DIGITAL INDUSTRIES SOFTWARE

Solido IP Validation Suite

Industry's first end-to-end silicon IP quality assurance for IC design

Benefits

Solido Crosscheck

- Improves final quality of silicon through IP data integrity

- Enables a comprehensive IP validation framework essential for IP production workflows

- Speeds up time-to-tape-out by identifying potential IP issues early in the flow

Solido IPdelta

- Comprehensive, repeatable, and scalable version-to-version IP QA

- Ensures a high-quality IP revision at every iteration

- Speeds up IP production cycles and design tape-out schedules by identifying issues earlier in the flow

Overview

Design intellectual property (IP) accelerates modern system-on-chip (SoC) development by enabling modularity and reusability in increasingly complex SoCs.

IP has many different views (logical, physical, timing, SPICE, etc.) that must be validated standalone and across design views. In addition, with frequent IP revisions, PDK changes, and updates, unexpected alterations in newer versions can lead to costly rollbacks or re-spins. Managing the IP data library is critical to ensure correct and consistent integration.

Solido™ IP Validation Suite consists of Solido™ Crosscheck and Solido™ IPdelta, offering in-view and cross-view IP QA, as well as version-to-version IP QA, respectively. Used together, these solutions create a robust IP QA flow, accelerating IP production cycles and helping to maintain a high level of IP quality with each iteration.

Solido Crosscheck

Solido™ Crosscheck software provides a comprehensive IP quality assurance (QA) framework for the validation of all IP, regardless of type or technology.

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Features

Solido Crosscheck

- A complete framework for IP validation, including checking, reporting, waiving, and data visualization

- Design- and technology-agnostic IP QA covering most design views in IC design flows

- Comprehensive validation coverage through 300+ in-view and cross-view built-in checks

- APIs for enabling custom formats, checks, and reporting

- IP QA rule deck enables supplier and integrator QA handshake on validation requirements and reporting

Solido IPdelta

- Comprehensive, scalable, and repeatable set of comparisons for version-to-version analysis across all IP format types

- Rule creation for identifying acceptable or expected differences at any hierarchy level (library, cell, pin, arc, layer, etc.)

- GUI tailored for format-specific debugging at all levels of hierarchy, enhancing user experience and efficiency

- Dashboard-like report feature for quick identification of differences

- API extensibility for custom reporting, and support for custom formats, ensuring flexibility and adaptability to various needs

- Detailed analysis of PPA (power, performance, area) changes between different library versions, for informed decision-making

Using Solido Crosscheck, users benefit from an expanding list of customer-driven, in-view and cross-view checks, covering front-end and back-end design views for IP production and integration workflows.

Aside from having a rich set of built-in checks, Solido Crosscheck is also highly customizable, providing a set of APIs for enabling custom checks and reports. It also includes utilities to ease the process of setup creation and maintenance. Solido Crosscheck includes GUI tools for viewing and debugging across different design views.
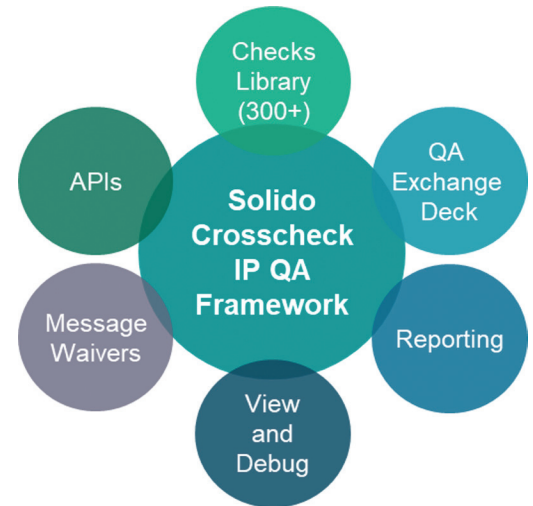

Figure 1. Solido Crosscheck QA framework overview.

Solido Crosscheck: Comprehensive in-view and cross-view IP validation

Solido Crosscheck provides in-view and cross-view IP validation for most design views used in IP production and integration workflows, including:

- Front-end views: Verilog/VHDL, .lib, SDF, UPF/CPF, Test, ATPG

- Back-end views: LEF/DEF/GDS2, Oasis, Plib, OpenAccess

- Simulation and schematics: multiple SPICE formats and binary DB schematics

- Other views such as IBIS, LVLIB, IP-XACT, etc.

