

Error Detection with Soft Error Correction

German Patent DE 102006 027 448

(Schaltungsanordnung)

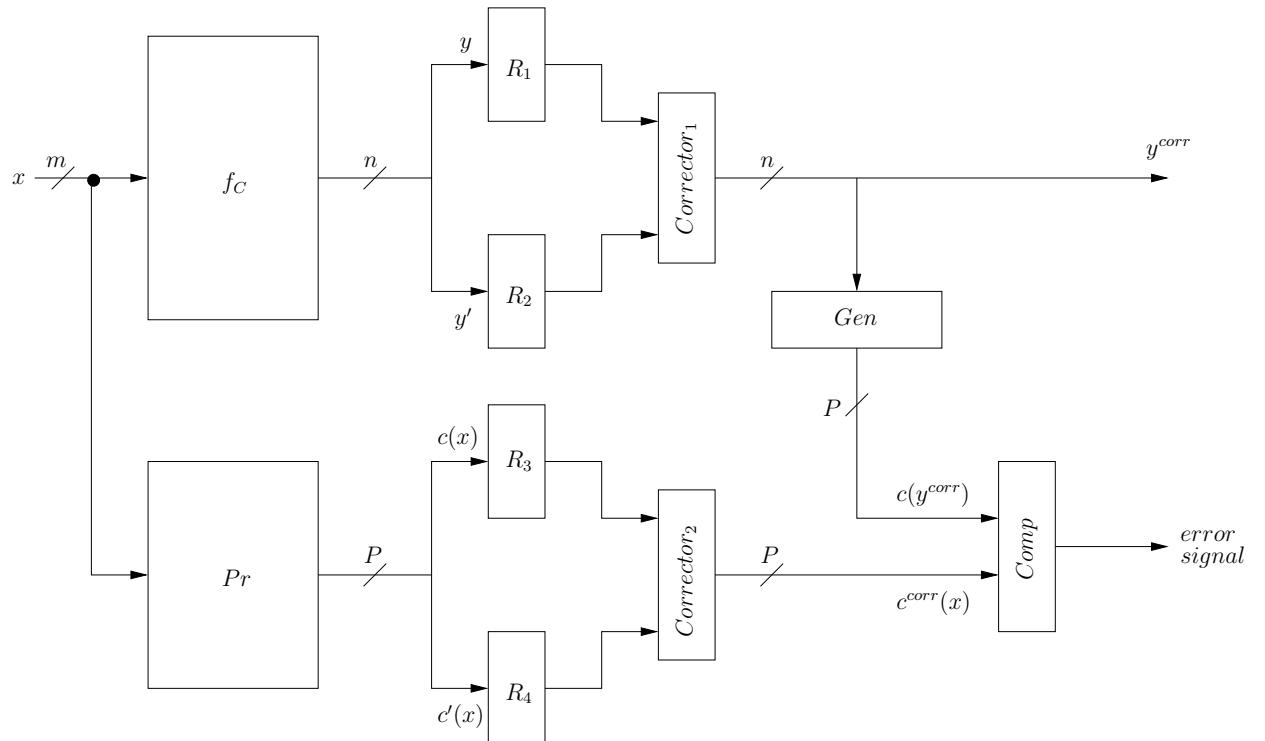


Fig. 1. Error correction combined with error detection for a systematic block code

I. SHORT DESCRIPTION

In this German Patent it is demonstrated, how error correction of soft errors, which are directly induced by radiation in the memory elements, and error detection by use of systematic codes for the errors caused by transient faults in the combinational parts of the circuit can be combined.

The number of soft errors generated directly in the latches is about 20-40 times higher than the number of errors in the latches caused by transient faults in the combinational parts of the circuit.

Since the soft errors directly generated in the memory elements are so frequent in the evolving nano-technology of the near future, the applicability of traditional error detection methods will be limited. The resulting frequent error indications and the associated numerous interruptions of normal operation for frequent restarts of the system are intolerable for many applications.

The memory elements, and not the circuit itself, are duplicated and the soft errors directly induced in the memory elements are corrected by use of C-elements.

Errors due to transient faults in the combinational circuit parts are checked by error detecting codes.

The correction logic is included in the error detection.

II. PATENT DATA

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