IJART- Vol-4, Issue-4, August, 2019 Available online at http://www.ijart.info/
DOI: https://doi.org./10.24163/ijart/2017/4(4):92-95

INTERNATIONAL JOURNAL OF APPLIED RESEARCH AND TECHNOLOGY
ISSN 2519-5115
RESEARCH ARTICLE

Review Paper of Different Patches of Microstrip Antenna for Wireless Applications

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Received: May 20, 2019
Revised: July 12, 2019
Published: Aug 31, 2019

ABSTRACT

The use of wireless communication devices is promptly increasing day by day and microstrip patch antenna is mostly in the use, as it provides low volume and low profile. The proposed antenna will be designed using triangular type patch. The paper will give a comparative study for various radiation patterns, return loss, bandwidth, gain, VSWR.

Keywords- : Microstrip patch antenna, Radiation pattern, Return loss, VSWR.

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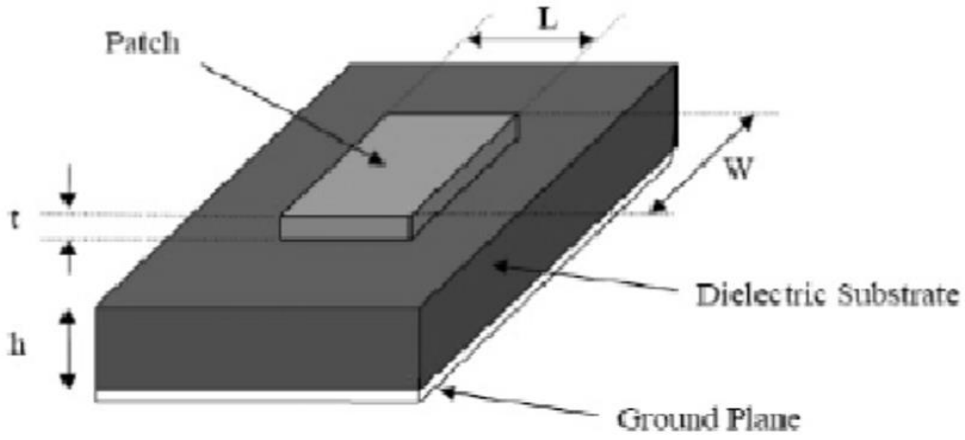
INTRODUCTION

Wireless communication involves the transmission of information over a distance without the help of wires, and cables or any other forms of electrical conductors. It has brought much advancement with its effective features. Wireless devices can be used for cellular telephony, wireless access to the internet, wireless home networking, and many more. The technology also includes GPS units, garage door openers, wireless computer mice, keyboards and headsets, headphones, radio receivers, satellite television, broadcast television and cordless telephones [1]. Wireless communication devices support many applications which require broad bandwidth. It is affordable, flexible, convenient, accessible, and have fast speed**.**

Microstrip antenna is also called printed antenna. It means antenna which is invented using microstrip technique on printed circuit board (PCB). It is mostly used at microwave frequencies. Microstrip antenna basically have a patch of metal foil of various shapes on the surface of PCB , with a metal foil ground plane on the other side of the board [2]. Mostly used type of microstrip antenna is patch antenna. Patch antenna is a very thin metallic strip i.e. placed over ground and can have different shapes like rectangular, square, circular, triangular or any other. The patch is generally is generally made of conducting material such as copper or gold [3]. That is the reason it can take any possible shape.



Microstrip patch antenna is easy to manufacture. It is used due to light weight, low profile, compact size, easily integrated with electronic circuits. It is used for multiband and ultra-wideband. Dual frequency and dual-polarization antennas

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can be easily made. No cavity backing is required. It has complex feed structure, low power handing capability, large ohmic losses. It has limited bandwidth and the improvement increases with increase in substrate thickness or by decreasing dielectric constant of substrate [4]. Recently triangular shape has gained attraction due to small size requirement [5]. Circular and elliptical shapes silghtly smaller than of rectangular patches. It will have smaller bandwidth and gain [6]. To radiate antenna a feed is used to excite by direct or indirect contact and feed can have many configurations like microstrip line, coaxial, aperture coupling and proximity coupling [7]. MSPA radiate mainly because of fringing fields effect between the ground plane surface and patch edge of antenna [8]. To improve gains, Phased Array Antenna (PAA) is a multiple antenna system, in which, the radiation pattern can be reinforced in a particular direction and suppressed in undesired directions [9].

LITERATURE SURVEY

Year	Structure	Parameters	Advantages
2015	The paper represents the modified shapes of patches (E shaped shaped, U Shaped, swastik shaped), and some techniques such as multiresonator, stacked and suspended multilayered techniques.	Bandwidth improved 20% in swastik shape, 17% in multiresonator technique, 15% in stacked multilayered technique and 12.1% in suspended multilayered technique.	Provides maximum bandwidth improvement.
2016	Improving bandwidth using rectangular patch antenna with slots for wireless local area network.	Utilizes 2-6GHz band. Increases return loss, VSWR, gain.	Radiating patch provides perfect match and high bandwidth.
2017	Radiation characteristic of two layer triangular patch antenna on equilateral triangular microstrip antenna.	Simulation is compared with invented antenna. Bandwidth is improved. Gain is enhanced and return loss is reduced.	Maximum power, VSWR.

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METHODOLOGY

WIDTH OF PATCH:

$$W = \frac{c}{2f_o\sqrt{\frac{(\varepsilon_r + 1)}{2}}}$$

Where, c = speed of light in free space

EFFECTIVE DIELECTRIC CONSTANT:

$$\varepsilon_{eff} = \frac{\varepsilon_r + 1}{2} + \frac{\varepsilon_r - 1}{2}\left[1 + 12\frac{h}{W}\right]^{-\frac{1}{2}}$$

EFFECTIVE LENGTH:

$$L_{eff} = \frac{c}{2f_o\sqrt{\varepsilon_{eff}}}$$

CONCLUSION

The triangular patch antenna is much better than other shape antenna due to its characteristics such as radiation pattern, bandwidth, return loss, VSWR. As future scope the antenna characteristics can be further improved by using high order fractional technique.

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