2020 IEEE International RF and Microwave Conference, RFM 2020 - Proceeding14 December 2020 Article number 9344791 2020 IEEE International RF and Microwave Conference, RFM 2020 Kuala Lumpur 14 December 2020through 16 December 2020 Code 167150

A Wideband Wearable Antenna Using Inverse Partial Ground Designed Using Characteristic Mode Analysis

Abstract

The design of a wearable wideband textile antenna based on a loop structure and fed using a coplanar waveguide line is proposed in this work. Characteristic mode analysis is used to first estimate the radiating modes on the structure. This is to ensure that the optimal mode significance is chosen. Analysis of modal significance enabled the first four modes to be identified from the structure. In this paper, the antenna is proposed to designed with an inverse partial ground (IPG) to enhance the bandwidth. It is shown that this IPG method improved impedance bandwidth to 1560 MHz (60.57%), indicating a bandwidth broadening of about 370 MHz (11.61%). A compact size of 70×70 mm2(0.57 × 0.57 ?g) is also maintained, with a realized gain of 4.23 dBi. Finally, the proposed antenna is fabricated and measured to validate the analysis experimentally, indicating a good agreement with simulations.

Keywords

Characteristic mode analysis; Wearable antennas; Wideband antenans; Wireless body area networks