

ABSTRACT

Measurement or monitoring of glucose levels in the blood often using invasive methods. Blood sampling requires a needle puncture on the skin that requires periodic blood tests over a period of time to monitor blood glucose levels. This method will cause pain, discomfort, and have a risk of irritation/infection. Currently, there are still few non-invasive blood glucose concentration monitoring techniques that are widely accepted in the medical industry.

This study focuses on a non-invasive method of measuring blood glucose levels using a microstrip patch antenna with a rectangular shape. Measurements will be made on three different concentrations of glucose, namely hypoglycemia, normal glucose, and hyperglycemia. This technique is based on the relationship of the resonant frequency of the monitoring antenna with the permittivity, and the conductivity of the skin associated with glucose levels in the blood. A narrowband microstrip antenna that works at a frequency of 1.27 GHz. The constituent materials used are substrates made from FR-4 Epoxy and for ground planes and patches made from copper.

From the measurement results on the rectangular antenna with insert feed, it can work at a frequency of 1.27 GHz in off-body and on-body conditions. After simulating the antenna with three glucose concentrations, an analysis was obtained, namely the smaller the Return Loss and VSWR values, the greater the concentration of glucose in the blood.

Keywords : antenna, microstrip, glukosa, blood glucose level (BGL), narrowband