DfR Solutions

reliability designed, reliability delivered

How Sherlock Can Help You Now and in the Future

DfR Solutions Open House

16 March, 2015

Who is DfR Solutions?

The Industry Leader in Quality-Reliability-Durability of Electronics

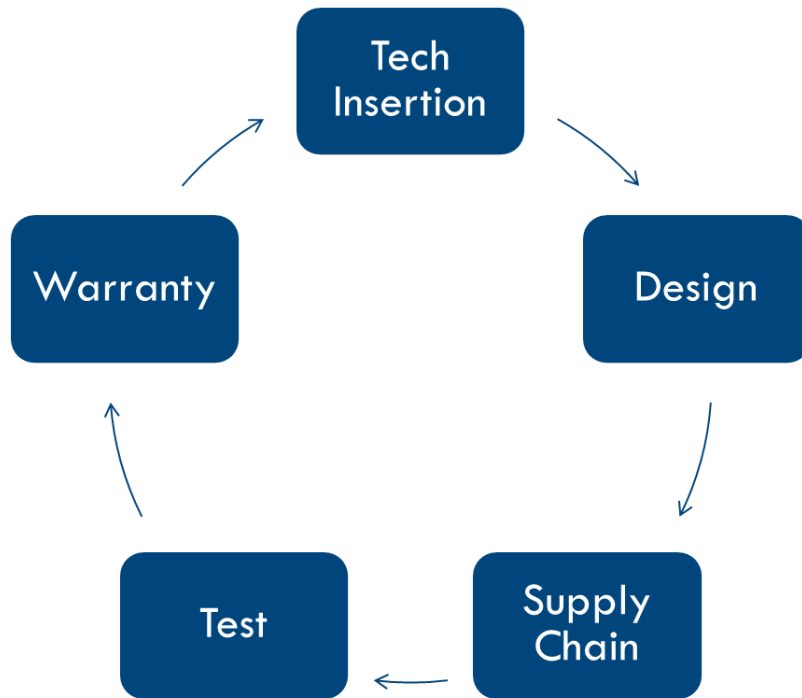**50 Fastest Growing Companies in the Electronics Industry**
- Inc Magazine

Best Design Verification Tool
- Printed Circuit Design

2012 Global Technology Award Winner

# 10 Years of Providing Solutions to the Electronics Marketplace

Tech Insertion

Design

Warranty

Supply Chain

Test

End-to-End Quality and Reliability Expertise

- DfR / DfM / DfT / DfS….. DfX
- Finite Element / Fluid Dynamics
- Physics of Failure Modeling
- FMEA / FTA
- 3rd Party Design Review
- Failure Analysis
- Root Cause Investigations
- Forensic Engineering
- Circuit Analysis
- Connector/Wiring Selection
- Analog/Power Design
- Material Characterization
- PCB / PCBA Onsite Audits
- Pottings and Coatings
- Software Risk Mitigation

