Non-invasive Microwave Sensor Blood Glucose Meter Integrated with Artificial Intelligence and Its Own Mobile App (GlucoTrack App) Using Bluetooth

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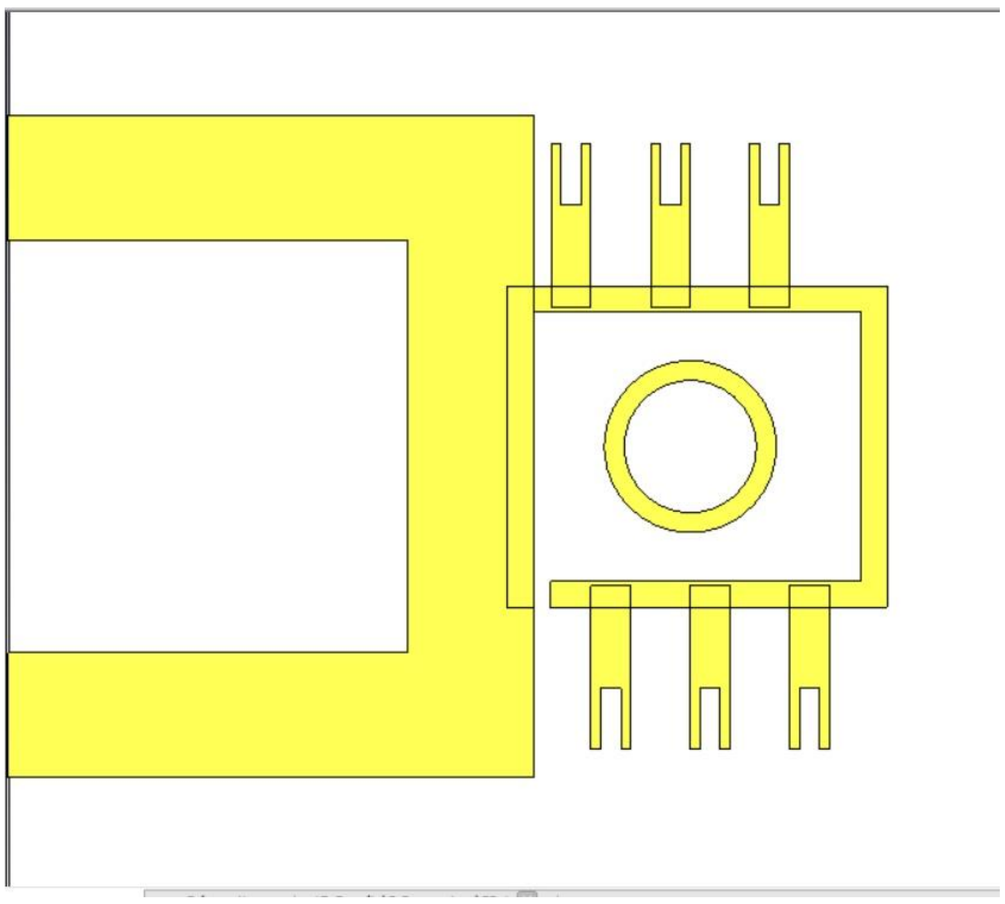
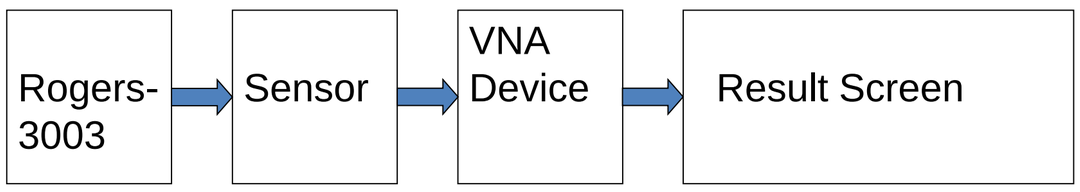
Abstract

Blood glucose measurement can be a very distressing and sensitive situation for patients or healthcare professionals for long-term patients or those with needle phobia. With our work, it will provide a great convenience for both patients and healthcare personnel. The Microwave Resonance Sensor (DFMRS) we designed is a technology developed to detect noninvasive changes in glucose levels with a fingertip

Template of the Sensor



Signal Flow Chart



Main Components

Rogers 3003 for Substrate
VNA for measurements
MATLAB

Microwave Sensor

The microwave sensor we designed with "Cst Studio" was analysed via Matlab or KEYSIGHT FieldFox and the rate of change in decibel and frequency ranges and the differences between the patient with blood sugar and the healthy patient were concluded.

Conclusion

Our aim with our non-invasive blood glucose measurement sensor is to enable blood sugar patients to measure by simply placing their fingers on the sensor, without taking blood.Further improvements in hardware and software will result in a system that will allow blood measurement without any puncture in the body, which will be useful for both patients with blood fear and patients with pain in their fingers due to puncture.

References:

• https://www.mdpi.com/1424-8220/23/22/9130
Non invasive Glucose Sensing Technologies and Products
• https://www.baylor.edu/content/services/document.php?id=35443
Design of a Microwave Sensor for Non Invasıve Determination of Blood Glucose Concentration