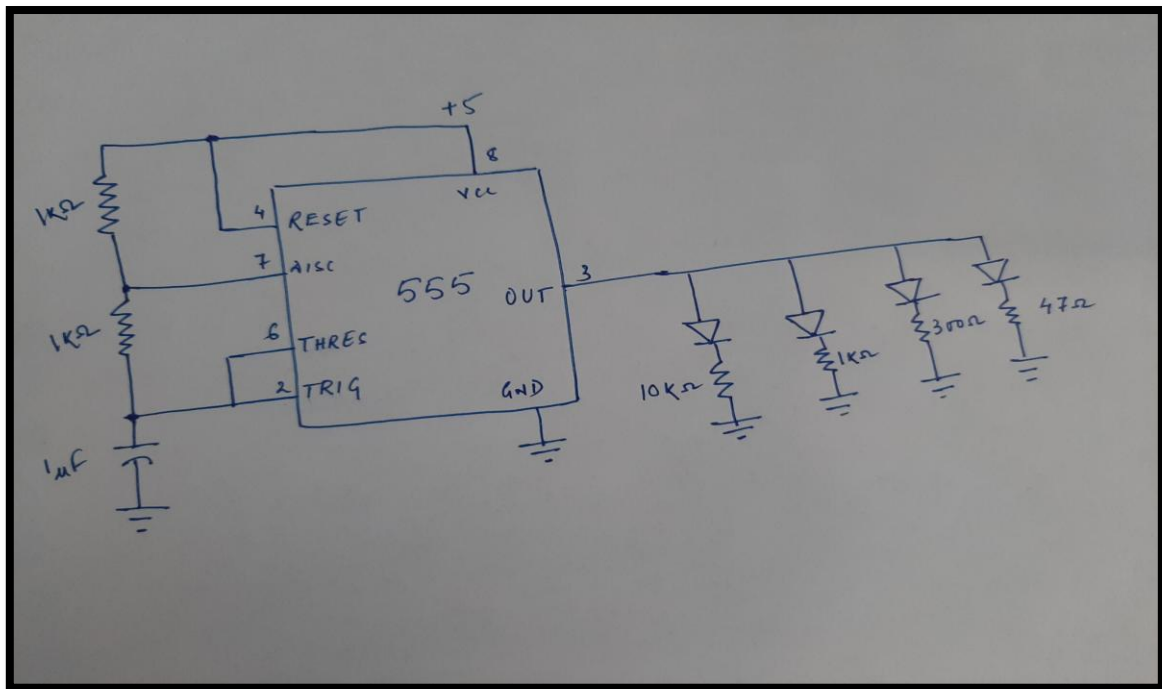
