Technology Transition Panel

Trusted and Assured Microelectronics

Distributed Transition Environment

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Integrated Circuit Supply Chain

Microelectronics Lifecycle

- Design
  - Design Tools
  - PDKs & IP
  - Model & Sim
- FAB
  - Mask Data
- Test
  - Function
  - PCM
  - Test Articles
- Insert
  - Package
  - Reliability
  - Harden
- Sustain
  - Authenticate
  - Integrity
  - Integration
  - Disposal Log
  - Monitor
  - Sustain

Integrated Circuit Supply Chain
Integrated Circuit Supply Chain

Microelectronics Lifecycle

- Design
- FAB
- Test
- Insert
- Sustain

Authenticate
Monitor
Disposal Log
Putting Tools in Users Hands

Distributed Transition Environment

Design FAB Test Insert Sustain
Multi-Domain Access

Distributed Transition Environment

Design  FAB  Test  Insert  Sustain

Spatial  Physical  Electrical  Confidence  Temporal

Location  Tracking  Implement  Function  Counterfeit  Longevity

IP  Architecture  2nd Order Analysis  Vetted IP  Malicious Content  Supply Chain

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Verification and Validation

**Distributed Transition Environment**

Design | FAB | Test | Insert | Sustain
Verification and Validation

Distributed Transition Environment

Verification & Validation Tools

Design  FAB  Test  Insert  Sustain
Identify and Transition

Distributed Transition Environment

Design  FAB  Test  Insert  Sustain

CRAFT  RAVEN  LADS  SHIELD

TRUST  CAT  IRIS  DAHI/TIC

DARPA/ IARPA

JFAC

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Identify and Transition

Distributed Transition Environment

Verification & Validation Tools

- Design
- FAB
- Test
- Insert
- Sustain

SBIR/TTP
Rif/SBIR
SBIR x3
SBIR/TTP
Sustainment S&T

Quantitative Risk Assessment Metrics

\[ PF = E(f(X_{Design}, X_{FAB}, X_{Test}, X_{Insert}, X_{Sustain})) \]

SBIRs/RiF/TTP
Game Theory

DARPA/IARPA
JFAC

SBIR

SBIR
Collaborative and Distributed

Distributed Transition Environment

Design  FAB  Test  Insert  Sustain

Verification & Validation Tools
Collaborative and Distributed

Analyst

Designer

Tester

Depot

Logistics

Threat Vectors

Design Tools
IP
Model & Sim

Sim Data
Characterization
Reliability
Malicious Content Tools

Counterfeit Detection
Insertion Log
Reliability Info

Location
Shelf Life
Traceability

Design
FAB
Test
Insert
Sustain

Verification & Validation
Tools
Multi-Dimensional Perceptivity

Verification & Validation Tools

- Design
- FAB
- Test
- Insert
- Sustain
Multi-Dimensional Perceptivity

[Diagram showing interrelated processes labeled as Design, FAB, Test, Insert, Sustain, with arrows indicating a flow and a label for Verification & Validation Tools]
Case Example

Legacy Component

Time Version Control

Verification & Validation Tools

Legacy Chip
Case Example

Legacy Component
Case Example
Legacy Component

Verification & Validation Tools

Design FAB Test Insert Sustain

Legacy Chip
Case Example

Legacy Component

Design  FAB  Test  Insert  Sustain

Verification & Tools

Time Version Control

Verification & Validation Tools

Legacy Chip
Case Example
Legacy Component
Distributed Transition Environment

Key Enablers

- Scalable lifecycle environment
- User access to tools and techniques
- Time and version control
- Address State of the Art, State of Practice, and Legacy and Boutique
Questions?