DD302: Troubleshooting On-Chip ESD Failures

Hans Kunz

Texas Instruments

Warren Anderson

AMD
Outline

• Example failure case
• Principles of good ESD protection
  – Corollary: principles of poor ESD protection
  – Demonstration of these principles using the example failure case
• Interactive trouble-shooting sessions
  – Case studies
  – Trouble-shooting tools introduced throughout case studies
Introduction

- This is an interactive tutorial where the participants will be exposed to real product qualification failures
  - Apply principles of good ESD protection to diagnose actual failure cases
- Goal is to
  - Determine the fundamental mechanism for each failure from the circuit perspective
  - Determine why the ESD protection is not working as intended
  - Apply corrective action
Purpose

• Companies are highly motivated to solve ESD failures quickly
  – ESD failures can hold up product qualification
  – Delay product shipment (revenue)

• With good troubleshooting skills, you can:
  – Quickly determine the problem
  – Quickly identify a corrective action
  – Improve communication to interested parties while investigations are underway
  – Improve knowledge-base for future products
Conclusion

• In this tutorial, you will learn from our mistakes, not your own!
• Seven actual cases of HBM and CDM component testing failures are presented for you to solve
  – Facts about each are revealed as they would be discovered in a real failure condition
  – Instructors guide you through diagnosing each
    • Finding the ultimate root cause
    • Determine what to do to fix