

Design of Compact Dual-Band Planar Antenna for WLAN Systems

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Abstract : A compact planar monopole antenna with dual-band operation suitable for wireless local area network (WLAN) application is presented in this paper. The antenna occupies an overall area of $18 \times 12 \text{ mm}^2$. The antenna is fed by a coplanar waveguide (CPW) transmission line and it combines two folded strips, which radiates at 2.4 and 5.2 GHz. In the proposed antenna, by optimally selecting the antenna dimensions, dual-band resonant modes with a much wider impedance matching at the higher band can be produced. Prototypes of the obtained optimized design have been simulated using EM solver. The simulated results explore good dual-band operation with -10 dB impedance bandwidths of 50 MHz and 2400 MHz at bands of 2.4 and 5.2 GHz, respectively, which cover the 2.4/5.2/5.8 GHz WLAN operating bands. Good antenna performances such as radiation patterns and antenna gains over the operating bands have also been observed. The antenna with a compact size of $18 \times 12 \times 1.6 \text{ mm}^3$ is designed on an FR4 substrate with a dielectric constant of 4.4.

Keywords : CPW antenna, dual-band, electromagnetic simulation, wireless local area network (WLAN)

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