

A New Efficient RNS Reverse Converter For The 4-Moduli Set $\{2^n, 2^{n+1}, 2^{n-1}, 2^{2n+1}-1\}$

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Abstract : In this paper, we propose a new efficient reverse converter for the 4-moduli set $\{2^n, 2^{n+1}, 2^{n-1}, 2^{2n+1}-1\}$ based on a modified Chinese Remainder Theorem and Mixed Radix Conversion. Additionally, the resulting architecture is further reduced to obtain a reverse converter that utilizes only carry save adders, a multiplexer and carry propagate adders. The proposed converter has an area cost of $(12n+2)$ FAs and $(5n+1)$ HAs with a delay of $(9n+6)t_{FA} + t_{MUX}$. When compared with state of the art, our proposal demonstrates to be faster, at the expense of slightly more hardware resources. Further, the Area-Time square metric was computed which indicated that our proposed scheme outperforms the state of the art reverse converter

Keywords : Modified Chinese Remainder Theorem, Mixed Radix Conversion, Reverse Converter, Carry Save Adder, Carry Propagate Adder

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