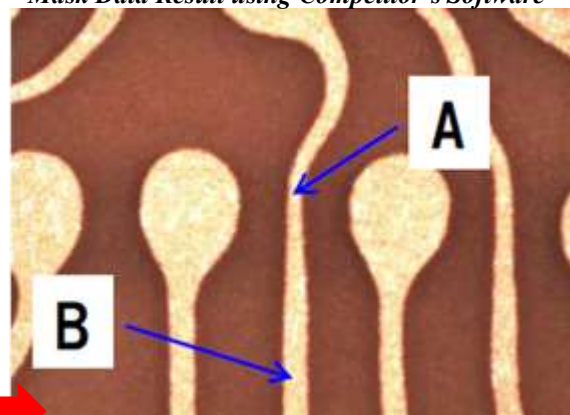
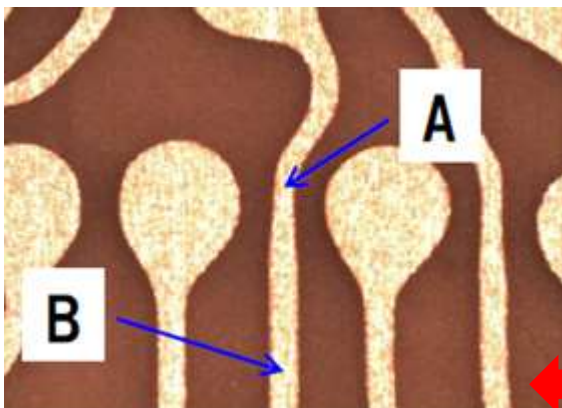


