A Review Of Bow Tie Antenna and Microstrip Patch Antenna

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***Abstract* - A bow tie antenna is made from bi-triangular sheet of metal. It is used for all UWB applications like Wi-Fi, ground penetrating radar, wireless and microwave imaging applications. But Micro strip patch antenna consists of a radiating patch on one side of a dielectric substrate which has a ground plane. The antennas may be easily mounted on missiles, rockets and satellites without major alterations. The bow tie antenna is resonant at multiple frequencies of 2.4, 3.6, 3.9 & 4.9GHz which are unlicensed band and used for wireless applications. Other hand a Micro strip patch antenna having the operational frequency of 1.8 GHz, 3.8 GHz and 5.2 GHz VSWR bandwidth and return loss bandwidth up to -23.75db has been obtained. So through bow tie antenna get four frequencies at four different levels which are used for wireless applications.**

Keywords- bow tie antennas, micro strip patch antennas, wireless

1.INTRODUCTION-

In recent years, the current trend in commercial and government communication systems has been to develop low cost, minimal weight, low profile antennas that are capable of maintaining high performance over a large spectrum of frequencies. This technological trend has focused much effort into the design of microstrip (patch) antennas. With a simple geometry, patch antennas offer many advantages not commonly exhibited in other antenna configurations. Microstrip antennas are widely used where small size, low weight and ease of installation are main constraints. A Microstrip patch antenna consists of a radiating patch on one side of a dielectric substrate. Microstrip antennas are compatible with modular designs (solid state devices such as oscillators, amplifiers, variable attenuators, switches, modulators, mixers, phase shifters etc., can be added directly to the antenna substrate board).Other hand Bow tie antenna is known for its geometry simplicity and broadband response. The bow tie antenna is geometrical approximation to the bi-conical antenna. Bow tie antenna is also key antenna in the range of micro strip antenna. A bow tie antenna is made from bi-triangular sheet of metal. It is extensively for all UWB applications like Wi-Fi, Wireless, ground penetrating radar and microwave imaging applications. It can be printed on a FR4 or TEFLON substrate. FR4 is easily available in the market so we mostly use FR4 for printing the antenna o this substrate. The input impedance is a function of length and flare angle. For television applications, the flare angle is between 60^o and 80^o. If the antenna is mounted ¼ λ in front of a reflecting surface, the gain increases to approximately 9 dB. Stacking two of them vertically one wavelength apart, increases the overall gain to about 12 dB.

2.LITERATURE SURVEY-

2.1 A four compact, shorted variations of an ETMSA have been proposed, which were obtained by splitting both the ETMSA and the HETMSA into two parts along their zero field lines and then shorting along the curved edges. The reduction in the area was approximately 2.5 and 5.0 times for fully shorted 60"- and 30″- SMSAs, respectively, in comparison with the ETMSA. For a shorting ratio of 0.1, the area reduces by factors of 3.9 and 6.3 for 60"- and 30"- SMSAs, respectively, as compared to the ETMSA (S.K. Satpathy et al. 1998**)**

2.2 A new approach for the design of multi-resonant printed bow tie antenna in this paper. Bow tie antenna was printed on Teflon substrate. Frequency range starts from 3.1-10.6GHz range. Circular as well as polygonal slots were added for making antenna resonant at triple frequencies. All the simulations were done using HFSSv10.1. In the result part resonances were obtained at 2and 3GHz bands and used for wireless and Wi-Fi applications. The final design consists of incorporating the two types of the slots inside the arms of the bow tie. So after inserting slots antenna become resonant at three frequencies.(Y.Tawk et al.,2008)

2.3 A bow tie antenna was designed and modeled by using WIPL-D for UWB range. Bow tie antenna was good choice of UWB antennas. The general characteristics of antenna

such as gain, impedance and VSWR were analyzed. It was fed by an element by the wire in the middle of dipoles. Their design gives desirable gain, wide impedance bandwidth; stable gain and VSWR were analyzed. E-field radiation pattern was Omni-directional which means the results were best suited for applications specific. (B. Saidaiah et al.,2009)

