iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 8 **Issue:** I **Month of publication:** January 2020

DOI: http://doi.org/10.22214/ijraset.2020.1066

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.177
Volume 8 Issue I, Jan 2020- Available at www.ijraset.com

A Review Paper on Circular Polarized Microstrip Patch Antenna

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Abstract: ***In this work shows microstrip patch antenna is introduced, associated with circular polarization. To generate circular polarized radiation along with several feeding techniques is reviewed in this paper. Because of we get better polarization matching in between transmitting and receiving that is why it is very effective circular polarization technique. Circular polarized antennas are increasingly gaining importance in wireless communication. This paper also presents literature survey of Circular Polarization techniques for design of Microstrip Patch Antenna for wireless Communication.***
Keywords: Microstrip Patch Antenna, Axial Ratio, Circular Polarization

I. INTRODUCTION

With the rapid development of Wireless Communication, Personal Communication (PCs), Mobile Satellite Communication, Direct Broadcast Television (DBS), Wireless Local Area Network (WLANs), and Intelligent Vehicle Highway System (IVHs), [1], microstrip antenna has become one of the most popular antenna because it has numerous advantage such as its low weight, small printed circuit technology, led to the design of several configuration for various application. [2]

Its simplicity comprises of a radiating patch on one side of a dielectric substrate and a ground plane on the other side. The top and side views of a rectangular are shown in fig. (1).Microstrip patch antenna have several shape, such as the square, circular, triangular, semicircular and annular ring shapes shown in fig. (2). Are also used [2]. The patch is generally made of conducting material such as copper or gold and can take any possible shape shown in fig. (2). the radiating Patch and the feed lines are usually photo etched on the dielectric substrate. For better antenna performance, a thick dielectric substrate having dielectric constant is desirable since this provides better efficiency, large band width and better radiation. [3].

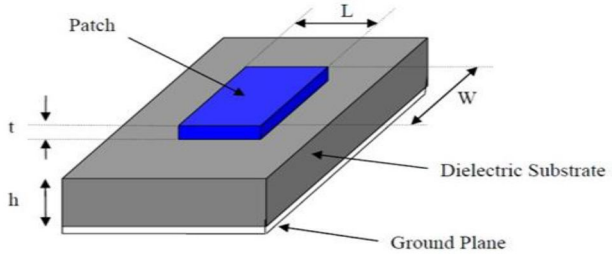

Fig. 1: Structure of a Microstrip Patch Antenna[1]

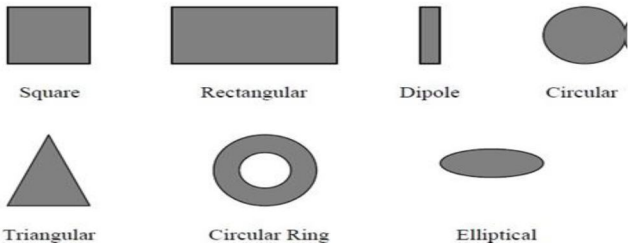

Fig. 2: Common shapes of microstrip patch elements[1]

Microstrip patch antennas are most popular antennas for wireless communication, as they offer the benefits of low profile, light weight, compact, conformable to surfaces, easy fabrication. Low gain and narrow bandwidth are the disadvantage of patch antenna. Several techniques to increase the impedance bandwidth of patch antennas, such as aperture coupled feed [5], L-shaped probe feed [6], U-slotted patch [7], have been proposed. The most commonly used polarization technique in today's communication is circular polarization (CP) as it is not concerned with the orientation of the transmitting and receiving antennas

II. LITERATURE REVIEW

Circulation polarization (CP) can be achieved by making axial ratio equal to one. Circular polarization is of two types- Right Hand CP (RHCP) and Left Hand CP (LHCP). Circular Polarized antennas (referred to as CP antennas hereafter) are increasingly gaining importance in wireless communications since they allow signal reception irrespective of the orientation of the receive antenna with respect to the transmit antenna, and also have the ability to suppress multipath interference. Linear polarized antennas require transmit and receive antennas to be of the same polarization, hence require accurate alignment of the antennas. Circular polarized microstrip patch antennas are widely used in portable/ hand held devices, for example RFID reader antenna, WLAN, GPS, for energy harvesting, mobile phone antenna, etc. Generating circular polarized radiation involves exciting two equal amplitude orthogonal modes. Feed position and feed technique decides the impedance bandwidth of the antenna. A number of techniques to generate circular polarized radiation are available in literature. Circular polarization techniques may be classified as single- feed and dual-feed. Single-feed configuration involves slightly perturbing the antenna structure at appropriate locations with respect to the feed to excite modes with 90° phase-shift for circular polarized radiation. Many types of feeding techniques can be applied to achieve CP microstrip patch antenna. Coaxial probe feed [3-9] though simple, provides only narrow bandwidth. Γ-shaped[5], In [7] a single fed truncated corner square patch to generate circular polarization characteristics, In [5] circularly polarized patch antenna with loaded parasitic shorting elements to obtain size reduction[9], Loading a pair of L-shaped stubs on adjacent edges of a corner truncated patch [10], A dual-band single-fed CP, S-shaped slotted patch antenna (for dual band) with a small frequency-ratio is proposed for GPS applications in [11], In [24] an omnidirectional dual-band dual CP antenna with wide beam radiation patterns using TM01 & TM02 modes is investigated.