*Other company's Mask data result using WELCOM*



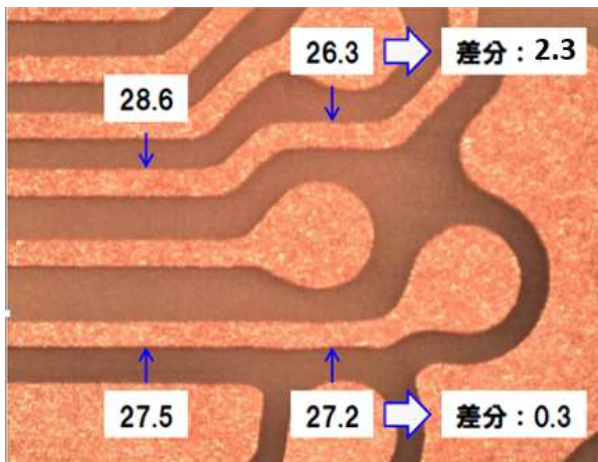
Comparison of Mask Data Results

*Mask Data Result using Competitor's Software*

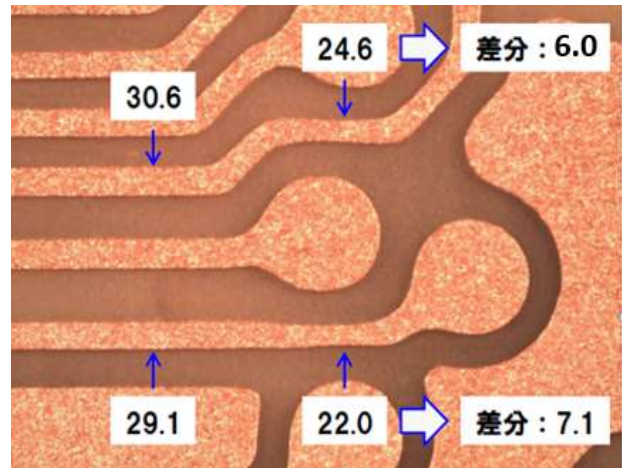


Comparison of Mask Data Results

*Mask Data Result using WELCOM*



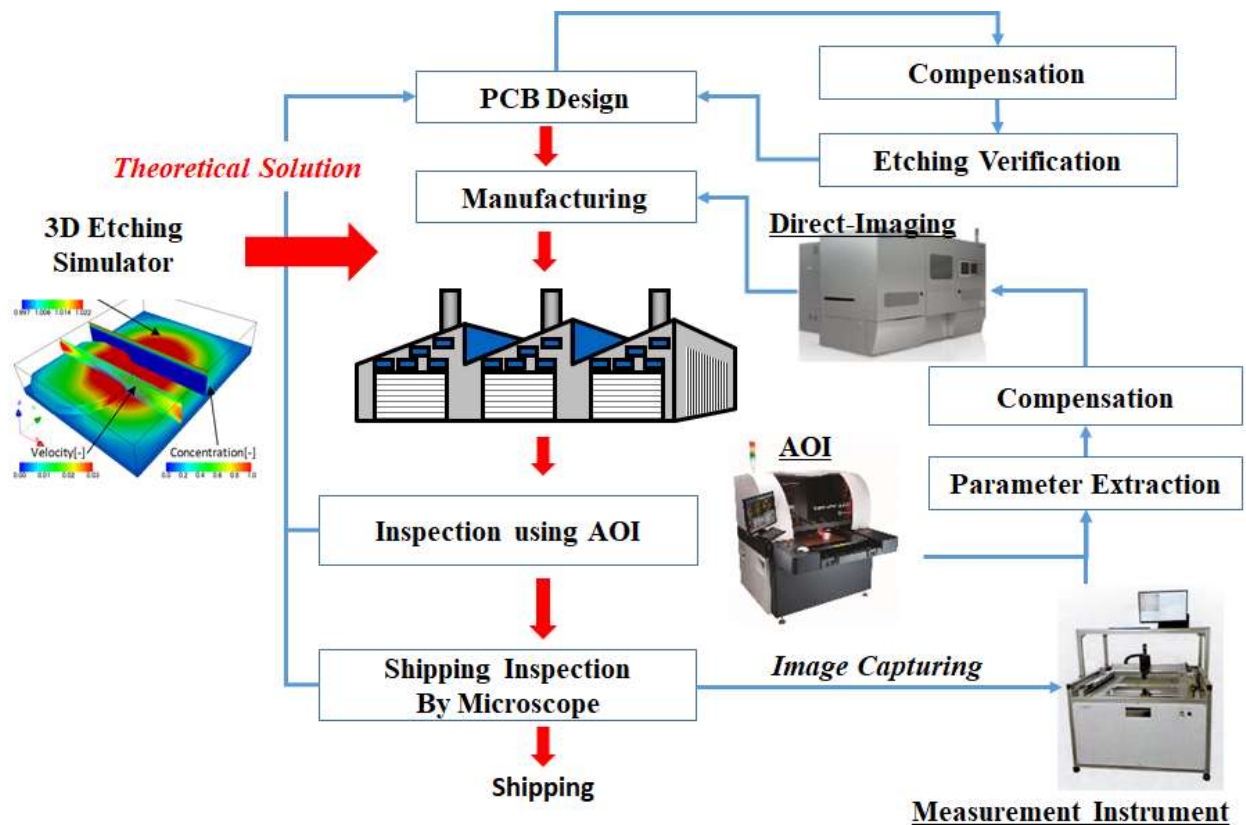
*Mask Data Result using Competitor's Software*



