In the recent electronics, integrated circuits have been designed using Complementary Metal Oxide Semiconductor (CMOS). With the improvement of Integrated Circuit (IC) technologies and communication systems, microprocessors are mainly operating at several gigahertz frequencies with low power, small chip area and an agreeable cost. Present time’s demand communication craving, requiring faster and more dependable ways to give an information flow. Oscillator circuits are used in many electronic circuits. Voltage Controlled Oscillator finds uses in different sectors namely as telecommunication department, cellular systems, digital data processors and power efficient circuits. Certain process parameters should be taken care of while designing an oscillator. With the use of oscillator in both analog and digital field, trade-off between parameters should be adhered to while modelling any circuit. With the scaling of transistor size, power consumption in the circuit is the main reason for concern for efficient performance of the circuit designed. It easily designs a fluctuating output signal according to the similar pulsation of the input signal.

Modification in the circuit with techniques like FinFET, MTCMOS, SVL and AVL has not only enhanced the performance of the circuit but reduced the leakage power, leakage current in the circuit design too. By applying leakage reduction techniques in the VCO circuit, efficiency in the circuit has increased with faster speed and lower noise. With the proposed design of the VCO circuit, better oscillation frequency is also being observed.

In nanometer, approved CMOS based circuit may not be utilized because of power consumption and leakage parameter. Another novel Voltage Controlled Oscillator (VCO) utilizing FinFET with another methodology is exhibited. Field-Effect Transistors (FinFET) are a new summarize of MOSFET which are made on a SOI base. The body of the transistor is etch into "fin" such as structure which is wrapped by the gate of transistor on both the sides where the broadness of the fin is measured in the path from source to drain characterizing the useful channel length tool. The twice gate MOSFET is a prominent decision, since this structure is adaptable and the short
channel effect can be covered up for a given alike gate oxide thickness. The Voltage Controlled Oscillator (VCO) is the basic component of Phase Locked Loop (PLL) oscillation frequency creation, which is generally utilized as a part of modern electronic information processing method. To work at higher frequency, low power dissipation and reduced leakage current. A study on design of FinFET based Voltage Controlled Oscillator (VCO) has been conducted to work at. The circuit is designed and simulated by using cadence virtuoso tool at 45nm.