

ABSTRACT

Antenna is one of the important elements in telecommunication world. Lately, the development of compact antenna is growing rapidly, this is caused by the increasing demand for telecommunication devices which are getting smaller. Therefore, in this final project author will create a microstrip dual-band antenna based on metamaterial to fulfill the demand. It is also caused by the use of metamaterial which can reduce the antenna dimensions which are quite significant compared to the dimensions of a microstrip antenna which are conventional. This was proven in various studies that had been done before.

In this final project realized a metamaterial-based antenna using the concept approach of Dual-Band Composite Right Left Handed transmission channel (DB-CRLH-TL). With the approach of the concept of CRLH-TL, the author designed a dual-band antenna based on metamaterial at 2.4 GHz (Wi-Fi) and 3.65 GHz (WIMAX) frequencies using CST Microwave Studio 2016 Software.

The realization of antenna can work in the 2.4 GHz and 3.65 GHz frequency bands. With bandwidth of 185 MHz and 672 MHz at each working frequency with $VSWR \leq 2$. In addition, the use of metamaterial can reduce antenna size up to 44.4% of conventional microstrip-patch antenna.

Keywords : Microstrip Antenna, Metamaterial, Dual-Band, Dual-Band Composite Right Left Handed Transmission Line (DB-CRLH-TL)