Why Defects Escape Tests

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Incomplete Tests

- Less than 100% SSF Coverage
  - Circuit redundancy
  - Tool limitations, Access limitations
- At least 100% SSF Coverage
  - Sequence dependence
  - Speed dependence
  - Operating condition dependence
  - Pattern dependence

Flaws

- Allow correct operation on tester
- Cause early life failures
- Detected(sometimes) by
  - Temperature burn in
  - Voltage burn in
  - SHOVE
  - Iddq
  - VLV
  - Min Vdd

Why Flaws Escape Tests

- Temperature burn in
  - Misses tunneling opens
- Voltage burn in and SHOVE
  - Less effective for low supply voltages
  - Miss tunneling opens
- Iddq
  - May miss tunneling opens
- VLV
  - Possibly less effective for low supply voltages
- Min Vdd
  - May miss timing flaws

Examples

- Open
- Silicide Open

Multiple Detect Example

- Miss the G-S short defect
  - Unless (WXY)=(001) is used to detect Z/1

W | X | Y | a | & | Z
---|---|---|---|---|---
0 | 0 | 1 | 1 | 1 | 0
0 | 1 | 1 | 1 | 1 | 1
1 | 0 | 1 | 1 | 1 | 1