Abstract

Elliptic Curve Cryptography (ECC) has gained increasing acceptance in the industry, the academic community and the cryptography applications. This interest is mainly due to the high level of security with relatively small keys provided by ECC. In this paper, a high-performance ASIC based ECC key generation processor is proposed. This processor supports generic elliptic curves over GF(2^m) with sizes (m) ranging from 113 to 256 bits. The proposed processor is based on programmable cellular automata. For real time implementation, the processor was simulated using active-HDL and synthesized using Synopsys Design Compiler. Further, the processor is implemented by an ASIC CMOS 120 nm technology. The results on the layouted processor over GF(2^{256}) show a high performance, confirming the efficiency of the processor.
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Index Terms

Computer Science

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Key words

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cellular automata

finite fields

ASIC

Montgomery point multiplication algorithm