

Method to Detect Internal Defects of CMOS-Microcircuits

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Abstract. For the acquisition of highly reliable equipment it is necessary to allow only those electronic components, which before the installation phase are fully functional and parametric. The testing center is often not able to conduct a full-fledged functional control of the electronic components products, because does not have information about internal blocks of complex functional products and how they interact with each other. The situation is complicated by the fact that the degree of integration and functionality of modern microcircuits is constantly growing. Another problem is the forecasting of further trouble-free operation of the product and the detection of internal hidden defects. At an early stage of operation, the microcircuit can contain insignificant internal hidden defects, the value of which practically does not affect the performance of the microcircuit. However, after a certain amount of time has elapsed as a result of the degradation processes of the product materials, the defect may increase and lead to irreversible failure of the product. Therefore, it is extremely important at the stage of autonomous testing of a product, not as part of equipment, to detect such internal defects. The article explains the need to search for small hidden defects in EEE products, suggests comparison of the most popular diagnostic methods, discusses the problems of using existing methods for diagnosing modern microcircuits, suggests an approach to detecting small internal defects of the microcircuit before the stage of its installation in equipment.

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