Abstracts

Finite-difference time-domain analysis of a dual resonance and shielded cellular antenna

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This paper presents a dual-resonance shielded antenna suitable for cellular phone applications. The antenna is shielded with a metallic wall to reduce possible health hazards towards user. Unlike other cellular antennas, new antenna's operating bandwidth spans between the first two resonances of the antenna and an almost 50 ohms flat input resistance can be obtained within a bandwidth of 824-896 MHz, using proper antenna dimensions. A proto-type of the dual resonance shielded antenna has been built and input impedance, near and far field measurements have been performed. Near field measurements showed that excessive electromagnetic radiation towards user is blocked by 90% without significantly sacrificing the omnidirectional characteristics required for cellular phone devices. Input impedance measurements are compared with the numerical results and a good agreement has been achieved. The new antenna uses all copper wires and shield which makes it easy and inexpensive to build.

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