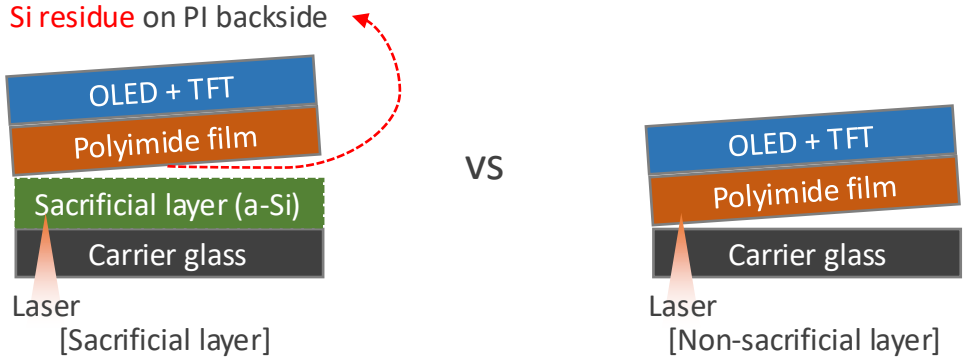
Validated Non-Sacrificial Layer Integration with Double-Digit Yield Improvement

Objectives

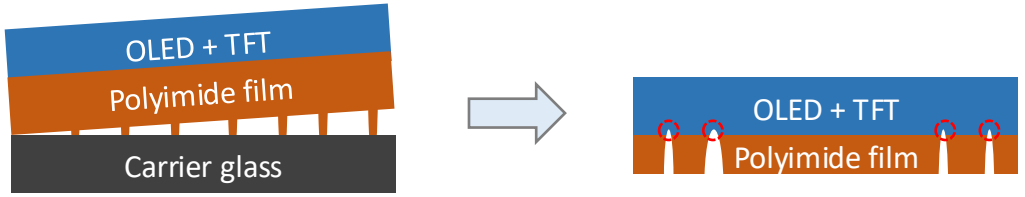
- Non-sacrificial layer technology development
  - Improve under-display optical sensor performance

Conceptual figure



Challenges

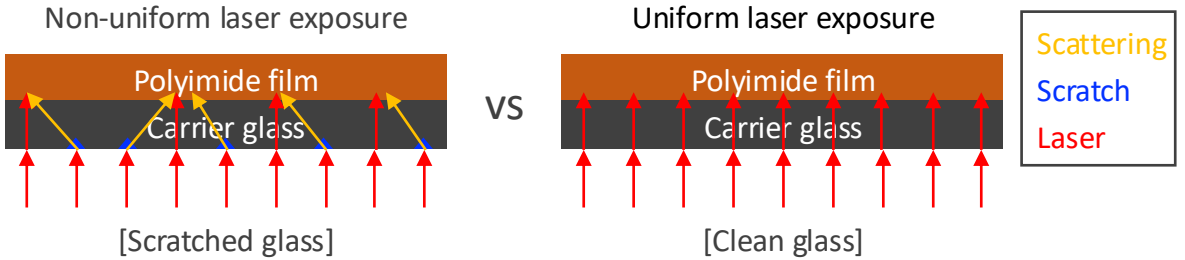
- PI ash
  - Excessive localized laser energy damages PI, generating ash that degrades optical sensor performance
- Under-processing
  - Insufficient laser exposure leads to incomplete release, causing rough delamination and PI tearing



Approach

- Laser lift-off (LLO) process optimization
  - Optimize the laser source, beam profile, and key process parameters to ensure **uniform laser exposure**
- Laser-blocking scratch reduction
  - Reduce glass scratches to minimize **scratch-induced laser blocking**

Conceptual figure



  - Implement backside inspection and statistical analysis to identify the **process steps driving glass scratches**
  - Adjust key process parameters to mitigate **glass scratch formation**

Outcome

- Yield improvement
  - Achieved double-digit (%) yield improvement for non-sacrificial layer integration
- Backside quality improvement
  - Reduced PI backside ash and glass scratches

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