Gain Enhancement of a Dual-Band Planar Slot Dipole using AMC Plane for WBAN and WLAN Applications

ABSTRACT

A dual band slot dipole antenna made from textile is proposed for Wireless Body Area Network and Wireless Local Area Network applications. The proposed antenna is integrated with an artificial magnetic conductor plane to mitigate backward radiation and reduce Specific Absorption Rate when operated on body. The artificial magnetic conductor plane is formed using a 3 x 3 array of unit cells, each consisting of a square patch integrated with diamond-shaped slot. The proposed antenna (denoted as Antenna B) is compared against another similar antenna (Antenna A) in free space and on-body, in flat condition (on chest) and under two bending axes (x- and y-axes) on the upper arm. Results indicate that Antenna B provided wider upper bandwidth to 766 MHz (in flat condition) and up to 875 MHz when bent. Besides that, higher gain of up to 5 dB with improved front-to-back ratio are also observed.