



Integrated bluetooth/LTE2600 superwideband monopole antenna with triple notched (WiMAX/WLAN/DSS) band characteristics for UWB/X/Ku band wireless network applications

Vigneswaran Dhasarathan^{1,2} · Manish Sharma³ · Manoj Kapil⁴ · Prem Chand Vashist⁵ · Shobhit K. Patel⁶ · Truong Khang Nguyen^{1,2}

© Springer Science+Business Media, LLC, part of Springer Nature 2020

Abstract

In this manuscript, a compact superwideband monopole antenna with triple notched band characteristics is presented and is experimentally investigated. Proposed antenna is also suitable for lower band of applications including Bluetooth and LTE2600 bands. Superwideband bandwidth with bandwidth ratio $\geq 10:1$ is obtained by using two identical ellipse which are placed at 70° with reference to major axis. A fractal stub is used to notch WiMAX interfering band while WLAN and DSS bands are notched by etching modified rectangular slots on the radiating patch. Antenna also constitutes slotted ground with chamfered corners for better matching of impedance. Proposed antenna is also investigated in terms of frequency, time and space domain. Antenna offers a wider superwideband bandwidth with $VSWR \leq 2$ for 2.34 GHz to 20.00 GHz. In time domain, antenna offers constant group delay in entire operating bandwidth and acceptable impulse response for input signal. Also, antenna offers maximum gain of 4.98 dBi and radiation efficiency of 89%. Stable radiation pattern and above features of proposed antenna suggest antenna to be a good candidate for numerous applications in wireless system.

Keywords Bluetooth · LTE2600 · Superwideband · Triple notch · WiMAX · WLAN · DSS

1 Introduction

Nowadays, wireless technologies plays very important role in modern era where one can find existing wireless communication system for numerous applications. Ultrawideband (UWB) technology working in bandwidth range of

3.10–10.6 GHz given by Federal Communication Commission (FCC) in 2002 opened wide gates for when development of wireless system for applications including imaging systems, wall imaging systems, through wall imaging systems, surveillance systems, medical systems etc. Also, higher frequency side bandwidth is considered,

✉ Manish Sharma
manishengineer1978@gmail.com;
manish.sharma@chitkara.edu.in

Vigneswaran Dhasarathan
Vigneswaran.d@tdtu.edu.vn

Manoj Kapil
manojkapil@yahoo.com

Prem Chand Vashist
pcvashist@gmail.com

Shobhit K. Patel
shobhitkumar.patel@marwadieducation.edu.in

Truong Khang Nguyen
nguyentruongkhang@tdtu.edu.vn

¹ Division of Computational Physics, Institute for Computational Science, Ton Duc Thang University, Ho Chi Minh City, Vietnam

² Faculty of Electrical and Electronics Engineering, Ton Duc Thang University, Ho Chi Minh City, Vietnam

³ Chitkara University Institute of Engineering and Technology, Chitkara University, Punjab, India

⁴ Swami Vivekanand Subharti University, Meerut, Uttar Pradesh, India

⁵ G. L. Bajaj Institute of Technology and Management, Greater Noida, India

⁶ Electronics and Communication Department, Marwadi University, Rajkot, India