Abstract

Quantum dot Cellular Automata (QCA) is an emerging digital logic representation techniques and one of the possible alternatives to Complementary Metal–Oxide–Semiconductor (CMOS) technology. It satisfies attractive circuit components of smaller size and low power dissipation of new circuit design technologies. Quantum dots are nano architecture and it works based on columbic interaction between two electrons. This paper presents Universal Reversible Gate based on QCA logic gates. For simulating and verifying the proposed gate QCA Designer a familiar simulation and verification tools has been employed. Correctness of the proposed circuit revealed by the simulated output. This paper also presents the VHDL Code of this circuit.

References

Digital logic gate using quantum-dot cellular automata. science, 284(5412), 289-291.
phenomenon of quantum-dot cellular automata. Journal of Zhejiang University Science A, 6(10),
1090-1094.
design of multi-function reversible logic gate. Communications in Information Science and
Management Engineering.
9. Bahar, A. N., Waheed, S., Uddin, M. A., & Habib, M. A. Double Feynman Gate (F2G) in
reversible logic gate in Quantum-dot Cellular Automata (QCA). In Electrical Engineering and
Information & Communication Technology (ICEEICT), 2014 International Conference on (pp.
1-6). IEEE.
Multiply Complements Logic (MCL) Gate using QCA Technology. Global Journal of Researches
In Engineering, 14(4).
PRESENTATION OF PERES GATE (PG) IN QUANTUM-DOT CELLULAR AUTOMATA (QCA).
European Scientific Journal, 10(21).
Fredkin Gate in Quantum-dot Cellular Automata (QCA). Düzce Üniversitesi Bilim ve Teknoloji
Dergisi, 3(1).
design and simulation tool for quantum-dot cellular automata. Nanotechnology, IEEE
Transactions on, 3(1), 26-31.

Index Terms

Computer Science

Circuits and Systems
Keywords

Quantum dot Cellular Automata (QCA), QCA logic gates, Universal Reversible logic Gate (URG) in QCA, Majority Voter (MV) gate.