Creation of an LSI Design Environment that Accommodates Short-Range Development

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Abstract

As process miniaturization advances, the large-scale integration (LSI) of circuits continues to proceed. Moreover, market demand is increasing the importance of early introduction, and further shortening of the design period is being sought.

Designing large-scale integrated circuits efficiently and with high quality requires the use of many tools. It is also important to raise design productivity without increasing costs. In order to quickly commercialize and introduce LSI circuits to the market, more efficient LSI evaluation is also indispensable.

The main intent of this report is to introduce the features of design environments created by our company to realize short-range development.
Introduction

[Diagram]

The diagram above illustrates the flow of information and processes within the system. Each node represents a different component or function, and the arrows indicate the direction of data flow or causality between these components. The diagram is designed to help visualize the complex interactions and dependencies within the system, allowing for a better understanding of how different parts contribute to the overall functionality.

This visualization is crucial for identifying bottlenecks, optimizing resources, and ensuring that all components are working in harmony. By examining the flow patterns, one can make informed decisions about system upgrades, maintenance schedules, and future development plans.
2.1 Digital LSI circuit design environment

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2.1 Digital LSI circuit design environment

1) Design using hardware description language

2) Improvement in quality via description checker

3) Improvement in circuit quality via improvement in test pattern accuracy

4) Improvement in design efficiency via static verification

5) Parallel verification via FPGA
2.2 Analog LSI circuit design environment

2.2.1 Effective use of licenses

2.2.2 Use of AHDL
2.3 Creation of digital-analog mixed design environment

The current state of digital-analog mixed design environment is presented in the figure. The current state of digital-analog mixed design environment is shown in the figure. The current state of digital-analog mixed design environment is presented in the figure.

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3.1 Improved design efficiency via LSF

3.1.1 Advantages of LSF

1) Effective use of hardware

2) Effective use of design tools

3.2 Reuse of Intellectual Property

3.2.1 Registration as IP
3.2.2 Actions for improving IP utilization

...actions for improving IP utilization. By implementing these actions, we can achieve a more efficient and cost-effective design environment for LSI development.

3.3 Promotion of Improved design efficiency for LSI circuits evaluation environment

3.3.1 Evaluation environment for digital LSI circuits

The digital LSI circuits evaluation environment is designed to support high-speed and high-performance design processes. By optimizing the environment, we can significantly reduce the development time and costs.

3.3.2 Evaluation environment for analog LSI circuits

The analog LSI circuits evaluation environment focuses on precision and reliability. By tailoring the environment to the specific requirements of analog circuits, we can ensure accurate and stable performance.

Comparison with design environments of other companies

<table>
<thead>
<tr>
<th>Feature</th>
<th>A Company</th>
<th>B Company</th>
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<tbody>
<tr>
<td>Design productivity</td>
<td></td>
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<tr>
<td>Design know-how</td>
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<tr>
<td>Number of tools</td>
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<tr>
<td>Number of EWSs</td>
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<tr>
<td>Design quality</td>
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</tbody>
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Future challenges

5.1 Support for C language design

- Higher simulation speed
- Verification of hardware/software coordination
- Future challenges
A standard language has not been established.

C language to HDL conversion tool does not exist at the practical application level.

5.2 Support for UML

Profiles of Writers

Wataru Ihara
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Conclusion