

THE BENEFITS



Improved Yields



Decreased Scrap



Decreased Downtime

SEMI SILICON WAFER THICKNESS

The Problem

Silicon Wafers are polished to a consistent thickness as part of the manufacturing process. Consistent thicknesses are critical to the manufacturing process. Out-of-tolerance thicknesses can lead to reduced yields, increased scrap, and expensive down time.

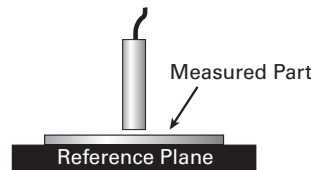


Figure 1 - Single-channel thickness measurements assume the part is flat and perfectly seated against the reference.

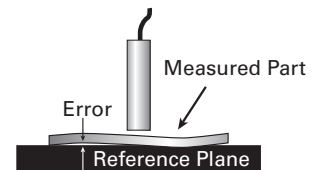


Figure 2 - Deformed parts and reference surfaces or foreign matter between the reference and the part create a thickness measurement error in single-channel systems.

Why Lion Precision

For over 30 years Lion Precision has been supplying non-contact capacitive displacement measurement systems for precise measurements to the industry. Their high bandwidth, nanometer resolution and vacuum compatibility combined with very high reliability and custom design capability made the Lion Precision capacitive system the best choice for this measurement.

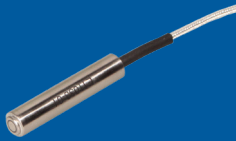
The Process

The customer reached out to Lion Precision to help them better measure the thickness variance. Lion Precision Capacitive sensors can be used to measure the thickness of silicon wafers. By inspecting the wafers after the grinding and polishing process, defects can be caught upstream, limiting their potential cost.

THE SOLUTION



CPL350 Driver



C8-2.0 Probe

DOWNLOADS



Z-Height Detection for Scanning Electron Microscopes



Z-Height Detection for Backside Semiconductor Wafer Inspection



Z-Height White Paper



Capacitive Sensor Operation & Optimization

LION
PRECISION

Because the measurement is non-contact, there is no risk of potentially damaging the wafer during the inspection process. Either single or dual channel measurements can be used to measure silicon wafer thickness. Single-channel thickness measurements measure the change in thickness between the part to be inspected and a “master” part of known thickness. Dual-channel thickness measurements place the part to be measured between two sensors (Fig. 3). Each side of the part is measured by a separate sensor. The sum of the measurements from the two sensors provides the final measurement of thickness (Fig. 4).

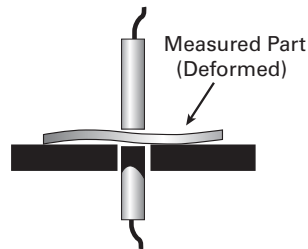


Figure 3 - Dual-channel systems compensate for deformities in the part or resting surface by measuring changes in position of the part's bottom and top surface.

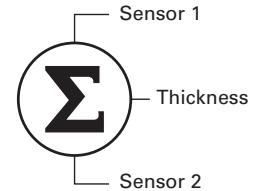


Figure 4 - Summing the two sensor channels produces a “thickness only” output by canceling changes of part position between the sensors.

The Solution

Lion Precision has full range of capacitive drivers and probes to fit the specific application needs. Here are a few that we have used in this application in the past.



CPL290 Driver



CPL350 Driver



C8-2.0 Probe

The Benefit

Improved yields, decreased scrap, and decreased down time.

Customization

Lion Precision understands that our customers have unique high precision applications with difficult to achieve performance specifications. As a result we work closely with each customer to ensure they get a solution to meet their application needs. It is why more than 60% of our products are customized. It is also why we have built our team around quickly responding and servicing these custom niche applications. Please give us a call let's discuss your specific needs.

7166 4th Street N. Oakdale, MN 55128
T: 651.484.6544 F: 651.484.6824 info@lionprecision.com
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