

# Abstract

## New Two-Port Microstrip Patch Antenna Structures

In this paper, a new compact microstrip antenna structure having two physically separated ports (180° orientation) has been proposed, designed and presented. Each antenna port resonates at a different single frequency (or dual frequencies) within the 4G band (broadband and/or wideband), and it has high port-to-port isolation (below -22.0 dB). The antenna design is mainly based upon a novel reconfigurable ground structure (shape, dimensions and location). The full ground of microstrip antenna has been partitioned into three isolated ground strips, each one having a specific width and length. The orientation of these strips is perpendicular to the feeders, and each strip has two (or more) slots of different geometries. Such ground configuration is referred to as Defective Digital Ground Structures (DDGS). The proposed microstrip antenna has been simulated using the CST\_MW studio, and it has been mounted on a cheaper FR4-substrate to verify the proposed design. Simulation results showed that for each antenna port, resonance frequencies, operating bands and isolation can be adjusted using the proposed DDGS to achieve the desired antenna specifications. Thus, DDGS is simply representing built-in resonance and decoupling circuits with no additional cost for antenna design. The presented study offers a new practical and simple approach to solve the multipoint antenna design problem.