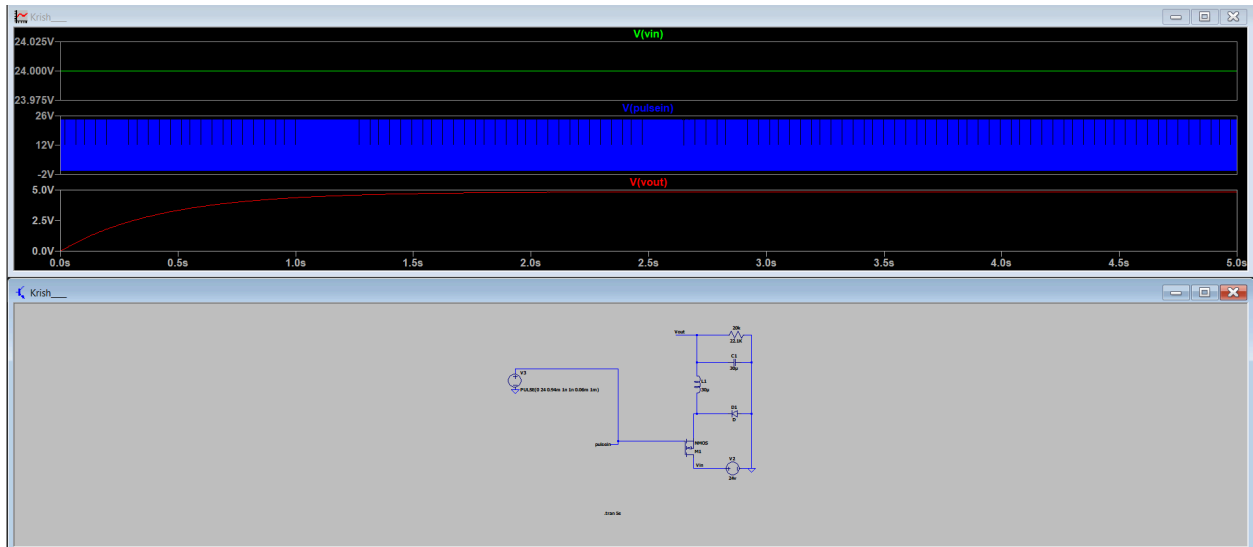## Schematic:

The schematic of the project was created using **LTSpice**, an open-source platform. In this design, we use the following components:



- A 30 µH inductor
- A diode
- A 30 µF capacitor
- An NMOS (IRF540N) for switching
- A PWM generator for providing a pulse
- A load resistor

The **PWM generator** is used to drive the gate of the MOSFET, switching it on and off. The duty cycle is set at **6%** to regulate the output voltage.

## PCB:

The **Gerber file** and **BOM** are attached. In this design, we are applying a **24V input**, which is regulated down to **5V** to power a **555 timer IC** configured as an astable multivibrator.

In the astable multivibrator:

- **R1** and **R2** are resistors used to set the frequency of the multivibrator.
- The output from the astable multivibrator is used to trigger the gate of the **IRF540N** MOSFET, controlling the switching process in the buck converter.

This design achieves step-down voltage regulation through the buck converter circuit.