

Chapter 4

Design of Slotted Hexagonal Wearable Textile Antenna Using Flexible Substrate

Lalita Kumari

CBS College of Engineering and Management, India

Lalit Kaushal

CBS College of Engineering and Management, India

Deepak Kumar

CBS College of Engineering and Management, India

ABSTRACT

In this chapter, a dual wideband textile antenna is proposed for WLAN and WiMax application. For antenna to be wearable, jeans material is used as a substrate to make ground plane, and copper tape is used to make patch of the anticipated antenna. The proposed antenna shows dual band performance with bandwidth of 82.48% covering 1.456 GHz to 3.5 GHz and 13.39% covering 4.32 GHz to 4.94 GHz. The simulated results like reflection coefficient, directivity, and radiation characteristics have been studied and analyzed.

INTRODUCTION

Textile Antennas are invaluable as a result of their compelling cost and straightforward acknowledgment process. There is a great deal of strategies to build the bandwidth, by expanding the thickness of substrate, utilization of

DOI: 10.4018/978-1-5225-9683-7.ch004

low dielectric substrate, utilizing various nourishing systems and by taking fractional ground (Klemm, Locher, and Troster, 2004). The proposed antenna configuration is utilized jeans which improves the bandwidth of antenna (Singh, Singh, and Singh, 2015; Bappaditya, Bhattechya and Choudhury, 2013; Xu and Li, 2012).

Another period for the attire industry is the reconciliation of gadgets into textile messengers. The article of clothing of things to come won't just ensure the human body against the limits of nature yet additionally give data about the wearer's condition of wellbeing and condition (Bappaditya, Bhattechya and Choudhury, 2013) appeared in Figure 1. This work not just goes for growing such wearable textile systems mostly for expert firemen and crisis calamities work force yet in addition for regular citizen casualties of common and different catastrophes. The fireman's inward and external article of clothing is being outfitted with an assortment of sensors (Bappaditya, Bhattechya and Choudhury, 2013). This off-body correspondence requires the improvement of appropriate antenna that consolidates adaptability with heartiness and unwavering quality. An assortment of antennas for body-driven correspondence has been presented as of late (Grilo, and Correra, 2015; Rawat and Sharma, 2014; Chandran and Scanlon, 2010; Osman, Rahim, Samsuri, Zubir and Kamardin, 2011; Singh, Ali, Avub, and Singh, 2014). Because of the special shape and conservativeness, textile antennas have turned out to be most appropriate for coordination into articles of clothing (Srivastava, Singh, and Avub, 2015; Singh, Ali, Avub, and Singh, 2014; Singh, Singh, and Singh, 2015).

Radiating patch and ground of antenna is made of copper self sticky tape. Reproduction is finished by utilizing CST programming studio and gives the outcome, for example, reflection coefficient, addition and data transmission. The real advantages of the material radio wires are lightweight, low manufacture cost, low upkeep cost and hearty. Flexible antenna requires less space for establishment as these are basic and little in size. The main object is the hole for feed line which is put at the back of the ground plane (Srivastava, Singh, Ali, and Singh, 2013; Din, Chakrabarty, Ismail, Devi and Chen, 2012; Srivastava, Avub, and Singh, 2012).

7 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/design-of-slotted-hexagonal-wearable-textile-antenna-using-flexible-substrate/235780

Related Content

Factors Influencing Students' Continuance Intention Toward Usage of E-Learning Systems in Tanzania: The Hybrid of ECM and ISSM Models

Deogratius Mathew Lashayo and Julius Raphael Athuman Mhina (2022). *International Journal of Mobile Devices, Wearable Technology, and Flexible Electronics* (pp. 1-20). www.irma-international.org/article/factors-influencing-students-continuance-intention-toward-usage-of-e-learning-systems-in-tanzania/311431

Design and Analysis of a High-Bandwidth Wearable Antenna With Rectangular DGS on Jeans Fabric for Advanced Healthcare Applications

Ajay Tiwari, Somesh Malhotra and Shiv Mohan Mishra (2025). *Design and Simulation of Wearable Antennas for Healthcare* (pp. 91-116). www.irma-international.org/chapter/design-and-analysis-of-a-high-bandwidth-wearable-antenna-with-rectangular-dgs-on-jeans-fabric-for-advanced-healthcare-applications/356816

Digital Health Literacy: A Future Healthy Choice

Cristina Vaz de Almeida (2021). *International Journal of Mobile Devices, Wearable Technology, and Flexible Electronics* (pp. 49-62). www.irma-international.org/article/digital-health-literacy/277794

A Circumgyrated Pika Shaped Wearable Antenna for Biotelemetry, IMDs, and BCWC Healthcare Applications: Trajectory Slotted Microstrip Antenna With DGS

Aparna Singh, Rajesh Kumar Dwivedi and Vinod Kumar Singh (2025). *Design and Simulation of Wearable Antennas for Healthcare* (pp. 67-90). www.irma-international.org/chapter/a-circumgyrated-pika-shaped-wearable-antenna-for-biotelemetry-imds-and-bcwc-healthcare-applications/356815

Remote Robot-Sensor Calibration Service: Towards Cyber Physical Robotics

Tapio Heikkilä, Tuomas Seppälä, Timo Kuula and Hannu Karvonen (2019). *International Journal of Mobile Devices, Wearable Technology, and Flexible Electronics* (pp. 15-36). www.irma-international.org/article/remote-robot-sensor-calibration-service/268889