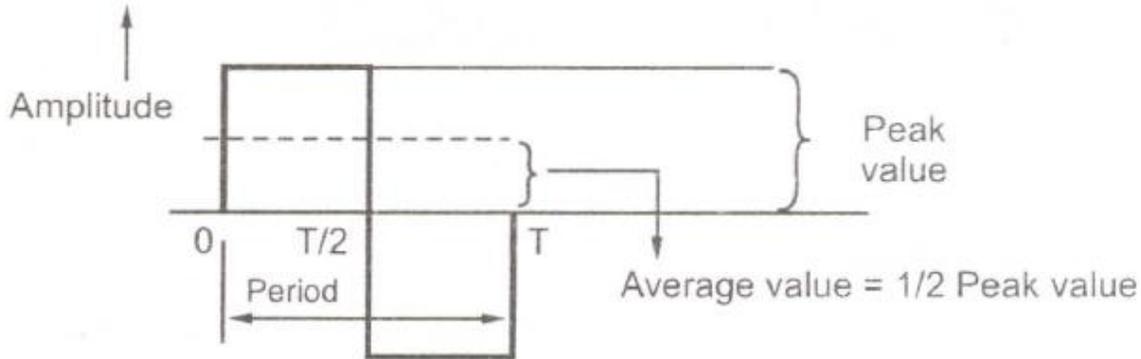


SQUARE WAVE AND PULSE GENERATOR

The square wave generator and pulse generator are generally used as measuring devices in combination with the oscilloscope. The basic difference between square wave generator and pulse generator is in the duty cycle. The duty cycle is defined as the ratio of average value of a pulse over one cycle to the peak value. It is also defined as ratio of the pulse width to the period of one cycle.

$$\text{Duty cycle} = \frac{\text{Pulse width}}{\text{Pulse period}}$$



The average value is half of peak value. Both the average value and peak value are inversely proportional to time duration. The average value of a pulse is given as,

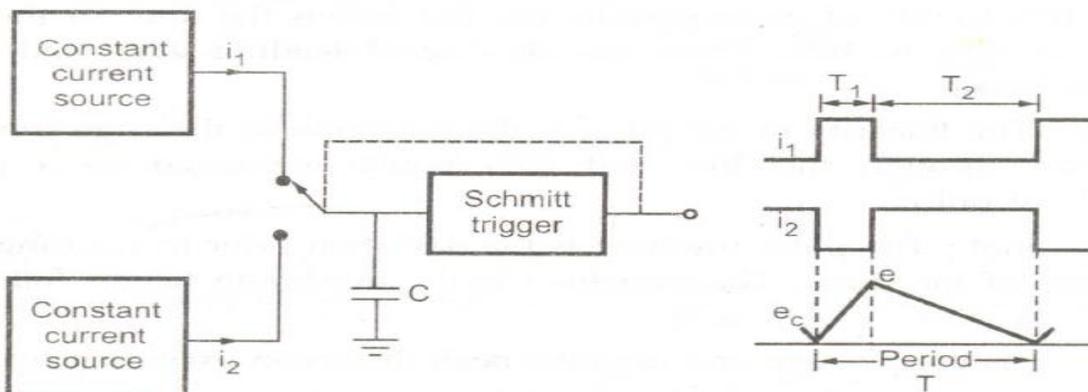
1

Average value = 1/2 Peak value

Duty cycle of square wave = 0.5

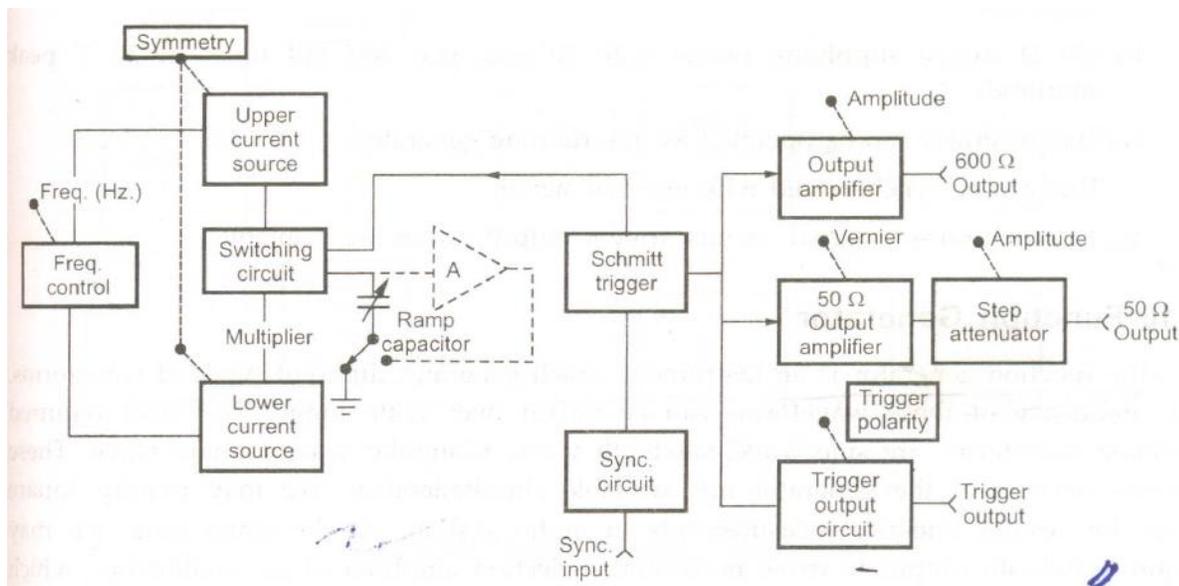
Thus square wave generator produces an output voltage with equal ON and OFF periods as duty cycle is 0.5 or 50% as the frequency of oscillation is varied. Then we can state that irrespective of the frequency of operation, the positive and negative half cycles extend over half of the total period

Laboratory type square wave and pulse generator:



The circuit consists of two current sources, a ramp capacitor, and Schmitt trigger circuit as well as current source circuit. The two current sources provide a constant current to a ramp capacitor for charging and discharging. The ratio of these charging and discharging current is determined by setting of symmetry control. The symmetry control determines duty cycle of output waveform. In the current source, an appropriate control voltage is applied to current control transistors which controls the frequency i.e. sum of two currents. The multiplier switch provides decade switching control output frequency. While frequency dial provides continuous vernier control of output frequency.

The block diagram of laboratory type square wave and pulse generator is as shown in fig:



Source : <http://elearningatria.files.wordpress.com/2013/10/ece-iii-electronic-instrumentation-10it35-notes.pdf>