IV CONCLUSION

A conceptual review on microstrip patch antenna is introduced in this research paper work, different technique use in design, different shape of patch taken ,different feeding technique and different type of substrate use in the design of this antenna for reducing size and weight and increasing bandwidth, gain etc. Microstrip antenna useful in wireless communication, RADAR , WLAN, etc due to their small weight and size.

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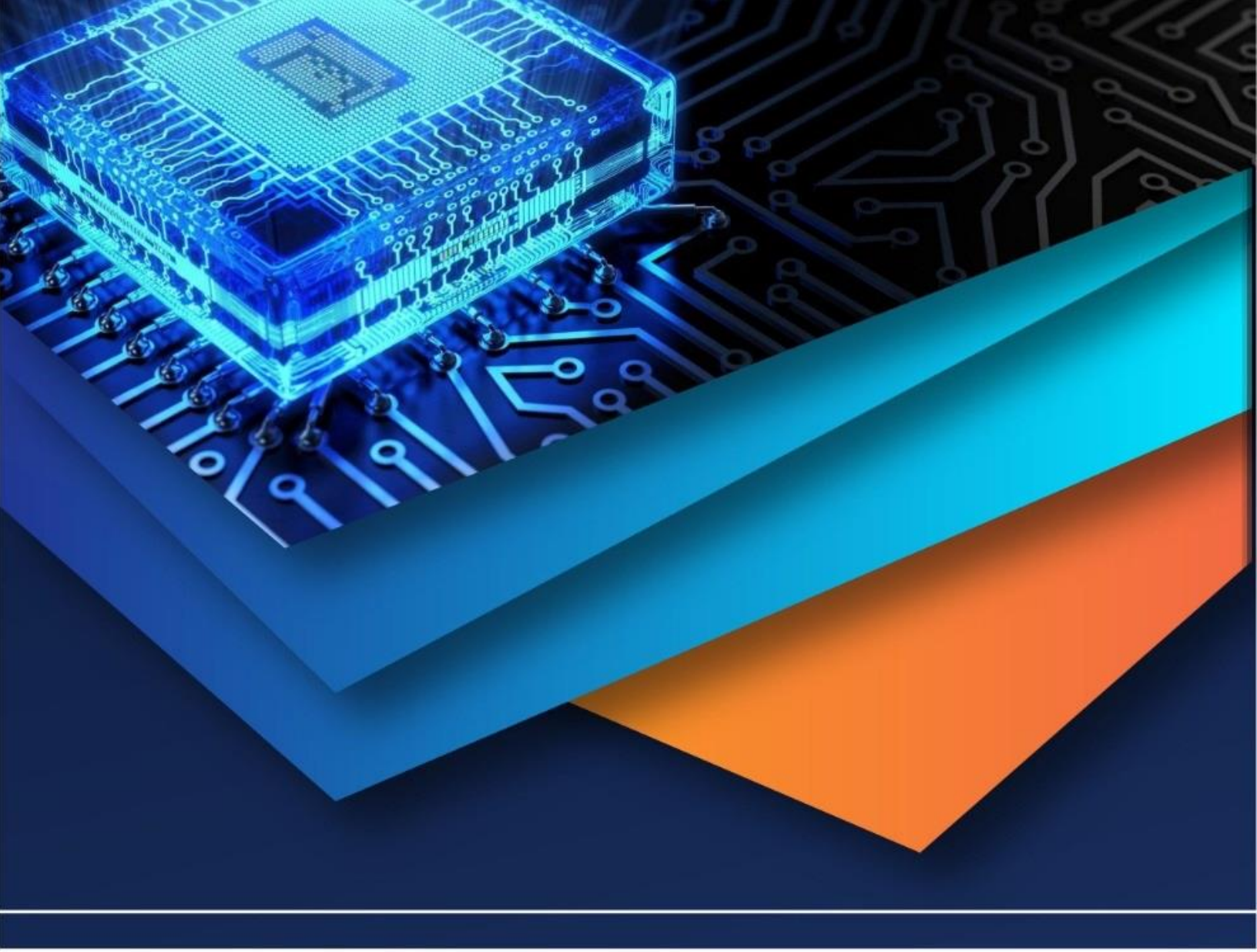

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