Abstract

Microstrip antenna technology has been the most rapidly developing topic in the field of antenna. In the last two decades, receiving the creative attention of academic, industrialist, government engineers & researchers throughout the world. In the recent years with the rapid growth in mobile and wireless communication systems, each communication system needs an antenna for receiving the signals as well as for transmitting the signals. Antennas are the integral part of wireless communication systems due to number of user and limitations of available bandwidth engineers are working to optimize network for larger capacity with improved quality and coverage this surge has led the field of antenna engineering to constantly evolve and to accommodate the need for broadband, reduced cost, miniaturized antennas which can easily integrate with other circuit elements lying inside the handsets. With the recent advancements, the communication devices are becoming smaller due to integration of electronic devices but antennas are too larger part of overall package area. This requires similar reduction in antennas size without significant impact on its bandwidth, gain and efficiency. So requirement of good performance and efficient antenna is there. So features of antenna require compact in shape, low weight and reduced cost, instead of these features it should also have numbers of resonant frequencies and wide bandwidth. In order to meet these requirements researchers have given much attention to design compact multiband and broadband antenna which can serve in a wide variety of applications.

all these features almost covered by microstrip patch antenna. They come in various configurations and hence analysis and development of these antennas may be considered as the most active field in antenna research. Due to its various advantages like, light weight, easy to handle design, low profile, and ease of fabrication due to printed circuit technology. Low cost etc. they are widely used in commercial sector, military application, application in wireless local area network, mobile satellite communication, global positioning system etc. However
microstrip antennas also having serious limitations like narrow bandwidth and less gain. Various methods are suggested to overcome these limitations which include Use of thick substrate with low permittivity, slot loading techniques, choice of suitable feeding techniques, etc.

Handling of less power and small gain limitations can prevail over by array arrangement of antenna and to increase bandwidth several methods are suggested. In this thesis the objective is to design and develop some compact, multiband and broadband antennas which may found applications in wireless communication systems. All patch antenna geometrics discussed in this thesis are design on glass epoxy FR4 substrate and simulation is done IE3D software which is based on method of moments. Different techniques are employed to increase the bandwidth such as stacked patches, deflected ground structure, gap coupled and coplanar waveguide feeding techniques which may possibly be a suitable candidate for mobile and wireless communication systems.