

الآية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالَ زَابٌ اشْرَحْ لِي صَدْرِي وَيَوْجِهْ لِي أَمْرِي **إِنْ هُوَ مِنْ لِسَانِي** (27)
يَفْقَهُوا قَوْلِي (28) "

صدق الله العظيم

(طه 25-28)

Dedication

Dedication to my mother....

With warmth and faith.

&

Dedication to the soul of my father....

With love and respect

&

Dedication to lights in my life

My families...

&

Dedicated to those taught and

now teaching on

&

To those who touched my life deeply

Friends

Acknowledgment

I would like to thank;

My colleges,

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Eng –Dr. Rashid A. Saeed

Eng. Ali Muslim

*All those who had helped me in the preparation of
this work,*

المستخلص

تتكون الشبكة المتنوعة (الغير متجانسة) من عدد من الشبكات اللاسلكية، حيث يتم جمع عدد من تقنيات الشبكات اللاسلكية مع بعضها البعض . كما تدعم الشبكة المتنوعة كل عبارات التقنيات اللاسلكية من حيث التغطية وعرض النطاق ودعم الحركة وغيرها . تعتبر الهوائيات متعددة الفرقة واحدة من أهم العناصر المستخدمة في الإتصالات اللاسلكية بالإضافة الي تضمينها داخل تصميم المستقبلات متعددة الإستخدام . تعد تقنيات الشبكة المحلية اللاسلكية (دبليو لأن) وتقنيات الوصول التوافقي للميكروويف في جميع انحاء العالم (واي ماكس) من أكثر التقنيات شيوعاً في الأجهزة اللاسلكية مثل نقاط وصول الفيمتوسل.

في هذا المشروع نقترح تصميم هوائي مايكروسترب ذاتي التشكيل ، يعمل علي تقنية الـ (واي ماكس) عند تردد 3.5 قيقا هيرتز و تقنية الـ (دبليو لأن) عند تردد 5.2 قيقا هيرتز . يتكون هوائي المايكروسترب المستطيل من مادة مقاومة للهب العازلة (إف آر 4) و نحاس في جزء الإشعاع (الرقعة و الأرضية) . تعتمد تقنية التصميم علي عمل شق علي شكل (C) فوق الرقعة وعمل شقين متوازيين في الأرضية . يمكن للهوائي المقترح إعادة تشكيل نفسه ذاتياً بواسطة ثلاثة (بي أي أن) دايود موضوعة علي شق الرقعة حيث يتم إستخدام خصائص الدايود في التغيير بين الترددات 3.5 و 5.2 قيقا هيرتز. ترتكز هذه الدراسة علي دراسة أبعاد الرقعة و أبعاد خط تغذية المايكروسترب ، حيث تمت محاكاة الهوائي داخل نظام تقنية المحكاة الحاسوبية (سي إس تي) واخذت نتائج جيدة لأداء الهوائي عند جميع الترددات.

Abstract

Heterogeneous network tends to use multiple types of wireless access networks. In heterogeneous wireless networks, different wireless access technologies are integrated to complement each other in terms of coverage area, mobility support, bandwidth, and price. The multi-band antenna is one of the most important elements and commonly used in modern wireless communication. It is incorporated into many multimode receiver designs. WiMax and WLAN are widely applied in wireless device such as femtocell access point. In this work, a design of reconfigurable rectangular microstrip patch antenna is presented. The proposed antenna is used in WiMax with centre frequency at 3.5 GHz and WLAN with centre frequency at 5.2 GHz.

The rectangular microstrip antenna consist the RF-4 proxy in substrate and also consist copper in the patch and ground plane. The design technique based on C-slot on the patch and two parallel slit on the ground plane. Antenna reconfigurabilty is achieved by three PIN diode switch in C-slot. However, the changes of PIN diode cases status on ON or OFF mode, the resonant frequencies can be changed between 3.5GHz and 5.2GHz. This design shows excellent mechanical characteristics for the antenna; and study is concentrates on effect of patch dimensions, width and length of microstrip feed line. The performances of the antenna are simulated by CST microwave studio simulator and having good results. The proposed antenna offers low profile, wide bandwidth and high gain for all frequencies.

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Abbreviations

4G	4 Generation
CE	Consumer Electronics
CST	Computer Simulation Technology
DC	Direct Current
FAP	Femtocell Access Point
FMC	Fixed Mobile Convergence
FR4	Flame Resistant 4
FTTH	Fiber-To-The-Home
GUI	Graphical User Interface
HDTV	High-Definition TV
HetNet	Heterogeneous Network
IEEE	Institute of Electrical and Electronic Engineering
IF	Intermediate Frequency
IMS	IP Multimedia Subsystem
IP	Internet Protocol
LNA	Low Noise Amplifiers
LTE	Long Terms Evaluation
MAC	Medium Access Control
MEMS	Microelectromechanical System
PA	Power Amplifier
PCB	Printed Circuit Board
PHL	Physical Layer
RF	Radio Frequency
RMSPA	Rectangular Microstrip Patch Antenna
SC	Sub-Layer
SDR	Software Defined Radio
SNR	Signal to Noise Ratio
TEM	Transverse-Electric-Magnetic
UMA	Unlicensed Mobile Access
VDSL	Very High Data Rate Digital Subscriber Loop
VoD	Video on Demand

VoIP	Voice-over-Internet Protocol
VSWR	Voltage Standing Wave Ratio
WiMAX	Worldwide Interoperability Microwave Access
WLAN	Wireless Local Area Network