2.4 A novel design of small sized, low profile coaxial fed patch antenna is proposed for BLUETOOTH applications at 2.4GHz frequency. The patch shape is similar to and different parameters like return loss, VSWR, gain along Θ, Ø directions, radiation pattern in 2-D and 3-D, axial ratio, E and H Field Distributions, Current Distributions are simulated using HFSS 13.0. The measured parameters satisfy required limits hence making the proposed antenna suitable for BLUETOOTH applications in 2.4GHz band.(Govardhani Immadi et al.2011)

2.5 The self-grounded bow-tie was a new type of UWB antennas. It has simple structure, low profile, compact and directional radiation characteristics. Antenna was simulated over frequency range of 2 – 15 GHz range and CST MS was used as tool for calculating the desired results. This antenna was new profile and directional UWB antenna and has widest applications in UWB technology and can be used as a low profile and directional UWB antenna. The self-ground bow tie antenna was protected by a pending patent. Reflection coefficient was as low as required for operation. Antenna has good results than Vivaldi for the same range and other parameters. (Jian Yang et al., 2011)

2.6 A novel C shape slotted microstrip patch antenna with enhanced gain is presented and discussed. The proposed design offers low profile, high gain and compact antenna element. The maximum gain is 7.31541 dBi at 2.31610 GHz, antenna and radiation efficiency are more than 95.5319% and bandwidth is 50% from 1GHz to 3GHz .The proposed design is suitable particular for wireless communication application such as Wi-Fi and WiMax.(Anamika Singh et al. 2012)

3.CONCLUSION-

The slotted bow tie patch antenna is resonant at multiple frequencies of 2.4, 3.6, 3.9, 4.9 GHz. Which are unlicensed band and used for wireless applications. So designed antenna can be applied effectively to all wireless applications. But a Micro strip patch antenna having the operational frequency of 1.8 GHz, 3.8 GHz and 5.2 GHz VSWR bandwidth and return loss bandwidth up to -23.75db has been obtained shown in figure 3.1. There are the two different S parameters of bow tie antenna and micro strip antenna which are taken through HFSS software.

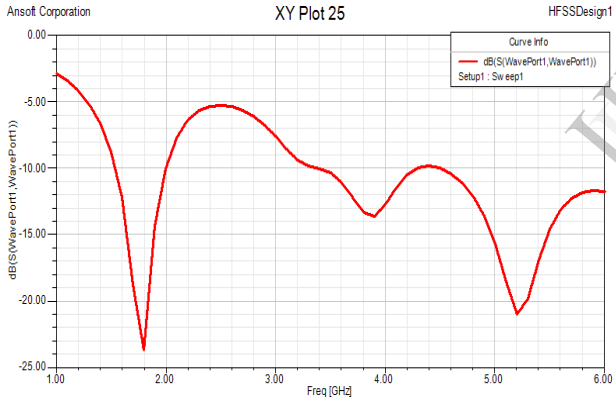

Fig.3.1 S-Parameters of Micro strip antenna

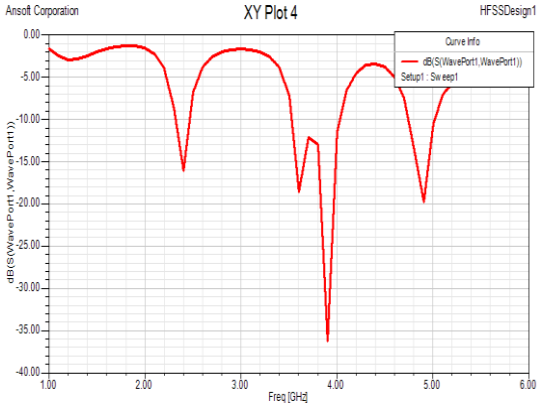

Fig.3.2 S-Parameters of Bow tie antenna

it is clear that through bow tie antenna get excellent result because there one peak goes near about below -35 db shown in figure 3.2, which means through bow tie antenna can get better results which are used for different applications. It can be performed different practical applications likes it can be used for Bluetooth applications in mobile phones, Wi-Max in institutions & industry areas and military radar system to find out correct locations.

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