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Design and Performance Analysis of Body Worn Textile Antenna Using 100% Polyester at 2.4 GHz for Wireless Applications



Shehab Khan Noor, Nurulazlina Ramli, Najah Najibah Zaini, and N. H. Abd Rahman

Abstract International Mobile Telecommunications-2020 (IMT-2020) is focused on creating a mobile ecosystem with a reasonable price and user friendly. With these reasons, the need for a communications framework that could be deployed at an affordable cost, compact and ease of mobility brought forward the concept of wearable technology. Wearable devices such as textile antennas are being developed with the potential to track, notify and demand attention where hospital emergencies are necessary. However, conventional antenna designs have a rigid structure, limited bandwidth, costly metallization and lack effectiveness. Therefore, in this paper, a simulation of a textile wearable antenna using 100% polyester as a substrate is designed for a wireless application at 2.4 GHz frequency. The antenna performance is observed in terms of reflection coefficient, bandwidth, Voltage Standing Wave Ratio (VSWR), gain and radiation pattern along with a thinner substrate compared to previous works to justify the validity of the current design proposed. The research paper has many possibilities for the future and could assist with when designing and manufacturing flexible and comfortable wearable devices for everyday use.

Keywords On-body communication · 100% polyester antenna · Textile antenna · Wearable devices · Wireless technology

1 Introduction

Antennas are now so significant where human beings can communicate and share information through air and space to each other through wireless communication [1]. Wearable fabric-based antennas have become one of the predominant research topics

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