Comparison of Mask Data Results

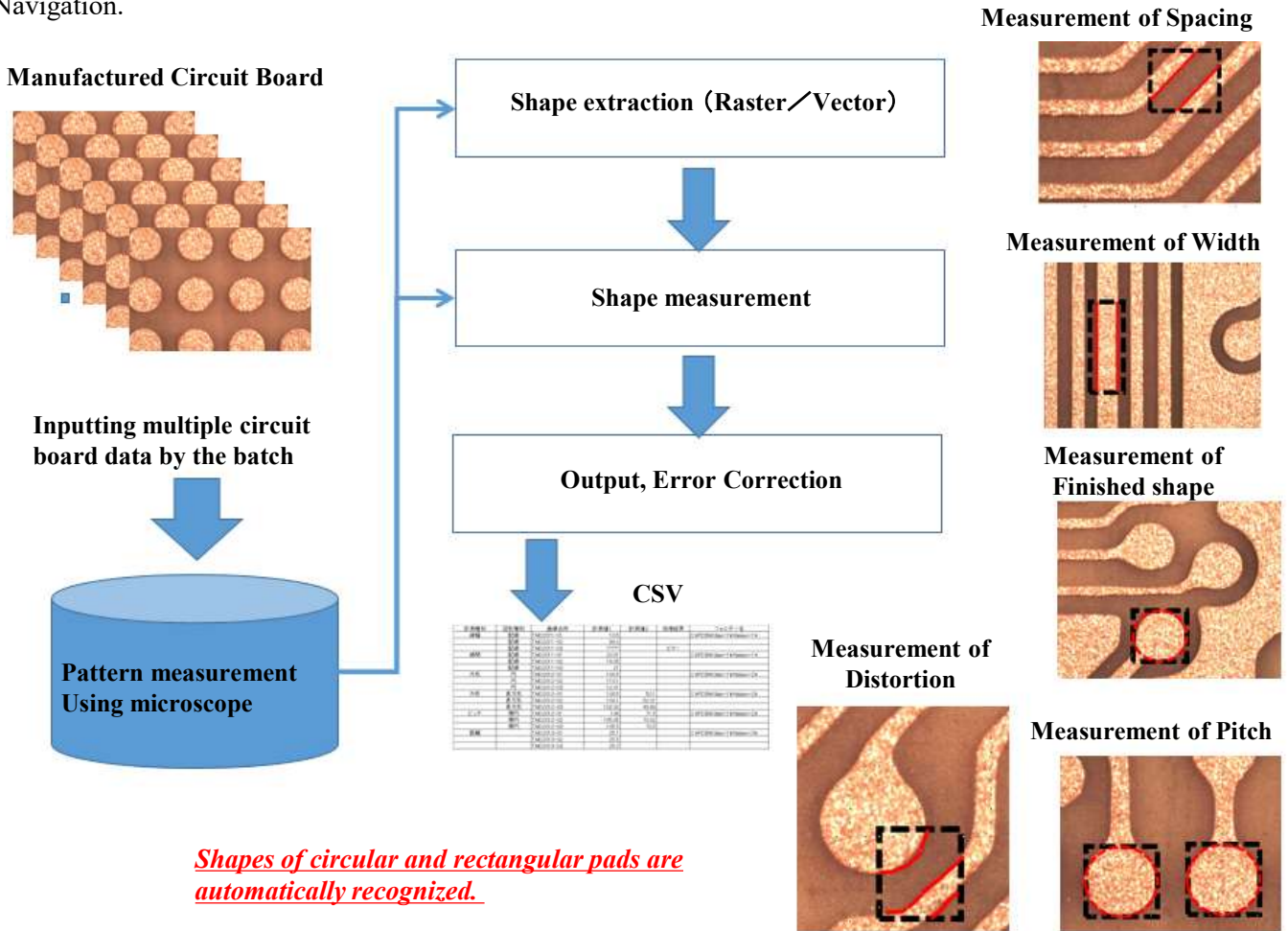
## 2. Solution for Improving Yield with Circuit Board Detecting Devices

- 1) We discovered the new production flow that combines the utilities of AOI (Automatic Optical Inspection machine), DI (Direct Imaging machine), and etching simulator.
- 2) Our technology is designed to enable automatic generation of mask data applicable to the latest state of concentration and surface irregularities of etchant.
- 3) We succeeded in establishing the mass production technology of  $L / S = 30 \text{ um} / 30 \text{ um}$  (error  $\pm 5 \text{ um}$ ) at a major PCB manufacturer.



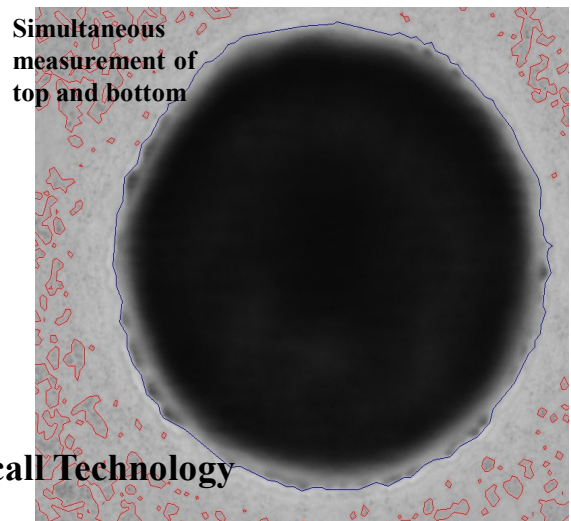
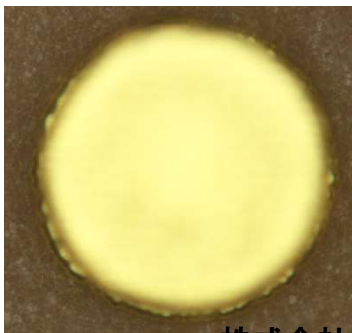
### 3. Automatic Measurement System

- 1) The use of our software provides quality inspection and error detection system for circuit board using microscope.
- 2) This system allows to ensure the elimination of unnecessary work of inspectors and human errors in measurement.
- 3) Using our software, you can have a measurement of line width, line spacing, circular pad, rectangular pad, pad pitch, and spacing variation between pad and wiring.
- 4) The default result output format is CSV. It contributes to shortening total review time.
- 5) After automatic positioning stage is integrated into microscope, you can measure the results with CAD-Navigation.



6) Our image processing technology, which could measure top and bottom of wire simultaneously, would dramatically streamline the circuit board measurement process.

**Original Image**



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