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Dual-band suspended-plate wearable textile antenna

Abstract

A novel, dual-band wearable textile antenna fabricated using conductive textiles for operation in both ISM and HiperLAN applications is presented. Its concept is based on the suspended-plate antenna. It features a 60 × 45 mm2 rectangular radiating element suspended over a 80 × 60 mm2 ground plane using a 5-mm foam substrate. The proposed rectangular radiator is modified using slots, slits, and shorting posts to enable dual-band resonance and broad bandwidths in both frequency bands: 277 MHz (2.22-2.48 GHz) in the ISM and 850 MHz (4.95-5.80 GHz) in the HiperLAN band. The antenna radiates unidirectionally, and the ground plane avoids coupling to the users' body. The SP-WTA shows a total efficiency between 67% and 89% and a peak gain of 8.33 dB.

Keywords

Biological effects of electromagnetic radiation; conformal antennas; dual-band antennas; textile antennas