

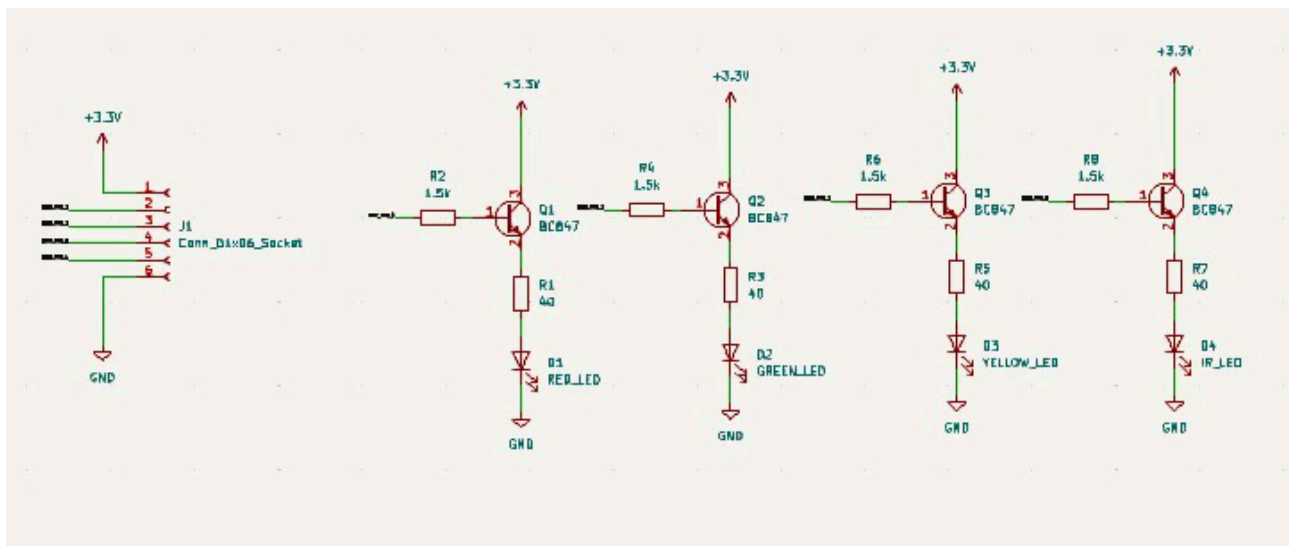
# Non-Invasive Method of Measuring Blood Sugar

This project aims to develop a non-invasive method for blood sugar identification using near-infrared (NIR) spectroscopy. By leveraging the specific absorption characteristics of glucose within the NIR region (700 nm to 2500 nm), we seek to measure glucose levels accurately and safely without penetrating the skin. The project focuses on utilizing wavelengths at 940 nm and 1600 nm, known for their effectiveness in penetrating deep into skin tissue and detecting glucose.

## Key Components

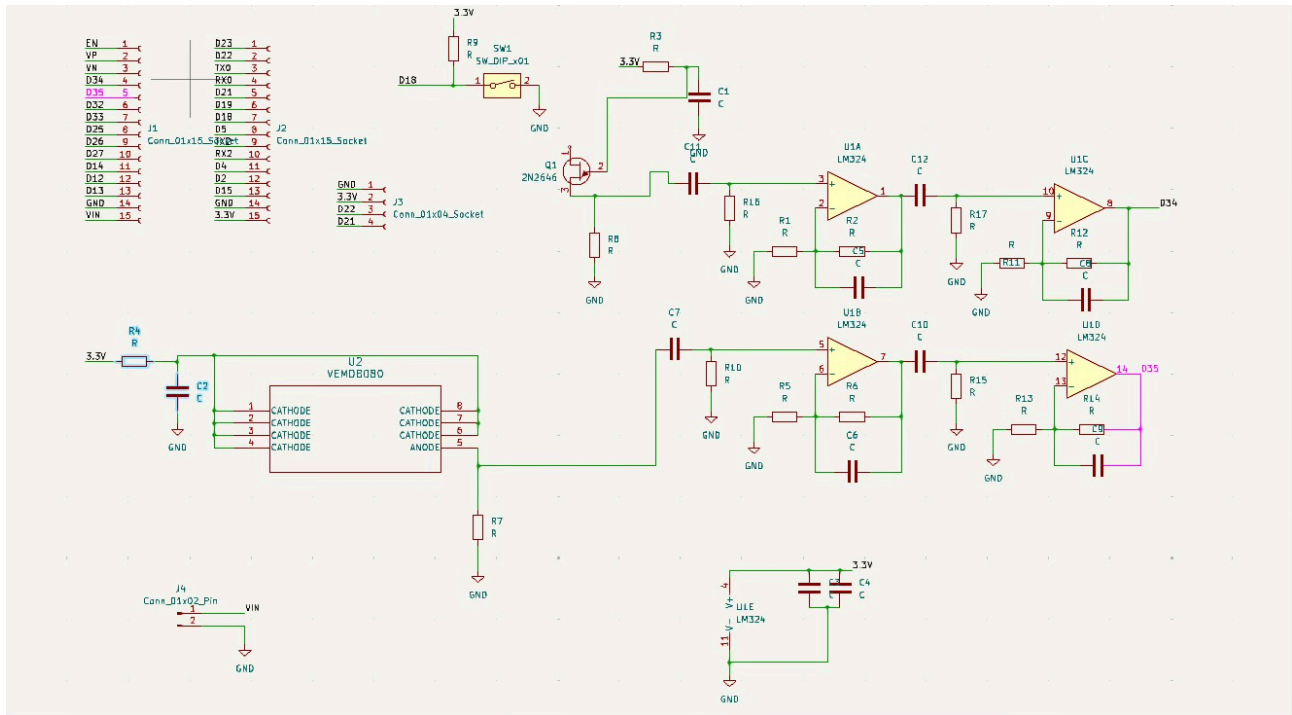
- **NIR Spectroscopy:** Utilizes 940 nm and 1600 nm wavelengths for deep tissue penetration and glucose detection.
- **Sensor Technology:** Employs NIR LEDs and photodetectors optimized for the selected wavelengths.
- **Signal Processing:** Develops algorithms to process and analyze NIR absorption data.
- **User Interface:** Creates a user-friendly interface for real-time blood sugar monitoring via a mobile app or dedicated device.

## Implemented Circuits



LED Driver Circuit

This circuit is designed to control the LEDs using BC847 transistors. Each transistor acts as a switch, allowing current to flow through the LEDs when activated. This circuit is crucial for illuminating the skin with different wavelengths of light. Each LED emits light at a specific wavelength, which can be absorbed or reflected by glucose molecules in the skin. By switching between different LEDs, the circuit allows for the collection of data at multiple wavelengths, which is essential for accurate glucose measurement.



Signal Conditioning Circuit

The signal conditioning circuit is critical for preparing the raw signals for further analysis. The amplified and filtered signals are more robust and easier to process, leading to more accurate determination of blood glucose levels. Without this circuit, the weak signals from the photodetectors would be difficult to analyze, resulting in poor measurement accuracy.

These circuits enable the accurate and reliable detection of blood glucose levels, providing a non-invasive alternative to traditional blood sugar measurement methods.