Extra Large Multi-DUT Array Probing enabling > X100 Parallel Testing

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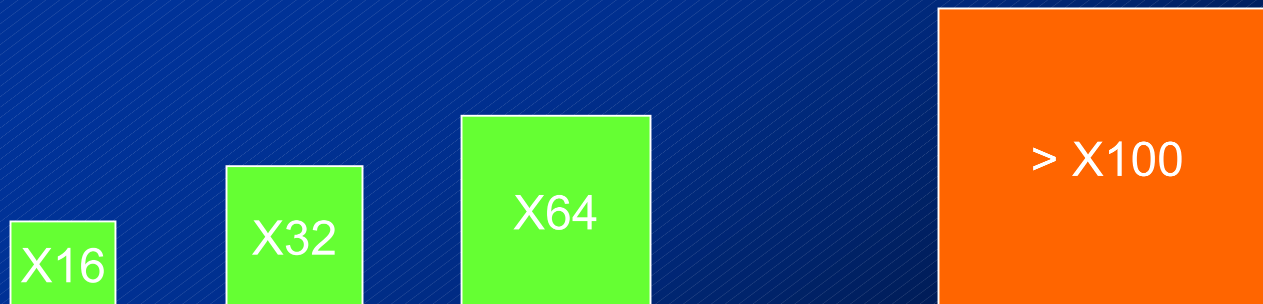
Agenda

- Introduction
- Motivation
- Challenges
- Preliminary Results
- Conclusions
- Acknowledgments

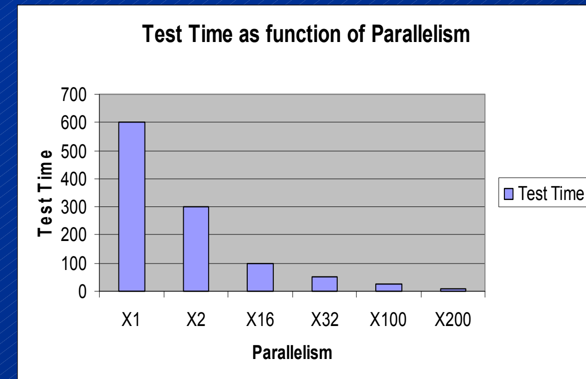
‘XL Multi-DUT Probe-Card’

- **Multi-DUT: Multi – Device-Under-Test, which is also defined as ‘Die Parallel’ testing method.**
- **Probe-Card: Interface unit between Wafer/Die on Wafer and Test System.**
- **Why XL ?**
  - **Flash Industry use X16 / X32 / X64 parallelism testing which is considered as standard.**



Motivation behind Multi-DUT testing

- **Reduced Wafer Test Time:**
  - Reduction in number of steps required to test a wafer
- **Increased test Output:**
  - Wafer throughput increase
- **Decrease in Probe-Card and Tester Inventory**

