

ABSTRACT

Since its release by the Federal Communications Commission (FCC) with a frequency of 3.1 GHz - 10.6 GHz for Ultra Wideband (UWB) wireless communication, UWB technology has made rapid progress as a short distance communication technology with high data transmission speeds. This UWB technology can also be used in the world of health by utilizing large bandwidth, short pulse duration, and high data transmission speeds. However, the realization of an antenna that uses UWB technology for medical applications with the required bandwidth in accordance with its use needs to be developed. For this reason, we need a UWB antenna design for medical applications with bandwidth that is in accordance with the requirements.

In this study a rectangular patch microstrip antenna was designed with a focus to widen the bandwidth of a rectangular patch microstrip antenna with a partially cut plane into a $\frac{1}{3}$ section on a rectangular patch microstrip antenna. The design process uses CST Studio Suite 2017 software with Epoxy FR-4 substrate which has a thickness of 1.6 mm and a dielectric constant of 4.3 at a frequency of 1 GHz - 5 GHz with a bandwidth between 2.53 GHz or 63.23% bandwidth. The choice of the frequency of 1 GHz - 5 GHz is based on the need to detect the system of the human body so that and follows the characteristics of UWB technology.

The results of this study get a wide bandwidth of 2.53 GHz, the return loss value is -15.966 dB at the middle frequency of 3 GHz, and the VSWR value is 1,381. When measuring, the antenna is able to detect breathing when making breathing and exhaling, which means that the antenna can be applied in the medical field in a breathing scenario.

Keywords: Rectangular microstrip antenna, Ultra wideband, Widening bandwidth