A Review Paper on: Design of Reconfigurable Microstrip Antenna with Low Noise for Wi-Max Applications

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ABSTRACT: Combined integration, single feed, multi-layered microstrip antenna style that can be rearranged with various spaces is provided in this paper. An oblong cone filled with straight spaces with extended capabilities in the structure is the base of the antenna. The suspension of multiple resonant waves is eliminated by the flexibility of the active electric field length by loading the varactor diodes across the slots. Eighty-four reductions in low operating frequency are obtained in comparison to a standard rectangular microstrip clip. Fixed antennas are useful for many wireless systems such as GSM1800, IMT2000, WLAN etc. which work in addition to a variety of bands. It discusses the measurable and practical effects of return loss, antenna gain and radiation patterns.

KEYWORDS: ***single feed, multi frequency, WLAN, rectangular patch, return loss.***

INTRODUCTION

With the advancement in wireless communications, there's a requirement to implement antennas that are "smart" to tune their operational characteristics (frequency, polarization, radiation pattern) consistent with the ever-changing communication needs. Moreover, victimization 2 antennas to hide every of the various wireless services that are scattered over a large frequency bands that will increase the system cost, the house requirements for the antennas, and their isolation. Reconfigurable antennas are potential candidates for future RF front-end answer to reduce the quantity of antennas needed in an exceedingly specific system. Reconfigurable antennas are extensively studied over last two decades. this sort of antenna needs shift parts to alter the antenna electrical properties yet as its radiation characteristics. Electrically reconfigurable antennas use RF-MEMS, p- i-n diodes, varactors to perform the desired tunability within the antenna functionality. The activation/deactivation of those switching elements requires the incorporation of biasing lines in the diverging plane of the antenna. Therefore, the interference of these lines on the magnetic force properties of the antenna has to be minimized. This paper presents novel compact styles of single feed, reconfigurable twin frequency rectangular microstrip antennas capable of achieving high standardization ranges while not victimization any matching networks. varied slots on an oblong patch are accustomed generate multi resonant frequencies. Varactor diodes are integrated across the slot arms that tune the resonant frequencies considerably. The important aspect of this design is that it provides a size reduction of 84% for the lower operating frequency, compared to conventional rectangular patch antenna. The radiation pattern, gain and polarization are essentially unaffected by the frequency tuning, which is essential characteristic for frequency reconfigurable microstrip antennas

BRIEF LITERATURE SURVEY:

1) H. A. Majid, M. K. A. Rahim, M. F. Ismail, M. R. Sani "Frequency reconfigurable microstrip patch antenna", applied electronics (AGPCE) 2012 IEEE Asia-Pacific Conference on Date-11-13 Dec-2012

In this paper a frequency reconfigural microstrip patch antenna is proposed three switches are used to produce six reconfigurable frequencies.

2) A. H. Ramadan, K.Y. Kabalan, A. EI- Haji, S. Khoury and M. Al-Husseini," A Reconfigurable U-koch microstrip antenna for wireless application", ECE department American University of Beirut

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In this paper the proposed antenna is simulated using the finite –element method for three different switching cases and the return loss is measured for each case.

PROBLEM FORMULATION

This paper introduces integrated novel styles for single-feed, remodeled horns of twin microstrip antennas that can achieve high stopping distances while not being compromised by any networks. the various slots in the oblong section do not usually produce many resonant waves. Varactor diodes are integrated into the slot arms which are highly adaptable to resonant waves.

A necessary feature of this style is that it provides an eighty-four size reduction of the operating frequency, compared to a standard rectangular clip antenna. Radiation pattern, gain and social segregation are basically unaffected by frequency setting, that is important. Features of 2 slot antenna for repetitive microstrip horns.

OBJECTIVES

The main objective of this paper is to have the conventional patch antenna is designed for 2.4 GHz the rectangular patch antenna is fabricated on glass epoxy substrate εr =4.4 with thickness (h) of 1.6 mm, width of the patch is W=30mm and length L=40mm. Simulated and measured results of return loss are shown in Fig.1. These results are good agreement with each other. At first, in order to have three

