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Swastika Shape Multiband Patch Antenna for Wireless Applications on Low Cost Substrate

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Abstract : In this article, a compact simple structure modified Swastika shape patch multiband antenna on a substrate of available low cost polymer resin composite material is designed for Wi-Fi and WiMAX applications. The substrate material consists of an epoxy matrix reinforced by woven glass. The designed micro-strip line fed compact antenna comprises of a planar wide square slot ground with four slits and Swastika shape radiation patch with a rectangular slot. The effect of the different substrate materials on the reflection coefficients of the proposed antennas was also analyzed. It can be clearly seen that the proposed antenna provides a wider bandwidth and acceptable return loss value compared to other reported materials. The simulation results exhibits that the antenna has an impedance bandwidth with -10 dB return loss at 3.01-3.89 GHz and 4.88-6.10 GHz which can cover both the WLAN, WiMAX and public safety WLAN bands. The proposed swastika shape antenna was designed and analyzed by using a finite element method based simulator HFSS and designed on a low cost FR4 (polymer resin composite material) printed circuit board. The electrical performances and superior frequency characteristics make the proposed material antenna desirable for wireless communications.

Keywords : epoxy resin polymer, multiband, swastika shaped, wide slot, WLAN/WiMAX
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