

1. Side-channel analysis-based detection approach of hardware Trojans

Accession number: 20123515381792

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Source title: Huanan Ligong Daxue Xuebao/Journal of South China University of Technology (Natural Science)

Abbreviated source title: Huanan Ligong Daxue Xuebao

Volume: 40

Issue: 6

Issue date: June 2012

Publication year: 2012

Pages: 6-10

Language: Chinese

ISSN: 1000565X

CODEN: HLDKEZ

Document type: Journal article (JA)

Publisher: South China University of Technology, Guangzhou, 510640, China

Abstract: During the fabrication of integrated circuit (IC) chips in untrusted foundries, malicious circuits may be inserted as hardware Trojans, which results in a significant risk of trustworthiness and reliability degradation of the chips. As such Trojan circuits are difficult to detect using conventional strategies, a nondestructive side-channel analysis-based detection approach is proposed, which employs the algorithm of singular value decomposition to analyze and statistically process the transient power of IC chips. Validation results of the approach on FPGA chips show that, even in the presence of big noise and process variation, the proposed approach is effective in detecting the hardware Trojans that are 2 orders of magnitude smaller than the original circuit.

Number of references: 13

Main heading: Hardware

Controlled terms: Degradation - Field programmable gate arrays (FPGA) - Singular value decomposition

Uncontrolled terms: Detection approach - FPGA chips - IC chips - Integrated circuit chips - Non destructive - Orders of magnitude - Process Variation - Reliability degradation - Side-channel - Side-channel analysis - Trojans - Validation results

Classification code: 605 Small Tools and Hardware - 721.3 Computer Circuits - 802.2 Chemical Reactions - 921 Mathematics

DOI: 10.3969/j.issn.1000-565X.2012.06.002

Database: Compendex

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Data Provider: Engineering Village