

Multiband fractal planar inverted F antenna (F-PIFA) for mobile phone application

The design of a novel Fractal planar inverted F antenna (F-PIFA) based on the self affinity property is presented in this paper. The procedure for designing a Fractal Planar Inverted F Antenna is explained and three different iterations are designed for use in cellular phones. The F-PIFA has a total dimension of $27 \text{ mm} \times 27 \text{ mm}$ and has been optimized to be operational at GSM (Global System for Mobile Communication), UMTS (Universal Mobile Telecommunication System) and HiperLAN (High Performance Radio LAN) with the frequencies range from 1900 MHz to 2100 MHz, 1885 to 2200 MHz and 4800 MHz to 5800 MHz respectively. The antenna achieved -6 dB return loss at the required GSM, UMTS and HiperLan frequencies with and has almost omnidirectional radiation pattern. This antenna has been tested using realistic mobile phone model and has met the performance criteria for a mobile phone application. Simple semi-empirical formulas of the operational frequency, numerical calculation and computational SAR of the antenna also has been presented and discussed.