



Design of Sierpinski Gasket Fractal Antenna using Proximity coupled feed mechanism for Multiband Applications - Survey Paper

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Abstract: Throughout this paper, the look of Sierpinski gasket form antenna exploitation proximity coupled feed for multiband applications is given. Positive properties of designed antenna structure like come loss and directionality reanalyzed and simulated exploitation 3D magnetic attraction machine cst MWS fourteen. The planned antenna is meant on FR-4 lossy substrate with thickness one.6 mm and theory of relativity theory permittivity four. The projected antenna has resulted once the booming combination of first, second and third iterations. Simulated results show that from second iteration forwards, the antenna starts showing multiband behavior at wholly completely different frequency bands. The broadband and multiple frequency choices of fractal antenna are given and mentioned.

Keywords: Sierpinski Gasket, Proximity coupled Feed, CST MWS V14.0, Return Loss, Directivity, Fractal antenna and Multiband.

1. INTRODUCTION

Over the past few decades, wireless communication systems unbroken bewitching the engineers, receiving lots of advantage due to their inbuilt advantage like low value and convenience. Wireless native space network (WLAN) are being universally establish as versatile, compact and high speed knowledge property answer. This guide to associate degree growing out of micro strip patch antennas .The construct of microstrip antenna was given by Deschamps in 1953.a copyright was issued in 1955 in France within the name of Gutton and Baissinor. Once twenty years, a sensible antenna was designed. The primary sensible antenna was developed by Howell and Munson. Microstrip antenna ar low profile, compact , easy and cheap that ar within the nice demand for each business and military application .Microstrip antenna have some disadvantage like slim information measure and low gain. The most downside in microstrip antenna is broad adornment. Conventionally every antenna is working at single or twin frequency bands, The present study is primarily based upon new trends well-known as —fractal antennal. Shape pure mathematics was developed by Benoit Mandelbort in 1975.FRACTAL means that broken or irregular shapes, that have same form as whole object however at a special scale. It means that it exhibit the self similar property. Geometry is wide utilized in model complicated shapes found in nature like trees, star and mountains. The complexness of nature was taken by shape than euclidean pure mathematics whose interpretation of mountains and cloud as cone and triangular severally would not be same as shape pure mathematics .Its Latin name is —fractus that found from the verb —frangerel means that break. This sort of pure mathematics became additional well-liked in 1990. With the assistance of this pure mathematics we will designed the multiband antennas moreover as new dimension of antenna array. Recently, shape antenna has been become additional well-liked as a result of its engaging options like higher input ohmic resistance matching, reduced mutual coupling in shape array antenna, miniaturization and frequency freelance. There square measure 2 necessary properties in geometry self similarity and area filling that don't seem to be present in the geometrician pure mathematics. Self similarity provides flexibility in antenna by reducing the antenna size in horizontal and vertical direction. Area filling property results in increasing the electrical size of antenna thus reduced the scale of antenna. Fractal antenna have totally different structure like Sierpinski gasket, Sierpinski Carpet and mathematician Island.

2. THEORETICAL BACKGROUND

GSM: - GSM remains for worldwide framework for versatile correspondence. It is an open source framework and access to code. It worked on the diverse frequencies like 900 MHz, 1800MHz and 1900 MHz.GSM in light of on the



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time division various gets to (TDMA).and utilizes voice coding and decoders. In spite of recurrence chosen by administrator, it is isolated into timeslot for singular telephone to work. It permits eight full rate or sixteen half rate discourse channels per radio recurrence. These eight radio timeslot are gathered into the TDMA outline. The transmission control in handset is constrained to 1watt in GSM 1800/1900.

IEEE standard for WLAN:- The IEEE , acknowledged the WLAN standard in 1997.IEEE developed the 802.11 and 802.11X for remote neighborhood (WLAN) innovation. 802.11 alludes to air interface between a remote customer and base station.802.11 family comprise of a progression of half duplex over the air regulation techniques.802.11b and 802.11 uses the 2.4 GHz ISM band. They experienced impedance cordless telephone and Bluetooth. They controlled their impedance by utilizing direct arrangement spread range (DSSS). 802.11a utilizations 5GHz recurrence band so that double band receiving wire was intended for WLAN applications which expanded the fast information rate.

