Abstract

Testing of analog and mixed signal circuit has often given bottleneck in the system design. Studies based on the simulation results have been presented by many authors. In this study an intelligent virtual instrument system design for the diagnosis of parametric faults in mixed signal analog circuit is presented. A benchmark R2R digital to analog converter mixed signal circuit is used for fault diagnosis in the study. The impact of circuit component parameter variations on the behavior of a circuit is analyzed by Monte-Carlo analysis. The optimum numbers of test patterns required for fault diagnosis are decided by sensitivity analysis. Finally the fuzzy logic is used for the classification of the faults. Along with fault classification, fuzzy classifier also gives the estimated value of the component faults. The virtual instrument not only displays the diagnosis result but acts as a standalone diagnosis system. The experimental results of the fault diagnosis are presented by both simulated data and the real time data.

References


Index Terms

Computer Science  Electronics

Keywords

Mixed signal circuit  Sensitivity analysis  Monte-Carlo analysis  fuzzy logic  Virtual instrument