ABSTRACT

Telecommunications science is always developing and has a huge impact on everyday life. One of the problems that occurs in daily life today is that it is still very minimal in transmitting signals over long distances. Because most of the signals used in everyday life are still limited in range, such as Wi-Fi, bluetooth signals can only be used within a distance of approximately 10 meters. Therefore, we make antennas that can be reached further in order to facilitate humans in their daily lives. Therefore, this Capstone Design is designed "Wearable Microstrip Antenna for 5G Technology Application" with inset-feed integration technique that can work at 3.5 GHz frequency.

In its development, several factors must be considered. First of all, the microstrip antenna design must utilize the inset-feed method at a frequency of 3.5 GHz to be compatible with 5G technology. The design should also consider compact size, light weight, and ease of attachment to clothing so that it can be comfortably integrated in daily life. Furthermore, research and development needs to be focused on increasing the gain of the microstrip wearable antenna. Higher gain will expand the signal coverage and overcome the constraints of the lack of long-distance signal transmission. Optimizing the radiation pattern of the microstrip antenna is also key to achieving a unidirectional radiation pattern that will increase the efficiency of the antenna. Finally, in the development of microstrip antenna wearables, SAR tests and evaluations need to be conducted to ensure the radiation levels are safe for the human body.

Tests were conducted on the 5G wearable antenna for a working frequency of 3,5 GHz and SAR value ≤1,6 W/Kg. Based on the final test, the VSWR value of 1,4815, return loss of -11,332 db, bandwidth >351,4 Mhz and gain of 3,098 dB were obtained.

***Keywords**: Wearable, Antenna, Microstrip, 5G*