

ABSTRACT

In the present modern era of wireless communication due to the increase in demands for higher data rate, capacity and resolution, the design of wideband antennas with enhanced radiation characteristics are capturing great importance. Nowadays users of wireless personal area network emphasize a strong desire for SWB antenna as it is good enough for both short and long range communication. SWB antennas can support a large number of wireless applications with a single device. SWB antenna supports high channel capacity and delivers voice and video transmission at a higher data rate.

Super Wideband (SWB) antenna does not have a predefined range of operating frequency. Antenna having bandwidth ratio 10:1 maintaining a return loss less than -10 dB and VSWR less than 2, over the entire range of operating frequency is considered as SWB antenna. This undergraduate thesis focused on design an antenna which work on UHF-X bands (0.3-12 GHz). Based on existing SWB research, circular monopole antenna is a antenna that can be design in very wide bandwidth, with the addition of tapered-Coplanar Waveguide (CPW) feed and spline-curved groundplane methods to widen the bandwidth.

Designing of a circular monopole antenna that works and reviewed in the frequency range 0.3-12 GHz is simulated using a software to investigate and obtain an antenna design that meets the proposed specifications. The antenna is designed with the FR-4 substrate with dielectric constant 4.3 and thickness of 1.6 mm. The antenna simulation results show that the antenna has a bandwidth of 11.3417 GHz where cover from range from 0.6583-12 GHz (with a testing limit up to 12 GHz frequency), and the bandwidth ratio is 18.23:1. The Bandwidth Dimension Ratio (BDR) obtained was 1905.37. The simulation results show that the antenna fulfil the antenna characteristic for the intended SWB application, but the frequency range still not fulfil the UHF band overall.

Keywords: UWB, Super Wideband, BDR.