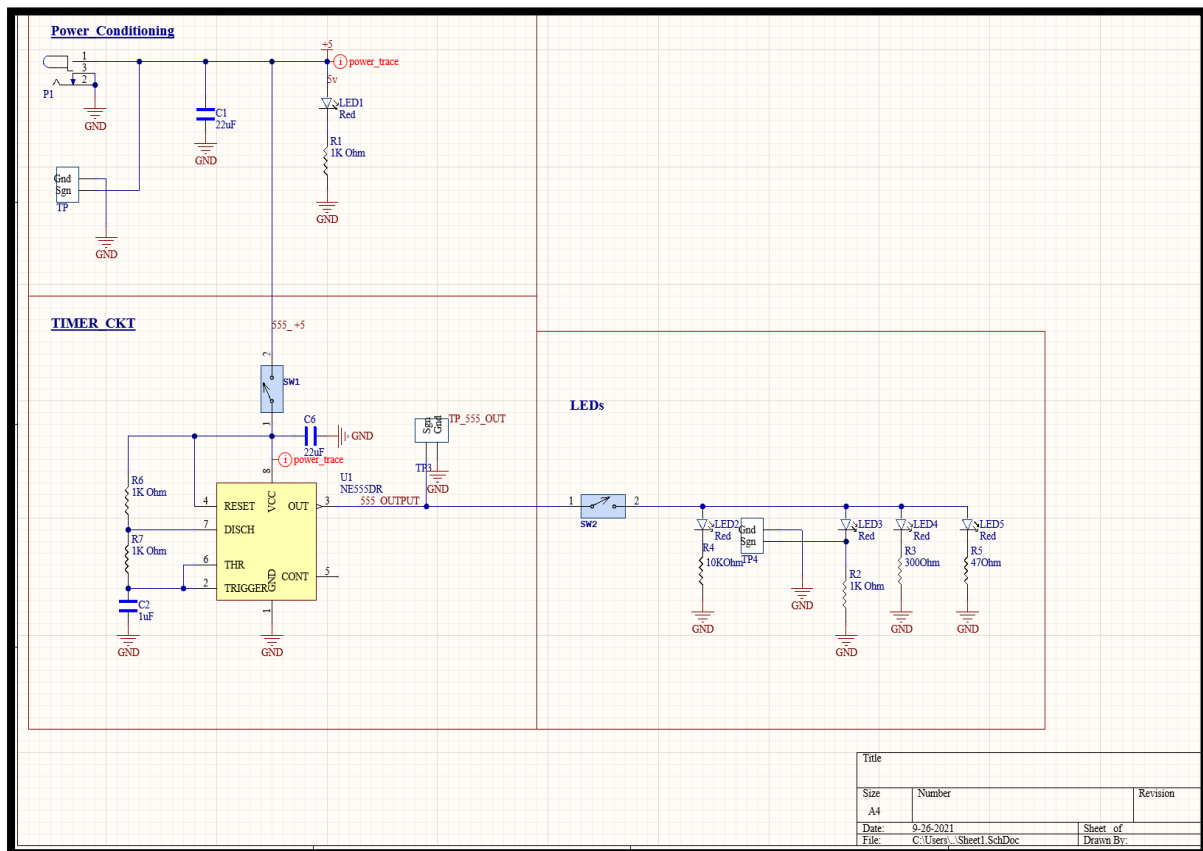


