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Abstract- The widespread requirement for mobile communication and information change over wireless devices has brought great success in antenna design. The purpose to this document is of provide the reference, understanding and overview framework for use of antennas in wireless communication devices. Present article describes the various antennas and their strengths and weaknesses. It also shows a simple comparison frame between different antennas based on different parameters. This white paper also summarizes the benefits and proper uses of Planner Inverted F Antenna for Universal Serial Bus dongles that cover the WoldWide Interoperability for Microwave Access band.

Introduction- Wireless communications have evolved rapidly over the last years, requiring smaller devices that support multi-band communications. As important segment of the communication system, the antenna is one of the's very important design problem. Since this is a small device, it requires a small and lightweight antenna. The compact size of the Planner Akes it ideal for use with wireless devices. The main advantages of Planar inverted –F antenna Ase of manufacture, and reduction of manufacturing cost of. The adjustable structure makes the PIFA a promising antenna for future technologies in the Planner Inverted F Antenna structure is mostely used for the internal antenna of M-phones. However, the narrow bandwidth makes it difficult to use them as a multi-band antenna. Therefore, researchers has analyzed, developed, and tested several technique that can achieve multi-band operation with the Planar inverted –F antenna structure.

Multi-band antennas is used in M-phone communication systems that can operate in specific frequency bands. Currently, mobile communication systems include Global System for Mobile communication 850 (824.894 GHz), Global System for Mobile communication 900 (890.960 GHz), Global System for Mobile communication 1900 (18501.990 GHz), Universal Mobile Telecommunications System (19202.170 GHz), Bluetooth (2.42 GHz), WiFi (5.165). .5 GHz). Use bandwidth.)

World Wide Interoperability for microwave Access is designed to support a data rate of 3040 Mbps. World Wide Interoperability for microwave Access has three license spectrum profiles. High Lower-band, middle-band and Higher-band and Lower-Band Frequency's Range Manuscript was received on August 5, 2013. Revised on January 12, 2014. 2.52.8 GHz, medium band frequency 3.23.8 GHz, high band frequency 5.25.8 GHz. The USB can be connected to World Wide Interoperability for microwave Access using a component known as dongle. USB dongles is used to provide plug-and then-play functions on components like laptops. Upcoming wireless Universal Serial Bus dongles will need to be able to handle high data rates in order to provide a variety of multimedia services. Two dual-band printing PIFAs can be used to manufacture dual-band multi-input multi-output (MIMO) antennas and implement Forth Generation USB dongle, applications. [4],[6]-There are

various applications such as wearable devices, wireless sensors, RFID, Global System for Mobile 850 (824.890 GHz), Global System for Mobile 900 (890.960 GHz), Ultera Wide Band devise with changeable antenna covering the available wideband with DCS / Global System for Mobile communication are antenna elements. Uses Planner inverted F Antenna 1800 (17101.880 GHz), WiBro (2300 MHz), Bluetooth (2420 MHz) and Universal Mobile Telecommunication System.

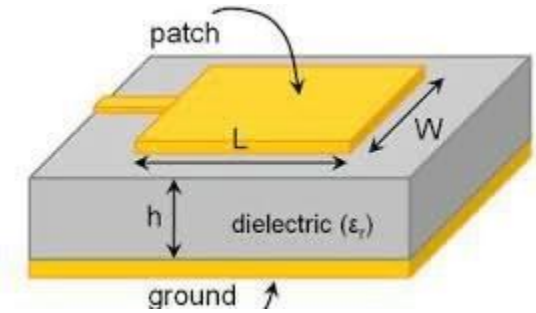

Fig 1 MSA(Microstrip Patch Antenna) [9]

