COMPARISON OF THREE DIELECTRIC SUBSTRATES IN SUBSTRATE INTEGRATED WAVEGUIDE AT KU-BAND

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ABSTRACT

Substrate Integrated Waveguide (SIW) on different types of dielectric substrates has been studied in this research. SIW structure is the planar metal applied on dielectric substrates with top and bottom metal layers perforated with metalized holes. Flame retardant also known as FR-4, RT-Duroid 5880 and RT-Duroid 5870 are applied as substrates in this study. The objective of this study is to make comparison between FR-4 RT-Duroid 5880 and RT-Duroid 5870 as substrates in SIW design which to operating at Ku-band application. The SIW is simulated using HFSS software in order to finding the results. The comparison of return loss and transmission gain between three different dielectric substrates have been assessed in this paper. The result demonstrates the return loss and transmission gain for RT-Duroid 5880 and RT-Duroid 5870 are better compared to FR-4 in SIW design.

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CHAPTER 1

INTRODUCTION

1.1 OVERVIEW OF STUDY

The SIW has been popularized in the past few years by some researchers. Usually passive components, active components and transmission components are made by different methods in manufacturing and different interfaces. So, the extra losses are incurred during the insertion, transition, and transmission processes. As outcome, the ideal design performance for each system components impossible to achieved. Because of that, a new form of transmission line has been introduce which is substrate integrated waveguide (SIW) in order to optimize the system integration as shown in Figure 1.1. The transmission lines formed by the SIW not only have the good physical characteristic of planar printed transmission lines, but also possess the excellent performance of solid waveguide.

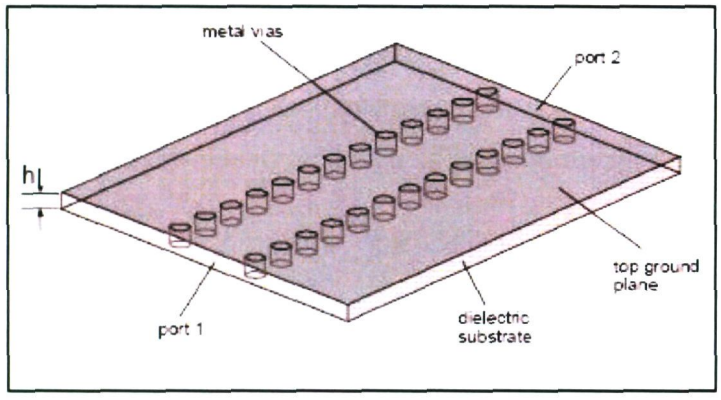

Figure 1.1: Substrate Integrated Waveguide (SIW)