BANDPASS FILTER DESIGN USING MICROSTRIP SPLIT-RING RECTANGULAR RESONATOR

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ABSTRACT

In this thesis, a multilayer bandpass filter using microstrip split-ring resonator has been proposed for frequency range of 1.452 GHz to 1.492 GHz. The filter was designed using Computer Simulation Technology (CST) software and implement on Rogers Duroid RO3003 substrate with dielectric constant, ε_r of 3 and tan δ of 0.0013 with thickness 0.75 mm. The insertion loss and return loss for this filter is -0.4539dB and -23.93 dB, respectively. The effect of coupling gap of the split-ring resonator and few other parameters was studied and the analysis has been included.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

In the 20th century the advance of technology has been fundamental in the way we live our lives today. The recent introduction of digital broadcasting has caused many technologists to become swept up in a sense of awed enthusiasm about the infinite possibilities of the new digital age. Digital broadcasting has thousands of new services to offer its viewers and listeners. Instead of pictures and sound being transformed into waves, the new technology turns them into a series of digits which are transmitted through the air and received by television or radio aerials. Digital broadcasting uses a wide bandwidth broadcast technology and typically spectra have been allocated for it in Band III (174 – 240 MHz) and L-band (1452 – 1492 GHz), although the scheme allows for operation almost anywhere above 30 MHz, L-band digital broadcasting is allocated to terrestrial broadcast to avoid interference. The realization of designing a suitable device with great performance to be used as a part of communication system is essential to improve the systems.

A multilayer printed circuit boards designs consist of multiple layers of electronic components placed over each other. Other methods are via-hole construction, the technology that was used to deal with planting the electrical components through the holes on the circuit board. This proved to be better than its predecessor, and it is comparable to a single layer printed circuit boards design. The