Type of Antenna-

1.Wide-Band Antenna
2. Multi-band Antenna

1:- Wide-Band Antenna-

Broadband antennas have amazing characteristics designing of wireless , radio frequency electronic. Broadband antenna differs from broad-band antennas in that they have a wider passband, but the pattern of radiation and gain of antenna may not the same across a passes- bands. Broadband antennas require more space to install than multi-band antennas. MSA fall into the part of broadband antennas are called as printed antenna. coward. shows a basic MSA. Lightweight, low cost, linearly polarized, circularly polarized are popular [2]. When this type of antenna is used in its original configuration, it has narrower bandwidth and lower gain. Use appropriate techniques such as B .: Stack patch, i. H. Bandwidth can be extended by thickening the board or using a low dielectric constant board. However, increasing the thickness of the circuit board beyond the limit can reduce the efficiency of the microstrip antenna. The thicker the board, the longer the probe. Prolonging the probe also increases the inductance of the probe, which can cause impedance matching problems.

2:- Multi-band Antenna-

Multiband antennas are designed for operation the in multiple bands. these antennae are also designed to allow some antennas to be active in the band. problem in designing a multiband antenna is to design a multiband antenna that creates multiple resonant paths [7]. To meet the needs of the wireless communication revolution, the classic monopole antenna with a length of λ / 2 first met the demand. But soon, the plane's inverted-F antenna took over the monopoly. This is due to the 's advantages such as low Specific absorption rate, compact size, and desirable cross-polarization [8]. They can also be described as an improved version of Posterior Inferior Cerebellar Artery. monopole antenna. Figure 2 shows a variation made on a monopole to form an inverted F

antenna or an inverted L antenna. This additional inverted L segment makes it easier to tune the antenna. Both Integrated Lense Antenna and Inverted-F Antenna basically
have a narrow bandwidth of. The evolution of the handset antenna structure from monopole to - planar inverted-F antenna shows that a key component of the handset of the antenna is the "wire". [9] [10]. Patches, slots, and stubs are only used to fix inconsistencies and improve radiation characteristics.

Feeding Technique-

Microstrip antenna is powered by a variety of methods. This method can be divided into two groups: contact type and non-contact type. Contact Technology uses connectors such as: B.connector that connects directly to the beam spot. Including B connector. B. Comes with a microstrip line. The second method is the non-contact method, and the energy transfer between the microstrip line and the radiating field uses the method field coupling. Lead is used to radiate through direct or indirect contact. Many feed technologies include microstrip line feeds, coaxial probes, aperture couplings, and proximity couplings.

