Fast Parallel Test of SRAM Arrays

AzTE Case # M10-169

**Background**

Static random access memory (SRAM) is used extensively in modern integrated circuits, comprising over 90% of the transistor count in server microprocessors. Over the past couple decades, technology has aggressively scaled down integrated circuit components, quickly entering the nanoscale. At this scale of manufacturing, there is inevitably an increase in fabrication variation leading to increased failure rates. In order to ensure a level of quality performance, testing must be performed on the chips. This is time intensive and expensive, ultimately costing as much as 1/3 of the total production costs.

**Invention Description**

Researchers at Arizona State University have developed a method of parallel testing that could greatly decrease the time and therefore cost of testing SRAM. The technology works by pre-conditioning the cells to one state in parallel, and then applying parallel stress to the cells, in this way stability parameters such as read margins, write margins, and other cell stability parameters can be determined on a massively parallel basis, feasibly increasing the test speed by more than 1,000 times over conventional methods.

**Potential Applications**

This technology applies to any company that manufactures SRAM which is used in products such as:

- Personal Computers
- Routers
- Digital Cameras
- Cell Phones
- Other Handheld Electronic Devices

**Benefits and Advantages**

- Drastically decrease test time in turn increasing production
- Decrease testing costs by up to 50%
- Potentially over 1,000 times faster than conventional testing methods

**Inventors**

**Dr. Lawrence T. Clark**  
Associate Professor  
School of Electrical Engineering

**Dr. Yu Cao**  
Associate Professor  
School of Electrical Engineering

**Intellectual Property Status:** Patent Pending

**Contact**

**Bill Loux**  
Director of Business Development  
Arizona Technology Enterprises, LLC (AzTE)

480.884.1996 main  
480.884.1992 desk  
Email: bloux@azte.com