THIRD ORDER SYMMETRICAL MICROSTRIP DUAL-BEHAVIOUR RESONATOR FILTER AT 6 GHZ

Presented in partial fulfillment for the awards of

Bachelor of Engineering (Hons) (Electrical)

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07 MAY 2010

ACKNOWLEDGEMENT

In the name of Allah S.W.T,The most beneficial and the most merciful. It is with deepest serve gratitude of the A-Mighty that gives strength and ability to complete this project.

I would like to take this opportunity to express special thanks to my project supervisor, Dr Mohd Khairul Bin Mohd Salleh for his guidance, advice, kindness and also being helpful to guide me throughout the development of this project. My appreciation also goes to and all his team of researcher from the Microwave Technology Center at Universiti Teknologi MARA for their cooperation.

Last but not least, special thanks go to my parents and family for their faith and prayers that has enabled me to succeed.

ABSTRACT

This paper is aimed on the design of microstrip dual-behaviour resonator (DBR) filter. The design is a third order filter developed at the center frequency 6 GHz. The bandwidth of the dual-behaviour resonator filter is 7%. Dual-behavior resonators (DBRs) are based on the parallel association of two different bandstop structures, which implies a constructive recombination. This filter is design by using relative permittivity, ε_r=5.4 and substrate thickness, h=1.6mm. Simulations are proposed throughout the paper to illustrate the various possibilities offered by the concept. Experimental results in microstrip technology are also presented in order to validate the idea.

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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 OF THE PROJECT

Radio frequency filters are commonly implemented inside receivers, with rigorous specifications about rejection of the adjacent transmitted frequency band in order to preserve them from possible damage and degradations due to high transmit power. Nowadays, the expansion of new telecommunication systems has brought severe constraints and particular requirements for RF front-ends and especially for RF filters [1]. Thus, this situation is requiring a tight technology. For such applications, the use of dual-behavior resonators (DBR) appears a very convenient solution because they allow the control of two attenuated bands on either side of one bandpass [2].

A dual-behavior resonator results from the combination of two different parallel bandstop structures. Each of them brings its own transmission zero with respect to its fundamental resonant condition. At the same time, their association is