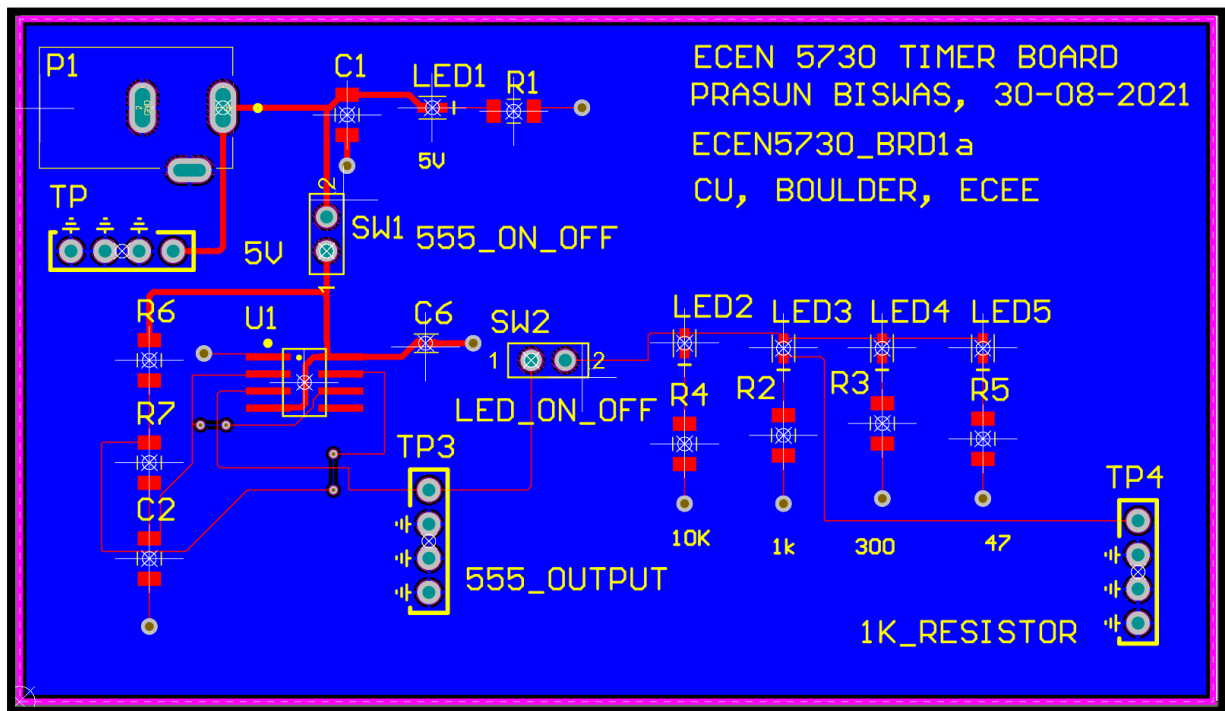
GOAL:- Bring up and Test of Board 1



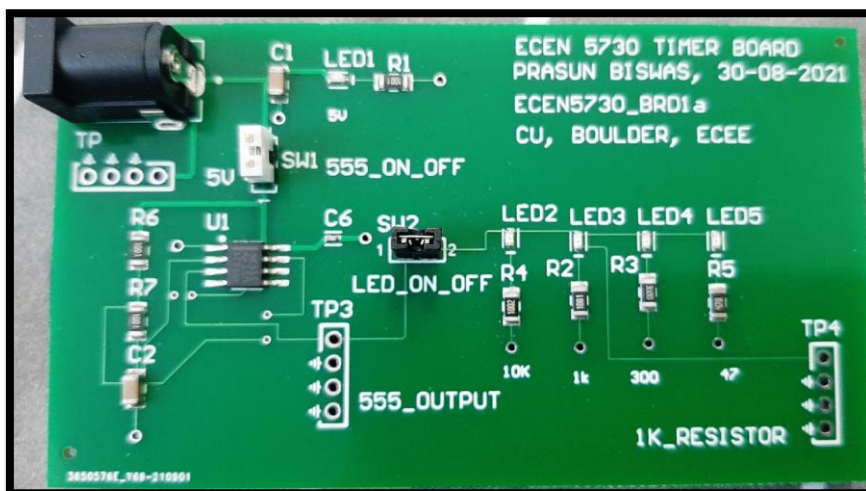
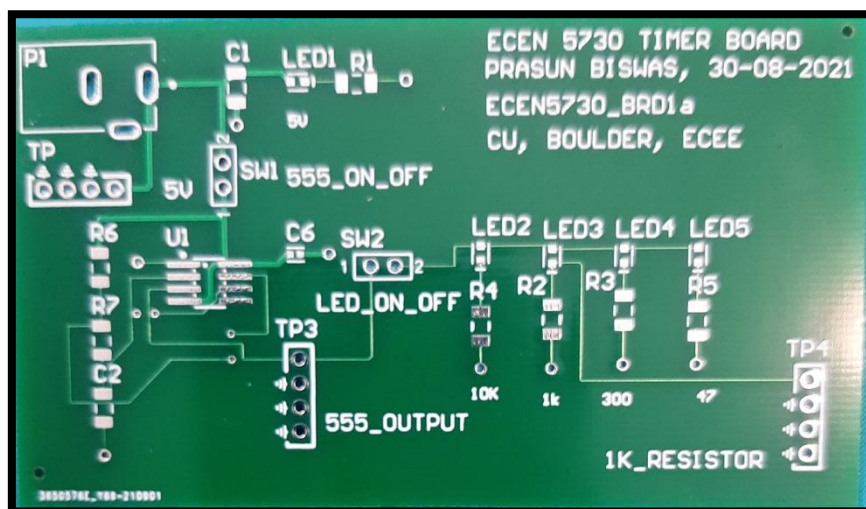
Rough sketch of the schematic



