Design and Analysis of Planar Monopole Antenna with Dual Band Notch for 3.9Ghz

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Abstract: - Ultra-wideband (UWB) technology is becoming promising technologies for the upcoming strong wireless communication information transfer requirement, even in high-precision radars and imaging systems. The UWB antenna is the primary focus of the needed portion of the UWB scheme. The Up gradation and enhancement in the UWB antenna require a lot of stuff to be accomplished as the demand for more information rate increases every day so wide bandwidth of 3.1–10.6 GHZ, stable gain and excellent pattern of omnidirectional radiation. Here we are getting the good frequency and gain in this new antenna. A straightforward and compact microstrip-fed planar antenna with dual stop bands focused at 3 GHz is described in this thesis covering the UWB operating band. Hence, a microstrip patch antenna is designed for 3.9Ghz and also fabricated and tested using network analyser.

Keywords: - Ultra-wideband, omnidirectional radiation, bandwidth, microstrip patch, frequency,

I. INTRODUCTION

A prevalent unlicensed band is allocated to ultra-wideband (UWB) frameworks between 3.1–10.6GHz. The transmission capacity used by these frameworks is 7.5GHz at the end of the day, which is the largest information transfer capacity allocated to any company to use up to this stage. The prospective targets for UWB frameworks have elevated data rates and accurate location capabilities with such a transfer speed. In, four planar UWB antennas are used with edge cutting and parasite circles. For the most portion, a band-indent UWB antenna is constructed by consolidating a conventional UWB antenna with a resounding band-stop framework [1]. At the end of the day, a two-advance methodology is the construction of band-indented UWB antennas. A UWB is scheduled with excellent execution coordination in the first phase. The second step involves a resonator for a band-stop and an exhibition upgrade. Two components regarding the complete structure to be used, which are the type and region, are regarded to create the score characteristics. Slot, microstrip, coplanar waveguide (CPW)[9] and metamaterial resonators are the kinds of resonators typically used. Usually, buyer products requiring UWB antennas are meant to be small in size [3][4]. This truth indicates that it must be conservative for UWB antennas used in such products. Scaling down can be achieved in two phases for planar band-scored UWB antennas. The first stage is to use the technologies used to scal the UWB antenna itself the second step is to scale down the resonators used to achieve the characteristics of the band. It should be noted that since UWB is a heartbeat-based correspondence, it is essential to demonstrate that an antenna displays excellent UWB execution, both recurrence and time region estimates. A decreased UWB staircase staircase is developed in this article [8].

The growth of the antenna from the nourished strip monopole of a finite surface coplanar waveguide (FG-CPW) is shown in detail. The antenna's coefficient of reflection, surface present and radiation examples are mimicked and examined. The antenna is developed and it was estimated that the presentation of the produced antenna is well in line with the recreated results. Transient examination of the antenna leads to the understanding and evaluation of the beat that takes care of the antenna's ability[10]

II. PROPOSED METHODOLOGY

Implementation:

Fabrication steps:

Frist step:

During the simulation operation, we simulate a straightforward rectangular patch antenna of the calculated sizes on the very common simulation instrument called a smooth HFSS 13.

Figure 1: fabrication of antenna step 1

Second step:

Therefore, the desired result is not achieved in this rectangular patch antenna simulation, we cut a single 7 mm average 2 mm strip on the left side of the patch as shown in Figure.4.3 and analyse the result. The loss of return is about the same as the first step.

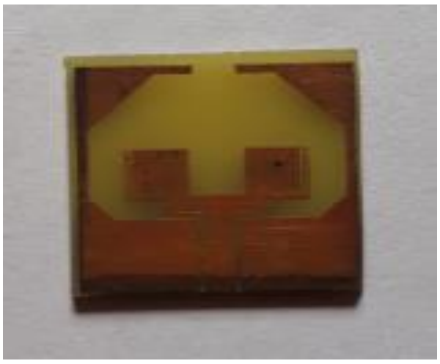

Figure 2: fabrication of antenna step 2

Third Step

As we have seen above, there is no change in the return loss graph here, so on the left side of the radiating patch we cut a strip of the same size again as shown in Figure.4.5, but we do not distinguish between the return loss plots.

Figure 3: fabrication of antenna step 3

Fourth Step

In this step, we consider both the radiation patch mentioned in earlier steps as shown in Figure.4.7 and evaluate the simulator outcomes, this is the return loss graph

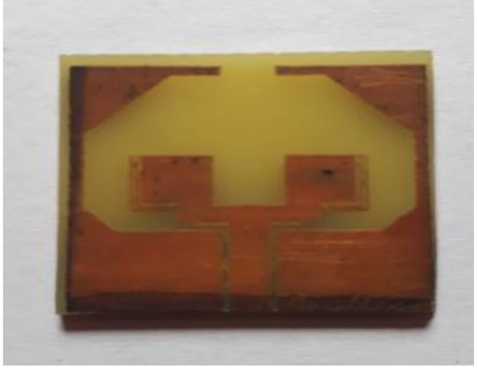

Figure 4: fabrication of antenna step 4

Fifth Step

We have etched an L-shape at the radiating patch to adjust the notch band at the required frequency and obtain better outcomes as shown in Figure 4. Compared to others, these antenna simulation findings are nice, but these are not required outcomes to get the WLAN notch band.

Figure 5: fabrication of antenna step 5

Figure 6: CRO readings

The above figure 4.6 shows the CRO reading here we can see the gain is -30.50 db and the frequency is =3.01200Ghz.

4.1.2 Fabricated Proposed Antenna:

Once the suggested antenna has been effectively simulated, its manufacture is finished effectively by etching the required design at FR4.