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Results: Over 1000 Satisfied Customers
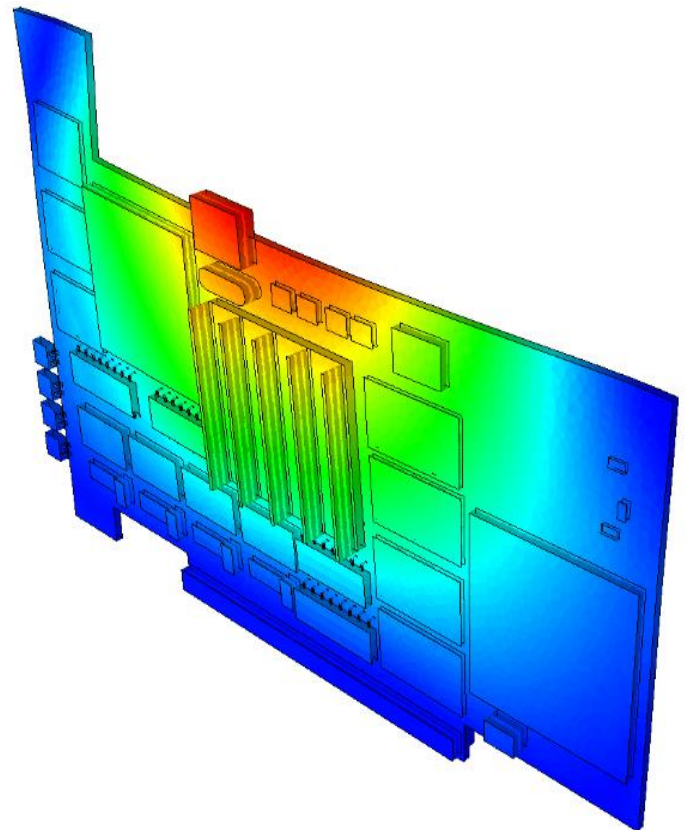
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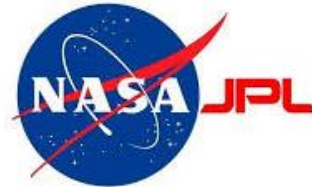
Sherlock Automated Design Analysis™

American auto maker saves $1.3mm

Global Storage Device Maker saves >$760K annually
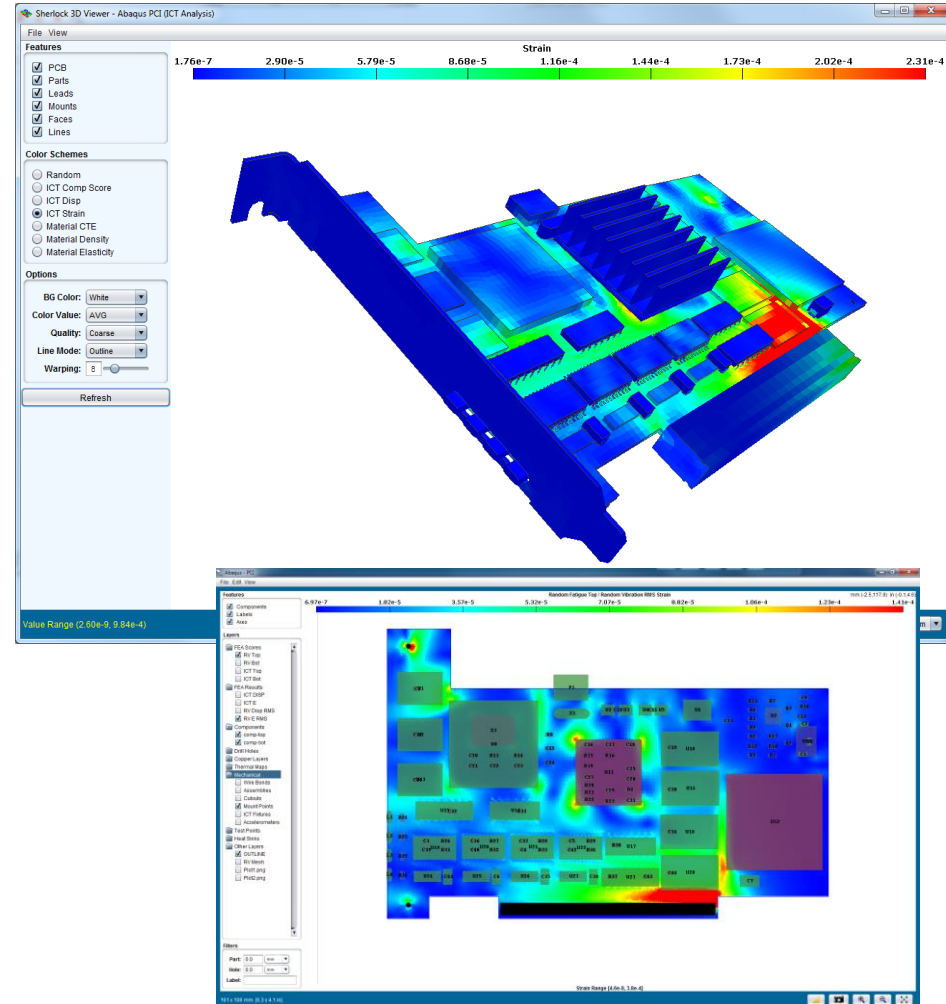
Time to market reduced 2 full months

