

$$R = \frac{V}{I} \quad (6.1)$$

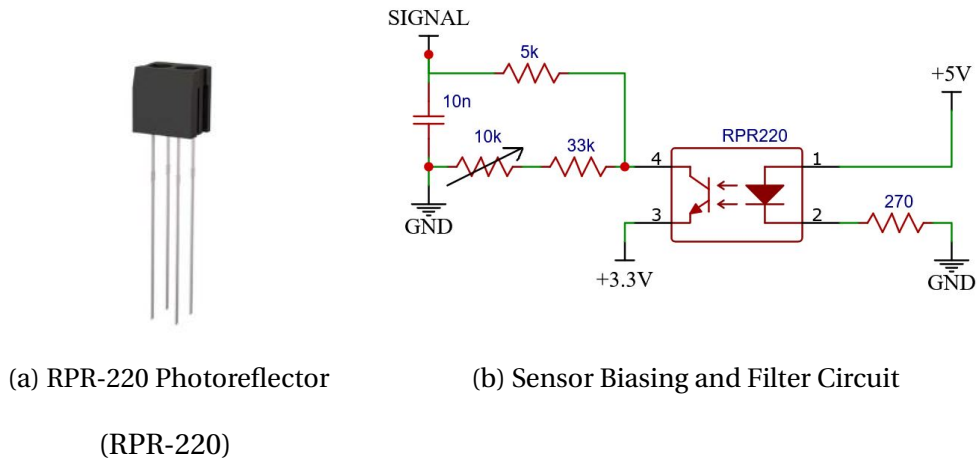


Figure 6.1: Sensor Design

Thus, with the 3.3V source and 0.8mA of current, the resistor value can be calculated using equation 6.1 as 4125Ω. This, however, is for the ideal case, and a much lower percentage can be expected to reflect when the sensor is implemented. For the design, a reflection of 90% at a distance of 6mm where the data sheet indicates the current will be 0.3mA. Following the same calculation, a resistor value of 11kΩ is determined.

$$f_c = \frac{1}{2RC} \quad (6.2)$$