

ABSTRACT

Telemedicine technology is technology that performs health services remotely using wireless communication on the human body or Wireless Body Area Networks (WBAN). Wearable antennas in WBAN communication have characteristics such as small size, light weight, and the ability to be bent or bent because the substrate material is made of flexible materials, so it is comfortable to use by users.

In this Final Project has been designed and realized Dual Band Wearable Antennas on the 2.4 GHz and 5.8 GHz ISM band frequencies. The antenna is designed using the slot method on a rectangular patch. In rationing using microstrip feed line method and VSWR optimization performed using the inset-feed method. As for the substrate using flexible jeans 1 mm thick textile material with a dielectric constant value of 1.7.

From the simulation results during normal conditions for 2.4 GHz frequency, the bandwidth value is 50 MHz, the VSWR value is 1.0668 and at the frequency of 5.8 GHz, the bandwidth value is 90 MHz, the VSWR value is 1.0773. From the simulation results when brought closer to the wrist phantom with a distance of 1 mm for a frequency of 2.4 GHz obtained bandwidth values of 55.5 MHz, VSWR 1.3892, and SAR 0.1025 W / kg, while at a frequency of 5.8 GHz bandwidth values of 98.9 MHz, VSWR 1.6543, and SAR 0.6839 W / kg are obtained. From the results of measurements during normal conditions at a frequency of 2.4 GHz obtained a bandwidth of 1060 MHz, VSWR 1.4113. And at a frequency of 5.8 GHz, a bandwidth of 1150 MHz is obtained, VSWR is 1.1878. The measurement results when the condition of the body at a frequency of 2.4 GHz obtained VSWR value of 1.709, bandwidth of 700 MHz, and Gain of 4,41317 dB. Whereas at the 5.8 GHz frequency, the VSWR value is 1.5711, the bandwidth is 650 MHz, and the gain is 5.5351 dB. Based on the parameters generated, this antenna can be used as an antenna for telemedicine applications in the 2.4 GHz and 5.8 GHz frequencies.

Keywords: Telemedicine, WBAN, Dual Band Wearable Antennas, Textile Jeans