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Review on Frequency Reconfigurable Planar Inverted F Antenna

Arati M Khade[1], Prof. A. S. Deshpande[2]
[1](ME Student, Department of Electronics and Telecommunication, Imperial College of Engineering and Research, Pune University, Wagholi, pune, Maharastra India.)
[2](Assistant Professor, Department of Electronics and Telecommunication, Imperial College of Engineering and Research, Pune University, Wagholi, pune, Maharastra India)
Corresponding Author: Arati M Khade

Abstract :*A frequency reconfigurable planar inverted f antenna for LTE/Bluetooth/WLAN wireless application is proposed. The proposed antenna has three Switches. The antenna has compact size. This antenna has six ways to operate using switch. When switch *1 is ON and other two switches *2 and *3 are OFF we get LTE Band having 2.3GHz operating frequency. When *2 is ON and other diodes are OFF we get 2.4 Bluetooth band. When diodes *1 & *2 are in ON state we get 3.65 WLAN. During diode *1 and *3 are ON we get 2.3 LTE band. During all the diodes ON we get 2.5 LTE bands in 6 operating modes.*

Keywords –*Frequency reconfigurable antenna, LTE/Bluetooth/WLAN antenna.*

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I. Introduction

Many antennas have been planned to cover wide bandwidth. A frequency reconfigurable antenna for LTE/WWAN for mobile phone application can be achieved with the variations of PIN diode. The antenna size is compact. Here adjust the bias state of PIN diode. Simply PIN diodes are used in this communication [1]. This antenna has three rectangular patches. By using 5 PIN diodes in proper location. We can achieve the frequency reconfigurability [2]. By using PIFA we can achieve the SAR value under standard limits. SAR values increases with increasing of tilt angle above 0 till perpendicular position. Also small decrease in efficiency and gain due to tilt angle [3]. By using reconfigurable microstrip patch probe we can increase bandwidth. While the non-reconfigurable version has extremely narrow bandwidth this was achieved by modifying (using a diode) the shunt capacitance, which produces the lowest radiating mode of the antenna [4]. A planar inverted-f antenna is included with a software-definite match control (SDMC) circuit in order to create an impedance match for a various set of frequency average. The software-demarcated match control circuits shown an excellent range of tuning to various target frequencies of operation [5]. PIFA with frequency reconfigurability is getting. By using diodes we can achieve frequency reconfigurability. A testbed setup, using cognitive radio. A reconfigurable PIFA antenna designed and imitation in AWR MWO. Output is for reconfiguring the PIFA Antenna so as to achieve new transmission mode [6-7]. A two channel frequency reconfigurable antenna for three m-WiMAX bands that is able to switch isolation characteristics was proposed [8]. A change in bandwidth is altering the distance across of the feed line using microwave switches [9]. Three rate of recurrence reconfigurable MIMO aerial in an internal scenario by utilizing angle of arrival. We get the frequency band's GSM/LTE 900 MHz, GSM 1800, WLAN 2450 MHz and more bands [10]. PIFA can cover (DCS: 1710-1880), (PCS: 1850-1990 MHz). PIFA can give different frequency ensembles PIFA is efficient for Handheld devices. PIFA gives triple band with UMTS 2100. Continuous tuning could be reached with an RF-MEMS variable capacitor (0.25pF to 1.875 pF in 14 steps) between 890 MHz and 790MHz. T-shaped ground-layer and patch tapering, are employed and optimized. The reconfigurability is accomplished by means of 13RF MicroElectroMechanical systems switches are used to change the probe bands at 221, 470, 620, 935 and 4960 MHz [11-17].

