

TITLE: 4-Bit Versatile ALU for Arithmetic and Logical Operations

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Problem Statement:

We often come across many such components which are common to many digital circuits and are re-used time and again. One such critical component is the **Arithmetic Logic Unit (ALU)**, which is responsible for performing basic operations such as addition, subtraction, multiplication, and comparison. Traditional implementations often require multiple discrete components for each operation, leading to increased hardware complexity, higher power consumption, and inefficient resource utilization.

Furthermore, in educational environments and small-scale applications like eSim-based circuit simulations, there is a lack of modular and easy-to-understand designs that demonstrate the integration of arithmetic and logical functions in a single, compact unit. This creates a gap for learning and implementing such systems effectively.

Journal/Publication Details:

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Reference:

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