An Embedded Digital Sensor Against EM and BB Fault Injection

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Abstract

Fault Attacks methods like Electro-Magnetic Pulse Injection or Body Biasing Injection have recently been demonstrated to be efficient against smartcards and Systems on Chip. As of now, security is a main constraint in product development, even for low-cost products riding the trend of the IoT (most of these devices operate in hostile environments). Unfortunately, the implementation of hardware countermeasures has a cost in silicon area, design time and performance. Therefore, it is important to develop protections while taking into account their costs and easyness of implementation. One way to achieve these ends would be to have an all-in-one fully digital detector whose integration is compliant whith the standard cell design flow. In this perspective, we propose an enhanced sensor to detect several types of attacks by exploiting analog phenomena induced at the gate level, instead of the attack itself. This paper describes the design and the im- plementation into FPGAs of this sensor, as well as experimental tests demonstrating its effectiveness for detecting electro-magnetic and body bias fault injection attempts. The placement of the sensors will also be adressed.