Actual Schematic layout on Altium

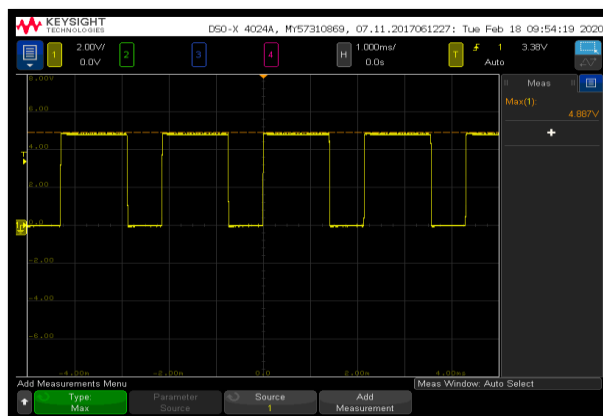


Board layout

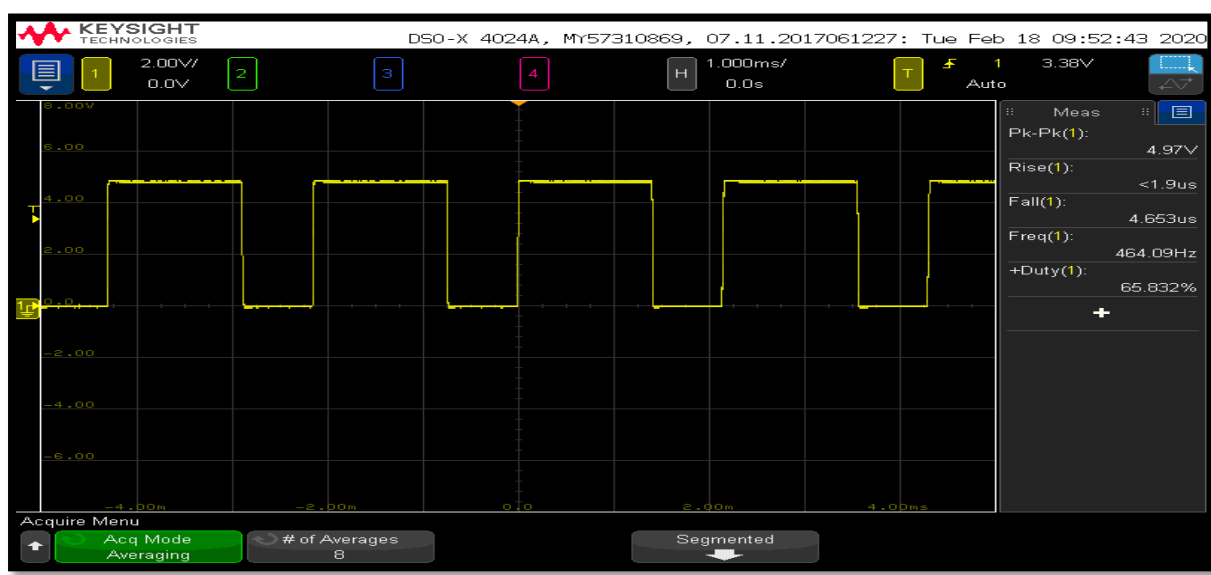


Assembled board

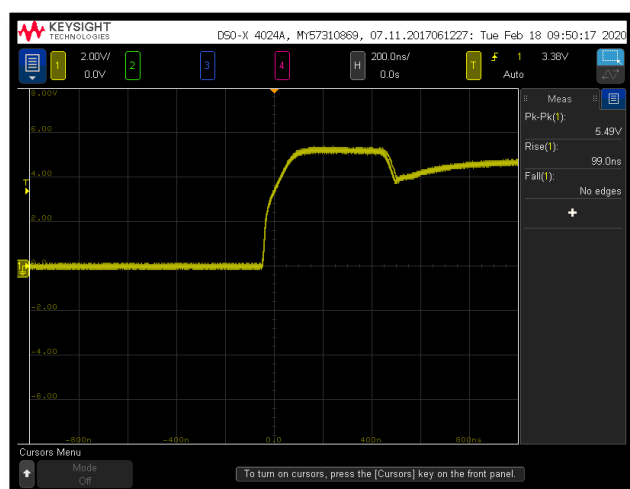
The thevenin's resistance on this board with respect to the formula- $R_{th} = R_l * \{(V_{th} - V_l) / V_l\}$ where open voltage $V_{th} = 4.9$ volts and the voltage drop when the LEDs were turned on was 4.2 volts so the thevenins resistance as per the formula is 6.5 ohms.



