

MICROSTRIP-FED PRINTED LOTUS ANTENNA FOR
WIDEBAND WIRELESS COMMUNICATION SYSTEMS

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Since modern communication systems require smaller size antennas with wideband characteristics, many researchers have investigated techniques to improve the antenna bandwidth and to reduce its size in order to fit in the new wireless tools like PDAs, cell phones, and computer PCMCIA cards. Printed microstrip antennas are therefore widely used in wireless communication systems as they exhibit a very low profile, small size, lightweight, low cost, and ease of installation. Furthermore, they are generally economical to produce since they are readily adaptable to integrated circuits fabrication techniques. Among the most widely used printed antennas in wireless communication systems are printed meander lines, dipoles, and quasi-Yagi antennas fed by microstrip or coplanar strip line (CPS).

In this paper, two new configurations of printed Lotus antenna, are designed and presented for wideband wireless communication systems. These antennas are designed to cover the two frequency ranges from 1.56 to 2.91 GHz and from 3.8 to 6.7 GHz, respectively. The return loss and far field radiation characteristics of these antennas are introduced. The simulation and analysis for the presented antennas are performed using the commercial computer software package, Ansoft HFSS. Verification for the computed return loss is performed using measurements and further computations using the commercial software Momentum of Agilent Technology Advanced Design System (ADS). The two printed Lotus antennas are characterized by a wide bandwidth of 60 and 55 percent, stable radiation patterns, cross polarization level less than -15 dB, wide beamwidth, and relatively high gain (5 dB). Fabrication tolerance analysis is also performed to predict the antenna performance sensitivity due to any small fabrication errors. The characteristics of these new designs are found to be insignificantly sensitive to fabrication errors up to 10 percent. The small profile of these antennas makes them suitable for a variety of modern wireless communication devices.

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