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LG
Draft

Current Yield of Thinned Phase-2 Sensors

We have received our first thinned wafer (wafer # B75041W05PE2) of Phase-2 sensors. The technique employed at the thinning company, Aptek Industries, was to pre-scribe the wafer with dicing lines of approximately 70 um depth and then to back-thin and release the individual sensors from the wafer. This process is significantly less expensive than individual dicing and thinning and is anticipated to be the production process for generating thinned sensors for the PXL detector. We report on the current yield. Each wafer contains 53 sensor reticles. We have visually inspected (not under a microscope) all of the reticles and electrically probe tested 18 of them.
The results of the simple visual inspection are shown below.

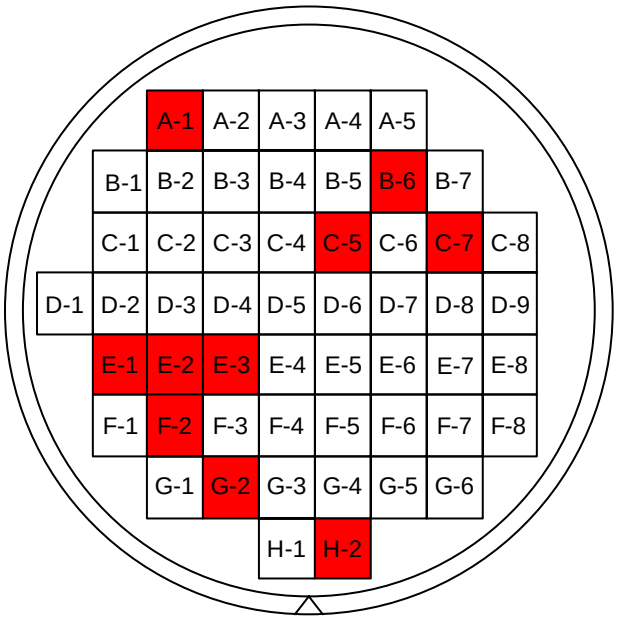

Figure 1: Results of a simple visual inspection of thinned Phase-2 sensors. In total, 10 sensors were found to be damaged. Two were fractured along column boundaries. The rest had chipped corners. The chipping appears to be fractured corners, not the standard chipping from a dicing saw.

The results from the electrical probe testing are shown below.

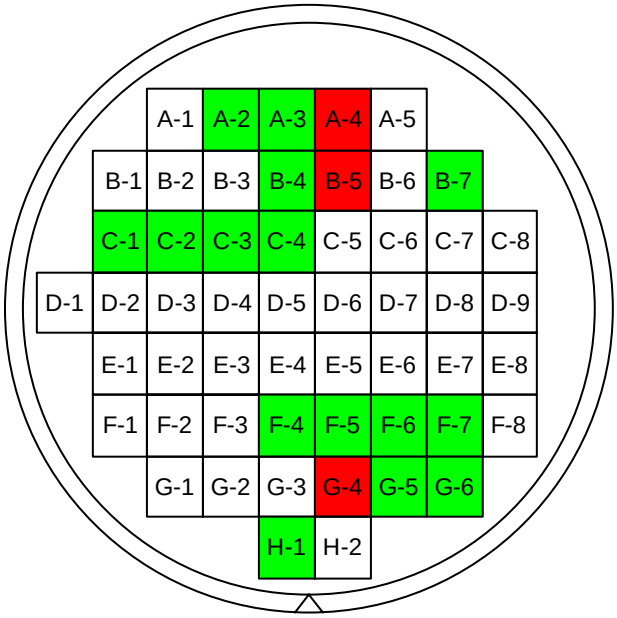

Figure 2: Results from probe testing of the thinned sensors. Sensors at positions A4 and G4 show mechanical damage that was not found by simple visual inspection but is visible under a microscope (surface scratches). Good sensors include sensors with 1 bad column (3 sensors) and 3 bad columns (1 sensor).

Mechanical damage appears to be the dominant factor in our current yield. We have found only one intact non-responsive sensor out of 16 tested. With the small sample size indicated, the numbers relevant to yield are shown below.

Source	**Sensors affected**
Visible inspection mechanical damage	19%
Mechanical damage discovered at probe test	11%
Sensor functionally unusable	6%
Total yield	**64%**

As a note, this level of mechanical damage is considered very high for the thinning company. We will pursue possible remedies with them.