II. Planar Inverted-F Antenna

An inverted-f antenna is always used in wireless communication. It first view in 1950's as bent-wire antenna. Planar inverted antenna has good radiation pattern as its patch is slide above the ground. And it does not affect the feeding point but in microstrip patch probe the feeding affect due to patch is directly mounted on ground. Radiation pattern is the sole of antenna. Microstrip patch mast has drawback of narrow bandwidth. PIFA is affect very less by the size of ground. PIFA is shorting at one close due to that, it resonate at quarter-wavelength. It has reduced radiation toward user head and body [3]. From several study it is set up that PIFA have good characteristics for wireless announcement and for portable handset application. A reconfigurable PIFA around the varactor diode. Operational bandwidth is increased about 75% [4].

III. Antenna with Frequency Reconfigurability

Frequency reconfigurability can be achieved by reducing or increasing the size of antenna by introducing the RF-switches and tuning diodes, tunable materials in antenna. Frequency reconfigurable PIFA antenna is proposed with 3 tuning diodes were used to complete frequency reconfigurability [5]. For achieve low mutual connector with bands m-WiMAX 2.3-3.6 GHz [8]. By shifting the thickness of the feedstuff line of antenna we can get frequency bandwidth reconfiguration between 3descrete values [9]. Capacitor with slit radiator is gives value range from 1.5-4pf [11]. Pin diode is positioned between close of ground plane, it gives various communication system with single antenna [13]. The reconfigurability of the antenna is achieved by switches in order to switch, between three public safety bands, which are centered around 160,450 and 800MHz [16].

IV. Literature survey

S. W. Lee and Y. Sung et al. Has proposed a compact antenna with reconfigurability for LTE/WWAN transportable cell phone applications was presented. The antenna has simple construction for planar structure. The protuberance control in six modes by adjust the bias states of two PIN diodes without any alteration to the radiation element. The proposed antenna can cover the LTE700/GSM850/900 bands in modes 1, 4 and 5, the upper band of the projected antenna is formed by modes 2, 3 and 6 to get the GSM/UMTS/LTE bands. Consequently, the proposed feeler can give the LTE/WWAN function bands. Good radiation characteristics for frequencies in the operating bands were observed. Therefore, the projected antenna show evidence of great potential for multiband cellular phone handset applications [1]. Xue Li et al. clarified the antenna consists concentric rectangular patches, five diodes are in correct locations for frequency reconfigurability. Four switching belongings are considered. The first situation, results in unique-band operation at nearly 900 MHz and impedance bandwidth of 13%. The second situation results in dual-band operation at 810 MHz and 2.65 GHz, bandwidth of 12% and 5.7% respectively. Whereas the third situation offers a dual-band operations at 1.471 and 2.62 GHz with range of frequency, 11.7% and 4.1% respectively [2].

M. Abou Al-alaa et al. has stated that antenna effects on human body and head. The higher values of SAR at changed orientations of antenna with respect to the head model are calculated. Computational values, SAR be an average of over 10gm is more accurate than that of 1gm. The antenna has resonating frequency is quarter-wavelength, as it has shorting stripe at the end. This antenna types is widespread in mobile cellular phone market and portable radio application due to its simple design, light weight, low profile and good radiation pattern also pifa has reduced backward towards user's head and body which further minimize its SAR values and improved its performance [3]. Malcolm Ng Mou Kehn et al. has presented the diversity of bands is getting, by the use of metallic semirings and microstrip patch. These are connected via varactor diode. All shorted to ground plane using copper vertical line, size reduction and thus compactness. PIFA have high Q-factors, they are efficient and well matched only within small frequency bands [4].

Kathleen L. Melde et al. The individual PIFA achieve better than -10dB reflection coefficient for a 13% bandwidth at 2.45 GHz. The concept is used in this paper gives, a require frequency series of operation [5]. Pham Trung Minh and Nguyen Trong Duc et al. Has design and implemented a novel six-band antenna for GSM 1800, WCDMA, m-WiMAX and WLAN applications. It consists of three radiator patches whose optimal parameters are interactively selected on different configurations using Genetic Algorithm (GA). PIN-diodes are used in appropriate locations to accurately control the operating frequency band. The antenna can be used in six applicable frequency bands. i. e. 1.8 GHz, 2.1GHz, 2.4GHz, 3.5GHz, 3.7GHz and 5.8 GHz with corresponding peak gains of 3.34 dBi, 2.8 dBi, 5.16 dBi, 3.95 dBi, 5.05 dBi, 6.98 dBi respectively [6]. S. Manoj et al. clarified antenna has been designed and simulated. Output is indicated by LED, which is the required diode switching pattern for reconfiguring the PIFA antenna so as to achieve new transmission mode. It has good SAR properties [7].