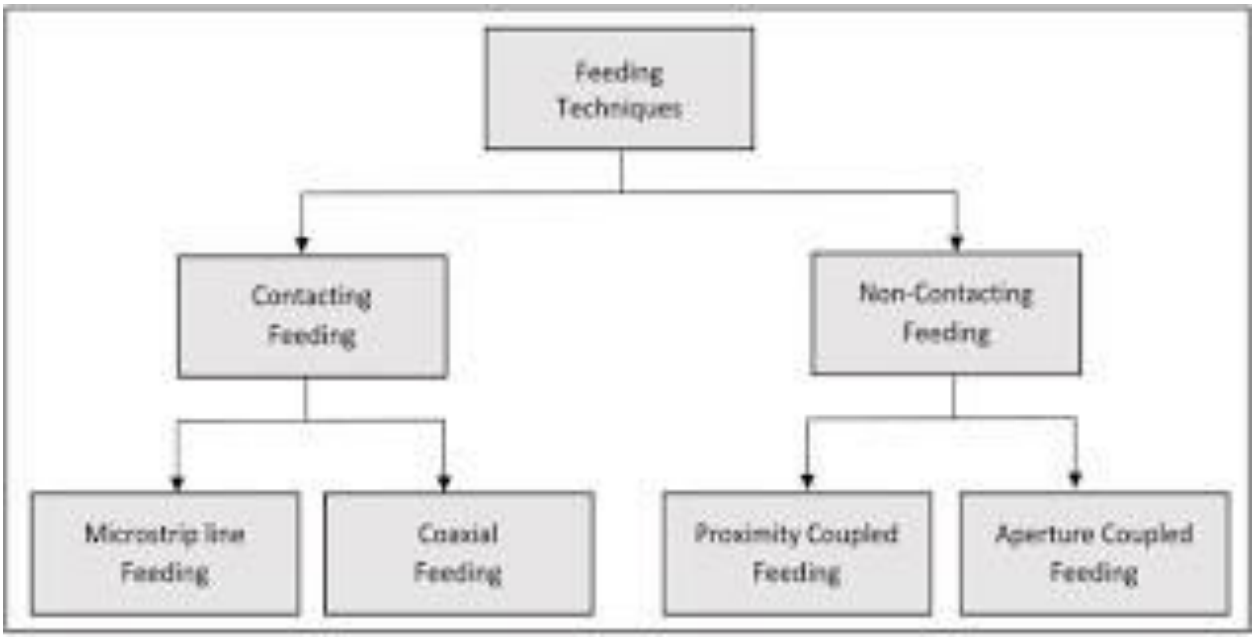

Fig 2 Feeding Technique [9]

A-Microstrip Line Feeding-

In the microstrip line feeding the conductive strip, the is connected to the tip of the microstrip pad. Compared to the patch, the conductor strip is wider and narrower. Microstrip printing is one of the better strategies for creating a , as it can be a single conductive strip attached to the patch and is therefore considered an extension of the patch. The microstrip line has many advantages because it can etch on the same substrate as the line and provide a planar structure. This structure is a simple planar structure of and is extremely popular. Given the risks of this method, the thickness of the board not only increases the thickness of the board, but also increases surface acoustic waves and spurious radiation, which can limit bandwidth. Be careful.

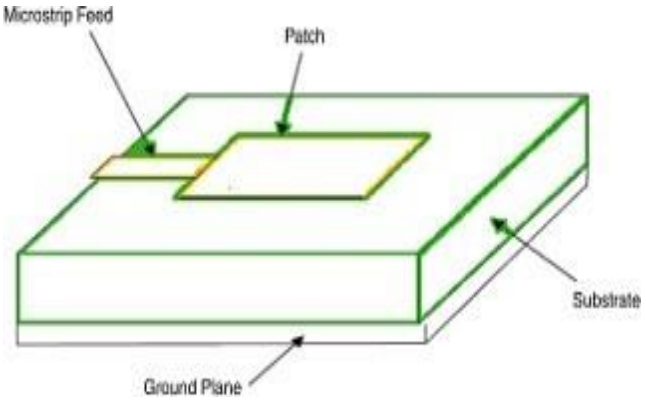

Fig 3 Microstrip Line feeding [9]

B-Coaxial Probe Feeding-

In microstrip feed technology, one such popular technology is the Coaxial Probe Feed technology. Considering the homocentric feeding scheme of the to which the inner conductor, beam spot, and homocentric antenna are connected, the outer conductor is connected to the ground plane. This is primarily and focuses on some of the benefits of the coaxial probe delivery method. The coaxial feed can be placed at any position on patch to match the impedance of input on. Several benefits are listed.

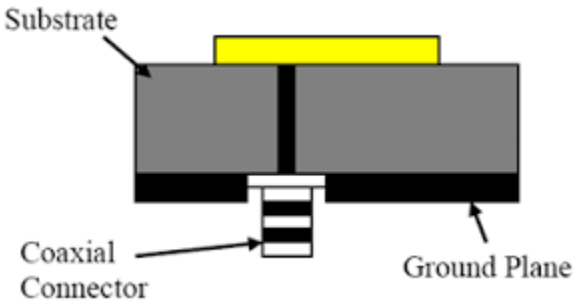

Fig 4 coaxial probe feeding [9]

C-Proximity coupling-

Building the is a difficult process due to its tight coupling. Neighbor-joining, widest bandwidth, less spurious emission. The width-to-length ratio of the patch is used to achieve the fit and length of the stub. Neighbor-joining, also known as , is the basis of magnetic coupling. Using the metal substrate used and a substrate made of 4442 material, the supply line is defined between the two substrates and the divergence point is above the upper substrate. Neighbor Join. The benefits of the combined proximity feed eliminate interference radiation and provide extended information (up to 13%) within the thickness of the microstrip patch antenna. Therefore, is provided with extended information with a total of added. Microstrip patch antennas reduce harmonic radiation and can be mounted on multi-layer boards.

