**Digital Camera**

**Electrical Engineering Report**

**Abstract**

A digital camera works by utilizing a grid of photodiodes that charge and activate the LEDs with the help of amplifiers. The multiplexer collects the information through channels, which are regulated by a button on the PSoC. This information is then displayed as an image on a computer, displaying various shades of black and white based on the brightness and grayscale of the light that was captured by the photodiodes.

**Project Description**

The project aims to design and develop a digital camera that uses photodiodes as an image sensor. Amplifiers are used to increase the strength of the electrical signals generated by the photodiodes. Photodiodes are light-sensitive devices that can convert light into electrical signals, making them an ideal choice for capturing images in digital cameras. The project will demonstrate how photodiodes can be used to gather information and display it as an image on a computer.

**Sensors (if applicable)**

Photodiodes are connected in reverse, with the cathode connected to +5V and the anode connected to a resistor that is grounded. When light hits the diode, it triggers a current to flow through the resistor, generating a voltage across it. The sensitivity of the photodiode can be adjusted by selecting a resistor value, and this voltage can be transformed into a grayscale color.

**System Design**

The image sensor, a photodiode, is the most crucial component of a digital camera, responsible for capturing the light and converting it into an electrical signal. The multiplexer is used to select and route signals from different sensors to show an image, with a reduced number of wired connections. The image data captured by the image sensor needs to be sent to a computer by a cd card. The camera is powered through the Li-Po charge battery.

**Firmware**

**Software or Mobile App (if applicable)**

In the project, the ADC Psoc voltage readings are used to read values of intensity which are then converted to a color value. We also implemented the code for the usage of multiplexer CD74HC4067 with the PSoÇ environment. The CD74HC4067 is a 16-channel multiplexer that can be used to select and route signals from multiple sources to a single destination. This makes it useful for digital camera design, where it can be used to gather information from multiple photodiodes and route it to the processing unit for image creation.

**Other technical sections that may be relevant to your specific project.**

**Project Budget**

The bill for materials for this project is $163.15. We also have five team members, who work on this project 10 hours a week and are asking for $25 pay. Which is totalling to $1,250 for one week of work.

**Conclusion**

**References**

