ANSYS Sherlock Overview

ANSYS Sherlock Automated Design Analysis software revolutionized electronics design and reliability by empowering designers to simulate real-world conditions and accurately model printed circuit boards (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

Libraries – Embedded Databases Easily Expanded by Users

Parts Library - Electronic parts. Tracks manufacturer, part number, technology type, electrical ratings, temperature ratings and packaging information.

Packages Library - Includes package types for semiconductor and discrete and passive electronic parts. Includes BGAs, QFNs, SOIC, QFP, EIA case sizes, axial, radial, etc.

Materials Library - Electronic materials, including encapsulants, underfills, thermal interface materials, staking compounds, conformal coatings and potting materials.

Laminates Library - Approximately 800 laminate materials from 24 different manufacturers. Includes CEM1, FR4, BT, CE, polyimide, high-temperature and flex.

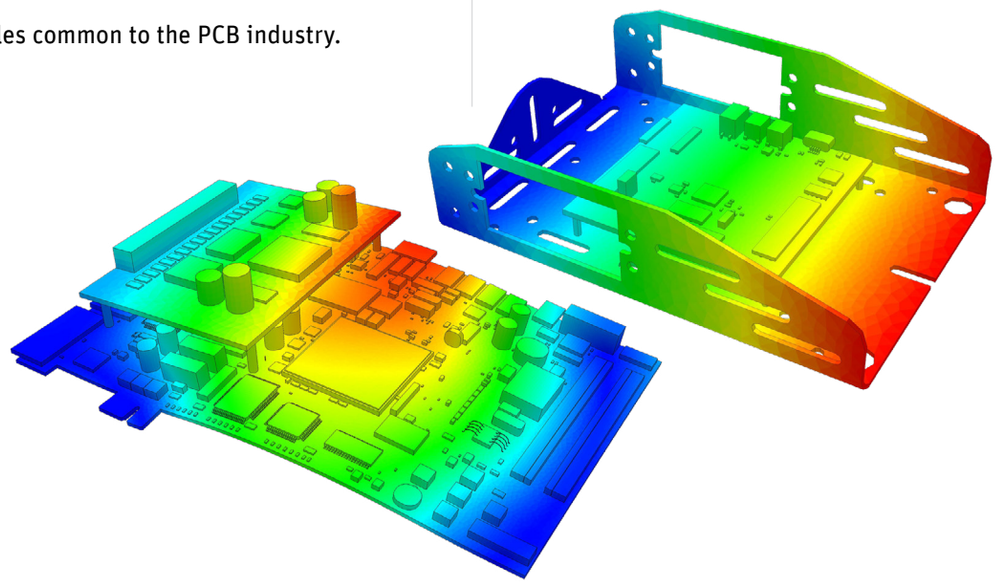
Solders Library - Includes nine solder materials, including SnPb, SAC305, SN100C, 90Pb10Sn, Innolot*, MaxRel*, SACm*, 90iSC* (*available upon request) and M794.

Glass Style Library - Approximately 100 glass styles common to the PCB industry.

Sherlock is Your Solution

No matter what your role is in the product development cycle – mechanical analysis, design engineering, product manufacturing and 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



Capabilities	
FLEXURE/BENDING	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 finite element analysis (FEA) solvers.
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, RELIABILITY PHYSICS	Perform MTBF calculations using physics of failure (PoF)/reliability physics per ISO 26262 and SAE J3168.
CERAMIC CAPACITOR WEAROUT	Predicts time to failure for ceramic capacitors (MLCC).
ELECTROLYTIC CAPACITOR WEAROUT	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.
SOLDER FATIGUE 1D, BOARD-LEVEL	Predicts solder fatigue reliability under thermomechanical and mechanical environments for all electronic parts (die attach, BGA, QFN, TSOP, chip resistor, through hole, etc.).
SOLDER FATIGUE, 3D, SYSTEM-LEVEL	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.

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