# SIMULATION AND MODELING OF DIFFERENT SHAPES OF MICROSTRIP PATCH ANTENNA FOR WIFI APPLICATION

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***Abstract:*** This paper is aimed to investigate microstrip patch antenna for WIFI (i.e. 2.4 GHz frequency range) application. For this purpose there are two model of microstrip patch antenna which has been presented. The antenna characteristics such as return loss, radiation pattern, Bandwidth and smith chart are considered for performance evaluation.

***Key-Words:***Microstrip patch antenna, return loss, WIFI.

***Introduction:***Rapid progress in wireless communicationpromises to replace wired communication networks in the near future in which antennas play a more important role. MicrostripAntennas (MSAs) are used in a broad range of applicationsfromcommunication systems to biomedical systems,primarily due to several attractive properties such as light weight, low profile, low production cost, conformability,reproducibility, reliability, and ease in fabrication and integration with solid state devices. In recent years the rapid decrease in size of personal communication devices has lead to the need for more compact antennas. As communication devices become smaller due to greater integration ofelectronics, the antenna becomes a significantly larger part of the overall package volume. This results in a demand for similar reductions in antenna size. The size of a conventional microstripantenna is somewhat large when designed at lower microwave frequency spectrum. Sometimes the size of the antenna even exceeds the dimension of the receiver or repeater system and thus is unsuitable for mounting conformably on the existing receiver/repeater system. For many antenna applications, such as handheld transceivers,small size is extremely important. In addition to this, low profile antenna designs are also important for fixed wirelessapplication.

The simulations are carried out with CST microwave suitSoftware. The proposed antennas are compact, having a patch area less than that of a conventional square microstrip patch antennafabricated on the same substrate and resonating at the same frequency. These antennas can find application in the WLAN 802.11bcommunication standard operating at 2.4 GHz and.

***Antenna Designs and results:***Fig.1 shows the E- shaped microstrip patchantenna with patch dimension L x W as 28.2 mm x 28.2 mmwith a dielectric constant of 2.2 the solution wassought utilizing standard PCB (FR-4, $\varepsilon_r$ = 4.4) as the dielectricmaterial with a backplane conductor to form a microstrip patch antenna. The thickness of the substrate is assumed to be 1.6 mm. However, the same configuration when realized with
Other low loss substrate gives better performance. The antennais probe fed which is the most widely used feeding method inmicrostrip antenna. The coaxial feed

position is determined togive optimal matching at 4.8 mm. The patch is found toresonate at 2.46 GHz.

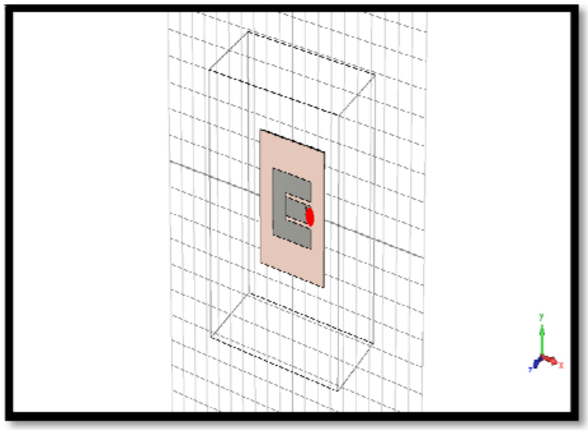

Fig-1:E- shaped microstrip patchantenna.

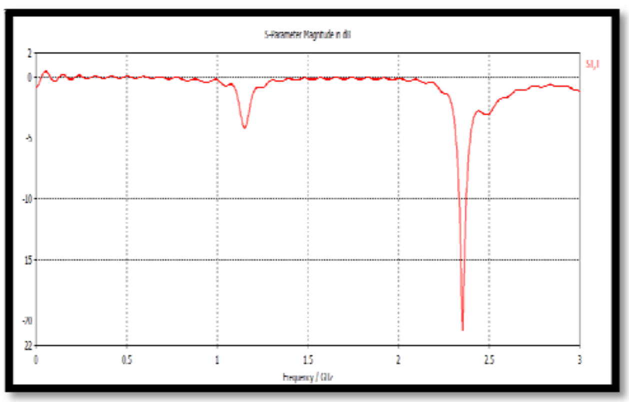

Fig-2:Return Loss Characteristics of E-shaped microstrip patch antenna.

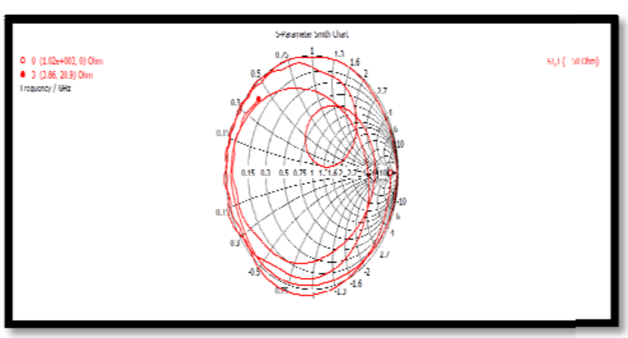

Fig-3:smith chart of E- shaped microstrip patch antenna.

