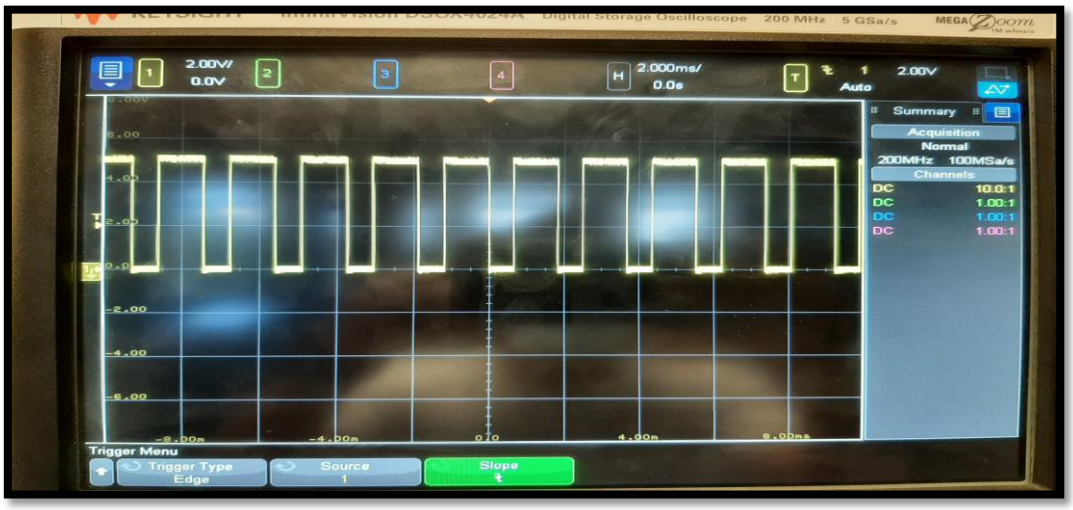
GOAL- Designing a 555 astable vibrator circuit operating at about 500 Hz and about 50% duty cycle.

Designing- With respect to the 555 astable timer circuit diagram**,** it is required to find the values of resistors (Ra, Rb) and capacitors. The minimum value of resistor should be 1k ohm otherwise more amount of current would be in the discharge pin which is not advisable. Our kit has 1 microfarad and considering taking minimum no. of unique parts Rb has also been taken as 1k ohm.

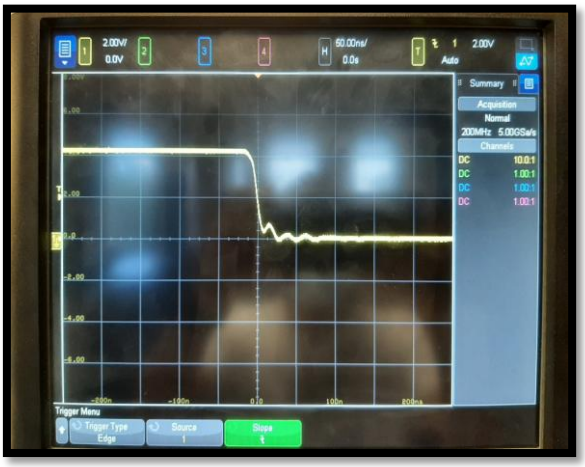
- ➔ F= 1.44/ (Ra+2Rb) C; 1.44/ (3000)10^-6; F = ~ 500 Hz
- ➔ Duty Cycle = 1 – (Rb/(Ra+2Rb)) ; ~ 67%

Below are the scope trace and measurements of NE555 timer-:

- **Scope Trace of NE555 timer**



- **Rise and fall time of NE555 timer**

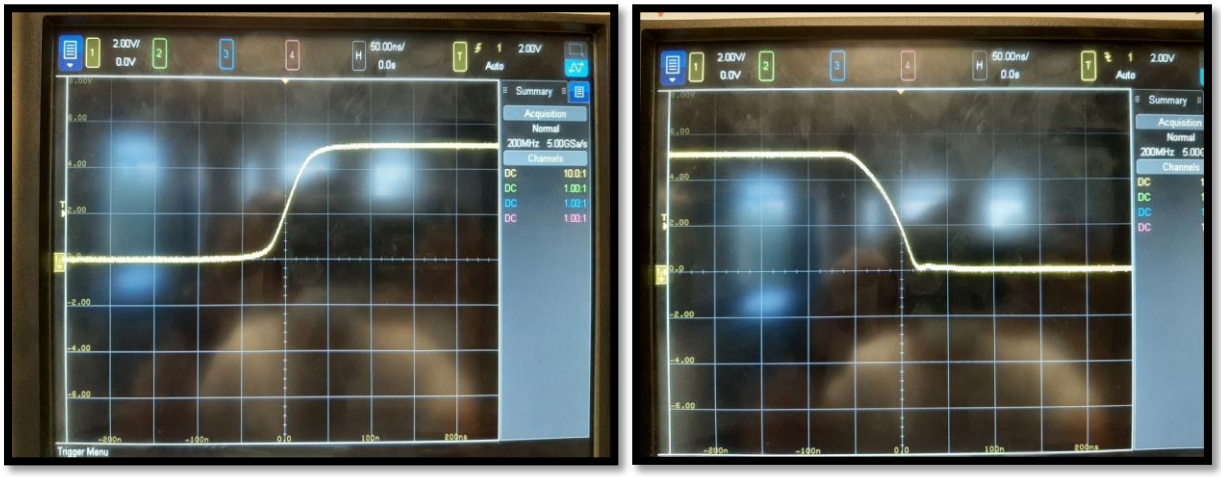


Figures of Merit

- ✓ Peak to peak voltage- 4.5 volts
- ✓ Frequency- 530.4 Hz
- ✓ Duty Cycle- 65.83%
- ✓ Rise Time- 115.620 ns (without load), 113.280 ns (with load)
- ✓ Fall time- 39.060 ns (without load), 38.280 ns (with load)

With respect to the datasheet the rising and falling time for NE555 timer is typically 100ns.

- ✓ **Rise and fall time of 7555 Timer**



Figures of Merit

- ✓ Peak to peak voltage- 5 volts
- ✓ Frequency- 530.4 Hz
- ✓ Duty Cycle- 63.57%
- ✓ Rise Time- 115.620 ns (without load), 113.280 ns (with load)
- ✓ Fall time- 39.060 ns (without load), 38.280 ns (with load)

With respect to the datasheet the rising and falling time for 7555 timer is typically 75ns.

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