

PROGRAMMABLE SAMPLE AND HOLD CIRCUIT FOR
RECONFIGURABLE SYSTEM

Final year project submitter in partial fulfillment of the
requirement for the Degree of Bachelor of Electronics (Hons)

Engineering

In the Faculty of Electrical Engineering

Universiti Teknologi MARA

Jan 2015



NUR ATHIRAH BINTI AZMAN
FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA (UiTM)
40450 SHAH ALAM
MALAYSIA

ABSTRACT

This project presents a sample and hold circuit design with four different frequency applications such as biomedical signal (16Hz-10MHz), radio frequency (<3kHz–300GHz), intermediate frequency (110kHz–1500MHz) and power (35.9 kHz-90.6 kHz). The frequency applications will be the input to the sample and hold circuit of Silterra CMOS 0.13 μ m technology. The designed sample and hold circuit use 1.5V for the power supply and designed using Mentor Graphic tools. Total power dissipation for sample and hold circuit is 153.89 μ Watts. The variety of frequency applications was used to obtain the different output signal for sample and hold circuit design before the signal is sent to the other system such as an analog digital converter (ADC).

TABLE OF CONTENTS

	Page
ABSTRACT	i
DECLARATION OF ORIGINALITY	ii
TABLE OF CONTENTS	iii
LIST OF FIGURES	v
LIST OF TABLES	vii
LIST OF SYMBOLS OR ABBREVIATIONS	viii
ACKNOWLEDGEMENT	x
CHAPTER 1 INTRODUCTION	
1.1 Overview	1
1.2 Problem statement	10
1.3 Objectives	10
1.4 Scope of work	10
1.5 Thesis organization	11
CHAPTER 2 LITERATURE REVIEW	
2.1 Introduction	12
2.2 Analog to digital converter	14
2.3 Basic sample and hold amplifier operation	15

ACKNOWLEDGEMENT

In the name of ALLAH, the Beneficent and the Merciful

First and foremost, I would like to thank to my supervisor, Dr Suhana Binti Sulaiman and my co-supervisor, Encik Abdul Hadi Bin Abdul Razak for the advice, encouragement, guidance and enthusiasm given throughout the progress of this project.

My appreciation also goes to my family who has been so tolerant and supports me all these years. Thanks for their encouragement, love and emotional support that they had given to me. I would also like to thank to lab technician, Encik Ahmad Ridwan for his technical support, guidance and helps in this project.

Nevertheless, my great appreciation dedicated to my senior and my entire batch and those whom involve directly or indirectly with this project. There is no such meaningful word than say. Thank You.

Nur Athirah Binti Azman
Faculty of Electrical Engineering
Universiti Teknologi MARA (UiTM)
Shah Alam
Selangor

CHAPTER 1

INTRODUCTION

1.1 OVERVIEW

Reconfigurable system is a system that can change or modified especially sub-system configurations. Reconfigurable devices, including field programmable gate arrays (FPGAs), carry an array of computational elements whose functionality is defined through multiple programmable configuration bits. These components, sometimes known as logic blocks, are plugged in using a set of routing resources that are also programmable. Programmable hardware is the core component in reconfigurable system, and it can be temporary (partly) customized for a specific program or part of the plan. Reconfigurability is divided in two categories:

- i. Static
- ii. Dynamic.