Sherlock Automated Design Analysis™ software revolutionized electronics design and reliability by empowering designers to simulate real-world conditions and accurately model PCBs and assemblies to predict product failure early in the design process.

As the only tool that uses a Reliability Physics approach, Sherlock continues to innovate and offer enhancements that allow users to manage complex analyses on circuit boards, components, and systems that are required more and more in today’s electronics products. With Sherlock you will:

- Make better design decisions in less time
- Take the guesswork out of your ‘what if’ analyses
- Save development and validation time
- Identify potential failures more efficiently and effectively

**STANDARD SHERLOCK MODEL FEATURES INCLUDE:**

**SOLDER FATIGUE ANALYSIS** Predicts solder fatigue reliability under thermo-mechanical and mechanical environments for all electronic parts (die attach, BGA, QFN, TSOP, chip resistor, through hole, etc.).

**THERMAL-MECHANICAL ANALYSIS** Incorporates the effect of system-level mechanical elements (chassis, module, housing, connectors, etc.) on Solder Fatigue Analysis.

**SHOCK AND VIBRATION ANALYSIS** Predicts the natural frequency, displacement, strain, and reliability under shock and vibration over a range of temperatures (-55°C to 125°C).

**PLATED THROUGH HOLE (PTH) FATIGUE** Predicts fatigue of plated through holes/vias in circuit boards using IPC TR-579 calculations.

**CONDUCTIVE ANODIC FILAMENT (CAF)** Sherlock benchmarks the printed board design and quality processes to industry best practices to identify risk of CAF failures.

**PCB/BGA SUBSTRATE STACKUP** Captures stackup from output files (Gerber, ODB++, IPC-2581). Automatically calculates weight, density, and in-plane and out-of-plane modulus, coefficient of thermal expansion, and thermal conductivity.

**LIBRARIES – EMBEDDED DATABASES EASILY EXPANDED BY USERS.**

- **PARTS LIBRARY** Electronic parts. Tracks manufacturer, part number, technology type, electrical ratings, temperature ratings, and packaging information.
  - Includes package types for semiconductor, discrete, and passive electronic parts. Includes BGAs, QFNs, SOIC, QFP, EIA case sizes, Axial, Radial, etc.
- **PACKAGES LIBRARY** Electronic materials, including encapsulants, underfills, thermal interface materials, staking compounds, conformal coatings, and potting materials.
  - Approximately 800 laminate materials from 24 different manufacturers. Includes CEM1, FR4, BT, CE, Polyimide, High-Temperature, and Flex.
  - Includes 9 solder materials, including SnPb, SAC305, SN100C, 90Pb10Sn, Innolot®, MaxRel®, SACm®, 90iSC* (*available upon request) and M794.
  - Approximately 100 glass styles common to the PCB industry.
- **MATERIALS LIBRARY**
- **LAMINATES LIBRARY**
- **SOLDERS LIBRARY**
- **GLASS STYLE LIBRARY**
ADVANCED CAPABILITIES INCLUDE:

| DESIGN FOR MANUFACTURABILITY (DFM) | Determines if any post-soldering processes could induce excessive flexure that would cause component cracking, pad cratering, or solder fracture. |
| CONFORMAL COATING/POTTING | Allows the user to evaluate the effect of staking compounds, underfills, conformal coatings, and potting materials on the reliability of electronic hardware. |
| CAE INTERFACE | Import to and export from Ansys, Abaqus and/or Nastran. |
| THERMAL DERATING | Flags devices being used outside of the specified operation or storage temperature range. |
| TRACE MODELING | Allows the user to explicitly model all PCB features over the entire circuit board or in a particular region. Can be exported for current density, thermal, or structural analysis. |
| MTBF, EMPIRICAL HANDBOOK | Perform MTBF calculations using either MIL-HDBK-217, Telcordia SR-332, or IEC-62380. |
| MTBF, RELIABILITY PHYSICS | Perform MTBF calculations using Physics of Failure/Reliability Physics per ISO 26262 and SAE J3168. |
| CERAMIC CAPACITOR TIME TO FAILURE | Predicts time to failure for ceramic capacitors (MLCC). |
| ELECTROLYTIC CAPACITOR TIME TO FAILURE | Predicts time to failure for aluminum liquid electrolytic capacitors. |
| INTEGRATED CIRCUIT WEAROUT | Predicts failure rate and end of life of integrated circuits using degradation algorithms for electromigration, time dependent dielectric breakdown, hot carrier injection, and negative bias temperature instability. |
| HEATSINK EDITOR | Create pin and fin-based heatsinks using fill-in fields and drop down menus and attach them to components or PCBS. |
| DFMEA | Allows the user to semi-automate the creation of a component-level DFMEA. Can be exported into any form/spreadsheet, including SAE J1739. |

SHERLOCK IS YOUR SOLUTION

No matter what your role is in the product development cycle – Mechanical Analysis, Design Engineering, Product Manufacturing & Testing, or Reliability Engineering, Sherlock can solve your design challenges.

- Translates ECAD to CAE files
- Predicts product failure
- Designs for manufacturability
- Optimizes the design process
- Analyzes Failure Mode effects

To learn more about Sherlock, please visit https://www.dfrsolutions.com/what-is-sherlock
To schedule a personal demonstration, please call: 301-474-0607