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A Survey on Fault Diagnosis of Analog Circuits: Taxonomy and State of the Art

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Abstract: Due to the wide range of applications of electronic circuits in the recent years, the fault diagnosis in electronic circuits is a foremost problem. The main purpose of the fault diagnosis technique is isolating the faults present in the electronic circuits and also, detecting the fault which affects the safety and performance of the system. For various real-time applications of fault diagnosis, literature presents several techniques for detecting the faults in electronic circuits. In this paper, reviews on the research based on the fault diagnosis techniques which are all gained much attention are comprehended. Accordingly, 114 research papers related to the fault diagnosis are reviewed and analyzed based on the various objectives. In this review, we present the taxonomy of the fault detection in analog circuits and discuss the state of the art algorithms with various advantages and major drawbacks. The comprehensive analysis is carried out on finding the coverage of the publishers, faults, circuits, methods, simulation tools, and metrics. This critical review finally discusses the research challenges that are still available in the existing techniques and the way to extend the current research is also examined.

Keywords: Analog circuit, catastrophic fault, fault diagnosis, fault dictionary, machine learning, parametric fault.

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