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Design of Band Stop Filter for Wireless

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Abstract: *The analysis and comparison of band stop filter for wireless communication is proposed. The rectangular structure with the resonant frequency of 1.5GHz was designed and simulated for pass band .The rectangular structure was modified by using diamond structure and it is observed that the operating frequency was 1.5GHz for stop band. Increasing the number of iteration produces more operating frequency. The dielectric material used is "FR4" with dielectric constant 4.4 and the substrate height 1.6mm .The simulation process has been done through IE3D Electromagnetic software which is based on method of moments. The properties of filter such as s parameter, bandwidth, radiation pattern has been investigated for all the designed structures.*

I. INTRODUCTION

The demands for the stop band filter are increasing as diverse wireless communication systems want to secure high quality of their own signals by rejecting interference from other systems. Planar BPF utilizing the suppression of spurious harmonic resonance for realizing the stop-band, have advantages of simple fabricating procedure and quite compact size. Much researches have been conducted on these planar BSF by using Flame resistant with 4(FR4).

In this letter are used to achieve the stop band responses by using inter digital capacitor, meta material. The BSF use FR4 substrate with thickness of 1.6mm and relative dielectric constant of 4.8. full wave EM simulators are carried out by zeland software IE3D.

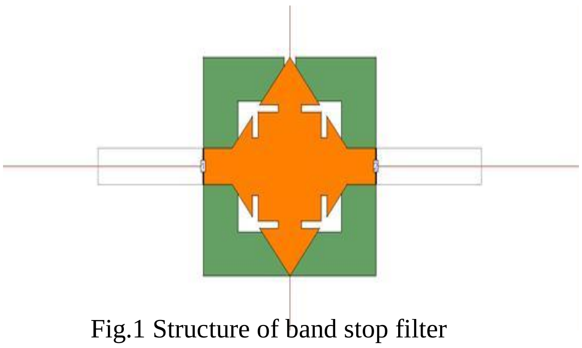

Fig.1 Structure of band stop filter

II. ZERO SLOTTING

Shows the structure of the diamond structure where the notations of the geometrical dimensions are similar as the figure 1 narrow and wide parts of this resonator denoted by A and B, and some portion of A is used for obtaining features of zero slotting. Here the even or odd mode equivalent circuit shows the slotting analysis Z_{in} are the input impedance for the even and odd mode circuit. The design of this filter starts with the choice of $K=Z_B/Z_A$. To make the ratio of the second resonant frequency to the first one is larger than 2.5 in order to aim f1 at 1.5Ghz .

This design procedure is obtained with the dimensions as L=43mm, W=55mm. then chebyshev BSF with order n=6. The parameters can be obtained by following,

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And

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FR-4 epoxy resin systems typically employ bromine, a halogen, to facilitate flame-resistant properties in FR-4 glass epoxy laminates. In order to aim f at 1.6GHz, the dimension were used.

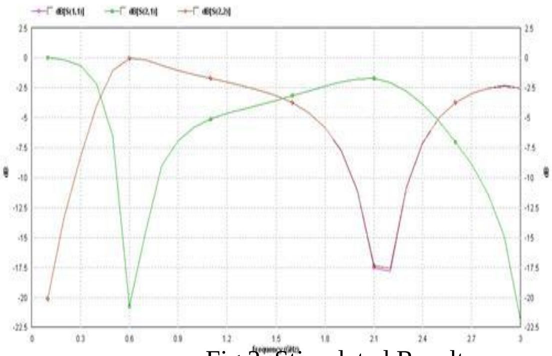

Fig.2. Stimulated Result

The values regarding the position and size are defined by the analysis of the length and width under three different values a five transmission zeros were observed to move periodically as s increases as w increases the varying range of those zeros becomes wide meanwhile just three zeros are observed. Therefore it can be inferred that additional transmission zeros can be achieved between each existing zeros.

III. FILTER IMPLEMENTATION AND EXAMPLES OF BSF

The structure is realized by utilizing the transmission lines the length is increased to 1.6mm.when only s= 0.34 where the remaining frequency is observed to be suppressed the raising trend of fZ1 is also expected with increase of width the measured and simulated result are compared with the existing results where the insertion and return losses 2.06 and 1.25 respectively. The low-pass filter prototype are normalized designs having a source impedance of $R_s = 1\Omega$ and a cutoff frequency of $\omega_c=1$. The filter transformations are used to scale the designs in terms of frequency and impedance and is converted to give high-pass, band pass, or band stop characteristics.

The figure shows the fabricated filter wider stop band the design 1 is different from design 2 and the spurious resonant frequencies to extend the stop band is also the different as a result the dimensions of the design are as follows h=1.6mm l=55mm w =43mm where the distribution n is not using the open circuited for transmission line for either feeder with lengths result in achieving supplementary zeros at those frequency keeping s=0.34 the measured result shows the return and insertion loss and suppression level and performance of the filter is compared with the other designs also.

IV. CONCLUSION

Band stop filters with wide stop band have been developed by using diamond structure with zero slotting .after analyzing the diamond structure the slotting method is designed to get effective suppression by making the impedance frequency schemes of distributing spurious resonant frequency and using inserted feed structures bring about wider and required stop band responses.

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