Abstract

The broadband E-shaped microstrip antenna is realized by cutting pair of rectangular slots on one of the radiating edges of rectangular microstrip antenna. While designing an E-shaped antenna at given frequency, the slot length is taken to be nearly quarter wave in length. However this simpler approximation does not give closer results. In this paper, first a comparison of slot frequency calculated by using quarter wavelength approximation against simulated data for an optimized E-shaped antenna, is presented, which shows larger error. Further a detailed analysis to study the effects of slot on broadband response in E-shaped microstrip antenna is proposed. It is observed that slots do not introduce any additional mode but reduces the resonance frequency of higher order orthogonal TM02 mode of the patch and along with fundamental TM10 mode yields broadband response. The slot also modifies the
surface current distribution at TM02 mode thereby yielding broadside radiation pattern over complete bandwidth without any variations in the directions of principle planes. Further an analysis of rectangular slot cut rectangular patch is also presented. The rectangular slot reduces orthogonal TM01 mode frequency of the patch and along with its TM10 mode, yields broadband response. The proposed analysis gives an insight into the functioning of widely used E-shaped antenna, and it will help in designing them in given frequency band.

References


Index Terms

Computer Science Wireless Communications

Keywords

Rectangular Microstrip Antenna E-shaped microstrip antenna Broadband microstrip antenna Rectangular slot

Higher order mode