

Comparative redundancy, an alternative to triple modular redundant system design.

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Abstract

A new scheme for implementing highly reliable digital systems is proposed. The method has a circuitry overhead which is comparable to that of the triple modular redundancy (TMR) scheme, although it is shown to have a reliability, and more importantly a mean time to failure, improvement well beyond that expected from the standard TMR systems. The reliability and mean time to failure are both developed from a discrete state, continuous time, Markov model of the new system. The results for the reliability and mean time to failure characteristics for this new design of system, termed comparative redundancy, are compared to both TMR and a single unit.



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