

Effects of Superstrate layer on the Performance of 5G Microstrip Antenna Operating at 43.5GHz

Abstract— The fifth generation (5G) technology working at mm-wave bands is introduced to achieve high data and large capacity, but mm-waves suffer from space attenuation. 5G systems requires antennas with simple configuration, light weight, and high gain to overcome free space attenuations.

This paper aims to design 5G microstrip antenna operating at of 43.5 GHz within the frequency band of 42-45 GHz. The proposed antenna is designed on FR4 substrate with dielectric constant of 4.4 and thickness of 0.76mm, and simulated using High Frequency Structure Simulator (HFSS) software. To evaluate the performance of this antenna, the characteristics such as radiation pattern and gain are studied. Moreover, the influence of superstrate on the antenna performance is investigated based on changing dialectic constant and thickness of superstrate.

Index Terms— 5G, 43.5 GHz, Superstrate layer, microstrip antenna.