ABSTRACT

Telemedicine is a technology that functions as a remote health facility using wireless communication on the human body. The telemedicine designed in this final project is a wearable antenna, which uses a microstrip antenna to transmit heart rate data to assess biological age. However, the microstrip antenna has some weaknesses such as low *gain*, narrow bandwidth and the choice of method to produce a dual-band antenna that works well. In addition, the wearable antenna must be able to work on the human body.

Based on the above problems, the Microstrip Slot Antenna (MSA) method is used to achieve results in line with the specifications of the dual-band antenna. The addition of slots on the antenna can also produce VSWR that is in line with the specifications for both frequencies. Bandwidth is widened by adding substrate thickness to the antenna. In addition, adding substrate thickness can increase *gain*. Normal and on-body tests are conducted to determine whether the antenna can work on the human body or not.

Tests are performed on each antenna frequency with normal and on-body conditions. The results of the VSWR normal condition test for the 2.4 GHz frequency showed a value of 1.28 with a bandwidth of 160 MHz and for the 5.8 GHz frequency, a value of 1.06 was obtained with a bandwidth of 250 MHz. The results of the VSWR on-body test for the 2.4 GHz frequency showed a value of 1.45 with a bandwidth of 150 MHz and for the 5.8 GHz frequency, a value of 1.06 was obtained with a bandwidth of 250 MHz. The *gain* values obtained under normal conditions for the 2.4 GHz frequency were 6.01 and for the 5.8 GHz frequency were 5.45, while the *gain* values obtained under on-body conditions for the 2.4 GHz frequency were 5.45 and for the 5.8 GHz frequency were 5.11. The Radiation Pattern obtained from the test results at both frequencies and two conditions showed a unidirectional radiation pattern.

Keywords : Telemedicine, wearable antenna, microstrip, biological age, dual-band, normal condition, on-body condition, microstrip slot antenna.