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Register-Like Block RAM with Boundary Coverage and Its Applications for High Energy Physics Trigger Systems

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In high energy physics experiment trigger systems, block memories are utilized for various purposes, especially in binned searching algorithms. In these algorithms, the storages are demanded to perform like a large set of registers. The writing and reading operation must be performed in single clock cycle and once an event is processed, the memory must be globally reset. These demands can be fulfilled with registers but the cost of using registers for large memory is unaffordable. Another common requirement is the boundary coverage feature during reading process. When a memory bin is addressed, the stored contents in the addressed bin and its neighboring bin must be output simultaneously. In this paper, a register-like block memory design scheme is described, which allows updating memory locations in single clock cycle, reading two adjacent bins and effectively refreshing entire memory within a single clock. The implementation and test results are presented.

Minioral

Yes

Description

Algo RAM access, address

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