

Novel EBG Structure BPF for UWB system

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Abstract: This paper discusses about application of Electro Magnetic Band-gap structure(EBG) application in design of microstrip band pass filter(BPF) in ultra wide band(UWB) frequency. Here to obtain improved pass-band region and good out of band region a single Electro Magnetic Band-gap structure (EBG) cell is used. The simulation of the filter is done using advanced design system software (ADS), the obtained result is satisfactory .in addition to the performance of the filter the size of overall filter is reduced in size which can be used in many compact handheld devices. [19],[20],[21]

Keywords : Band-pass filter, electromagnetic band-gap (EBG), ultra wideband (UWB), wideband filter.

I. INTRODUCTION

In present day correspondence frameworks ultra wide band (UWB) recurrence is utilized progressively due to in wide band nature application in transmission and getting information for its speed. This is because of the consent conceded by Federal Communications Commission (FCC) recurrence band 3.1 to 10.6 GHz for business correspondence applications in February 2002[1].therefore in any correspondence framework band pass channel assumes a significant job, likewise structuring a conservative band pass channel turns out to be additionally encouraging are in remote minimal handheld gadgets. The other fundamental parameters taken to thought in structuring a band-pass channel are low addition misfortune over the whole pass band recurrence which is 3.1 to 10.6 GHz and great return misfortune in stop band recurrence. Over numerous years numerous new techniques had been actualized in acquiring the previously mentioned parameter.in this strategy UWB channel present deceptive band, this undesired false groups is a noteworthy burden in execution of channel in pass band area. [2],[4],[6]

Currently Electromagnetic band-gap structures (EBG) are designed for application of filter design and other application in communication systems.. EBG structure has the unique property of suppression of propagating surface waves in micro strip device. Also the property of high impedance in suppressing surface waves in particular frequency it is more suitable for UWB –band-pass filter design. [14],[16],[18]

II. FILTER THEORY

In planning any channel, beneath referenced are significant parameters

1. Pass data transfer capacity

2. Stop band constriction and frequencies

3. Input and yield impedances

4. Return misfortune

5. Insertion misfortune

6. Group postponement

The parameters in over the abundance reaction given as far as the addition misfortune Vs recurrence attributes are considered in reenactment. [1],[3],[5]

III. PROPOSED EBG STRUCTURE.

The electromagnetic band-hole (EBG), structure has a wide band-hole in nature. The inductor L is because of the present coursing through the associated by means of. The hole between conductor sides of two adjoining cells offers ascend to equal capacitance C. This two dimensional occasional LC system is acquired, which results to recurrence band-hole and the inside recurrence of band-hole to decide utilizing recipe

$$\omega = 1/\sqrt{LC}$$

From condition it demonstrates that so as to accomplish progressively reduced electromagnetic band-hole (EBG), structure, its capacitance C and inductance L ought to be expanded. In the EBG structure strategy , the inductance L can't be changed if thickness of dielectric and type dielectric material is picked. The main strategy is to build the estimation of the capacitance C. [13],[15],[17]

Figure.1 below shows the proposed electromagnetic band-gap (EBG),

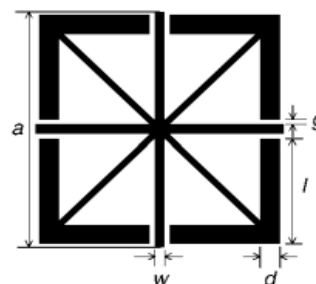


Fig 1.Proposed EBG structures

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IV. THE PROPOSED ELECTROMAGNETIC BAND-GAP (EBG), UWB FILTERS



The proposed UWB band pass channel is structured and reenacted utilizing ADS reproduction programming. The band pass channel is planned with thickness 0.635 mm on a RT/Duroid substrate which has the dielectric steady 10.2. The schematics of uni-planar minimal EBG (UC-EBG) structure are appeared in fig 2. The inside recurrence of 6.85 GHz is gotten by the bury computerized coupled lines. [8],[10],[12]

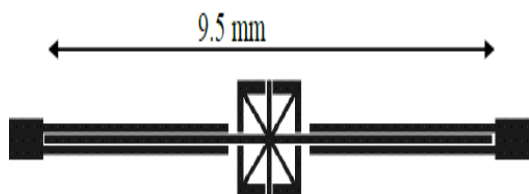


Fig.2 (a).EBG Embedded Multi Mode Resonator BPF

IV. SIMULATION RESULTS

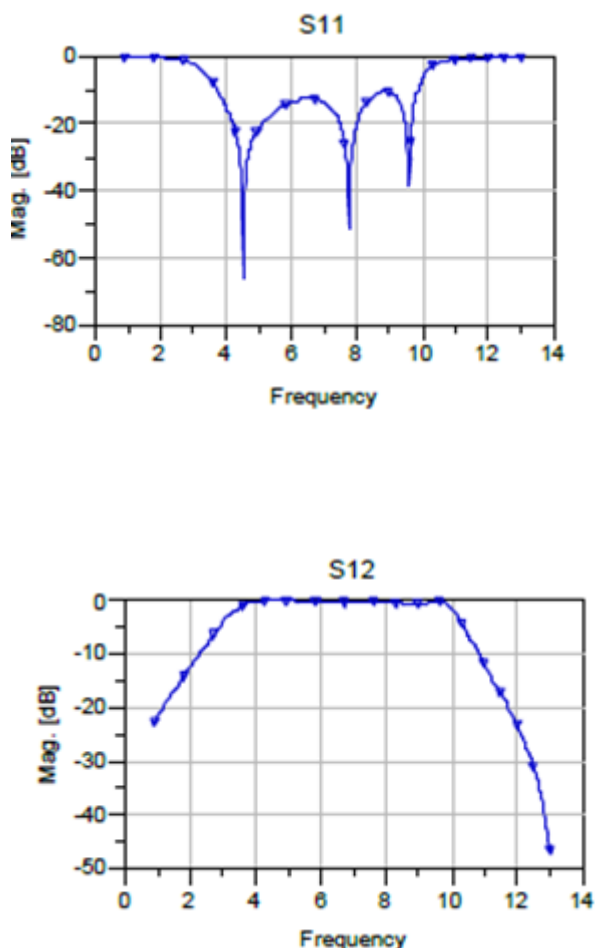


Fig 2(b).EBG Embedded MMR BPF return loss and insertion loss

V. CONCLUSION

The, Electromagnetic Band-hole (EBG), structures applied in planning ultra wide band BPFs shows improved pass-band in

ultra wide band locale, likewise with great out-of-band dismissal in stop-band district .By utilizing this proposed the Electromagnetic Band-hole (EBG) structure channel generally size is decreased which will be appropriate for smaller remote gadgets. The outcomes been reenacted utilizing advance plan frameworks Momentum test system programming, the future work should be possible on various EBG structures and the reaction in channel plan. [7],[9],[11]

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