Antenna Design For UWB (Micro Strip Patch Antenna)

Final Year Project Report

Supervised by

Mr. Abdullah Saqlain

Presented by

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DEPARTMENT OF ELECTRICAL ENGINEERING

UNIVERSITY OF MANAGMENT AND TECHNOLOGY, LAHORE

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Antenna Design For UWB (Micro strip Patch Antenna)

An Undergraduate Final Year Project Report submitted to the
Department of
ELECTRICAL ENGINEERING

As a Partial Fulfillment for the award of Degree

Bachelor of Science in Electrical Engineering

by

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UNIVERSITY OF MANAGEMENT AND TECHNOLOGY LAHORE
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Final Approval

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has been approved for

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Dedication

This thesis is dedicated to our family, who supported us in every difficult situation and taught us that the best kind of knowledge to have is that which is learned for its own sake and it is also dedicated to our teachers, who taught us that even the biggest task can be achieved if it is done with determination.

Acknowledgements

We would like to express our gratitude first of all Almighty Allah and our beloved parents who were the source of courage throughout the project. We would also like to thank Mr. Abdullah Saqlain for her supervision during the project and all other teachers who help us in every possible way for the completion of this project.

Muhammad Umer Farooq
Muhammad Yousaf
Bilal Tariq

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List of Acronyms

dB…….	Decibels
AR……	Axial ratio
AWR…….....	Applied wave research
HFSS……	High frequency structure simulator
FR4……...	Flame retardant 4

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Abstract

This is the project report on the Final Year Project titled “Micro-Strip patch antenna (UWB)”. Micro strip patch antennas are gaining popularity day by day because they are very compact in size having low weight and easy for integrating with devices. Micro strip patch antennas can be designed in different shapes and configurations for different characteristics of band such as dual-band, multi-band, wide- band and ultra wide band for GSM WLAN, Wi Max and other wireless technologies. Ultra wide band antennas actually enable low power consumption, high data transmission rates in wireless communication application. In this project a simple micro strip-fed antenna is proposed with ultra wide band characteristics. The antenna is composed of circular patch converted into key like shape with help of slits and slots in order to improve results, and a partial ground plane having slit. The main emphasis was to design an antenna which covers the bandwidth of ultra wide band applications. This patch antenna is designed and simulated in Ansoft HFSS 11 (High Frequency Structure Simulator).

Chapter 1
Project Overview

1.1 Overview:

Wireless communication technology is progressing rapidly day by day. Cords are been replaced by wireless because wireless can provide mobile access to the users, which is a current issue.[5] Without suffering from managing yards of expensive cables, wireless local area access can provide services to the users. Ultra wide band is one of the technologies of wireless communications. Ultra wide band antennas actually enable low power consumption, high data transmission rates and in wireless communication applications. In this project a simple micro strip-fed antenna is proposed with ultra wide band characteristics. Nowadays, compact micro strip patch antennas are current topic for researchers. Micro strip patch antennas are gaining popularity day by day because they are very compact in size having low weight and easy for integrating with devices. [1]

1.2 Objective and Scope

Many antennas are designed and tested by different researchers for different applications. The main theme of designing is ultra wide band characteristics and compactness. . Compactness and ultra wideband characteristics are main concern and our design covers these aspects.
The scope of our project is to design simulate and fabricate ultra wideband micro strip patch antenna for wireless applications. The main consideration in this project is that the antenna is small in size and covers the desired bandwidth. The performance of the proposed antenna is investigated in terms of bandwidth and radiation pattern

1.3 Methods Used:

To achieve the objective mentioned above, firstly a comprehensive literature review on ultra wideband antennas is required and was done in order to get full knowledge of developments on ultra wideband micro strip antennas.
For the process of designing and simulation, software HFSS v11.0 is used.

1.4 Report Outline:

This report consists of six chapters. Each chapter consists of different issues related to this project. The outline of the each chapter is discussed in following paragraphs.

Chapter one covered the introduction and overview of the project background, problem statement, objectives, scope of work and methodology to carry out this project.

Chapter two shows historical overview and fundamentals of antenna, theory of antenna

Chapter three explains the ultra wide band its applications and uses.

Chapter four describes Micro strip patch antenna in detail. All its parameters along with feeding mechanism, substrate material advantages and limitations of micro strip antenna along with their solutions are explained.

Next, the **chapter five** explain on the design procedures and antennas design. The proposed antennas design, geometry structures and specifications are being presented. Simulated results are provided with 2d and 3d plot also rectangular plot of S_{11} parameters.

Chapter six presents the conclusion and future works in order to enhance the performance of this antenna.