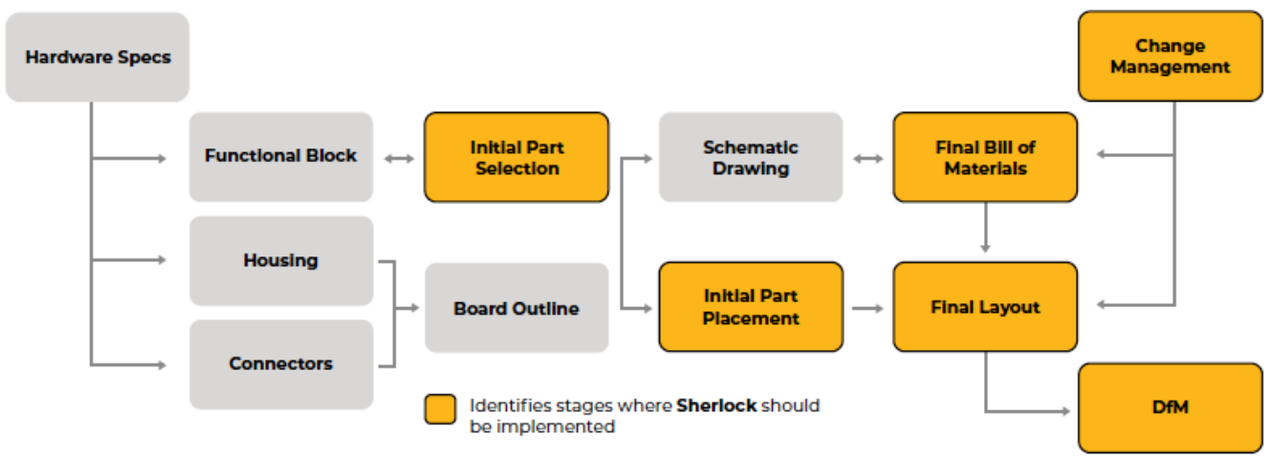
BROCHURE

Ansys Sherlock – Reliability Physics in Your Design Process

Standard Hardware Design Process



Minor Alternations to Your Current Design Process

1. Enhances your current design process.
2. Seamlessly integrates with already occurring simulation.
3. Prevents costly “test-fail-fix-repeat” cycle.

Sherlock Automated Design Analysis™ Software is the only Reliability Physics-based electronics design tool that provides fast and accurate reliability predictions in early design stages.

Initial Part Selection (Critical Components)

- When designing functional block diagram, identify critical parts.
- Determine which Sherlock analysis to perform.
- Benchmark Sherlock analysis to existing data (test, field, etc.).
- Re-run Sherlock analysis based on environmental requirements.

Initial Part Placement (Pre-layout!)

- Perform part-level Sherlock analysis with temperatures from Icepak thermal analysis.
- Place parts based on risk of failure due to vibration, mechanical shock, thermal cycling and bending.

Final BOM

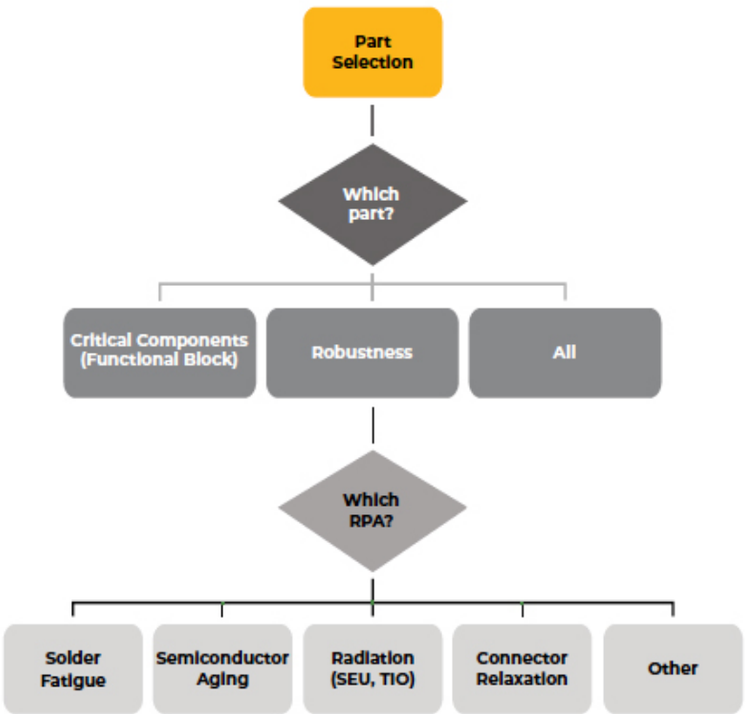
- Run Sherlock analysis on piece parts (discretes, passives).
- Identify problem parts before test.
- More valuable than a simple derating table.