IMT (International portable Telecommunication):- In 1980, The ITU chipped away at up and coming era of versatile radio standard to move win portable system from local standard. This will help in finding the new recurrence band and in addition to build the juncture within win second era remote portable innovation. In 1990, development of 2G versatile increments quickly, now ITU begun to move from 2G to3G innovation. Portable radio advances turn out to be anything but difficult to approach for the telecom benefit available to undeserved district in creating nations. ITU reported the IMT (2000) to help transmission information rate up to 2Mbps for settled station and 384 Kbps for portable stations. It comprises of different standard incorporate the accompanying: CDMA2000, WCDMA and UMTS and so forth. In 2007, world radio gathering discovers range for IMT, underneath 1GHz or more 2GHz.

IEEE STANDARD FOR WiMAX:- WiMAX alludes — Worldwide Interoperability for microwave access| and furthermore known as IEEE 802.16 remote metropolitan range organize. WIMAX wind up plainly problem area for worldwide telecom administrator over the advancement of broadband innovation. In 1998, IEEE built up the WiMAX to exchange the network access all through the world [31]. WiMAX depends on different innovation, for example, MIMO, OFDM and OFDMA. It underpins the two sorts of standard: IEEE 802.16d supporting the air interface of settled and versatile broadband remote get to framework. It bolsters the information rate up to 80Mbps more than 60 km.

Wireless Applications		Frequency Band (MHz)	Bandwidth (MHz)
GSM	GSM 900	890-960	70
	GSM 1800	1710-1805	95
	GSM 1900	1850-1990	140
IMT		2300-2400	100
		2700-2900	200
		3400-4200	800
		4400-4900	500
WLAN		2400-2484	84
		5150-5350	200
		5725-5825	100
BLUETOOTH		2400-2500	100
WiMAX		2500-2690	190
		3400-3690	290



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3. RELATED RESEARCH WORK

The general methodology for outlining a Sierpinski Gasket Fractal radio wire utilizing closeness coupled bolster instrument for multiband application is introduced. The reception apparatus is intended to work in the multiband recurrence application. It has been discovered that as number of emphasis builds, number of thunderous frequencies increments to the Sierpinski Gasket structure. The proposed reception apparatus is reasonable for remote application. This plan is reproduced utilizing 3D electromagnetic test system CST MWS 14.0. At last the outcomes are gotten from recreation are illustrated.

In this sustaining system, two substrate are utilized. It is a kind of non-reaching sustain. This encourages line isolate two substrate. As if there should be an occurrence of opening coupled sustain, determination of substrate material are choosing same. The inconvenience of this method is its manufacture on account of various layers. The benefit of closeness coupled encourage procedures is its greatest transmission capacity and it likewise decreased the spurious radiation and coupling.

There are few preferred standpoint of Proximity Coupled sustaining system over other encouraging strategies.

Higher Bandwidth Impedance coordinating is simple.

No immediate contact between nourish line and emanating patch Higher solid bolstering procedure

Less spurious radiation

Outline thought of fractal reception apparatus

The fix measure is outlined in view of width, Length of fractal for a given full recurrence and dielectric steady of reception apparatus. An exhibit can be utilized as gathering of components which can be utilized as a part of outlining radio wire. The general objective is to accomplish particular execution qualities at sought working recurrence. In the event that radio wire setup accomplishes these objectives, the principal expect to choose reasonable receiving wire geometry. A fractal radio wire can be outlined utilizing the strategy portrayed in next segment. Substrate choice

The initial step to pick great dielectric substrate with thickness h and misfortune digression for planned receiving wire. A substrate with high dielectric steady decreased the measurement of receiving wire. A low estimation of ϵ_r for the substrate will build the bordering field at the fix fringe, and in this manner the emanated control. In this manner, substrates with $\epsilon_r = 4.4$ are favored. Here substrate thickness $h=1.6$ mm and dielectric steady $\epsilon_r = 4.4$ are viewed as (FR4) for the coveted radio wire.

Component length and width

A plan technique is sketched out which prompts useful outlines of fractal reception apparatuses, in view of the disentangled definition. The strategy incorporates the dielectric steady of the substrate (ϵ_r), the resounding recurrence (f_0), and the stature of the substrate h .

Nourish point area

In the wake of picking the fix measurement for a given substrate, the following thing is to decide the bolster area to give the great impedance between input impedance of fix component and generator impedance. It is demonstrated that adjustment in encourage position offer ascent to change consequently misfortune.

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