

# **BUTTERWORTH BAND-PASS FILTER USING PARALLEL COUPLED LINES FOR WiMAX APPLICATION**

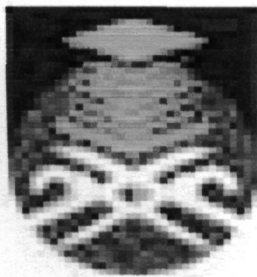
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## ABSTRACT

This paper describes the design, simulation and analysis of a Butterworth band-pass filter (BBPF) using parallel coupled line for WiMAX application. Butterworth approach was used in designing the filter and the simulation was carried out using *Genesys* simulation software. The performance of the filter was simulated based on Rogers Duroid 4350B with dielectric substrate ( $\epsilon_r$ ) is 3.48. The operating frequency range from 5.7175GHz to 5.8225GHz with the cut-off frequency 5.770 GHz with the consideration of 100MHz bandwidth. It was observed that both the simulated and measured values were close.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

This chapter gives an overview of the overall work involved in designing, simulating and analysis of the prototype.

### 1.2 Background the Project

A band-pass filter is an essential component in microwave communication system. It usually used in both receivers and transmitters. The quality of the band-pass filter is important and currently used for fabricated using printed circuit technology and it was suitable for commercial applications [1].

Band-pass filter has the property that one band of frequency is transmitted while two band of the frequencies namely those below and above the pass-band are blocked. Microwave filter is two port network used to control frequency response within a system by allowing the transmission of certain frequencies in pass-band while attenuating frequencies in the stop- band [2].

The parameters of the BBPF consist of the length,  $l$  and the width,  $w$  of the coupled lines, as well as the distance between the two coupled lines known as space gaps,  $s$  [3]. The advantage of Butterworth Band-pass filter is the frequency response is maximally flat and no ripples in the pass band [4].

This work involved with design and simulation, fabrication and analysis of the BBPF based on Rogers Duroid substrate. The design is focused for WiMAX application.