

A novel 1.575-GHz dual-polarization textile antenna for GPS application

Abstract

This article presents a novel dual-polarization textile antenna (DPTA) for Global Positioning System applications. In this design, four sector radiating elements are centrally fed by a coaxial probe. A novel antenna structure is successfully achieved by integrating electronic components into a wearable textile antenna. Silver loaded epoxy adhesive is used in embedding four PIN diode switches on ShieldIt super textile of the proposed antenna. The activation of certain PIN diode switches configuration determines the polarization of DPTA. Dimension-wise, this antenna is compact and small where it consists of 40-mm radius. The proposed DPTA design successfully generated dual-polarization omnidirectional radiation pattern with maximum gain 1.81 dB at angle of $0^{\circ}/360^{\circ}$, 90° , 180° , and 270° . Its small size, flexible, and wearable features enables this DPTA to be easily integrated onto safety jacket and rain coat for tracking, search, and rescue applications.

Keywords

Dual-polarization textile antenna; PIN diode switches; Global positioning systems