

# VERIFICATION MEHTODS FOR VLSI DESIGN

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# MOTIVATION

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- Increasing Complexity of VLSI Designs
- Critical Industry Relevance
- Advances in Verification Technologies


# INTRODUCTION

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## **What is VLSI Design?**

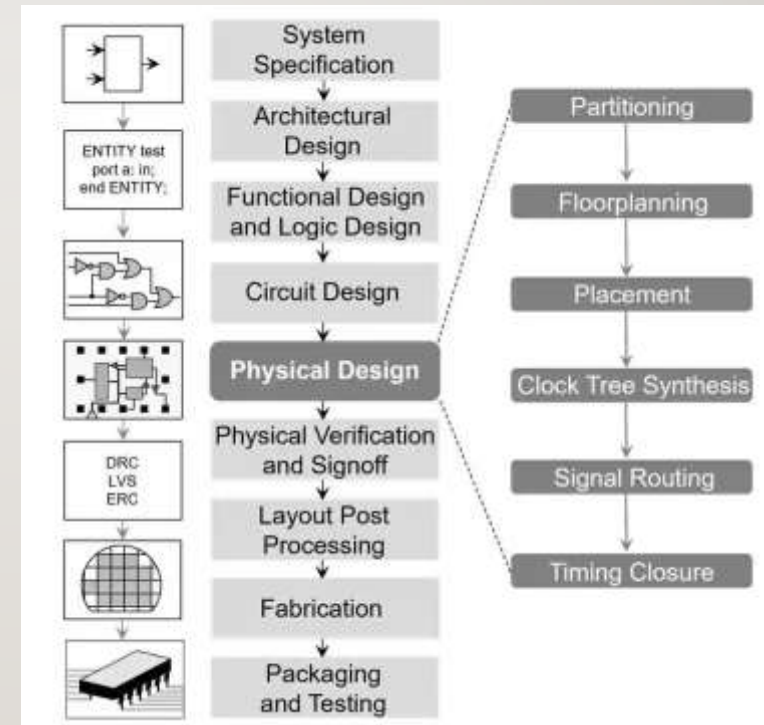
- VLSI (Very Large Scale Integration) involves designing integrated circuits by combining thousands to millions of transistors into a single chip.
- It is a key enabler of compact, high-performance, and energy-efficient electronic devices

## **Importance of Verification in VLSI**

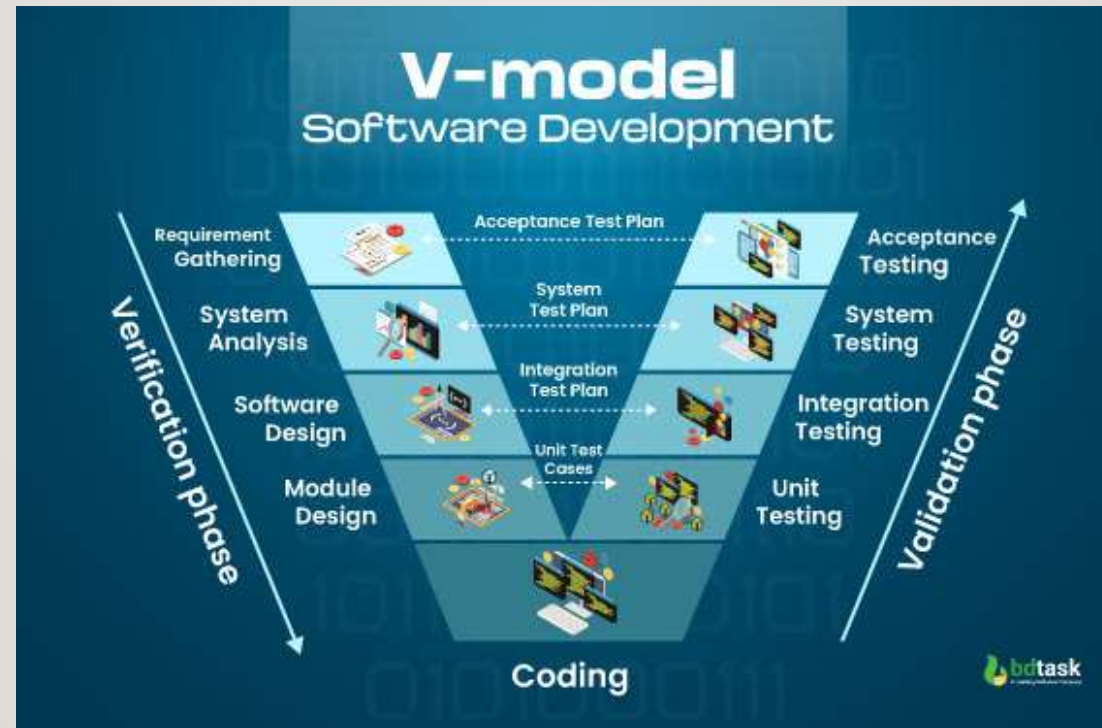
- Ensures functionality, performance, and reliability of complex VLSI designs before fabrication.
  - Plays a critical role in detecting and addressing errors early in the design process, reducing costs and time-to-market.
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# OVERVIEW OF VLSI DESIGN FLOW

- System Specification
- Architectural Design
- Function and Logic Design
- Circuit Design
- Physical Design
- Physical Verification
- Fabrication
- Packaging and Testing



# V MODEL





# VERIFICATION METHODOLOGIES IN VLSI DESIGN

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- Simulation Based Verification
- Formal Verification
- Emulation Based Verification
- Static Verification
- Post-Silicon Verification

# INDUSTRY STANDARDS IN VERIFICATION

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- IEEE 1800 (System Verilog)
- Universal Verification Methodology (UVM)

# VERIFICATION ANALYSIS AND KEY METRICS IN VLSI DESIGN

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- Code Coverage
- Functional Coverage
- Timing Analysis



# IMPACT OF VERIFICATION ON DESIGN QUALITY AND EFFICIENCY

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- Cost Savings
- Product Reliability
- Time to time market

# SUMMARY

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- Verification ensures that VLSI circuits function correctly, meet performance standards, and adhere to power, timing, and area constraints.
- V Model provides a structured and systematic approach to verification.
- Standards like IEEE 1800 (SystemVerilog) and UVM enable scalable and reusable verification workflows.
- Verification ensures manufacturable, reliable, and efficient designs.

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