

Dual Reconfigurable Antenna Using Capacitive Coupling Slot and Parasitic Square Ring

Authors : M. Abou Al-alaa, H. A. Elsadek, E. A. Abdallah, E. A. Hashish

Abstract : A square patch antenna with both frequency and polarization reconfigurability is presented. The antenna consists of a square patch with coplanar feed on the ground plane. On the patch side, there is a parasitic square ring that is responsible for changing the antenna polarization. On the ground plane, there is a rectangular slot. By changing of length of this slot, the antenna resonance frequency can be changed. The antenna operates at 1.57 and 2.45 GHz that used in GPS and Bluetooth applications, respectively. The length of the slot in the proposed antenna is 40 mm, and the antenna operates at the lower frequency (1.57 GHz). By using switches in the ground plane the slot length can be adjust to 24 mm, so the antenna operates at upper frequency (2.45 GHz). Two switches are mounted on the parasitic ring at optimized positions. By switching between the different states of these two switches, the proposed antenna operates with linear polarization (LP) and circular polarization (CP) at each operating frequency. The antenna gain at 1.57 and 2.45 GHz are 5.9 and 7.64 dBi, respectively. The antenna is analyzed using the CST Microwave Studio. The proposed antenna was fabricated and measured. Results comparison shows good agreement. The antenna has applications in several wireless communication systems.

Keywords : microstrip patch antenna, reconfigurable antenna, frequency reconfigurability, polarization reconfigurability, parasitic square ring, linear polarization, circular polarization

Conference Title : ICCIT 2014 : International Conference on Communication and Information Technology

Conference Location : New York, United States

Conference Dates : June 05-06, 2014