Reconfigurable patch array antenna with beam steering characteristic

Abstract:

This paper describes a reconfigurable patch array antenna with beam steering characteristic. The microstrip patch array antenna is developed by using an aperture coupled technique. This method has separated the radiating element and feed network in order to reduce the spurious effect. The novel design of spiral feed network has suppressed the antenna dimension of 100 mm × 100 mm and eventually help to determine the main lobe direction. By positioning the rectangular radiating element at four different orientations, the proposed antenna has successfully achieved four steered beam with direction of +179°, -14°, +3° and 14°. Beam steering technique is realized by controlling the switch-on time sequences via the PIN diode. Each beam direction has a similar cutoff frequency of 2.4 GHz. This multilayer antenna occupied negative Taconic substrate. All designs and simulations have been performed by CST Microwave Studio. This antenna is a potential candidate for Wireless Fidelity (WiFi) smart antenna system.