Monitoring Co-Planarity During Semiconductor Manufacturing

BACKGROUND

Thermocompression bonding (TCB) can be used for wire bonding or Flip Chip bonding. The thermal excursions normally required for reflow bonding or high-temperature TCB consume process time, can create misalignments, and materials stresses when joining devices with large differences in CTE. During some facets of IC and semiconductor manufacturing, monitoring of the parallelism of two planes is required.

SOLUTION - Gap Monitoring Using Fiber Optic Sensors

Philtec's DMS Control Software includes a Multi-Trace Screen. It displays the outputs from three displacement probes in three colors. The signals can be viewed with Tare On or Tare Off.
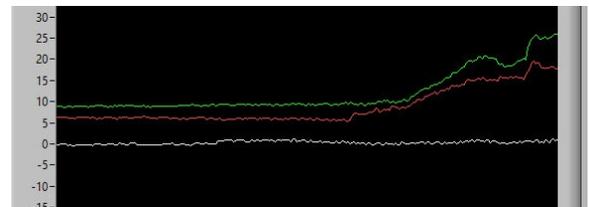
EXAMPLE 1 - Gap Setting With Parallel Planes

Gaps of three probes were set and then tared to zero. As the plates moved while staying parallel, all three traces remained overlayed.

EXAMPLE 2 - Tilt of Two Planes

When the planes deviate from parallel, the sensor traces will separate, providing a measure of the amount of tilt.

SUMMARY

The Multi-Trace Screen was initially created to monitor co-planarity during semi-conductor manufacturing. However, it is a general purpose tool that can be used to simultaneously monitor the outputs from three displacement probes in any mechanical system where gap, tilt and parallelism are important parameters to measure.

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