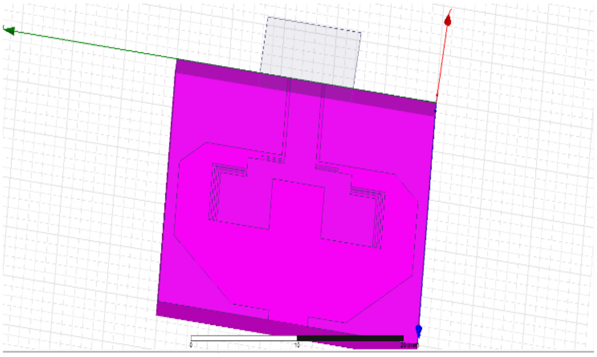

Figure 7: FR4 substrate

The antenna prototypes were manufactured using photolithography on a microwave substratum. This method is used when high dimensional precision is required. First, Laser printer printed a adverse antenna geometry mask on a butter paper. Using acetone, copper clad sheet of the appropriate size was washed to remove the oxide coating on its surface. A thin layer of photo-resistant material was applied to the copper clad and dried using a high-speed spinner. Then the copper clad was placed only on the substratum to UV rays with the prepared adverse mask. A thin layer of photo-resistant material was applied to the copper clad and dried using a high-speed spinner. Then the copper clad was placed only on the substratum to UV rays with the prepared adverse mask. Finally, to remove the hardened adverse photo resistor, the board is washed.

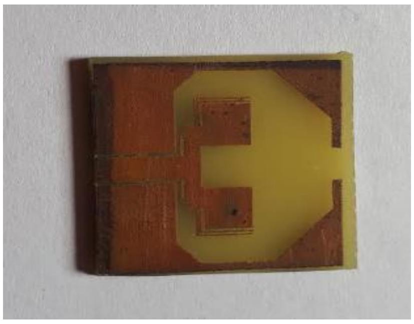

Figure 8: Fabricated Structure of proposed antenna

The figure 8 shows the final fabricated structure of proposed antenna

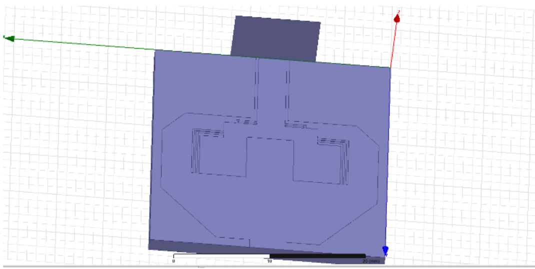

Figure 9: proposed patch antenna

The figure 9 shows the proposed patch antenna in x and y axis

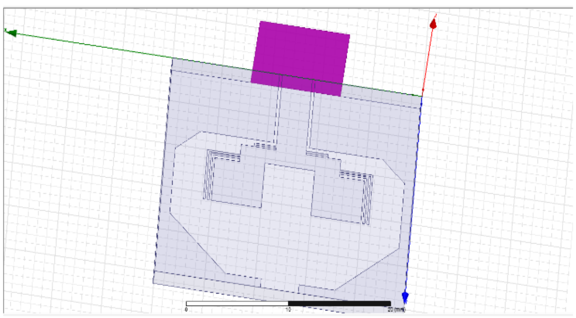

Figure 10: wave port view of proposed antenna

The figure 10 shows the wave port view of proposed antenna

III. RESULT

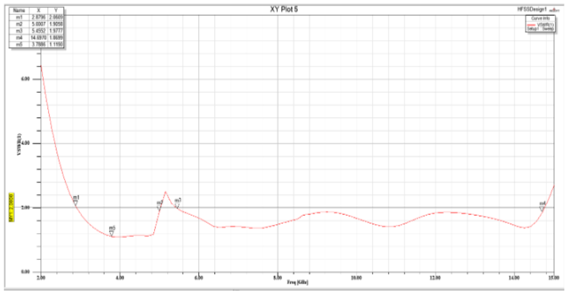

Figure 11: graph diagram of VSWR

The above figure shows the graph diagram of antennas VSWR graph, here we can see the VSWR is less in m5(3.7886) and it is design in HFSSD software.

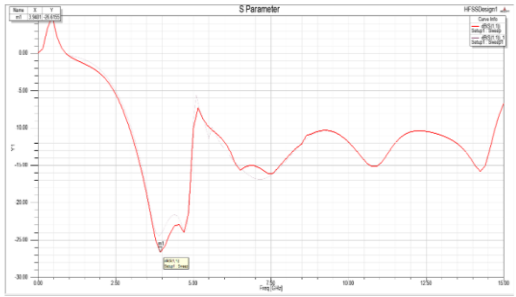

Figure 12: Graph diagram of return loss

The above figure 12 shows the graph diagram of return loss in antenna here indicating the frequency is 3.9Ghz and this graph is plotted in design in HFSSD software.

IV. CONCLUSION

Hence here we are studied the Design and Analysis of Planar Monopole Antenna with Dual Band Notch for 3.9Ghz and practically it is also showing almost same frequency depending upon environmental errors. Here we are fabricating the different new antenna it is getting good gain and frequency. The gain here getting -30.50db and the frequency is +3.012Ghz. This area gives the features of the discoveries and humble entries drawn from the trial re-enactment studies completed on various conservative planar restraining infrastructure antennas with double band antennas utilizing 50 microstrip line sustaining methods which have been examined broadly in this proposal. The principle goal of this proposition is to structure and to create of a smaller organizer monopole antenna with double score band for future UWB applications.

V. REFERENCES

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