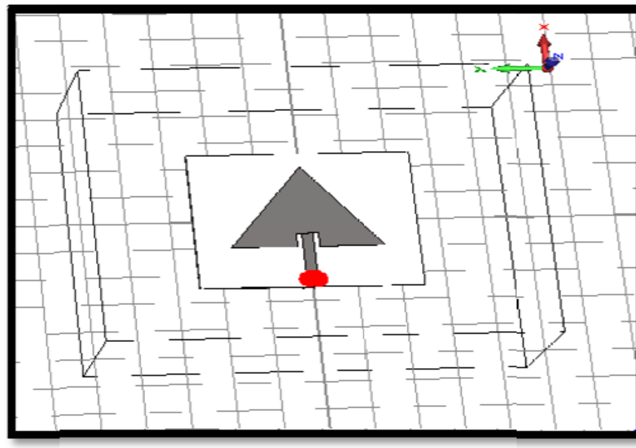

Fig-4:V- shaped microstrip patchantenna.

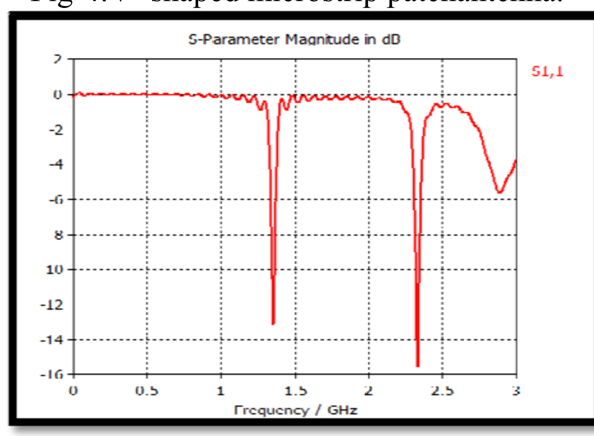


Fig-5:Return Loss Characteristics of V-shaped microstrip patch antenna.

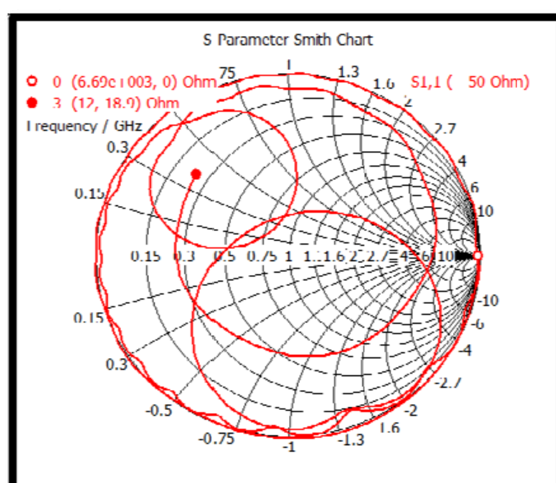

Fig-6:smith chart of V- shaped microstrip patch antenna.

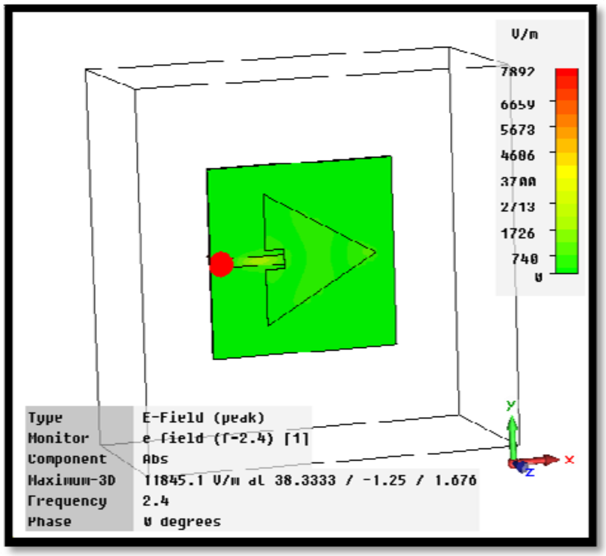


Fig-7:E- Field Pattern of V- shaped microstrip patch antenna.

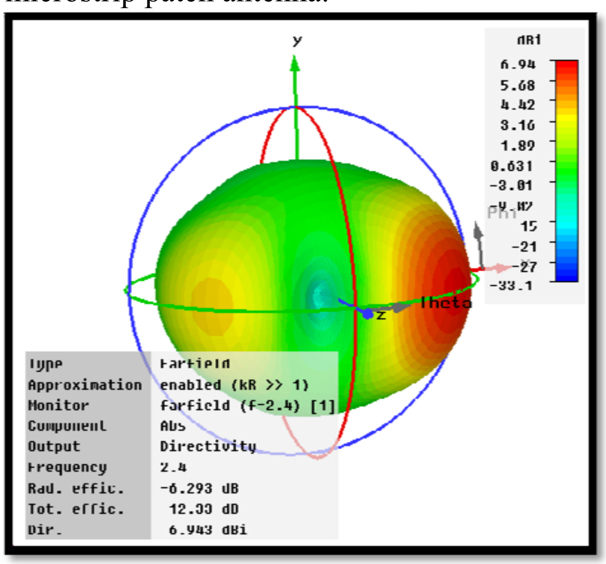


Fig-8:Radiation pattern of V- shaped microstrip patch antenna.

**Conclusion:** Two compact microstrip patch antennas are proposed forWLAN 802.11b communication standard at 2.4 GHz. band.The characteristics of the proposed compact microstrip patchantennas are compared with each other. The proposed patch antennasshow a significant radiating frequency and radiation pattern as well. The gain and bandwidth of the proposed antennas can beincreased significantly using stackedconfiguration.

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