

ABSTRACT

Non-contact respiratory monitoring is a technology that detects the activity of breathing without direct contact with the human body. This technology is a development of electrocardiogram technology that requires electrodes to be attached to the surface of the body part of the human chest. Therefore non-contact respiratory monitoring makes it easy to monitor patients regularly.

This technology utilizes antennas to emit electromagnetic waves that can illuminate parts of the human body, so that they can perform diagnostic on the respiration periodically, and therefore this technology is more effective and efficient than previous electrocardiogram technology. In this Final Project, MIMO microstrip antennas have been designed to work at 2.4 GHz frequency for non-contact respiratory monitoring systems. The design of this MIMO is later expected to have good monitoring accuracy of large displacement of chest surface size when recording breathing using MIMO. The substrate material used was RT / Duroid 5880 with a dielectric constant of 2.2 and a thickness of 1,575 mm. In the patch part using cooper material with a thickness of 0.035 mm, then the antenna is designed by comparing 4 different antenna position scenarios. The shape of the patch antenna used is rectangular and the inset feed feed method.

The most optimum MIMO antenna scenario when the second antenna is turned to the left by 90° then given the distance between the antennas is $\lambda / 6$. The measurement results of MIMO antenna parameters after fabrication have a value of S11 -15,061 dB, S12 -30,667 dB, S21 -30.6708 dB, S22 -13,581 dB, VSWR 1 1.428, VSWR 2 1.529, antenna 1 gain 5.838801927 dBi, unidirectional radiation pattern, antenna 2 -13.581 dB, VSWR 1 1.428, VSWR 2 1.529, antenna 1 gain 5.838801927 dBi, unidirectional radiation pattern, antenna 2 gain 13.581 dB, VSWR 1 1.428, VSWR 2 1.529, antenna 1 gain 5.838801927 dBi, unidirectional radiation pattern, antenna 2 gain 5.698801927 dBi, unidirectional radiation pattern.

keywords: Non-Contact Respiratory Monitoring, Antenna Microstrip, MIMO