Jong-Hyuk Lim et al. clarified a antenna is presented for worldwide m-WiMAX bands 2.3-2.7 GHz and 3.4-3.6 GHz. In order to achieve small mutual pairing, i.e. high isolation, a band-notched quarter-wave slot line is used between the two reconfigurable antennas [8]. Also proposed a projection using a diode and a tuning varactor is offered for mobile communication application. Selection of diode switching operates for USPCS, WCDMA and WLAN. As a result, 0-V varactor operates for, USPCS, WCDMA, m-WiMAX and WLAN, respectively [17]. James R. Kelly et al. clarified a projection having a reconfigurable frequency operating bandwidth. By changeable the width of feed line we can alter the bandwidth. This is because of switches. The bandwidth can be changed between 3-discrete values. It is used in portable devices and in wireless communication in next generation [9].

Umar Johar et al. has studied the performance of three rate of recurrence reconfigurable antennas in an internal scenario using the slant of arrival (AoA) as a comparative parameter. Their performance was

investigated in the well-known frequency bands of GSM/LTE900 MHz, PCS 1800 MHz WLAN 2450 MHz and few other bands [10]. ITE Elfergani et al. clarified a inverted-F antenna type reconfigurable projection is presented. The antenna can cover frequency band with include, 1710-1880 MHz, 1850-1990 MHz, and 1900-2200 MHz. Initially, this antenna has radiator with range from 1.5-4pf [11]. Kevin R. Boyle et al. clarified all antenna with switches operate on cellular radio frequency bands, simulations show that superior SAR performance is possible in high frequency modes [12]. Ashish Kumar Bahera et al. clarified antenna with operation on LTE/GSM/DCS/PCS/GPS applications. The projection is considered to be work in the PIFA, LOOP mode, which is attained by calculating the tuned diode ON/OFF states. The simulated result shows that the -6/bi reflection coefficient bandwidths of the probe are 36.65% (682-988) and 20.69% (2286-2811 MHz) in the pifa mode and 27.82% (1504-1990 MHz) in the loop mode [13]. Also clarified a reconfigurable projection for LTE/WWAN applications. The antenna can operates over tri-bands (729-984, 1470-2200 and 2300-2760 MHz) with respect to -6 dB reflection coefficient. The radiation patterns which is suitable for the mobile communication [14]. Samantha Caporal Del Barrio at el. Has clarified on indication of the techniques published over the past years to address continuous frequency alteration. The antenna is a dual-band PIFA in use at the GSM bands [15].

M. Unlu et al. has proposed a frequency 1220-5000 MHz, Multi-band antenna for the US public safety band is presented. The antenna is reconfigurable using Micro Electro Mechanical system switches in demand to alter the bands, at 221-4960 MHz where 10%-8% fractional bandwidth is measured in the five bands respectively [16].

V. Conclusion

A review on aerial for portable phone, wireless communication systems. The frequency ranges, efficiency, reflection coefficient, gain of various frequency ranges reconfigurable pifa have been identified. Frequency reconfigurable PIFA antenna is proposed. It radiates at 0.85, 0.81, 2.45, 1.47, 2.62 and 3.35 GHz frequency reconfigurability among these 6 frequencies can be achieved using diode switches. The average gain of the antenna is 3.53 dB and normal radiation efficiency is 67.58%. The proposed antenna can select among several wireless communication applications in LTE bands, GSM 850, CDMA 850, WiMax, WLAN, Bluetooth and Wi-Fi bands

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