Remote Fault Diagnosis for Testing Digital Circuits through Internet of Things in Industrial Applications

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Abstract

In this paper, the new remote edge fault diagnosis method for testing digital circuits is presented. The proposed test system generates the target test patterns to the circuit under test (CUT), receives test responses from the CUT for signature compaction generation, and carries out the edge fault diagnosis algorithm through the Internet of Things (IoT) between the main repair workshop and the small repair workshop. The edge fault location enables to locate faults in all edges of the printed circuit board (PCB) to the edge level not the nodal level. In addition, the merge between the edge fault diagnosis and the IoT enables to integrate the huge testing capabilities of the main repair workshop to the small repair workshop. This method consists of three main phases; fault detection phase, fault location phase, and remote testing using the IoT phase. It is applied to test some digital circuits and compared with the previously published related testing methods. The experimental results show that this method is effective in terms of fault coverage, the portability, hardware overhead, and remote testing.

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