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READ-ONLY MEMORY DIAGNOSIS AND REPAIR

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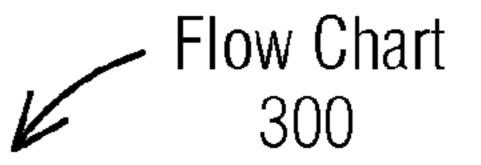
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(57)**ABSTRACT**

A testing circuit configured to test and diagnose a read-only memory comprises two multiple-input signature registers configured to generate two sets of signatures for multiple iterations of reading some or all of words stored in the read-only memory, control circuitry configured to control, according to a test algorithm, from which of the outputs of the read-only memory each of the two multiple-input signature registers receives test response signal bits for each of the reading operations during each of the iterations, and a faulty element location determination device configured to generate a faulty element location signal for the read-only memory based on results of comparing the two sets of signatures with reference signatures.



Performing M=log₂N iterations of reading N elements from a read-only memory, in the Kth iteration, two multiple-input signature register alternatively receive test response signal bits for every 2 K-1 consecutive elements in the N elements

Outputting a first test response signature from the first multiple-input signature register and a second test response signature from the second multiple-input signature register for each of the $M = log_2N$ iterations

Generating a first pass-fail signal and a second pass-fail signal by comparing the first test response signatures with first reference test response signatures and the second test response signatures with second reference test response signatures, respectively

Generating a faulty element location signal for the read-only memory based on values of the first pass-fail signal and the second pass-fail signal for each of the $M = log_2N$ iterations

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