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Design and Simulation Study of Antenna for Wireless Body Area Network (WBAN)

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Abstract

In this work, a flexible microstrip patch antenna has been designed to be operated at frequency 2.45GHz (ISM band). Three different materials have been used in this work which is rubber with permittivity of 3.0, loss tangent of 0.02 and thickness of 2.70mm, polydimethylsiloxane (PDMS) with dielectric constant of 2.71, loss tangent of 0.0134 and thickness of 1mm, and jeans with permittivity of 1.7, loss tangent is 0.025 and thickness of 1mm. Different substrate permittivity affect the antenna performance in various ways. The antenna is designed using CST Studio Suite 2019 software and the parameter such as return loss, VSWR, gain, directivity, and radiation pattern are analyzed. Here, the antenna performance when bending at five different angle, SAR value using human body layer and antenna performance when attach to the human arm model will be discuss in this paper.

Keywords: Microstrip patch antenna; ISM band; WBAN; PDMS; Wearable antenna; SAR; CST SS.