

Certitude Functional Qualification System



VERIFICATION ENHANCEMENT SOLUTIONS

The Certitude™ Functional Qualification System is the only solution that removes the uncertainty of the effectiveness of your verification environment. It identifies verification weaknesses that allow bugs to go undetected and lead to functional problems, ASIC re-spins, and delays to market.

The Certitude system does this with unique automation technology that:

- Objectively measures the quality of the verification environment
- Identifies verification holes that can hide design bugs

Confidence In Your Verification Environment

The Certitude system provides detailed information on the ability of your verification environment to activate, propagate and detect potential bugs in your design, exposing significant weaknesses that have gone unnoticed by other tools. The system provides data to identify vulnerabilities in the stimuli, observability, and checkers as well as holes in your verification plan. With the uncertainty removed, your verification efforts will be more reliable and efficient.

Operation Modes

The Certitude system works in two modes:

- *Verification improvement mode* analyzes the verification of your design and identifies specific holes and weaknesses
- *Metric mode* objectively measures the overall quality of your verification environment

Verification Improvement Mode

The primary method of using the Certitude system identifies weaknesses and holes caused by incomplete or missing results checkers and test scenarios or problems in the verification infrastructure. It provides you with a complete report of the results in HTML format that highlights the problem areas. This mode is used to expose shortcomings and guide improvements in your environment to ensure that RTL bugs do not slip through the process.

Metric Mode

You can also use the system to objectively assess overall functional verification quality. The metric mode uses statistical sampling techniques to analyze the ability of your verification environment to activate, propagate, and detect potential bugs. The scores produced by the metric mode in these areas allow for:

- High confidence IP exchange
- Better SoC predictability
- Optimized allocation of verification resources

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How It Works

The Certitude Functional Qualification System works with a patent-pending technology that combines mutation-based techniques and static analysis to stress the verification environment and identify holes and weaknesses that can allow bugs to remain undetected.

