A New Compact Dual Band GPS Patch Antenna Design Based on Minkowski-Like Pre-Fractal Geometry

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Abstract

A low profile compact microstrip antenna for GPS (L1/L2) application has been presented in this paper. The proposed antenna design is based on the 3rd iteration Minkowski-like pre-fractal geometry. The resulting antenna design offers a compact size, low profile and light weight making it suitable for use in handheld applications. Antenna performance has been evaluated using the EMSightTM from the Applied Wave Research. The proposed antenna has shown to possess two resonance bands (for return loss ≤-10 dB) covering the two GPS bands. Reasonable radiation characteristics have been achieved at the GPS frequencies (L1:1575.42 ± 10.23 MHz, L2:1227.60 ± 10.23 MHz) with good circular polarization characteristics. Realized circular polarization Bandwidths (for axial ratio ≤ 3 dB) are found to cover adequately those required for these GPS bands.

Keywords: GPS (L1/L2), Fractal Antenna, Dual Band Antenna, Circular Polarization, Axial Ratio.