

Design Project 1.0 Report OUTLINE

ENSC 350

Group 12

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DP1.0 Report Outline Document Structure:

Audience Definition:

- Shareholders and future investors.

Interests and Concerns of Audience:

- To find a suitable design candidate for an addition circuit.

Purpose of Report:

- To provide 4 design candidates meeting the DUT (Adder) specifications, outlining their design principles, topologies, and implementations.
- To provide functional verification results for each design candidate, derived through rigorous testing fulfilling the verification specifications.
- To provide a cost-benefit comparison between the design candidates, to allow the audience to select the best design candidate for their interests.

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1.0 Introduction

Content Rectangle 1.0.0: Identify the audience (Shareholders), abstract

1.1 Background

Content Rectangle 1.1.0: Motivation for making efficient addition circuits, specifications

1.2 Purpose Statement

Content Rectangle 1.2.0: Purpose of report

1.3 Experimental Procedure

Content Rectangle 1.3.0: Functional verification procedure

Content Rectangle 1.3.1: Testbench code snippet

2.0 Design Candidates

Content Rectangle 2.0: Overview of design candidates, similarities, differences

2.1 Baseline Adder

Content Rectangle 2.1.0: Circuit theory for ripple adder (design principle), design topology, design implementation on Cyclone IV, prediction

Content Rectangle 2.1.1: VHDL code snippet

Content Rectangle 2.1.2: Baseline RTL View (Image)

Content Rectangle 2.1.3: Baseline Technology Viewer (Image)

2.2 Design Candidate 1

Content Rectangle 2.2.0: Circuit theory for conditional sum adder (design principle), design implementation, prediction

Content Rectangle 2.2.1: VHDL code snippet

Content Rectangle 2.2.2: Design Candidate 1 RTL View (Image)

Content Rectangle 2.2.3: Design Candidate 1 Technology Viewer (Image)

2.3 Design Candidate 2

Content Rectangle 2.3.0: Ripple adder on Arria II: outline differences between the implementation here and the implementation for the Cyclone IV. RTL, code will be same as Design Candidate 1

Content Rectangle 2.3.1: Design Candidate 2 Technology Viewer (Image)

2.4 Design Candidate 3

Content Rectangle 2.4.0: CSA on Arria II: outline differences between the implementation here and the implementation for the Cyclone IV. code will be same as Design Candidate 2

Content Rectangle 2.4.1: Design Candidate 3 Technology Viewer (Image)

3.0 Conclusion

Content Rectangle 3.0.0: Description of how the cost-benefit metric for each design candidate will be determined based on items like the functional verification results and resource utilization metrics

3.1 Speed Comparison

Content Rectangle 3.1.0: Description of how speed was calculated (Will likely be done by comparison to the baseline device)

Content Rectangle 3.1.1: Table of speeds for each design candidate

	Baseline	Design Candidate 1	Design Candidate 2	Design Candidate 3
Speed				
...				
...				

Content Rectangle 3.1.2: Analysis of the findings

3.2 Cost Comparison

Content Rectangle 3.2.0: How cost is measured, comparison of resource utilization metrics, make reference to prior technology viewer images

Content Rectangle 3.2.1: Table of costs from compilations/flow report

	Baseline	Design Candidate 1	Design Candidate 2	Design Candidate 3
LE/ALM Usage				
...				
...				

Content Rectangle 3.2.2: Analysis of the findings

3.3 Concluding Statement

Content rectangle 3.3.0: Summary of results for candidates, cost-benefit analysis for each design candidate