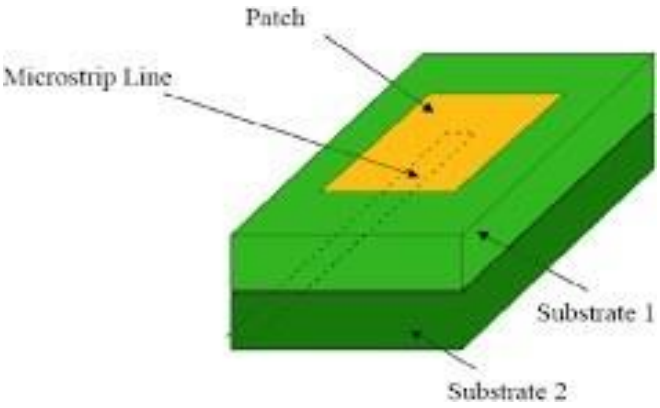

Fig 5 Proximity coupled Feed [9]

D-Aperture coupling-

With this delivery method, the Aperture coupling is an indirect delivery method. The aperture-coupled microstrip antenna can be coupled through the aperture of the microstrip line . Two completely different boards separated by a ground plane. On the side of the very inexpensive on the bottom board is a microstrip feedline that couples a power supply to the patch via a bottom level slot that separates the two boards. Coupling variants d according to sizes , . H. Aperture length and width optimizes results with wider bandwidth and better reflection attenuation. The coupling aperture is usually in the center under the patch and has less cross-polarization due to the symmetry of the configuration.

Comparison of feeding Technique[9]: -

SR. No	Characteristics	Line Fed	Coaxial Feed	Aperture Coupled	Proximity Feed
A	Bandwidth	2-5%	2-5%	12-15%	8-10%
B	Fabrication	Easy	Soldering Required	Alignment Required	Alignment Required
C	Reliability	Better	Poor	Good	Good
D	Spurious Radiation	More	More	Less	Minimum

Designing-

The width of the patch is calculated using the following equation:

$$w = \frac{Co}{2fr}\sqrt{\frac{2}{\varepsilon r + 1}}$$

Where -

W=width of the antenna

Co=Speed of light

εr =Dielectric Substrate

Effective refractive index:

$$\varepsilon reff = \frac{\varepsilon r + 1}{2} + \frac{\varepsilon r - 1}{2}\left[1 + 12\frac{h}{w}\right]^{\frac{-1}{2}}, \frac{w}{h} > 1$$

Length:

Due to fringing, electrically the size of the antenna is increased by an amount of (ΔL):

$$\frac{\Delta L}{\Delta h} = 0.412\frac{(\varepsilon reff = 0.3)\left(\frac{w}{h} + 0.264\right)}{(\varepsilon reff - o.258)\left(\frac{w}{h} + 0.8\right)}$$

The Length of patch (L):

$$L = \frac{Co}{2fr\sqrt{Ereff}} - 2\Delta L$$

Length (Lg) and Width(Wg) of ground plane:

Lg=6h+l

Wg=6h+w

Conclusion-

This paper outlines many research papers published by various researchers. Some authors have focused on the feed method, while others have slightly compared this method to the -MIMO. Much work is being done on microstrip to improve the use of microstrip and next-generation wireless communications. MIMO technology will improve the throughput, bandwidth, bitrate, and error rate of future wireless systems. Many methods are used to improve the gain and bandwidth of microstrip antennas. This paper primarily presents the strengths and weaknesses of microstrip antennas for microstrip antenna applications. The classification of microstrip antennas has been reviewed and validated. Researchers are very interested in microstrip antennas because they are easy to design and manufacture. This paper helps researchers find about microstrip antennas and about. This allows researchers to dig deeper into the design of microstrip antennas and improve performance.

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