Design and Simulation of an integrated micro-machined antenna for 60GHz Applications

Abstract:

The antenna is an important component in any wireless communication system as it is an efficient interface between the electronics inside the system and the outside world. In keeping with the trend towards higher frequencies in communications (e.g. local multipoint distribution systems (LMTDSs) networks at 28GHz, industrial, scientific and medical (ISM) networks and wireless local area networks (WLANs) at around 60GHz) the antenna technology needs to meet new requirements. It is obvious that the size of the antenna gets smaller as the frequency increases (e.g., at millimeter wave frequencies). This poses several manufacturing issues, some of which could be overcome with the use of micromachining techniques. Micro- strip antennas cannot easily be scaled to millimeter –wave frequencies and beyond. Hence many of the micromachining approaches aim at overcoming these difficulties.

A second and major advantage of micro-machined antenna is the ability of integration with other circuit components on the same substrate, achieving the System - On - Chip approach.

Project roadmap:

1- Review of published works of micro-machined antennas.
2- Design of an integrated micro-machined antenna.
3- Simulation of design using HFSS Software.
4- Design of fabrication flowchart and masks using L-Edit Software.