



Testing Challenges: The Next Generation

A Customers Prospective

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A Customers Prospective on Risk Management and Radiation Testing



Constraints

- Typical project has finite budget and defined reserves
- Test and evaluation activities should not effect schedule - preliminary design through launch

Goal

- Minimize risk (maximize performance/quality) to acceptable levels effectively – hopefully within constraints

A Note on Risk

- Risk is never “zero”, nor is it desirable to pursue “zero” risk in any one area - to do so is to steal assets from other areas

The Engineer’s job is to identify and manage risk “cost effectively”, not to eliminate it

Commercial Device Technology

- Use of commercial devices continues to increase
- Often the device is not mature and continues to undergo process variations (mask change, diffusion profile, etc.)
- Characterized lot may perform differently than the flight lot
- Cannot wait to characterize flight lot – increased risk
- Methods considered to verify/control flight lot performance
 - Perform flight lot SEE acceptance tests – high cost – low risk
 - Develop laser screen to detect changes – med cost – low/med risk
 - Perform verification of die topography – low cost – med/high risk

***Increasing need to verify flight lot SEE capability
where state-of-the-art commercial devices are used***

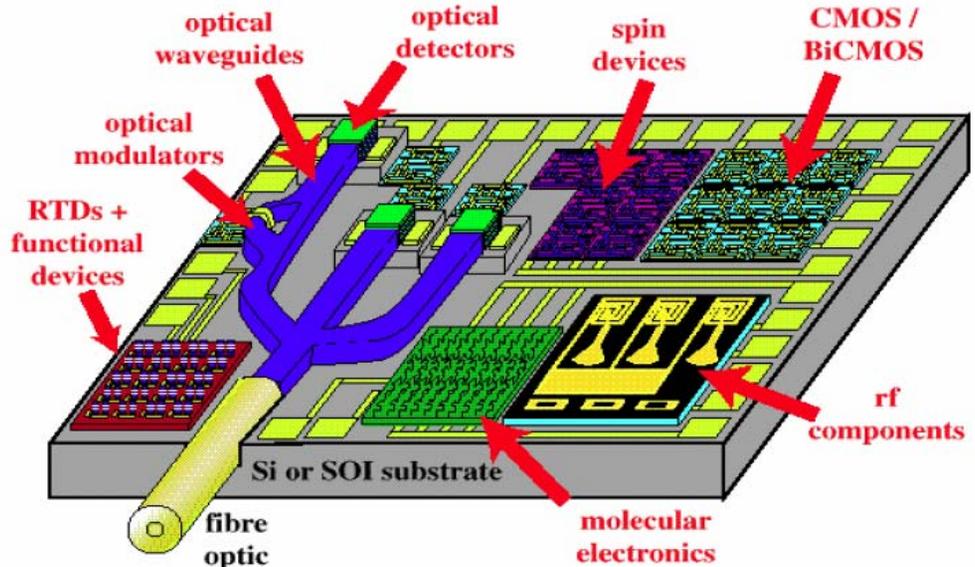
SETs in Linear Devices

- There is increased interest in evaluating Single Event Transients in linear devices both standard and complex
- There is limited device data even for very standard devices
- What data is available is often misleading, incomplete or incorrect
- Recommendations for testing
 - When testing is done it should address real applications
 - Where possible a range of applications should be addressed
 - Published test reports must contain enough information to assess the applicability of the test
 - Include the circuit designer in the evaluation

Best of all worlds – through effective testing develop a model that can be used to evaluate device performance in all circuit applications

System-on-a-Chip

- Next 10 years will see an influx of extremely complex devices
- Projects will likely drive need for evaluation
- Most facilities do not presently have adequate test capability
- Typical project cannot fund test development on their own
- How do we respond:
 - Develop consortium
 - Develop test capability at selected facilities



Source: *ESPRIT – Microelectronics Advanced Research Initiative Nanoelectronics Roadmap*

Need for evaluation of very complex devices has to be identified early and addressed in project budgets