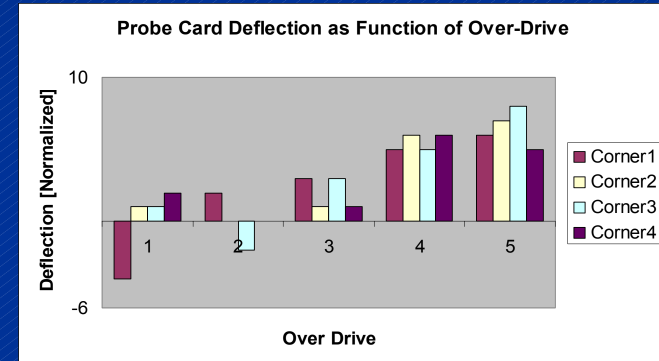


XL Multi-DUT Probe Card Challenges

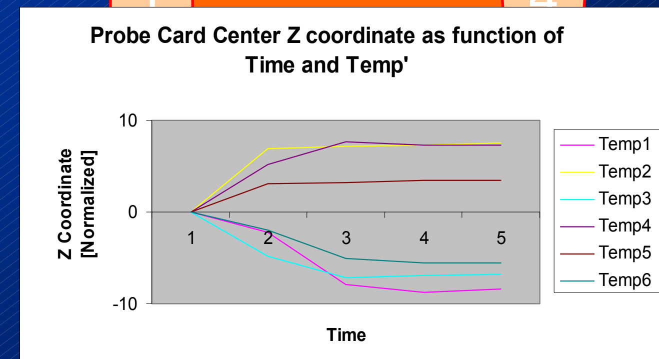
- Probing Process
- Metrology Technology
  - Existence & Capability
- Repair & Maintenance
- Tester capability
  - Channel count , Parallelism and S/W
- Automation
  - Support systems
- Advanced Process Control

XL Multi-DUT Probing Challenges

- Very large effective probing area :
  - Requirement for a large area contact uniformity through control of Alignment , Planarity and Test-Head deflections.



- High thermal sensitivity:
  - Probe-Cards have to be operational within the required Temp' Range of test.



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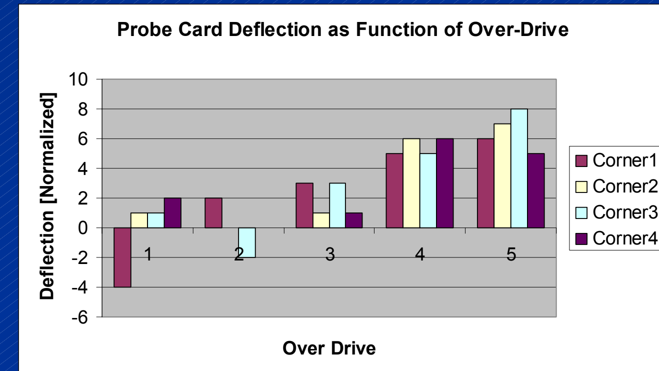

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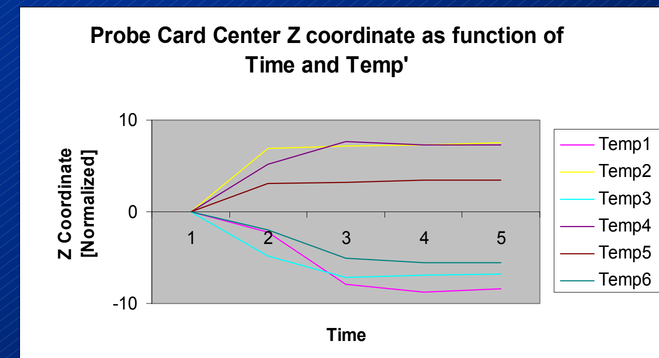
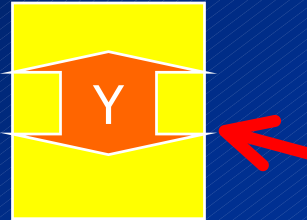
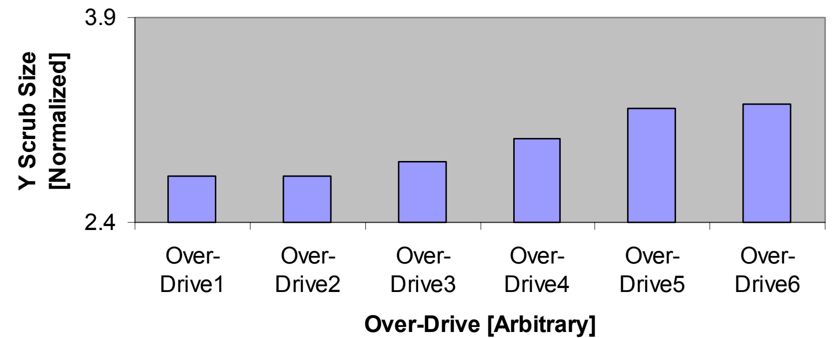