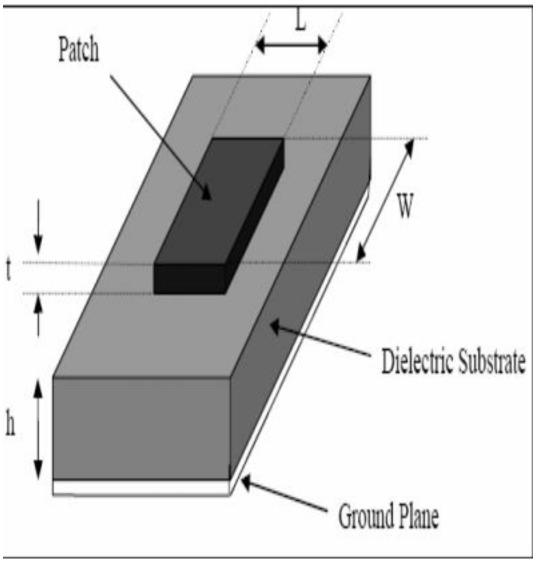

Figure 1: A Typical Microstrip Patch Antenna

different resonance frequencies without considering the switches in the design, two horizontal slots have been placed on patch position of the antenna. Matching for each of the resonance frequencies is achieved by the theory of off-centered microstrip- feed slot antennas [3, 4]. By etching two slots on patch position of the antenna the simulated and measured return losses are in good agreement. Two slots on conventional antenna design is designed and fabricated and it is called as two slot antenna as shown in Fig.4.

The breadth of all the slots is ready around to 1mm. the employment of two slots makes offers size reduction that is because of the excitation of each horizontal and vertical currents of the slots. it's additionally found that the radiation diagram of the 2-slot antenna has smart co-polar and cross polarized levels. Such slot doesn't have any effects on the far-field radiation characteristics. It's also studied that the various orientation slots is for having lower mutual coupling between the slots. The simulation and measured come losses are shown in Fig.2. the precise positions for diodes are found throughout the planning by numerous simulations iterations with completely different positions. it's mentionable that because the diodes are loaded remote from the co axial feed leads to broadsided radiation patterns. Hence, the varactor diode is placed 0.2 millimetre from the sting of every slot. The planned reconfigurable antenna is as shown in Fig.4.

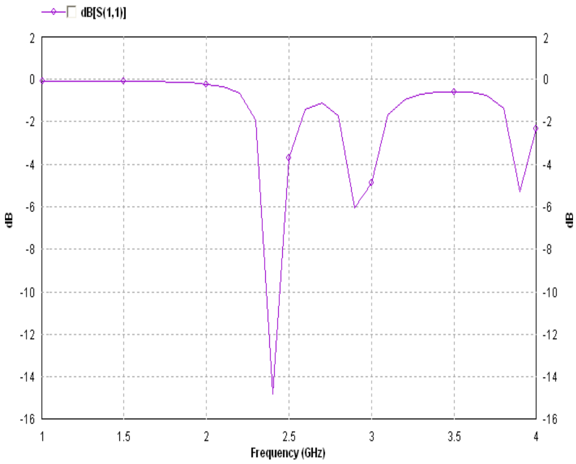

Figure 2(a): RL curve for the patch antenna

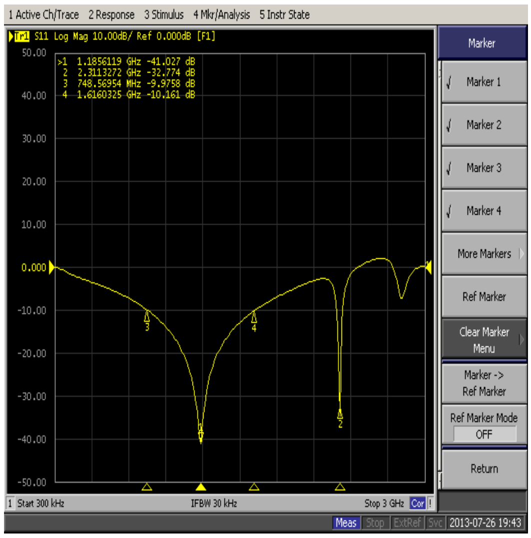

Figure 2(b): Measured Curve for Patch antenna

Fig.3 (a) with slots on top edge, middle and bottom edge of the patch. Simulated and measured return losses are shown in Fig.3 (b) and respectively. The proposed reconfigurable antennas are simulated using matlab software. The simulated patterns in the E planes are shown in Fig. From Fig. 3, it is clear that, the radiation pattern of such resonance does not change when the diodes turn off or on, which leads to the same pattern for the same resonance in different states.

