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Design of Compact Antenna Designs for WLAN/WiMAX Bands and for Dual Band-notched UWB Applications

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Abstract

Recently, rapid evolution of wireless communication systems has fueled the need to design antennas for portable terminals suitable for Wireless Local Area Networks (WLANs), as well as for Worldwide Interoperability for microwave access (WiMAX). There is ever growing commercial pressure to reduce the antenna size to keep pace with the decreasing size of the electronics.

In this talk we first present the design of a dual-band (3.5GHz and 5.8GHz), meandered monopole antenna for WLAN/WiMAX applications, which is fed by an asymmetric coplanar strip (ACS). The proposed antenna is comprised of an asymmetric ground plane, an ACS-fed structure, and coupled meandered monopole-type of radiating elements that are designed to provide the two desired operation bands, namely 3.5GHz and 5.8GHz. The two resonance frequencies of the antenna can be controlled by adjusting the dimensions of the radiating elements, namely the two meandered monopoles, and the gap between them which controls the coupling. The designed antenna has a small size, which is only 20mm×12mm including the ground plane. Simulated and measured results will be presented to demonstrate that the proposed dual-band antenna is well suited for WLAN and WiMAX applications.

The talk will then go on to discuss the extension of some of the above concepts to the design a reconfigurable Ultrawideband (UWB) antenna with one or more notches for interference suppression, and will include illustrative experimental results for this type of antenna as well.

Keywords: Dual-band antenna, asymmetric coplanar strip, WLAN antenna, WiMAX antenna, Reconfigurable UWB antenna