

ABSTRACT

Use of microstrip patch antenna is very popular, but microstrip patch antenna suffer from a number of disadvantages such as narrow bandwidth. . In this paper, a planar Electromagnetic Band-Gap (EBG) structures are used for further enhance the antenna bandwidth. An inset rectangular patch antenna was designed to work with a design frequency of 2.4 GHz. To analyze the EBG properties, the suspended transmission line method is used. In order to bandwidth enhancement, 1x3 EBG array arrange on the same layer of antenna's patch but the distance between patch and EBG were optimized. Simulation and measurement result are compared. In the end, it resulted the bandwidth of the rectangular microstrip antenna has increased 1.79 % noticeably by using the EBG structures for simulation result and increased 4.8 % for measurement result, and inclusion of EBG structure also improve gain as much as 0.345 dB and increase directivity of antenna 0,309 dBi. Application of EBG structure succeeds to increase the performance of antenna in simulation and measurement result respectively.

