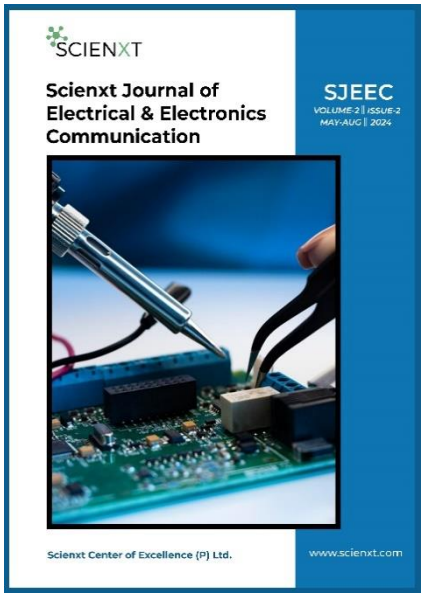

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Contact-less integrity verification of microelectronics ssing near- field EM analysis

[*1]Manu H. M, [2]Yella Ajay Kumar Reddy

[*1]Associate Professor, Department of Electronics and Communication Engineering, Dayananda Sagar Academy of Technology and Management, Bengaluru, Karnataka, India
[2]UG Student, Department of Electronics and Communication Engineering, Dayananda Sagar Academy of Technology and Management, Bengaluru, Karnataka, India

[*]*Corresponding Author: Manu H. M*
Email: ajayreddy15.y@gmail.com

Abstract:

The development of a contact-less integrity verification system for microelectronics using near- field electromagnetic (EM) analysis. The system is designed to insert digital signatures into hardware or software targets and then detect them without physical contact. The system consists of two main components: a transmitter and a receiver. The transmitter generates digital signatures using a linear-feedback shift register (LFSR) circuit and emits them as near-field EM signals. The receiver uses a probe and a high-speed oscilloscope to sense the EM signals and detect the digital signatures.

This also includes the protection against EM interference, error correction mechanisms, and experimental results related to the logic utilization, memory usage, and speed of EM signature generation. Additionally, it provides information about the researchers involved in the project, their affiliations, and their research interests.

It's a novel methodology for authenticating hardware and software at different stages of their supply chains. It enables the secure transmission of information from an IC without physical contact and can be applied to various applications such as reading a physical unclonable function (PUF) output signature, authenticating hardware or software cores within embedded systems, and securely transmitting other types of information from an IC.

Keywords:

Near-field electromagnetic emission, hardware integrity verification, FPGA fabric, system on chip, linear-feedback shift register, counterfeit electronics.