

ABSTRACT

Antenna is a device that used for radio communication as transmitter of electromagnetic energy to the free space or receiver from the free space. In mobile radio communication system with higher frequency, the usage of broad band antenna is needed for varied information exchange and it is also economical from the energy utilization.

The antenna that will be designed and realized in this final project is helix antenna that appropriate with the design of technical drawing. It uses binomial transformer $\lambda/4$ system for matching impedance with two parallel wires channel construction. The work frequency of this antenna is adapted with today's trend, i.e. 800-950 MHz and 1700-2500 MHz including CDMA 800, GSM 900, DCS-1800, CDMA 1900, WCDMA, Wi-Fi, WIMAX and another varied application frequency range.

From the measurement that has been done, generally, the obtained bandwidth with standard VSWR ≤ 1.5 is 251.99 MHz (30.36%) at low band frequency and 1209.96 MHz (54.45%) on high band frequency. The antenna's impedance is $49.6 + j7.21$ Ohm at frequency 875 MHz and $38.85 + j5.201$ at frequency 2100 MHz, unidirectional pattern radiation, polarization is approaching the circle (circular), and gain is reaching 12.294 dBi at frequency 875.06 MHz at frequency 1799.8 MHz, 15.524 dBi at frequency 2180.9 MHz and 12.319 dBi at frequency 2447.6 MHz.

Key word: Helix Antenna, Dual Band, CDMA800, GSM900, DCS-1800, CDMA1900, WCDMA, Wi-Fi and WIMAX