Sherlock Value Proposition

- Greater Insight Earlier in New Product Development
  - Introduces Modeling/Simulation Earlier in the NPI Process
- Eliminate Test Failures Due To Design
  - Accelerates product qualification process with fewer respins
- Release Rev1, not Rev3
- Quantitative Tradeoff Analysis (no more Opinioneering)
  - Select the right material the first time based on real cost/benefit analysis
- Ensure More Rapid Acceptance Of Newer, More Ground-Breaking Technologies
  - Allows for first-to-market with no change in quality

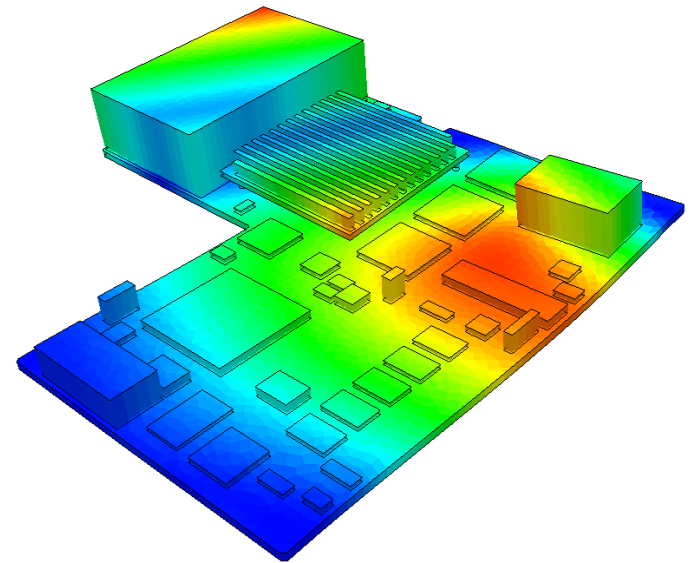# Mechanical

o Sherlock provides the Mechanical Analyst the ability to quickly and accurately develop intelligent 3D models of electronic assemblies

o Finite element simulations are post-processed to identify critical components and predict time to failure

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Manufacturing

o   Biggest risk in electronics manufacturing is post-assembly flexure

o   Current risk mitigations are insufficient
   o   Existing DfM tools only capture solder issues
   o   Strain measurements are laborious
   o   Supplier analyses often inaccurate

o   Sherlock can rapidly assess all post-assembly handling operations
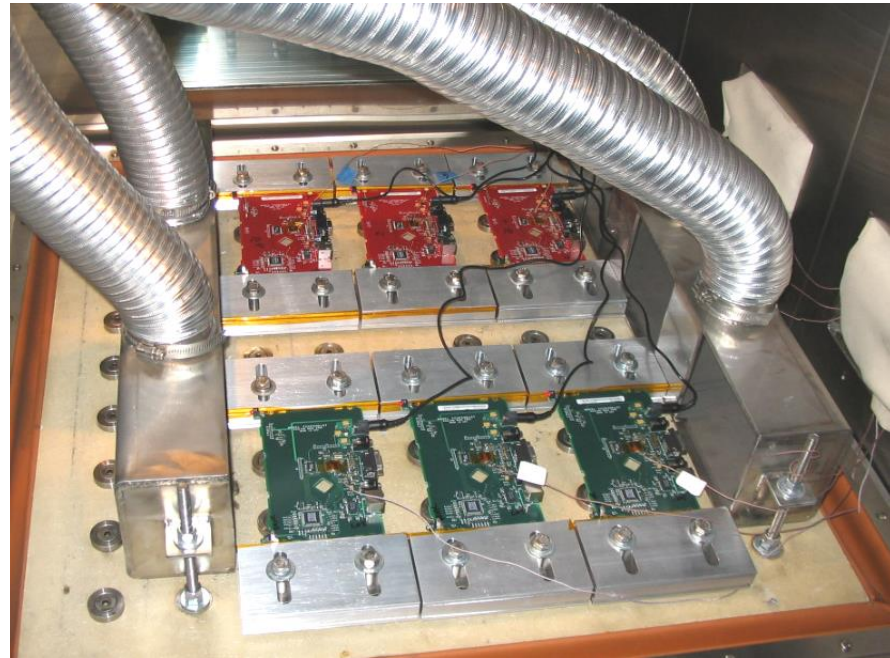   o   In-Circuit Test, Depaneling, Connector Insertion, Compliant Pin, Heatsink Attachment