Solido Crosscheck has 300+ checks today, with additional checks continuously added by customer request. In addition, custom formats and user-defined checks are also supported through a custom check API.

Solido Crosscheck: Reporting, visualization, and debugging

Solido Crosscheck includes a full set of capabilities to report and visualize validation results. In addition to user-friendly HTML and CSV standard reports, Solido Crosscheck users can also utilize customizable templates and API access to the results database to create custom reports tailored to their requirements.

Solido Crosscheck allows users to temporarily waive issues found with a provided reason so that known issues can be set aside while still preserving the QA accountability to address those later. A built-in IP viewer allows users to examine source data such as layouts, netlists and timing models.

The tool also includes visualization methods for QA results, such as graphical analysis of pass/fail/waive outcomes, enabling users to quickly identify areas of violations with high impact to overall IP production readiness.

Solido IPdelta

Solido™ IPdelta offers a robust and adaptable solution for ensuring the quality and consistency of intellectual property (IP) across different versions. It is tool-agnostic, compatible with various design types, and incorporates a comprehensive framework for result reporting, debugging, and analysis, speeding up design validation.
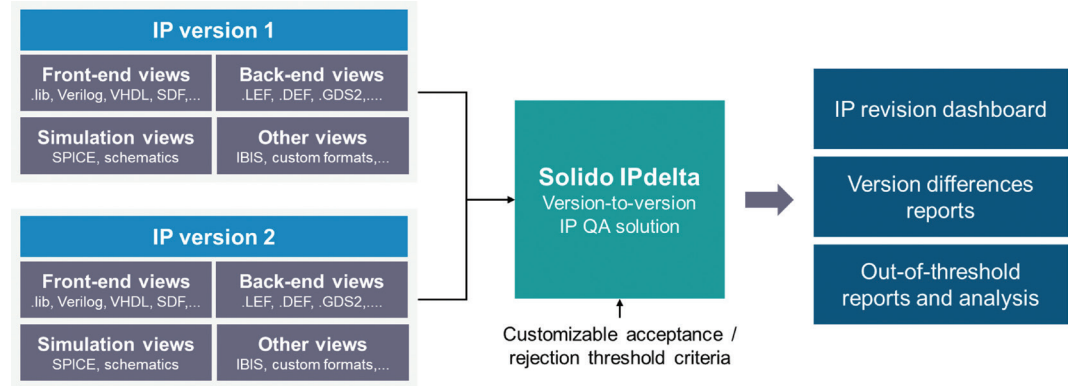

Figure 2. Solido IPdelta overview.

Solido IPdelta incorporates a powerful comparison engine that analyses each design view and format across the older and newer IP versions. It presents differences between the two versions in a user-friendly format and configurable UI. Expected differences can be acknowledged, while unexpected differences can be investigated to necessitate corrective actions in the IP data.

Solido IPdelta: Comprehensive version-to-version IP Validation

Solido IPdelta provides version-to-version IP validation for most design views used in IP production and integration workflows, including:

- Front-end views: Verilog/VHDL, .lib, SDF, UPF/CPF, Test, ATPG
- Back-end views: LEF/DEF/GDS2, Oasis, Plib, OpenAccess
- Simulation and schematics: multiple SPICE formats and binary DB schematics
- Other views such as IBIS, LVLIB, IP-XACT, etc.

Solido IPdelta also offers 15 distinct version-to-version comparison checks, each equipped with the capability to incorporate tolerances for identifying undesirable differences between the two iterations of the IP.

Custom formats and user-defined checks are also supported through a python-based API.

Operating point

Format comparison	Cell comparison	Net comparison
Parser errors	Extra/missing cell properties	Terminal comparison
PPA score	Layer comparison	Instance comparison
File comparison	Layout comparison	Arc comparison
Library comparison	Text label comparison	Table comparison

Table 1. Types of comparisons supported by IPdelta

Easy set-up, user-friendly reporting, and debug

Solido IPdelta provides a user-friendly experience with its intuitive interface and straightforward setup. It enables selection of essential comparisons across desired formats, ensuring a fast and seamless initiation process. Reports are available in both HTML and PDF formats, providing detailed insights into version differences.

