# ABSTRACT

One of the problems that has become the center of attention of all groups today is the problem of health monitoring services. Lots of patients who experience death due to slow treatment by doctors to patients. Therefore, we need a wearable health monitoring system that has a low cost and can be operated by all groups. One of the constituent components of the system is the transmitter antenna, therefore this research will focus on designing a transmitter antenna for a wearable health monitoring system. The designed transmitter antenna is a 5G-based reconfigurable wearable antenna which has the advantage of flexible data transmission along with integration of 5G technology which causes the health data transmission speed to be very fast and the health monitoring system to be real-time and constant.

In this study, the reconfigurable nature of the antenna is achieved by the presence of a switch in the form of a PIN diode and a brick in the form of coppertape. To support the wearable nature of the health monitoring system, the substrate material used must be a textile substrate material. Therefore, in this study the characterization of the substrate materials will be carried out, namely four substrate materials consisting of fleece, felt, denim and leather. Characterization of the types of switches is also carried out, namely mechanical switches in the form of bricks and electrical switches in the form of PIN diodes.

The measurement results that are closest to the simulation results are obtained on the antenna with fleece material using a mechanical switch. At the switch off condition, the return loss value is -25,63 dB, VSWR is 1.01, bandwidth is 183 MHz, gain is 7,864 dBi, SAR is 0,0162, elliptical polarization and unidirectional radiation pattern. Bending tests were also carried out on the antenna and changes in bandwidth and VSWR were obtained as the degree of bending increased. When the switch is on, all the substrate materials with the two tested switches experience a frequency shift that is far from the simulation results, so antenna parameters at the 2,6 GHz frequency are not optimal. There is agreement between the simulation results and the measurement results that the substrate material with a large loss tangent value will have a wide bandwidth but the gain value obtained is small. There is agreement between the measurement results and the simulation results that the smaller the permittivity value of a material, the greater the gain value. Also found in the measurement results the mechanical switch gain value is greater than the electrical switch gain value.

Keywords : 5G, Electrical Switch, Mechanical Switch, Reconfigurable Antenna, Wearable