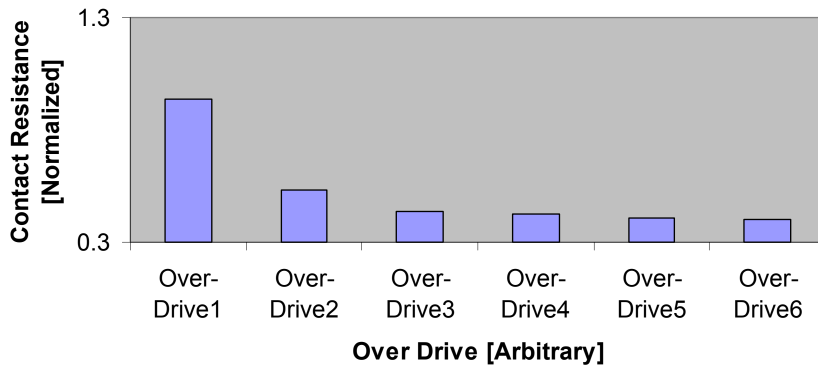
XL Multi-DUT Probing Challenges:

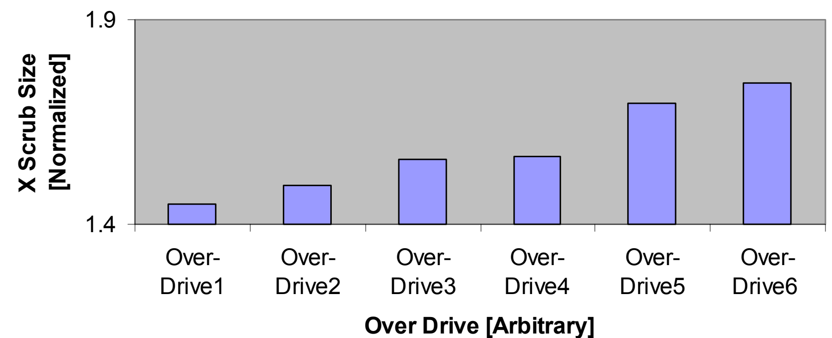
- **Probing Over-Drive:**
  - Characterizing the best value which achieves Lowest Contact-Resistance & Pad Damage.
- **Probe-Card Durability:**
  - Probe-Card & Process characteristics are to remain within given value window all through probe-card life time.

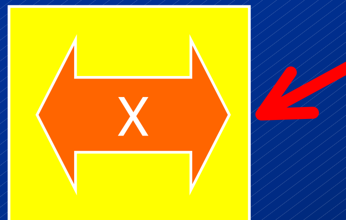
XL Multi-DUT Probing Challenges:











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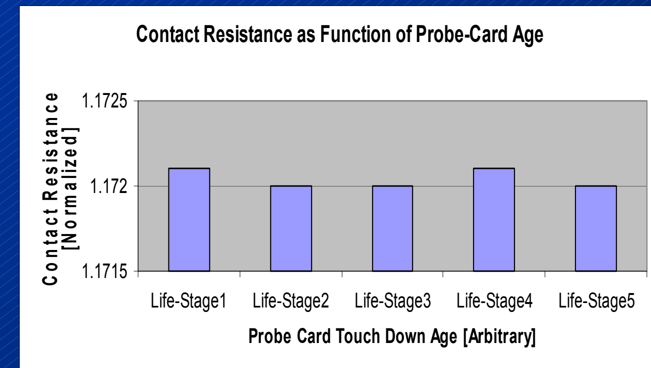

Summary

- Flash Like XRam test evolution drive a need for ever increasing parallel testing.
- ‘XL Multi-DUT Probing’ brings many challenges.
- Key challenges where Identified and Mitigated.
- Preliminary data have shown promising results.
- More work is needed to understand process characteristics.

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