Design and Verification of Reversible Logic Gates using Quantum Dot Cellular Automata

Abstract

This paper portrays the designing of Reversible Logic gates through the use of Quantum Dot Cellular Automata (QCA) which is a nanotechnology concept and also a striking substitute for transistor based technologies. This technology helps us to rise above the confines of CMOS technology. It also gives better results in terms of digital and analog waveform, Quantum cost, garbage output. The fundamental logic in QCA is the logic state that does not compute with voltage level; rather it measures the polarity of electrons in a quantum cell. Basically Reversible logic gates are an essential building block of various computing system. Comparing with standard gates, the reversible logic gate lower the information bits use loss by reusing the logic information bits logically and realizes the goal of lowering power consumption of logic circuits. A QCA designer tool is used for simulation of different kinds of Reversible logic gates such as Toffoli gate, Fredkin gate and some others.

References


Index Terms

Computer Science
Circuits And Systems

Keywords

QCA  Reversible gates  Majority gate  clock  NANO-Technology