The Certitude system introduces mutations, also called “faults”, into your existing Register Transfer Level (RTL) code. For example:

```
a = b | c;      (original code)
a=b & c;      (faulty program code)
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The system then determines whether the verification environment can activate the faulty code, propagate the effects to an observable point, and detect the presence of the fault. This is done in three phases:

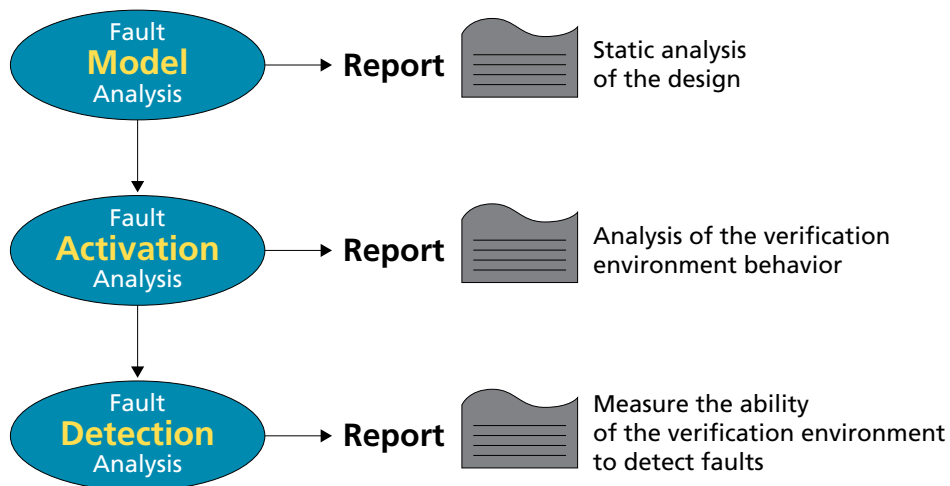
- The *fault model analysis phase* analyzes the RTL design and selects the faults to insert
- The *fault activation phase* runs a complete regression simulation and analyzes the behavior of the verification environment with respect to the faults
- The *fault detection phase* runs selected tests from the verification environment to measure the ability of the verification environment to detect the faults

The Certitude system uses proprietary techniques to optimize and manage the overall process. This enables practical usage on real-world designs and the identification of significant verification weaknesses with a minimal amount of simulation.

Adopt Qualification Early in the Process

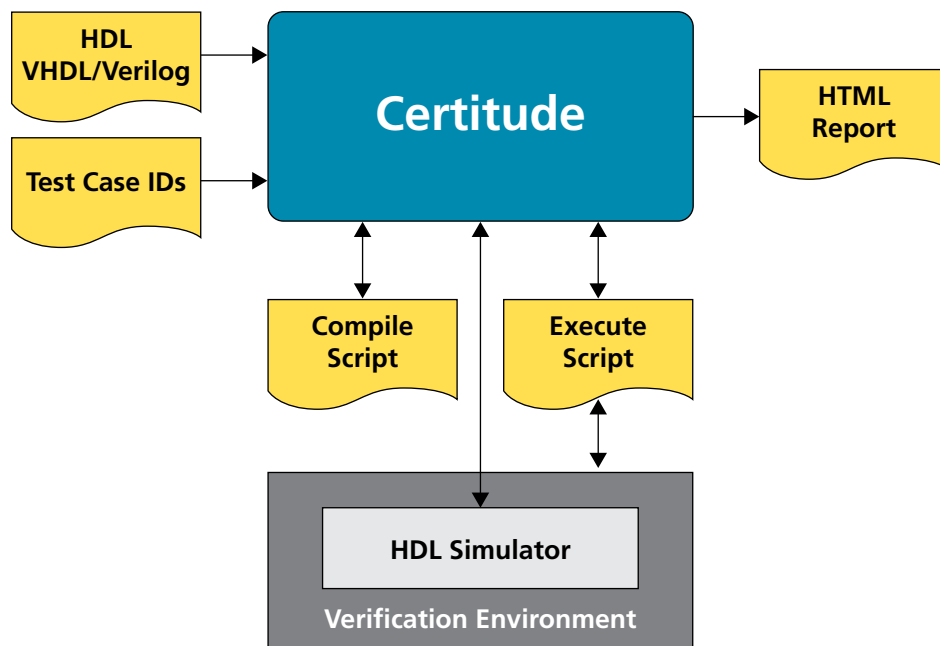
Research has shown that certain faults are more likely than others to expose big weaknesses in the verification environment. The Certitude system uses a patent-pending fault detection algorithm to automatically classify and prioritize the faults related to your RTL design. The faults are then injected and qualified in priority order. Subsequent qualifications inherit results from previous runs and focus on the remaining undetected faults. This process allows you to:

- Find and fix big weaknesses early in the verification process
- Expand the set of qualified faults as the environment and design mature
- Achieve incremental improvement over time
- Minimize analysis and debug effort



Interoperability

The Certitude system is tightly integrated with the most commonly used commercial simulators and is easy to insert into existing functional verification flows. It is fully compatible with all current verification methodologies such as directed random stimulus generation and assertion-based approaches. The Certitude system also leverages the Verdi™ Automated Debug System to enable quick debug and analysis of results.



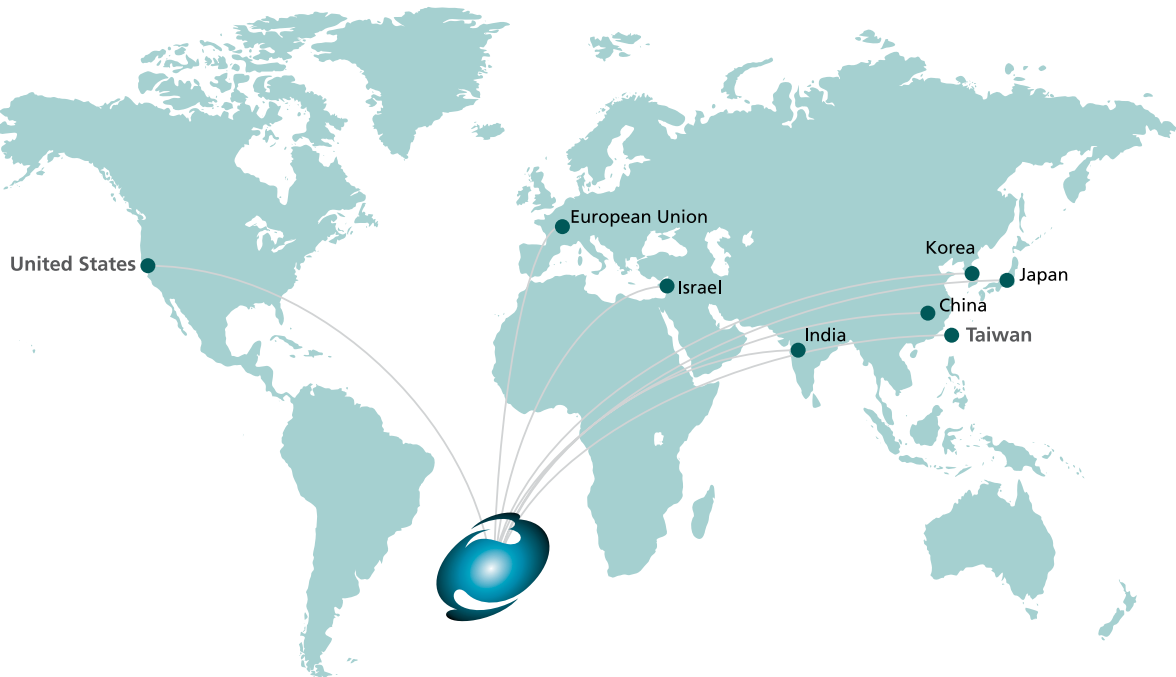
The Certitude Functional Qualification System removes the uncertainty of the effectiveness of your verification environment. Its unique automation technology objectively measures the quality of your verification environment and identifies holes and weaknesses that can allow RTL bugs to remain undetected. The Certitude system is interoperable with existing verification tools and easy to integrate into your current flow. The Certitude Functional Qualification System is yet another way that SpringSoft is Accelerating Engineers.

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