

Design Project 1.0 Report OUTLINE

ENSC 350

Group 12

Kane Zhan

Kirstin Horvat

Ben Britton

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 adder circuit.

Purpose of Report:

- To provide 4 design candidates meeting the Design Under Test (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.

TABLE OF CONTENTS

1.0 Introduction.....	
1.1 Background.....	
1.2 Purpose Statement.....	
1.3 Experimental Procedure.....	
2.0 Design Candidates and Testing.....	
2.1 Baseline Adder	
2.2 Design Candidate 1	
2.3 Design Candidate 2	
2.4 Design Candidate 3	
3.0 Conclusion.....	
3.1 Speed Comparison.....	
3.2 Cost Comparison.....	
3.3 Concluding Statement.....	

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

Content Rectangle 1.3.2: Synthesis and simulation procedure

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. RTL, code will be the same as Baseline

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. RTL, 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 metrics will be determined

3.1 Speed Comparison

Content Rectangle 3.1.0: Description of how speed was calculated

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

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