

Computational and experimental analysis of highly isolated double side triple band notched UWB MIMO antenna

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Abstract

In this article, we present a double side highly isolated triple band-notched UWB MIMO antenna for short-range wireless communication applications. The proposed MIMO antenna design provides a UWB band with the notched band at the IEEE INSAT C band satellite communication and WLAN band (4.6–5.9 GHz), the X band uplink and downlink satellite communication (7.70–8.43) and (10.3–10.98 GHz). It has double side placement of polygon-shaped radiating elements, and an inverted L-shaped stub to obtain high isolation between radiating elements. The proposed antenna has a size of 18×28 mm², which operates from 3 to 12 GHz. The antenna characteristics such as isolation between radiating elements, S11/S22, gain, and radiation characteristics are studied. The proposed MIMO antenna has isolation of >19 dB, 0–7.5 dBi peak gain and almost radiation pattern over the entire operating frequency band with pattern diversity. Furthermore, MIMO diversity performance was investigated using an ECC, diversity gain, multiplexing efficiency, TARC, and CCL. The proposed UWB MIMO antenna has very low ECC of 0.0025, and DG of >9.9, over the entire operating band (3–12 GHz). Also, the real-time indoor short-range communication capability of the proposed MIMO antenna demonstrated by using the NI 802.11 framework

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