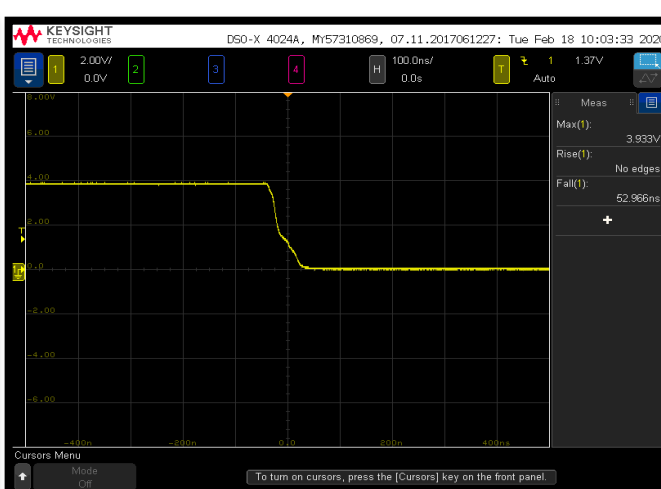
Voltage without load



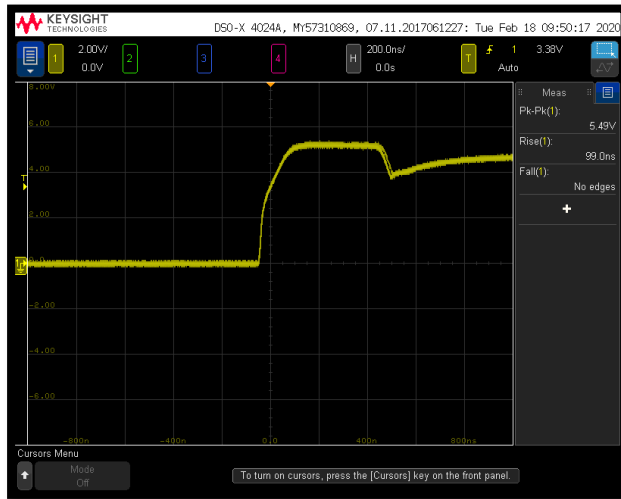
Frequency and duty cycle of my 555 timer board when led's are on