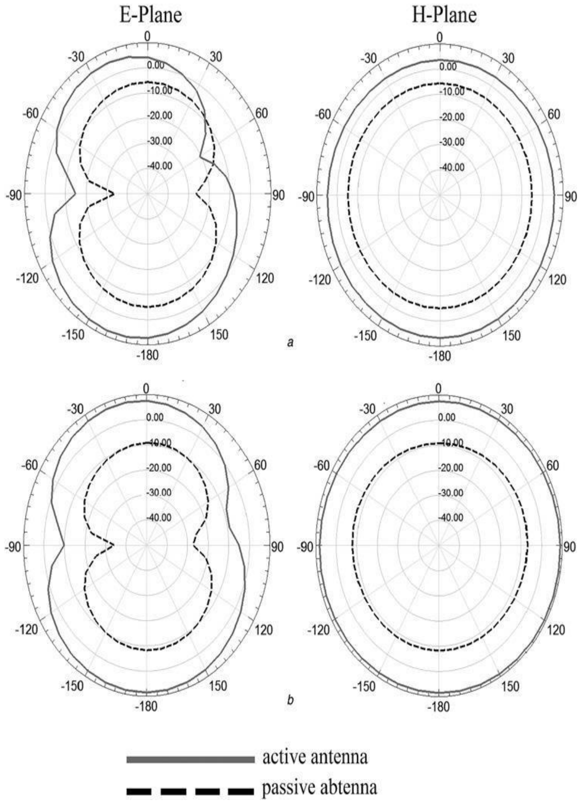

Figure 3: Radiation pattern characteristics of the presented reconfigurable passive and active antennas in dB and at

a 3.5 GHz

b 2.4 GHz

PROPOSED SYSTEM

The bestowed reconfigurable microstrip monopole Associate in Nursingtenna structure with its style parameters is shown in Fig. 4. The designed antenna is written on an FR4 substrate with a thickness of 1.6 mm, permittivity of 4.4 and loss tangent of 0.018. The passive antenna structure consists of a truncated rectangular ground plane, a microstrip feed-line and a changed divergent patch that itself consists of two-folded arms and a microstrip stub which is placed between the two-folded arms. So as to divide the input among the collapsible arms and also the microstrip stub which is placed between them, the microstrip feed-line is modified at its intersection finish with the divergent patch.

A surface-mount assembly instrumentation is connected to the opposite end of the feed-line for signal transmission, as are often determined in Fig. 4. In the planned antenna structure so as to style a completely unique multiband antenna, rather than mistreatment typical rectangular or circular formed patches a mixture of two- folded arms with a microstrip stub between them is employed because the diverging stub. mistreatment this structure ends up in extra surface current methods which ends up to completely different resonance frequencies [4, 5]. The initial length of the rolled-up arms are chosen appreciate the WLAN band frequency (lg/4 at the centre waveband of 2.4 GHz) and therefore the length of the microstrip stub between the two-folded arms is correspondent to the WiMAX band frequency (lg/4 at the Centre waveband of 3.5 GHz), wherever lg is that the radio- controlled wavelength [8], then a constant study has been conducted so as to attain an appropriate compromise between the antenna frequency responses at each higher and lower resonance frequencies The planned reconfigurable antennas are simulated mistreatment Zeeland IE3D software.

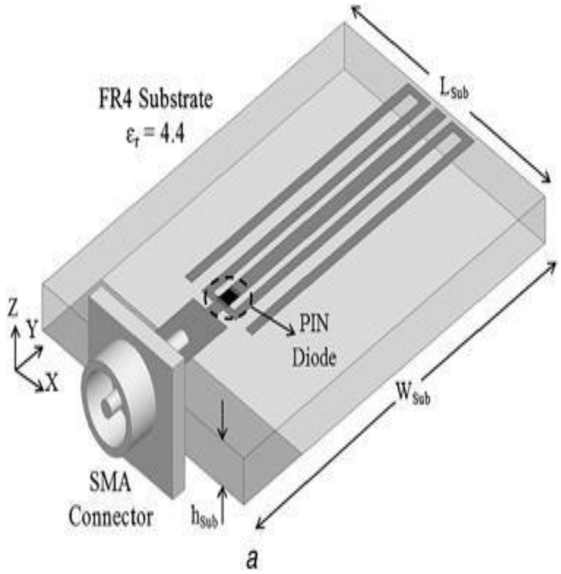

Figure 4: Geometry of the proposed passive reconfigurable antenna

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