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High Directivity Hexagonal Slot Antenna for WLAN Applications

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ABSTRACT

This paper consists of the microstrip patch antenna with hexagonal slot feeded by the SMA feed system. It supports the IEEE 802.11a that can supports the frequency range of 5.15 GHz to 5.35 GHz. This antenna uses non overlapping channels for wireless local area networks. This antenna stimulated by using CST Microwave simulator.

Keywords: SMA, Hexagonal slot and CST.

1. INTRODUCTION

The printed antennas are simple and easily hidden inside packages. Unfortunately, a classical micro strip patch antenna still they have their field to improve their bandwidth and to reduce their size, to make these more compact in size. That includes its use in the communication Systems. If the frequency bandwidth could be widened, a broadband Slot antenna would prove very useful in commercial applications such as WLAN, Wi-MAX and etc.

From the simplicity of slot antenna the microstrip patch antenna is widely used in mobile phones gadgets which needs wireless. For example printer that may use the feature of wireless printing from portable wireless network. Apart from smallest gadgets the slot antenna can be used in gigantic applications such as aircrafts and etc.

2. EXPLANATION

The hexagonal slot antenna uses hexagonal patch as top layer which is feed by the positive RF power supply from SMA connector that is used for co-axial cable transmission. The substrate used between the patch and ground plane of the antenna.

The substrate is made up of FR-4 epoxy glass material which is a PCB material that may act as an insulator. So that, the whole antenna looks like a capacitive coupled device. And the ground is feed by negative terminal of the RF power input via SMA connector.

3. FEASIBILITY ANALYSIS

The performance decay of the antenna can be analyzed and simulated by using the simulation software. This can be achieved by using the HFSS and CST simulation software.

4. OBJECTIVES

The main objective of this project is to increase the directivity and bandwidth of the antenna. The bandwidth of the antenna can be increased by increasing more number of hexagonal slot in the Patch of the antenna.

5. ANTENNA DIAGRAM

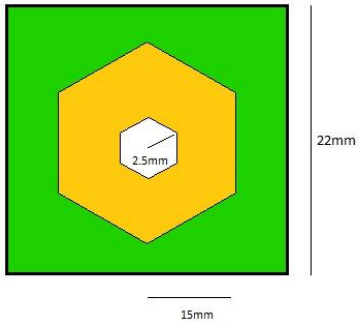


Figure: Hexagonal slot antenna

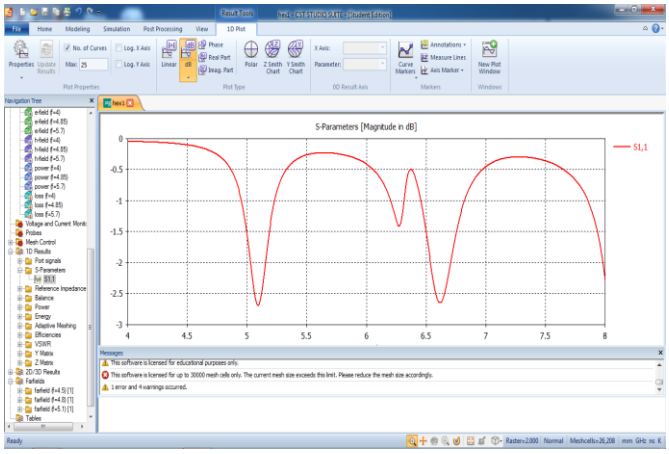
6. SOFTWARE USED

CST: Computer Simulation Technology, which is a leading simulation software that produce accurate result with high frequency. The antenna is simulated by CST STUDIO Student version.

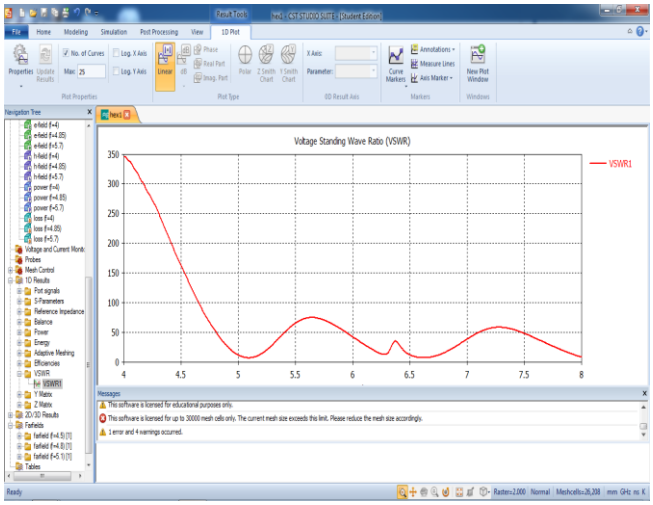
7. RESULT

The simulated result is shown as following diagram.Which shows the increased dirctivity of the antenna.

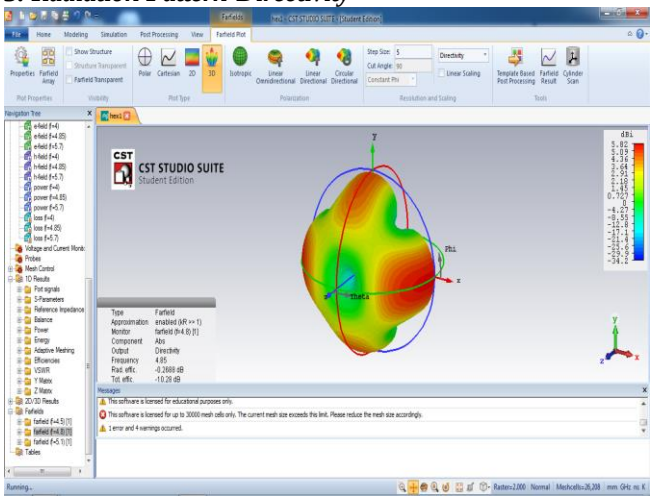
1. Return Loss



2. VSWR



3. Radiation Pattern-Directivity



8. CONCLUSION

From this proposal the hexagonal slot antenna provides better directivity and improved Voltage Standing Wave Ratio than the existing system. And it provides its uses in various applications.

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