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IIC, DIC & SSIP 2.0 CELL

REPORT

VLSI Physical Design: Challenges and Opportunities

Introduction

VLSI Physical Design is a crucial phase in semiconductor design where an abstract circuit is transformed into a physical layout for fabrication. With advanced technology nodes, physical design has become more complex.

Objectives

- Understand fundamentals of VLSI Physical Design
- Analyze key challenges
- Explore emerging opportunities
- Bridge theory with practical applications

Overview

Stages include:

1. Floor planning
2. Placement
3. Clock Tree Synthesis
4. Routing
5. Sign-off and Verification

Challenges

- Technology scaling issues
- Power consumption
- Timing closure
- Design complexity
- Routing congestion
- Manufacturing constraints

Opportunities

- **Advanced EDA tools**
- **Emerging technologies (FinFET, GAA)**
- **Low-power techniques**
- **Machine learning integration**
- **Growing industry demand**

Applications

- **Smartphones**
- **Automotive electronics**
- **Medical devices**
- **Communication systems**
- **Consumer electronics**

Outcomes

- **Understanding of design flow**
- **Awareness of challenges**
- **Knowledge of tools**
- **Industry readiness**

Conclusion

VLSI Physical Design is essential in modern electronics. Despite challenges, it offers vast opportunities through innovation and technological advancement.

Glimpse of the Event:



