Quantum Dot Cellular Automata (QCA) is a rising innovation which seems to be a good competitor for the next generation of digital systems and widely utilized as a part of advanced frameworks. It is an appealing substitute to ordinary CMOS innovation because of diminutive size, faster speed, extremely scalable feature, ultralow power consumption and better switching frequency. The realization of quantum computation is not possible without reversible logic.

Reversible logic has enlarged operations in quantum computation. Generally reversible computing is executed when system composes of reversible gates. It has numerous fields of use as applied science, quantum dot cellular automata as well as low power VLSI circuits, low power CMOS, digital signal processing, computer graphics. In this paper, the quantum implementation of primitive reversible gate has been presented. The proposed gates have been designed and simulated using QCADesigner.

**Index Terms**

Computer Science  

Circuits and Systems
Keywords

Quantum-dot Cellular Automata (QCA), Reversible logic, Reversible gates, QCA Designer