Abstract

In this paper, the different types of logical structure based on Quantum dot Cellular Automata (QCA) design are discussed. The QCA offers a new transistorless computing paradigm in nanotechnology. It has the potential for attractive features such as faster speed, smaller size and low power consumption than transistor based technology. By taking the advantages of QCA we are able to design interesting computational architecture. The basic logic elements used in this technology are the inverter and the majority gate. The other logical structures are designed using the basic elements. Here, we have designed the logical structures using 2cells inverter instead of 7cells inverter. By applying this method, the hardware requirements for a QCA design can be reduced. These structures are designed and simulated using QCADesigner. The QCA designer is a design and simulation tool for quantum dot cellular automata. The standard functions and the simplified majority expressions corresponding to these standard functions are also presented.

Reference


Index Terms

Electronics

Nanotechnology
Key words

QCA
QCADesigner
Majority gate.