

MIMO Antenna with Pattern Reconfiguration and Correlation Reduction for WLAN Applications

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Abstract

In this paper, a novel beam steerable 2.4 GHz MIMO antenna array is proposed based on the Yagi-Uda principle. The antenna consists of two co-axially excited patch radiators with modified ground plane. A conducting strip with an integrated PIN diode is optimally placed between the patch radiators to act as a director or a reflector to steer the main beam by an angle of $\pm 60^\circ$. For all switching modes, the MIMO antenna demonstrates an average gain and efficiency of 5 dB and 92%, respectively, at the resonance frequency of 2.4 GHz. Reduced envelope correlation coefficient in one switching mode exhibited 17 dB improvement in mutual isolation. The simulated results agreed well with measured data. This simple, low-cost, efficient, and mutually isolated antenna array can be very useful in MIMO WLAN applications.

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