Final Layout

- Perform Sherlock analysis with all design features.
- Perform optimization studies.
- Risk of failure? Identify mitigations before test.

Manufacturability

- Evaluate all post-assembly manufacturing processes.
- Establish load limits to prevent solder fracture, pad cratering and component cracking.



Decide Which Critical Components Should be Subjected to RPA

Within an analog/digital circuit, the critical components are almost always an integrated circuit.

Option 1:

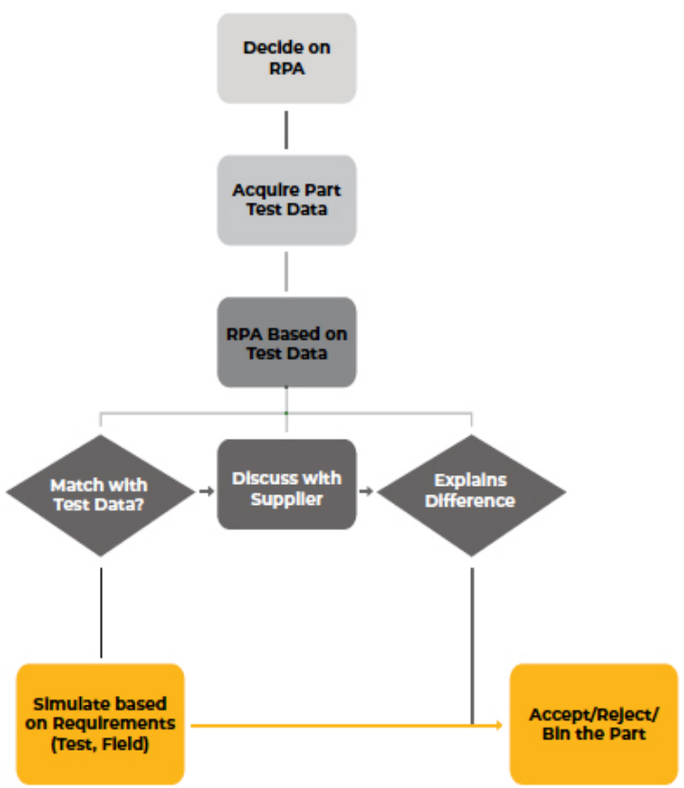
All critical components

- Relatively few critical components (five to 20) in most systems.
- Financially painful if components need to be replaced.

Option 2:

Critical components most likely to fail

- Integrated circuits have three to four different reliability risks.
  - Aging/Wearout of Silicon Transistors (EM, TDDB, HCI, NBTI).
  - Cracking of Low-K Dielectric.
  - Radiation-Induced Failures of Silicon Transistors (SEU, TIO).
  - Solder Fatigue of the Semiconductor Packaging (Thermal Cycling, Vibration).
- Evaluate critical components based on their susceptibility to these risks.



/ Decide Which RPA to Run:

- Aging/Wearout of Silicon Transistors (EM, TDDB, HCI, NBTI.)
- Cracking of Low-K Dielectric.
- Radiation-Induced Failures of Silicon Transistors (SEU, TIO).
- Solder Fatigue of the Semiconductor Package (Thermal Cycling, Vibration).

/ Aquire Selected Part Test Data and Benchmark to Test Data

Option 1:

- If simulation does not match, test data, discuss with supplier.
- After benchmarking to test data, model components to environmental conditions.
- Accept/Reject/Bin the part.

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