Basic Astable 555 Oscillator Circuit.

Mayank Patil, Vidyavardhini's College of Engineering and Technology,

Vasai Road.

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ABSTRACT

In this paper, I am going to Design and Implement a Basic Astable 555 Oscillator Circuit. it's an electronic circuit which is used to implement a variety of simple two-state devices such as relaxation oscillators, timers, and flip-flop. It has various applications such as wave generator, Voltage-frequency converter, pulse synchronization etc.

REFERENCE CIRCUIT DETAILS

- ❖ In this circuit we have used 555 timer IC. Which has inbuilt combination of comparators, transistor and SR flipflop. So initially when the circuit is powered ON, Trigger pin voltage is below Vcc/3, that turns on the lower comparator and it gives the output as HIGH which further makes the output of 555chip is also HIGH.
- ❖ When voltage reaches above Vcc/3 then lower comparator output becomes LOW, but the 555 output still remains HIGH
- ❖ Now when capacitor charging gets to voltage more than 2/3Vcc, then the voltage of non-inverting end (Threshold PIN 6) becomes higher, and output of 555chip gets LOW
- ❖ Then capacitor C1 starts discharging to the ground through the discharge PIN 7 & Register R2.
- ❖ While discharging, when capacitor voltage gets down below Vcc/3, 555's output again gets HIGH.
- ❖ This charging and discharging of capacitor continuous and rectangular waveform is generated. When the capacitor is charged it makes IC's output HIGH and when capacitor is discharging, IC's output becomes LOW. So this mode is called Astable Mode, because the state of 555 timer IC interchanges its state from HIGH to LOW and LOW to HIGH automatically, So it is called free running Multivibrator.
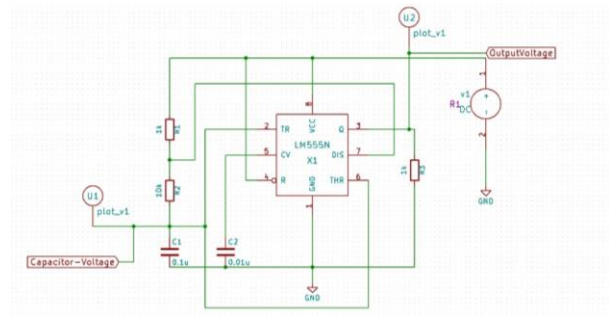
1. REFERENCE CIRCUIT

Fig.1 Reference circuit diagram.
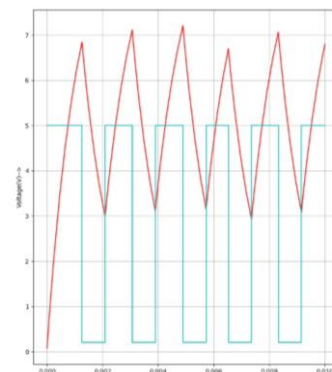
2. REFERENCE CIRCUIT WAVEFORM

Fig.2 Reference waveforms.

3. REFERENCE

1) Multivibrator in IEEE Std. 100 Dictionary of Standards Terms 7th ed., IEEE Press, 2000 ISBN 0-7381-2601-2 .
2) https://www.electronicstutorials.ws/waveforms/555_oscillator.html