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MULTIBAND PLANAR INVERTED-F ANTENNA (PIFA) FOR MOBILE PHONES

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ABSTRACT

The proposed antenna consists of the radiating patch of dimension 71mm×21mm, and the finite ground plane of dimension 90mm×26mm. Both are made by 0.2 mm thick copper foil. The thickness of air (dielectric material layer) is 5mm. A probe feed of radius 0.35 mm is inserted. Techniques such as shorting plate, a parasitic element, and shorting pins are also carried out in the proposed antenna design. The proposed antenna is designed and simulated using Transmission Line Model and HFSS software in the frequency range 1-6 GHz. After simulation, three bands are obtained at resonance frequencies of 1.975 GHz, 3.5GHz and 5.45GHz. The return loss of -12.8 dB, -30.9 dB and -33.7 dB are found at corresponding resonance frequencies. The bandwidth of 41.9MHz, 977.6MHz and 261.2MHz as well as normalized radiation efficiency of 62%, 61.6% and 93% for the proposed antenna are seen. The corresponding gains of the proposed antenna are found to be 4.5 dB, 6.19 dB and 6.0 dB. Performance parameters of the proposed antenna are greatly improved with the antenna under reference. The proposed antenna is fabricated and measured. The simulated and measured results are compared and they have good agreement. The proposed antenna is useful for mobile phone covering PCS 1900 & WIMAX at 3.5 GHz & 5.5 GHz, respectively.

KEYWORDS: Fabricated Antenna, Internal Antenna Multiband, Planar Inverted-F Antenna (PIFA).

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