Fast, efficient IP QA with Smart Parsing

Smart Parsing in Solido Crosscheck enables saving and restoring of parsed inputs, allowing users to save already-parsed input data into Solido Crosscheck's internal database, and restore when needed. This provides additional speedup as well as memory efficiency when performing IP QA on larger datasets.
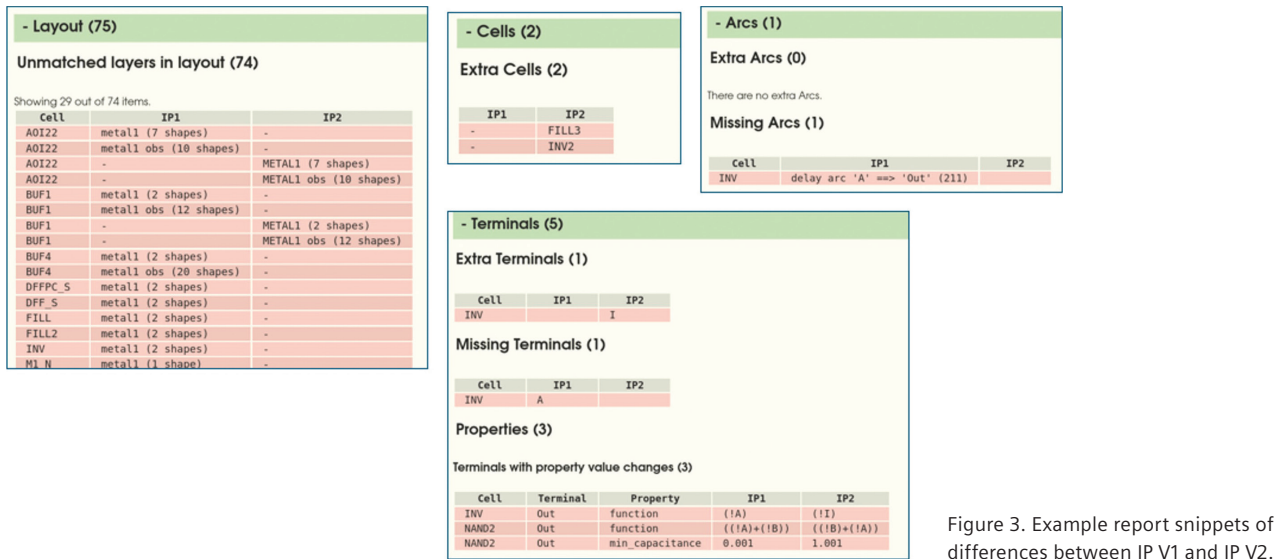
Figure 3. Example report snippets of differences between IP V1 and IP V2.

IPdelta can visualize validation results in real-time, providing live reporting of the results while the comparison and checking process is actively running.

Summary: Solido IPdelta and Solido Crosscheck form a unified IP QA solution

The Solido IP Validation Suite provides in-view and cross-view IP QA, as well as version-to-version IP QA, respectively. Solido Crosscheck and Solido IPdelta, components of the Solido IP Validation Suite, create a robust IP QA flow, accelerating IP production cycles and helping ensure a high level of IP quality with each iteration.
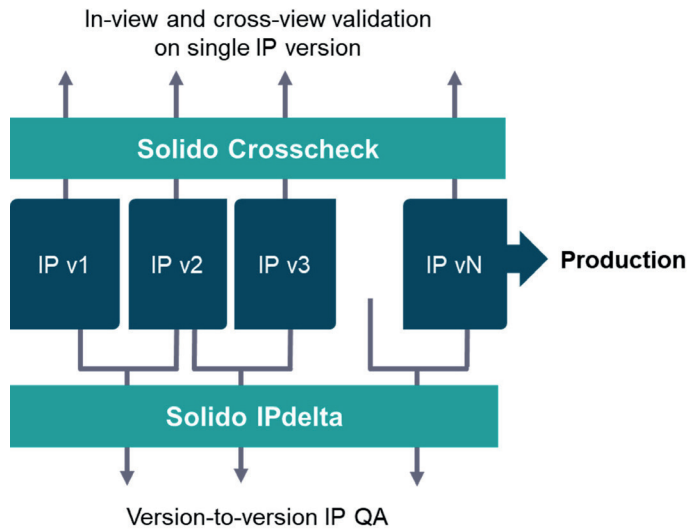

Figure 4. The crosscheck-IPdelta synergy.