

Design and Simulation of Various Band Selective (Tunable Range) Wideband Microstrip Filter

A Dissertation submitted towards the partial fulfillment of
the requirement for the award of degree of

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in

Microwave and Optical Communication Engineering

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CERTIFICATE

This is to certify that work which is being presented in the dissertation entitled **Design and Simulation of Various Band Selective (Tunable Range) Wideband Microstrip Filter** is the authentic work of **Aditya Byagra (2K13/MOC/01)** under my guidance and supervision in the partial fulfillment of requirement towards the degree of **Master of Technology in Microwave and Optical Communication Engineering**, jointly run by Department of Electronics & Communication Engineering and Department of Applied Physics in Delhi Technological University during the year 2013-2015. As per the candidate declaration this work has not been submitted elsewhere for the award of any other degree.

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DECLARATION

I hereby declare that all the information in this document has been obtained and presented in accordance with academic rules and ethical conduct. This report is my own, unaided work. I have fully cited and referenced all material and results that are not original to this work. It is being submitted for the degree of Master of Technology in Microwave and Optical communication engineering at the Delhi Technological University. It has not been submitted before for any degree or examination in any other university.

Signature
Aditya Byagra

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ABSTRACT

Many systems require multi functions capability in the filter aspects of the systems, the method currently used is filter banks for achieving different centre frequency, bandwidth, gain and so on which take up a lot of space. It is better use a single reconfigurable filter to replace a filter bank. The aim of this research is to make a reconfigurable microwave filter for 1-10GHz which is suitable for satellite communication and cellular phones. This work presents a method to design a both frequency and bandwidth tunable filter using coupled microstrip line and short circuit straight stubs. This filter incorporates facility to vary both frequency and bandwidth using simple switching technique. Bandwidth is varied by simply switching ON and OFF the straight stubs keeping coupled line fixed. Various combination of straight stubs results in different bandwidths. Furthermore effective length of coupled line can also be varied to vary centre frequency and along with switching stubs gives both frequency and bandwidth tunable filter. Pin diode is supposed to be used for switching due to their superior performance in ultra high frequency (UHF) band of our interest. The filter has been designed and simulated using Agilent advanced design system (ADS2010.11) where parametric analysis has been performed to tune the impedance and length of coupled line and stubs.

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