HIGH SPEED AND LOW POWER DOUBLE-TAIL COMPARATOR FOR ADC APPLICATION USING 0.13 μM TECHNOLOGY

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ABSTRACT

Analog to digital converters (ADCs) is an electronic integrated circuit for converting a signal from analog to digital form. ADCs converts analog signal into digital data that can be processed by computers for various purposes. The main purpose of the ADCs is that to digitize the analog signals, which means to record and store the analog signals in numbers. Comparator is electronic devices which are mainly as a part of analog to digital converter. This project proposes design Double – Tail Comparator for analog to digital converters (ADCs) application. This design gives better performance of the comparator by minimizing the propagation delay and the power consumption. The schematic design for this proposed design is obtained using 0.13 μm technology with supply voltage of 1.8 V and the operating frequency of 800 MHz. The design is carried out using Mentor Graphics tools with Silterra 0.13 μm technology files. The schematic design and simulations is performed using Mentor Graphics Design Architect tool. At the end of this project, the proposed design results to reduce the propagation delay and the power consume for the comparator circuit which is very important issues for various applications in electronics design.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

The quickly developing electronics industry is pushing towards high speed low power analog to digital converters (ADCs). Comparator is electronic devices which are mainly as a part of analog to digital converter. In ADC they are used for quantization process, and are mainly responsible for the delay produced and power consumed by an ADC. A high speed low power comparator is obliged to fulfill the future demand. The comparators are used in analog to digital converters (ADCs), data transmission applications, switching power regulators and many different applications. The voltages that show up at the inputs are analyzed by the comparator that creates a binary output which represents a difference between them [1].

The comparator is used in the process of converting analog to digital signal [2]. It compares two different inputs signal to produce relevant output. In most ADCs application, the comparator is the main important fundamental building blocks and the high speed comparator influences the overall performance of ADCs directly [3]. In designing a comparator, the speed, power consumption and chip area are the important factors that must be take into consideration.