

ABSTRACT

Non-communicable diseases (NCDs), which are a major health problem in Indonesia, require health monitoring of people with them. However, the high cost of health monitoring devices is an obstacle faced. Wearable device technology that is affordable, flexible, and can work anywhere well is needed to help this health monitoring.

One of the main components of the health monitoring device is the antenna. The antenna in this research is designed to have reconfigurable capabilities by using a PIN diode electrical switch to switch frequencies to be able to work at 4G and 5G frequencies. The substrate is made of textile material so that it can be worn on the human body flexibly and comfortably and supports the wearable nature of the health monitoring device. It is hoped that the presence of this antenna can reduce the production cost of health monitoring devices to make it more affordable for all people.

The antenna is realized with two substrate materials, namely bandage and cotton, which is designed to work at a frequency of 1.8GHz for 4G and 3.5GHz for 5G with a PIN diode as a switch. On the bandage substrate in the off condition at 3.5GHz frequency, S11 value of -14.389dB, VSWR of 1.136, bandwidth of 942MHz, and gain of 7.18dBi are obtained. For the on condition, namely the frequency of 1.8GHz, a shift to the frequency of 2.0GHz is obtained with S11 value of -33.66dB, VSWR of 1.2116, bandwidth of 169MHz, and gain of 3.82dBi. While the cotton substrate is still obtained many values that do not meet the desired specifications due to many factors that occur during fabrication.

Keywords: Reconfigurable Antenna, Wearable, Electric Switch, 4G, 5G