

**DESIGN OF BOW-TIE PATCH ANTENNA WITH AND
WITHOUT U-SLOT ON GROUND PLANE AT RESONANT
FREQUENCY 2.5GHz**

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ACKNOWLEDGEMENT

Firstly, thank you Allah for giving me the strength to complete on my thesis. My gratitude and thanks go to my supervisor En.Mohd Nor Bin Md Tan, Universiti Teknologi Mara (UiTM) and Antenna Research Group (ARG) for guiding me and giving me useful knowledge to finish my research and thesis.

My appreciation goes to Madam NorAyu Binti Zakaria as coordinator for Final Year Communication Project (EE240) who gives information regarding the report's format.

Finally, this thesis is dedicated to my family and loving memory of my very dear late father for the vision and determination to educate me. Special thanks to my colleagues and friends for helping me with this project. Alhamdulillah.

ABSTRACT

The main purpose of this paper is to design a bow-tie patch antenna with U-slot on ground plane at resonant frequency 2.5GHz. The designed was carried out at two different structures. First, designed the bow-tie antenna without slot and second, with slot on ground plane. The microstrip patch antennas were designed using 1.6mm FR-4 substrate with dielectric constant of 4.3 and loss tangent 0.025. The design were simulated by using CST Microwave Studio and measured by using Vector Network Analyser (VNA) for return loss and using Anechoic Chamber for the radiation pattern. The value for the return loss is increased from -24.659 to -25.537 dB for bow-tie patch antenna without slot on ground plane while the bow-tie antenna with slot on ground plane, the return loss is reduced from -31.833 dB to -30.478 dB but the resonant frequency is shifted from 2.5 GHz in simulation to 2.65 GHz and 2.64GHz in measurement.

TABLE OF CONTENTS

Contents

APPROVAL	ii
DECLARATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT.....	v
CHAPTER 1	1
INTRODUCTION	1
1.1 INTRODUCTION	1
1.2 PROBLEM STATEMENT	2
1.3 OBJECTIVES	3
1.4 SCOPE OF WORK.....	3
1.5 THESIS ORGANIZATION.....	4
CHAPTER 2	5
LITERATURE REVIEW	5
2.1 INTRODUCTION TO ANTENNA.....	5
2.1.1 MICROSTRIP ANTENNA	5
2.1.2 BICONICAL ANTENNA.....	6
2.1.3 ANTENNA PROPERTIES.....	8
2.2 INTRODUCTION TO SLOT STRUCTURE.....	12
2.2.1 U-SLOT PATCH ANTENNA	13
2.3 FEEDING TECHNIQUES	14
2.3.1 MICROTRIP FEED LINE.....	15
2.3.2 Coaxial Feed	16
2.3.3 APERTURE COUPLED FEED.....	16
2.3.4 PROXIMITY COUPLED FEED	17
2.3.5 INSET-FED	18
CHAPTER 3	20
METHODOLOGY	20
3.1 INTRODUCTION	20
3.2 FLOW CHART.....	22

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Antenna is one of the most the essential components which are used in various electronic systems especially in telecommunication system. In these days, one of the most rapidly growth sections in the industry is utilizing the microstrip antennas [1]. The microstrip antennas are broadly used over other type of antenna because of its characteristics. Thus, it is an antenna that has a light mass, easy to fabricate, suitable to be placed on almost any type of surface and small size. Patch antenna has some disadvantages such as narrow bandwidth, small gain and directivity, and low efficiency [2]. These favorable aspects are the reason for the radio frequency engineers to choose microstrip patch as their basic designs [3].

The popular of the design microstrip patch antenna shapes aside from the conventional shapes; rectangular, circular, and fractal-shaped are triangular microstrip antenna. Generally, bow-tie patch antenna is the combination of two imaginary triangular which fabricate on single substrate [4].bow-tie shapes are chosen over the conventional shapes for antenna design due to characteristics of the bow-tie patch antenna. This type of the antenna is wideband antenna which can transmit and receive the signal widely. Thus, the design can helps in several growing applications in communications industries such as WLAN applications and mobile base station antenna.