

THE PROBLEM OF A FAULT-TOLERANT SELF-TIMED CIRCUIT ANALYSIS ON SEMI-MODULARITY AND ENERGY-RELIABILITY

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Self-timed devices (speed-independent devices) often apply for the post in a high-reliable computing system; however, questions of fault-tolerant designing of self-timed circuits were researched poorly. We started with the implementation of existed techniques of fault-tolerant designing for the fault-tolerant self-timed device. After that we develop some new techniques with using of redundant bases, these techniques can greatly increase reliability of key-units such as indicators etc. Design results analysis shows that traditional fault-tolerant designing techniques does not allow achieving the demanded technical parameters of a device. Thus, one of the actual task for researches is development of fault-tolerant designing techniques that will be efficiently use the advantages of self-timed circuits. The problem of fault-tolerant device analysis on self-timed property appears during development of fault-tolerant self-timed designing techniques. This problem is considered in the first part of the paper. Also in the paper, the correlation between scaling of energy-consumption and reliability is analyzed. The index that allows to compare energy-efficiency & reliability is proposed.