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## DESIGN OF HIGH PERFORMANCE ARITHMETIC AND LOGIC CIRCUITS USING MULTIPLE VALUED RADIX-4 DIGITS

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## Abstract

Arithmetic operations are widely used and play important roles in various digital systems, such as computers and signal processors. With recent advances of technology of integrated circuits, various high-speed arithmetic circuits with regular structures has been proposed and some of them have been fabricated using VHDL circuits. Hence, with respect to these advancements, an effective algorithm and the corresponding simulated design of Quaternary Signed Digit (QSD) adder through final output equations. These are simulated by solving the truth tables of different stages in VHDL. Quaternary Signed numbers are mapped into the intermediate sum and carry by intermediate sum/carry generator, so that when these numbers are added, it results in carry free addition.

Keywords: Quaternary Signed Digit (QSD), Adder, Carry, Radix-4, VHDL