

SJ BIST™ for Mission Critical Electronics

Breakthrough in Solder Joint Intermittent Fault Detection

Preventing Impending FPGA Failures

Intermittent and catastrophic faults in electronic control systems can now be prevented with Ridgetop Group's SJ BIST™. The SJ BIST (Solder Joint Built-In Self-Test) technology accurately detects and reports instances of high resistance, including intermittent opens, in Field Programmable Gate Arrays (FPGAs).

Solder joints are subject to mechanical failure; they inevitably suffer damage from thermal and vibrational stresses, causing troublesome intermittent connections between components on the boards. The ability to measure, detect, and predict solder aging and the resultant failure of electronic modules is a true advancement in electronics reliability.

Unique In-Situ Testing in Operating Circuits

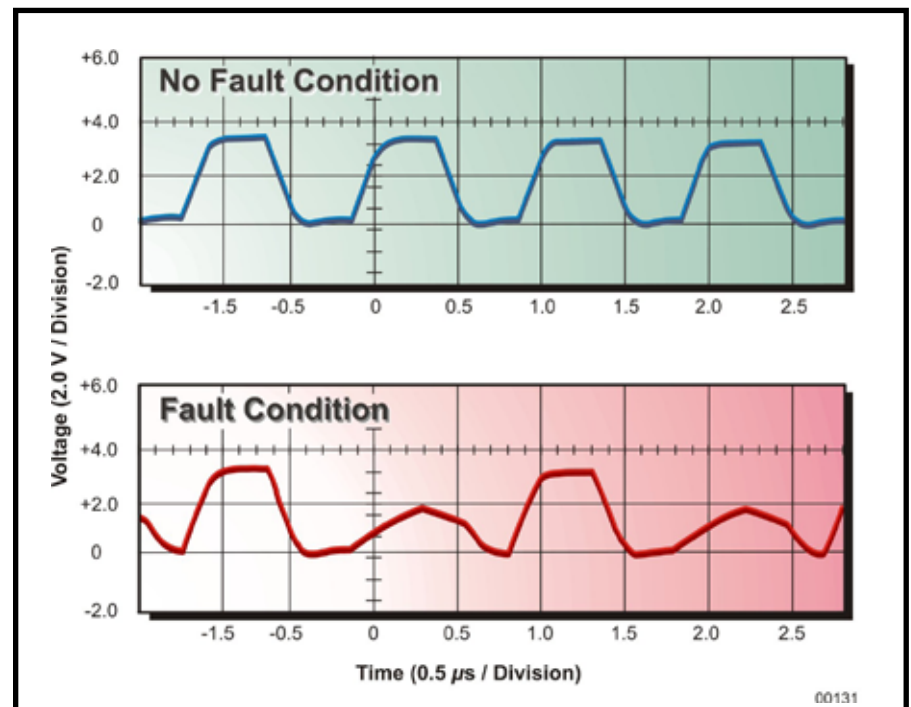
Before SJ BIST, the only way to check programmed FPGAs for faults was to take them offline for testing and x-rays. These methods raise maintenance costs and often result in "no trouble found" or "could not duplicate" diagnoses. SJ BIST is installed in your operating components, and predicts when a component is likely to fail — with zero false alarms.

Features & Benefits

- Detects damage prior to catastrophic failure of FPGA
- Independently tested and verified
- Works with new processes and equipment
- Endorsed by leading automotive and aerospace customers

CALL NOW TO SEE HOW WE CAN SAVE YOU TIME AND MONEY.

1.520.742.3300



No Fault and Fault Conditions in SJ BIST Two-Port Test. Fault Shows 150 Ω Resistance at 1 MHz

Features and Benefits

Benefits

Customized Built-In Self-Test Solutions

Starting with predesigned Intellectual Property (IP) blocks from the Sentinel Silicon™, InstaBIST™, and InstaCell™ libraries, Ridgetop customizes built-in self-testing to particular customer requirements.

- Services provided by Ridgetop assure successful implementation
- Exceptional opportunities to reduce testing costs and improve product quality

Faults Detected in Operating Microcontroller Applications

SJ BIST replaces offline full functional testing and statistical degradation models with real-time, direct monitoring for FPGAs in the field. Its sensitivity is at least as low as 100 ohms, which compares favorably with a manufacturing reliability standard of 300 ohms.

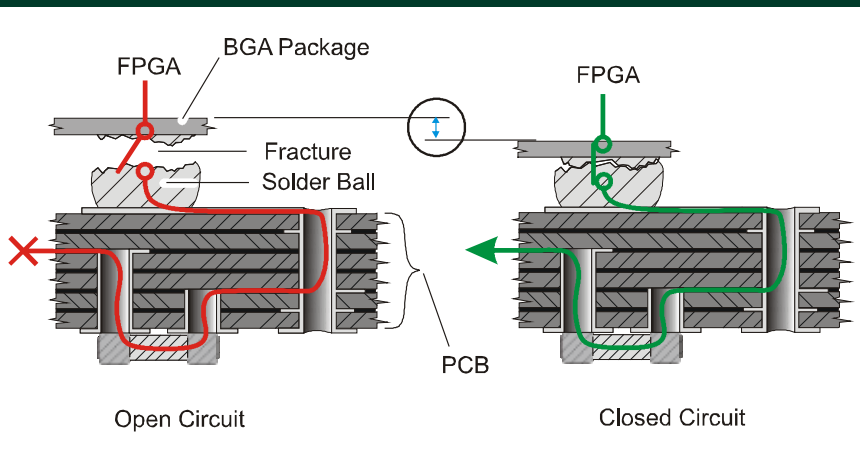
- No downtime for testing
- Great savings in maintenance and inventory costs
- Minimal power requirement — for example, 150 mW to monitor eight pins
- Fast test time

Proven, Definitive Results

SJ BIST has been independently validated on multiple FPGAs and ball grid array (BGA) packages, in multiple applications. It improves fault coverage without significantly increasing the complexity of the system.

- Provided as an IP core, incorporated into existing self-test backbone
- Supports condition-based maintenance
- Detects damage prior to catastrophic failure of FPGA

Intermittent Signal Failures



Intermittent signal failures, shown above, are caused by solder ball fractures that periodically open and shut. Vibration, motion, thermal, and other stresses cause conditions where a solder ball can move enough to open or shut a fracture.

Customer Testimonial

"SJ BIST is the first known direct in-situ measurement that is a true canary for intermittent electrical contact between bumps, PCB, and package."

—German Automotive Firm

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Ridgetop Group products described herein are covered by U.S. patents: 7,239,163 7,196,294 7,271,608 Other patents are pending.

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