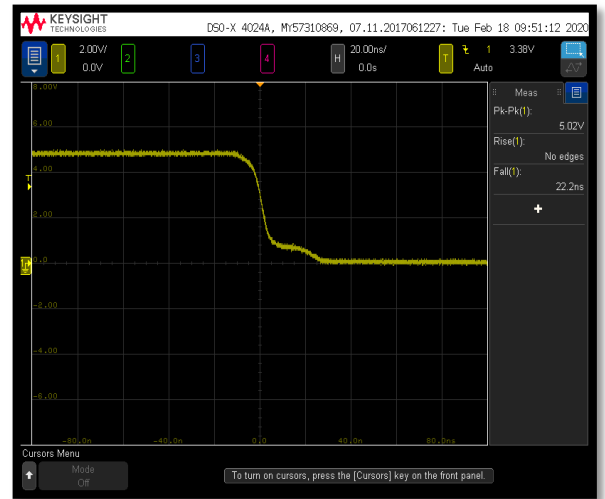
Rise time while led's are on



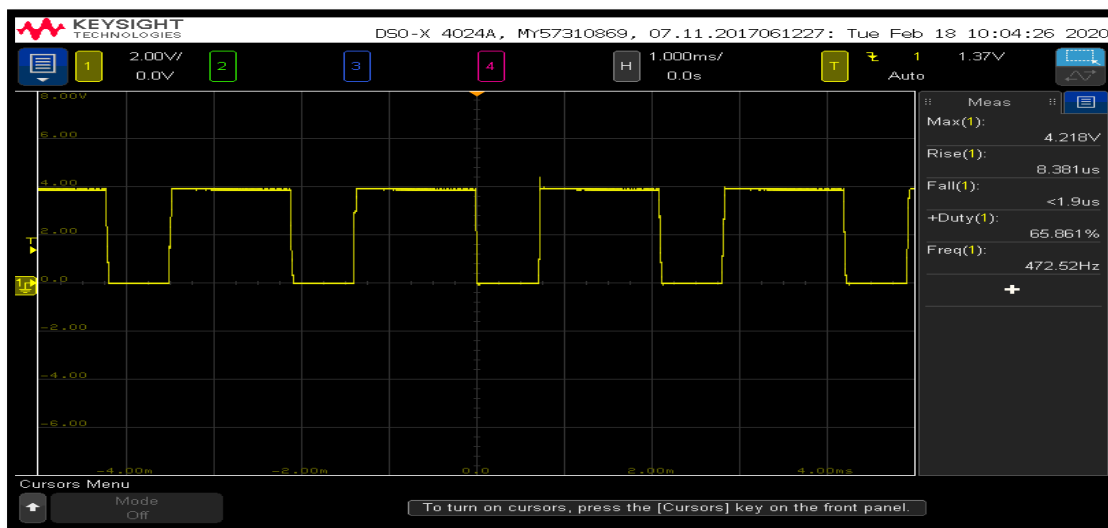
Fall time while led's are on



Rise Time when led's are off



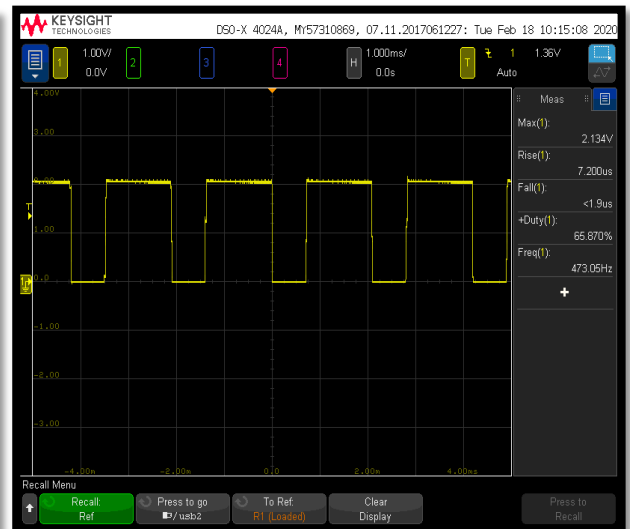
Fall time while led's are off



Frequency, duty cycle and rise time when the led's are off



Switching noise voltage on the 5 V power rail synchronous with the 555 switching signal



Current through 1k resistor

Figures of Merit (with load)

-> Frequency- 464.09 Hz
-> Duty Cycle- 65.832%
-> Rise Time- 99 ns (without load),
113.280 ns (with load)
-> Fall time- 52.966 ns (without
load), 38.280 ns (with load)

Figures of Merit (without load)

-> Frequency- 472.52 Hz
-> Duty Cycle- 65.861%
-> Rise Time- 99 ns (without load),
113.280 ns (with load)
-> Fall time- 22.2 ns (without load),
38.280 ns (with load)

With compared to what I expected, the rise time should have been much better as here it had more noise, and apart from that the frequency and the duty cycle has come as expected which is ~500Hz and ~70%. There were no hard errors on my board. The routing paths I made in my board should have been made more shorter which is why it induced some switching noise as well. Next time I will keep a note on my routings and I will also be placing my decoupling capacitor as closer as possible to the power pin of the IC. The current across 1k, 10k, 300, 47 ohms resistors with approx voltage drop of 2v each are 3mA, 0.3mA, 10mA, 63mA respectively.