

RING BAND-PASS FILTER (RBPF) FOR GLOBAL POSITIONING SYSTEM (GPS)

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ABSTRACT

This work presents the design, simulation and analysis of a band-pass filter based on ring shape for microwave application. In designing the filter, Tschebycheff approach was used and simulation was carried out using commercial simulation software. The prototype filter was fabricated on the RT Duroid 4350B dielectric substrate (ϵ_r) with the value of 3.48. The operating frequency is from 1.559 to 1.610 GHz with the cut-off frequency at 1.584 GHz and bandwidth of 51MHz. it is observed that there was a slight discrepancy between the measured frequency response of insertion loss and return loss compare to simulated frequency response.

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CHAPTER 1

1. INTRODUCTION

In this chapter, the background of the project is briefly discussed to provide an overview of the overall project. Also, some general information related to the design was included to give an insight of what radio frequency design.

1.1 Background of the Project

To realize the miniaturization potential of solid state devices such as diodes, transistors, varactors etc, smaller transmission systems than waveguide or coaxial line are required. Microstrip function the same way printed circuit boards (PCBs) do at low frequencies. The uses of PCBs at microwave frequencies are impractical because the losses become so high. Microstrip laminates has a special dielectric substrate that confines the signal. [1].

Microstrip is a type of electrical transmission line which can be fabricated using printed circuit board (PCB) technology and is used to convey microwave frequency signals. It consists of a conducting strip separated from ground plane by a dielectric layer known as the substrate. It is less expensive than traditional waveguide technology, as well as being far lighter and more compact. The microstrip laminates has a special dielectric substrate that confines the signal. Hence less losses and this reason has made microstrip an important role in RF design [1].