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Reliability

o **Sherlock performs reliability predictions previously not possible**

  o Commercial off-the-shelf (COTS) assemblies, wearout of complex integrated circuits (ICs)

o **Provides stronger linkage to mechanical group**

  o Takes results of mechanical and thermal analysis and makes a reliability prediction for thermal cycling, vibration, and shock

o **Accelerates traditional design for reliability (DfR) activities**

  o MTBF, DFMEA, Thermal Derating

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Test

- Pass the test the first time
  - Thermal cycling, Power-temperature cycling, sinusoidal vibration, random vibration, mechanical shock

- Pre-HALT your HALT
  - Make HALT an even more powerful activity

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American auto manufacturer saves over $1,384,000 in test costs

o   In 2013 American auto manufacturer begin utilizing Sherlock for electronic module analysis in parallel with its current testing plan.

- o   American auto manufacturer believed that Sherlock could accurately simulate power temperature cycling (PTC) tests and thereby eliminate certain tests, reduce valuable senior engineering time and correspondingly reduce reliability testing costs and time to market.

o   Over the course of a twelve-month period, Sherlock identified 4 designs wherein the probability of failure during PTC exceeded the acceptable standard for the auto manufacturer.

- o   Had the design moved forward, 4 additional PTC tests would have had to be performed at a cost exceeding $346,000 each or $1,384,000 over the year

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Sherlock Software Case Study

- Case Study: Replacing Testing with Rapid Assessment

- Working closely with DfR, Tier 1 automotive manufacturer has convinced a major OEM to replace elements of Product Qualification (temperature cycling, vibration, mechanical shock) with a combination of Sherlock and DfR-led Quality Assessment
  - Initial focus on managing design changes and cost reductions

- Time-to-market reduced by 10 weeks and estimated cost savings of $150,000

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Sherlock Services Case Study

- Case Study: Optimizing Test Conditions and Test Time

- Major HVAC manufacturer was performing extensive thermal cycling and thermal shock on all new designs
  - Actual test time was in excess of seven weeks

- DfR used Sherlock ADA software to demonstrate test time was equivalent to 2X desired lifetime
  - Sherlock also demonstrated that current test was not stressing the components at greatest risk of failure

- Time-to-market reduced by three weeks and test costs reduced by $50,000

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Sherlock Software Case Study- Summary

o Global Storage Manufacturer

  o Eliminates 1-2 physical tests for EACH PCBA Design

  o 10 PCBAs are designed annually

  o Engineering labor and hard test costs (Chambers, Samples) equal $76,000/ test

  o Annual Savings > $760,000

  o Eliminates 2 Design Phases for EACH PCBA

  o Time to market reduced by 2 months

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How to Move Forward With Sherlock

o Understand the Problem You are Trying to Solve

o Understand the Process for Acquiring Software Tools

o Identify a Design

o Receive Full Sherlock Training

o Complete 30-Day Trial with DfR Technical Support

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Get Started!

Contact Tom O'Connor

toconnor@dfrsolutions.com

to set up your Sherlock Free Trial

or Click Here.

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