

Shield Design and ASIC Integration for Protecting ICs Against Invasive Hardware Attacks

Müştak E. Yalçın

Istanbul Technical University,
Electronics and Communication Engineering Department,
Istanbul, Maslak, TR-34469, Turkey.
e-mail: mustak.yalcin@itu.edu.tr



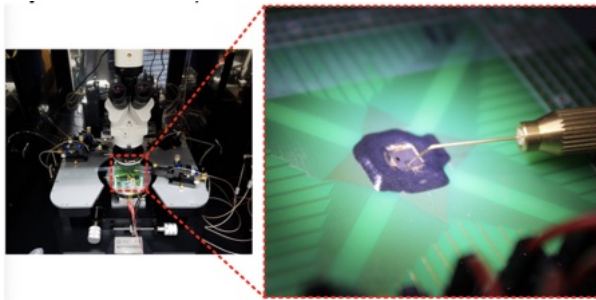
April 6, 2025

Invasive Attacks

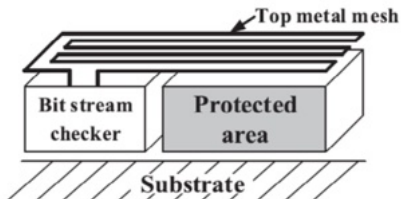


involve physical access to IC components, using advanced tools to extract, manipulate, or disable sensitive data.

Decasuplatation → **Depacking** → Probing Attack



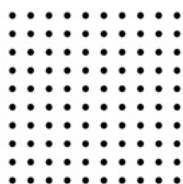
Mun, Yeongjin, and others doi:10.5573/JSTS.2019.19.3.260



- Bit Pattern Generator & Checker
- Shield Structure
 - ▶ Full Coverage,
 - ▶ Complexity,
 - ▶ Connectivity.

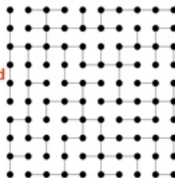
A different shield should be automatically generated for each new fabrication...

Automatic Multi-layer Shield Generation



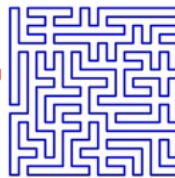
Initial Area

SW_Area2Shield

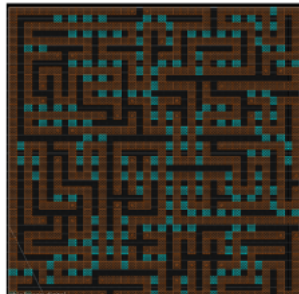
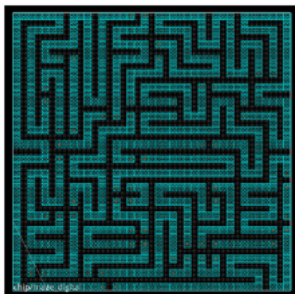


Output of the Shield Algorithm

SW_Checker4Shield

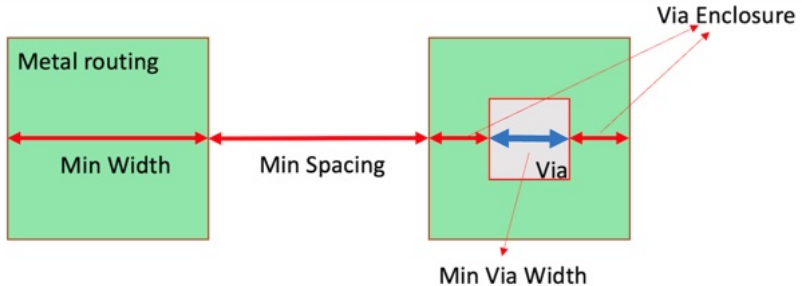


Generated Shield

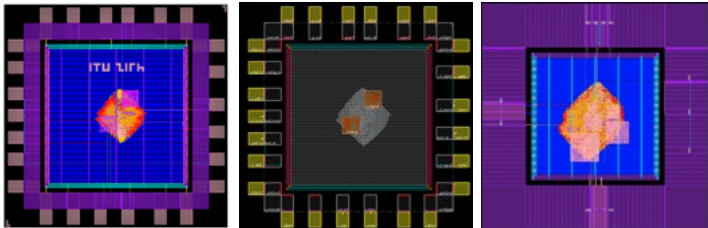


Converting Shield into Layout and Implementation

Generated Shield to LEF(Library Exchange Format) File: [SW_Shield2LEF](#)



Physical layout of the shield on the TSMC 65LP and 65GP: [SW_LEF2GDS](#)



Tapeout with TSMC 65nm

